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AIX Commands Reference Vol.6
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Software

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CEDOC
34 Rue du Nid de Pie – BP 428
49004 ANGERS CEDEX 01
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Trademarks and Acknowledgements

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Commands Reference, Volume 6

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This edition of the *AIX Version 4.3 Commands Reference, Volume 6* applies to the AIX Version 4.3, 3270 Host Connection Program 2.1 and 1.3.3 for AIX, and Distributed SMIT 2.2 for AIX licensed programs, and to all subsequent releases of these products until otherwise indicated in new releases or technical newsletters.

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Trademarks and Acknowledgements

About This Book

This book is Volume 6 of the six−volume *AIX Version 4.3 Commands Reference*, SBOF−1877, which contains reference information on Advanced Interactive Executive (AIX) Operating System commands. It describes the tasks each command performs, how commands can be modified, how they handle input and output, who can run them and provides a master index for all six volumes.

For a quick reference list of commands arranged in functional groups, see Volume 6.

Who Should Use This Book

This book is intended for users of AIX commands.

How to Use This Book

A command is a request to perform an operation or run a program. You use commands to tell the AIX Operating System what task you want it to perform. When commands are entered, they are deciphered by a command interpreter (also known as a shell) and that task is processed.

Some commands can be entered simply by typing one word. It is also possible to combine commands so that the output from one command becomes the input for another command. This is known as pipelining.

Flags further define the actions of commands. A flag is a modifier used with the command name on the command line, usually preceded by a dash.

Commands can also be grouped together and stored in a file. These are known as shell procedures or shell scripts. Instead of executing the commands individually, you execute the file that contains the commands.

Some commands can be constructed using Web−based System Manager applications or the System Management Interface Tool (SMIT).

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Format

Each command may include any of the following sections:

Purpose	A description of the major function of each command.
Syntax	A syntax diagram showing command line options.
Description	A discussion of the command describing in detail its function and use.

Flags	A list of command line flags and associated variables with an explanation of how the flags modify the action of the command.
Parameters	A list of command line parameters and their descriptions.
Subcommands	A list of subcommands (for interactive commands) that explains their use.
Exit Status	A description of the exit values the command returns.
Security	Specifies any permissions needed to run the command.
Examples	Specific examples of how you can use the command.
Files	A list of files used by the command.
Related Information	A list of related commands in this book and related discussions in other books.

Implementation Specifics

To list the installable software package (fileset) of an individual command use the **lslpp** command with the **−w** flag. For example, to list the fileset that owns the **installp** command, enter:

```
lslpp -w /usr/sbin/installp
```

Output similar to the following displays:

```
File                             Fileset                  Type
-----------------------------------------------------------------
/usr/sbin/installp                 bos.rte.install           File
```

To list the fileset that owns all file names that contain `installp`, enter:

```
lslpp -w "*installp*"
```

Output similar to the following displays:

```
File                             Fileset                  Type
-----------------------------------------------------------------
/usr/sbin/installp                 bos.rte.install           File
/usr/clvm/sbin/linstallpv          prpq.clvm                 File
/usr/lpp/bos.sysmgt/nim/methods/c_installp
                                   bos.sysmgt.nim.client     File
```

Syntax Diagrams

AIX command syntax is represented by syntax diagrams and usage statements.

Syntax diagrams are designed to provide information about how to enter the command on the command line. A syntax diagram can tell you:

- Which flags can be entered on the command line
- Which flags must take a parameter
- Which flags have optional parameters
- Default values of flags and parameters, if any
- Which flags can and cannot be entered together
- Which flags and parameters are optional
- When you can repeat flag and parameter sequences.

AIX commands use the following conventions in their syntax diagrams:

- Diagram items that must be entered literally on the command line are in **bold**. These items include the command name, flags, and literal characters.

- Diagram items representing variables that must be replaced by a name are in *italics*. These items include parameters that follow flags and parameters that the command reads, such as *Files* and *Directories*.
- Default values that do not have to be entered are in the normal font on a **bold** path.

The Sample Syntax Diagram illustrates the conventions used in syntax diagrams. Each part of the diagram is labeled. An explanation of the labels follows the diagram.

You interpret the example diagram as follows.

0 PATH LINE	The path line begins the syntax diagram.
1 COMMAND NAME	This item in the diagram is the name of the command you want to invoke. It is in bold, which indicates that it must be entered exactly as it appears in the diagram. In the example diagram, the path branches into two paths after the command name. You can follow either the lower path (discussed in item 2) or the upper path (discussed in item 3).
2 SINGLE CHOICE BOX	If you follow the lower path, you encounter a box with the words *one of* over it. You can choose only one item from this box.
3 DEFAULT LINE	If you follow the upper path, you bypass the single choice box, and enter nothing. The bold line around the box is a default line, which means that you do not have to enter anything from that part of the diagram. Exceptions are usually explained under "Description." One important exception, the blank default line around input and output files, is explained in item 10.
4 REPEAT ARROW	When you follow a path that takes you to a box with an arrow around it, you must choose at least one item from the box. Then you can either follow the arrow back around and continue to choose items from the box, or you can continue along the path. When following an arrow that goes around a box (rather than an arrow that includes several branches in the diagram), do not choose the same item more than once.
5 REQUIRED ITEM	Following the branch with the repeat arrow is a branch with three choices and no default line around them. This means that you must choose one of A, B, or C.
6 GO TO NEXT LINE	If a diagram is too long to fit on one line, this character tells you to go to the next line of the diagram to continue entering your command. Remember, the diagram does not end until you reach the vertical mark.
7 CONTINUE DIAGRAM	This character shows you where to continue with the diagram after it breaks on the previous line.
8 OPTIONAL PARAMETER	If a flag can (but does not have to) take a parameter, the path branches after the flag. If you cannot enter a space between the flag and parameter, you are told in a footnote.
9 DEFAULT VALUE	Often, a command has default values or actions that it will follow if you do not enter a specific item. These default values are indicated in normal font in the default line if they are equivalent to something you could enter on the command line (for example, a flag with a value). If the default is not something you can enter on the command line, it is not indicated in the diagram. **Note:** Default values are included in the diagram for your information. It is not necessary to enter them on the command line.
10 INPUT OR OUTPUT	A command that can read either input files or standard input has an empty

	default line above the file parameter. If the command can write its output to either an output file or to standard output, it is also shown with an empty default line above the output file parameter. If a command can read only from standard input, an input file is not shown in the diagram, and standard input is assumed. If a command writes only to standard output, an output file is not shown in the diagram, and standard output is assumed. When you must supply a file name for input or output, the file parameter is included in the diagram without an empty default line above it.
11 FOOTNOTE	If a command has special requirements or restrictions, a footnote calls attention to these differences.
12 VERTICAL MARK	This ends the syntax diagram.

Running Commands in the Background

If you are going to run a command that takes a long time to process, you can specify that the command run in the background. Background processing is a useful way to run programs that process slowly. To run a command in the background, you use the & (ampersand) operator at the end of the command:

```
Command&
```

Once the process is running in the background, you can continue to work and enter other commands on your system.

At times, you might want to run a command at a specified time or on a specific date. Using the **cron** daemon, you can schedule commands to run automatically. Or, using the **at** and **batch** commands, you can run commands at a later time or when the system load level permits.

Entering Commands

When you work with AIX, you typically enter commands following the shell prompt on the command line. The shell prompt can vary. In the following examples, **$** is the prompt.

To display a list of the contents of your current directory, you would type **ls** and press the Enter key:

```
$ ls
```

When you enter a command and it is running, the operating system does not display the shell prompt. When the command completes its action, the system displays the prompt again. This indicates that you can enter another command.

The general format for entering AIX commands is:

```
Command Flag(s) Parameter
```

The flag alters the way a command works. Many commands have several flags. For example, if you type the **−l** (long) flag following the **ls** command, the system provides additional information about the contents of the current directory. The following example shows how to use the **−l** flag with the **ls** command:

```
$ ls −l
```

A parameter consists of a string of characters that follows a command or a flag. It specifies data, such as the name of a file or directory, or values. In the following example, the directory named **/usr/bin** is a parameter:

```
$ ls −l /usr/bin
```

When entering commands in AIX, it is important to remember the following:

- Commands are usually entered in lowercase.
- Flags are usually prefixed with a − (minus sign).
- More than one command can be typed on the command line if the commands are separated by a `;` (semicolon).
- Long sequences of commands can be continued on the next line by using the \ (backslash). The backslash is placed at the end of the first line. The following example shows the placement of the backslash:

  ```
  $ cat /usr/ust/mydir/mydata > \
  /usr/usts/yourdir/yourdata
  ```

When certain commands are entered, the shell prompt changes. Because some commands are actually programs (such as the **telnet** command), the prompt changes when you are operating within the command. Any command that you issue within a program is known as a subcommand. When you exit the program, the prompt returns to your shell prompt.

AIX can operate with different shells (for example, Bourne, C, or Korn) and the commands that you enter are interpreted by the shell. Therefore, you must know what shell you are using so that you can enter the commands in the correct format.

Stopping Commands

If you enter a command and then decide to stop that command from running, you can halt the command from processing any further. To stop a command from processing, press the Interrupt key sequence (usually Ctrl−C or Alt−Pause). When the process is stopped, your shell prompt returns and you can then enter another command.

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AIX 32−Bit Support for the X/Open UNIX95 Specification

Beginning with AIX Version 4.2, the operating system is designed to support the X/Open UNIX95 Specification for portability of UNIX−based operating systems. Many new interfaces, and some current ones, have been added or enhanced to meet this specification. Beginning with Version 4.2, AIX is even more open and portable for applications.

At the same time, compatibility with previous AIX releases is preserved. This is accomplished by the creation of a new environment variable, which can be used to set the system environment on a per−system, per−user, or per−process basis.

To determine the proper way to develop a UNIX95−portable application, you may need to refer to the X/Open UNIX95 Specification, which can be obtained on a CD−ROM by ordering the printed copy of *AIX Version 4.3 Commands Reference*, order number SBOF−1877, or by ordering *Go Solo: How to Implement and Go Solo with the Single Unix Specification*, order number SR28−5705, a book which includes the X/Open UNIX95 Specification on a CD−ROM.

AIX 32−Bit and 64−Bit Support for the UNIX98 Specification

Beginning with AIX Version 4.3, the operating system is designed to support the X/Open UNIX98 Specification for portability of UNIX−based operating systems. Many new interfaces, and some current ones, have been added or enhanced to meet this specification. Making AIX Version 4.3 even more open and portable for applications.

At the same time, compatibility with previous AIX releases is preserved. This is accomplished by the creation of a new environment variable, which can be used to set the system environment on a per−system, per−user, or per−process basis.

To determine the proper way to develop a UNIX98−portable application, you may need to refer to the X/Open UNIX98 Specification, which can be obtained on a CD−ROM by ordering the printed copy of *AIX Version 4.3 Commands Reference*, order number SBOF−1877, or by ordering *Go Solo: How to Implement and Go Solo with the Single Unix Specification*, order number SR28−5705, a book which includes the X/Open UNIX98 Specification on a CD−ROM.

Related Information

The following books contain information about or related to commands:

- *AIX and Related Products Documentation Overview*, Order Number SC23−2456.
- *AIX Version 4.3 Files Reference,* Order Number SC23−4168.
- *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs,* Order Number SC23−4128.
- *AIX Version 4.3 Problem Solving Guide and Reference*, Order Number SC23−4123.
- *AIX Version 4.3 System Management Guide: Communications and Networks*, Order Number SC23−4127.
- *AIX Version 4.3 System Management Guide: Operating System and Devices*, Order Number SC23−4126.
- *AIX Version 4.3 System User's Guide: Operating System and Devices*, Order Number SC23−4121.
- *AIX Version 4.3 System User's Guide: Communications and Networks*, Order Number SC23−4122.
- *AIX Versions 3.2 and 4 Performance Tuning Guide,* Order Number SC23−2365.
- *AIX Version 4.3 Guide to Printers and Printing*, Order Number SC23−4130.
- *AIX Version 4.3 Kernel Extensions and Device Support Programming Concepts,* Order Number SC23−4125.
- *5080 Graphics System Installation, Operation, and Problem Determination*, Order Number GA23−2063.
- *AIX Version 4.3 Technical Reference: Base Operating System and Extensions Volume 1* Order Number SC23−4159
- *AIX Version 4.3 Technical Reference: Base Operating System and Extensions Volume 2,* Order Number SC23−4160.
- *AIX Version 4.3 Technical Reference: Communications Volume 1*, Order Number SC23−4161.
- *AIX Version 4.3 Technical Reference: Communications Volume 2*, Order Number SC23−4162
- *AIX Version 4.3 Technical Reference: Kernel and Subsystems Volume 1*, Order Number SC23−4163.
- *AIX Version 4.3 Technical Reference: Kernel and Subsystems Volume 2*, Order Number SC23−4164.
- *AIX Version 4 Keyboard Technical Reference,* Order Number SC23−2631.
- *Distributed SMIT 2.2 for AIX: Guide and Reference,* Order Number SC23−2667.
- *3270 Host Connection Program 2.1 and 1.3.3 for AIX: Guide and Reference,* Order Number SC23−2563.

The following books also may be helpful:

- Lamb, Linda. *Learning the vi Editor*. Sebastopol, CA: O'Reilly & Associates, 1990. Order Number SR28−4966.

- Dougherty, Dale. *sed & awk*. Sebastopol, CA: O'Reilly & Associates, 1990. Order Number SR28−4968.
- Hunt, Craig. *TCP/IP Network Administration*. Sebastopol, CA: O'Reilly & Associates, 1992. Order Number SR23−7422.

Ordering Publications

You can order publications from your sales representative or from your point of sale.

To order additional copies of this book, use order number SC23−4120.

To order additional copies of all six volumes of *AIX Version 4.3 Commands Reference*, use Order Number SBOF−1877.

Use *AIX and Related Products Documentation Overview* for information on related publications and how to obtain them.

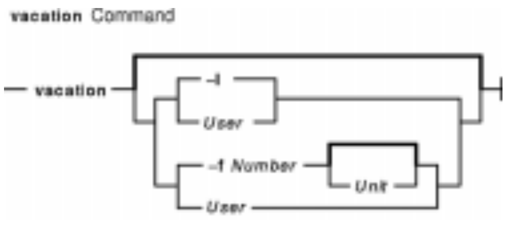
Alphabetical Listing of Commands

vacation Command

Purpose

Returns a message to the sender that the mail recipient is on vacation.

Syntax



vacation [{ **−I** | *User* }] | [{ **−f** *Number* [*Unit*] | *User* }]

Description

The **vacation** command returns a message to the sender of a mail message to notify the sender that the recipient is on vacation. The intended use is in a **$HOME/.forward** file that allows messages to come to you while also sending a message back to the sender.

The **vacation** command expects a **$HOME/.vacation.msg** file containing a message to be sent back to each sender. If this file does not exist, the **vacation** command looks for **/usr/share/lib/vacation.def**, a systemwide default vacation message file. It should be an entire message, including any desired headers, such as `From` or `Subject`. By default, this message is sent only once a week to each person who sends mail to you. Use the **−f** flag to change the frequency intervals at which the message is sent. The names of the people who send messages are kept in the files **$HOME/.vacation.pag** and **$HOME/.vacation.dir**. These files are created when the **vacation** command is initialized for your user ID using the **−I** (uppercase i) flag.

If the **−I** flag is not specified, the **vacation** command reads the first line from the standard input for a `From` line to determine the sender. If no text is available from standard input, the command returns an error message. All properly formatted incoming mail should have a `From` line. No message is sent if the `From` header line indicates that the message is from `Postmaster`, MAILER−DAEMON, or if the initial `From` line includes the string`−REQUEST@` or if a `Precedence: bulk` or `Precedence: junk` line is included in the header.

Flags

−I	Initializes the **$HOME/.vacation.pag** and **$HOME/.vacation.dir** files. Execute the **vacation** command using this flag before you modify your **$HOME/.forward** file.
−f*Number* **[***Unit* **]**	Specifies the frequency interval which at the vacation message is sent. The *Number* parameter is an integer value and the *Unit* parameter specifies a time unit. The *Unit* parameter can be one of the following:

s	Seconds
m	Minutes
h	Hours

d
: Days

w
: Weeks

Note: The **−f** flag cannot be used with the **−I** flag.

Examples

1. Before you use the **vacation** command to return a message to the sender saying that you are on vacation, you must initialize the **$HOME/.vacation.pag** and **$HOME/.vacation.dir** files. To initialize these files, enter:
   ```
   vacation −I
   ```
2. Modify the **.forward** file. For example, Mark enters the following statement in the **.forward** file:
   ```
   mark,|"/usr/bin/vacation mark"
   ```
   The sender receives the message that is in the **$HOME/.vacation.msg** file, or if the file does not exist, the default message found in the **/usr/share/lib/vacation.def** file. If neither of these files exist, no automatic replies are sent to the sender of the mail message and no error message is generated. If either of these files exist, the sender receives one vacation message from `mark` per week, regardless of how many messages are sent to `mark` from the sender.
3. If the following entry is contained in your **.forward** file,
   ```
   mark, |"/usr/bin/vacation −f10d mark"
   ```
   The sender receives one vacation message from `mark` every ten days, regardless of how many messages are sent to `mark` from the sender.
4. To create a vacation message that is different from the default vacation message, create the file **$HOME/.vacation.msg** and add your message to this file. The following is an example of a vacation message:
   ```
   From: mark@odin.valhalla (Mark Smith)
   Subject: I am on vacation.
   Delivered−By−The−Graces−Of: the Vacation program
   I am on vacation until October 1. If you have something urgent,
   please contact Jim Terry <terry@zeus.valhalla>.
      −−mark
   ```
5. To cancel the vacation message, remove the **.forward** file, **.vacation.dir** file, **.vacation.pag** file, and **.vacation.msg** file from your **$HOME** (login) directory:
   ```
   rm .forward .vacation.dir .vacation.pag .vacation.msg
   ```

Files

$HOME/.forward	Contains the names of people who you want your mail to be forwarded to.
/usr/share/lib/vacation.def	Contains the systemwide default **vacation** message.
$HOME/.vacation.dir	Contains the names of people who have sent mail to you while the **vacation** command was being used.
$HOME/.vacation.msg	Contains your personalized **vacation** message.
$HOME/.vacation.pag	Contains the names of people who have sent mail to you while the **vacation** command was being used.
/usr/bin/vacation	Contains the **vacation** command.

Related Information

The **mail** command, **sendmail** command.

The **.forward** file.

Mail Overview and Forwarding Mail, Sending a Vacation Message Notice in *AIX Version 4.3 System User's Guide: Communications and Networks*.

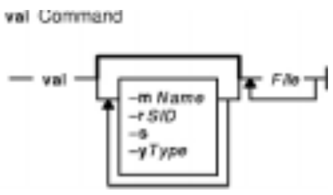
Understanding Directories in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

val Command (SCCS)

Purpose

Validates SCCS files.

Syntax



val [**−s**] [**−r***SID*] [**−m***Name*] [**−y***Type*] *File* ...

Description

The **val** command reads the specified file to determine if it is a Source Code Control System (SCCS) file meeting the characteristics specified by the accompanying flags. If you specify a **−** (minus) for the *File* value, the **val** program reads standard input and interprets each line of standard input as **val** flags and the name of an SCCS file. An end−of−file character terminates input.

The **val** command displays messages to standard output for each file processed.

Flags

Each flag or group of flags applies independently to each named file. The flags can appear in any order.

−m*Name*	Compares the *Name* value with the SCCS **31** identification keyword in the specified file. For identification keyword information, see the **get** command.
−r *SID*	Specifies the SID of the file to be validated. The SID must be valid and unambiguous.
−s	Suppresses the error message normally written to standard output.
−y*Type*	Specifies a type to compare with the SCCS identification keyword in the specified file.

Exit Status

The **val** command returns 0 if successful for all files; otherwise, it returns an 8−bit code that is a disjunction of the possible errors. It is interpreted as a bit string in which set bits (from left to right) are interpreted as follows:

0x80	Missing file argument.
0x40	Unknown or duplicate option.
0x20	Corrupted SCCS file.
0x10	Cannot open file or file not SCCS.
0x08	SID is invalid or ambiguous.
0x04	SID does not exist.
0x02	, y mismatch.

0x01 31, m mismatch.

> **Note:** The **val** command can process two or more files on a given command line and can process multiple command lines (when reading standard input). In these cases, an aggregate code is returned; a logical OR of the codes generated for each command line and file processes.

Example

To determine if file `s.test.c` is an SCCS text file, enter:

```
val −ytext s.test.c
```

Related Information

List of SCCS Commands in *AIX General Programming Concepts: Writing and Debugging Programs*.

The **admin** command, **delta** command, **get** command, **prs** command.

The **sccsfile** file format.

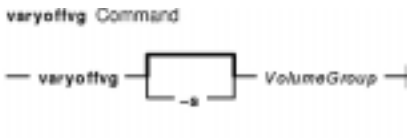
Source Code Control System (SCCS) Overview in *AIX General Programming Concepts: Writing and Debugging Programs*.

varyoffvg Command

Purpose

Deactivates a volume group.

Syntax



varyoffvg [**−s**] *VolumeGroup*

Description

The **varyoffvg** command deactivates the volume group specified by the *VolumeGroup* parameter along with its associated logical volumes. The logical volumes first must be closed. For example, if the logical volume contains a file system, it must be unmounted.

To activate the volume group, use the **varyonvg** command.

> **Note:** To use this command, you must either have root user authority or be a member of the **system** group.

You can use the System Management Interface Tool (SMIT) to run this command. To use SMIT, enter:

```
smit varyoffvg
```

> **Note:** A volume group that has a paging space volume on it cannot be varied off while the paging space is active. Before deactivating a volume group with an active paging space volume, ensure that the paging space is not activated automatically at system initialization, and then reboot the system.

Flag

−s Puts the volume group into System Management mode, so that only logical volume commands can be used on the volume group. In this mode, no logical volume can be opened or accessed by users.

Examples

1. To deactivate volume group `vg03`, enter:
   ```
   varyoffvg vg03
   ```
2. To deactivate volume group `vg02,` but allow logical volume commands to continue to take effect, enter:
   ```
   varyoffvg −s vg02
   ```

Logical volumes within the volume group cannot be opened, but logical volume commands continue to take effect.

File

/usr/sbin/varyoffvg Contains the **varyoffvg** command.

Related Information

The **exportvg** command, **mount** command, **umount** command, **varyonvg** command.

The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the structure, main menus, and tasks that are done with SMIT.

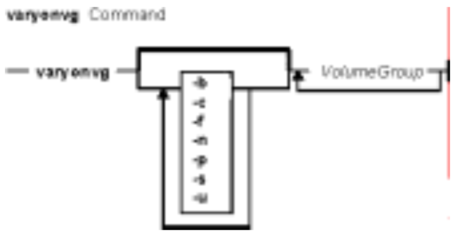
The Logical Volume Storage Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the Logical Volume Manager, physical volumes, logical volumes, volume groups, organization, ensuring data integrity, and allocation characteristics.

varyonvg Command

Purpose

Activates a volume group.

Syntax



varyonvg [**−b**] [**−c**] [**−f**] [**−n**] [**−p**] [**−s**] [**−u**] *VolumeGroup*

Description

The **varyonvg** command activates the volume group specified by the *VolumeGroup* parameter and all associated logical volumes. A volume group that is activated is available for use. When a volume group is activated, physical partitions are synchronized if they are not current.

A list of all physical volumes with their status is displayed to standard output whenever there is some discrepancy between the Device Configuration Database and the information stored in the Logical Volume Manager. The volume group may or may not be varied on. You must carefully examine the list and take proper action depending on each reported status to preserve your system integrity. A list of every status and its meanings can be found in the **lvm_varyonvg** subroutine.

While varying on in concurrent mode, if the varyon process detects that there are logical volumes which are not previously known to the system, their definitions are imported. The permissions and ownership of the new device special files are duplicated to those of the volume group special file. If you have changed the permissions and/or ownership of the device special files of the logical volume on the node it was created, you will need to perform the same changes on this node.

If the *volume group* cannot be varied on due to a loss of the majority of physical volumes, a list of all physical volumes with their status is displayed. To varyon the *volume group* in this situation, you will need to use the force option.

The **varyonvg** will fail to varyon the volume group if a majority of the physical volumes are not accessible (no Quorum). This condition is true even if the quorum checking is disabled. Disabling the quorum checking will only ensure that the volume group stays varied on even in the case of loss of quorum.

The *volume group* will not varyon if there are any physical volumes in `PV_MISSING` state and the quorum checking is disabled. This condition is true even if there are a quorum of disks available. To varyon on in this situation either use the force option or set an environment variable `MISSINGPV_VARYON` to TRUE (set this value in **/etc/environment** if the volume group needs to be varied with missing disks at the boot time).

In the above cases (using force varyon option and using `MISSINGPV_VARYON` variable), you take full responsibility for the *volume group* integrity.

Note: To use this command, you must either have root user authority or be a member of the **system** group.

You can use the System Management Interface Tool (SMIT) to run this command. To use SMIT, enter:

```
smit varyonvg
```

Flags

−b Breaks disk reservations on disks locked as a result of a normal **varyonvg** command. Use this flag on a volume group that is already varied on. This flag only applies to AIX Version 4.2 or later.

Note: This flag unlocks all disks in a given volume group.

−c Varies the volume group on in concurrent mode. This is only possible if the volume group is Concurrent Capable and the system has the HACAMP product loaded and available. If neither is true, the volume group will fail the varyon. This flag only applies to AIX Version 4.2 or later.

If the varyon process detects that there is a new logical volume in the *volume group* whose name is already being used for one of the existing logical volumes, then the varyon will fail. You will need to rename the existing logical volume before attempting the varyon again.

−f Allows a volume group to be made active that does not currently have a quorum of available disks. All disk that cannot be brought to an active state will be put in a removed state. At least one disk must be available for use in the volume group.

−n Disables the synchronization of the stale physical partitions within the *VolumeGroup*.

−p All physical volumes must be available to use the **varyonvg** command.

−s Makes the volume group available in System Management mode only. Logical volume commands can operate on the volume group, but no logical volumes can be opened for input or output.

Note: Logical volume commands also cannot read or write to or from logical volumes in a volume group varied on with the **−s** flag. Logical volumes that attempt to write to a logical volume in a volume group varied on with the **−s** flag (such as **chvg** or **mklvcopy**) may display error messages indicating that they were unable to write to and/or read from the logical volume.

−u Varies on a volume group, but leaves the disks that make up the volume group in an unlocked state. Use this flag as part of the initial varyon of a dormant volume group. This flag only applies to AIX Version 4.2 or later.

Attention: AIX Version 4.2 or later provides the flags **−b** and **−u** for developers who use n−tailed DASD systems. The base design of LVM assumes that only one initiator can access a volume group. The HACMP product does work with LVM in order to synchronize multi−node accesses of a shared volume group. However, multi−initiator nodes can easily access a volume group with the **−b** and **−u** flags without the use of *HACMP*. Your must be aware that volume group status information may be compromised or inexplicably altered as a result of disk protect (locking) being bypassed with these two flags. If you use the **−b** and **−u** flags, data and status output cannot be guaranteed to be consistent.

Examples

1. To activate volume group `vg03`, enter:

   ```
   varyonvg vg03
   ```

2. To activate volume group `vg03` without synchronizing partitions that are not current, enter:

   ```
   varyonvg −n vg03
   ```

Files

/usr/sbin	Contains the **varyonvg** command directory.
/tmp	Stores the temporary files while the command is running.

Related Information

The**chvg**command, **lspv** command, **lslv** command, **lsvg** command, **varyoffvg** command.

The **lvm_varyonvg** subroutine.

The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the structure, main menus, and tasks that are done with SMIT.

The Logical Volume Storage Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the Logical Volume Manager, physical volumes, logical volumes, volume groups, organization, ensuring data integrity, and allocation characteristics.

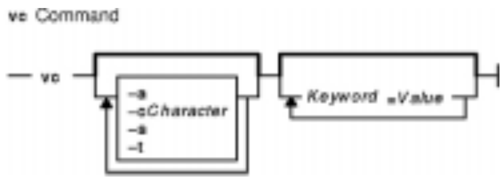
AIX HACMP/6000 Concepts and Facilities.

vc Command

Purpose

Substitutes assigned values for identification keywords.

Syntax



vc [**−a**] [**−t**] [**−s**] [**−c***Character*] [*Keyword*=*Value*]...

Description

The **vc** command copies lines from standard input to standard output. The flags and keywords on the command line and control statements in the input modify the resulting output. The **vc** command replaces user−declared keywords with the value assigned on the command line. Keywords can be replaced both in text and in control statements.

Control Statements

A control statement is a single line beginning with a control character (the default control character is a **:** (colon)). Control statements provide conditional processing of the input. The allowable types of control statements are:

:if *Condition*

Text

:end	Writes all the lines between the **:if** statement and the matching **:end** to standard output only if the condition is true. You can nest **:if** and **:end** statements. However, once a condition is false, all remaining nested **:if** and **:end** statements are ignored. See the "Condition Syntax" section for the syntax of conditions and allowable operators.
:dcl *Keyword***,** [*Keyword* . . .]	Declares specified keywords. All keywords must be declared.
:asg *Keyword*=*Value*	Assigns the specified value to the specified keyword. An **:asg** statement takes precedence over keyword assignment on the **vc** command line. A later **:asg** statement overrides all earlier assignments of the associated keyword. The keywords that are declared but not assigned *Values*, have null values.
:: *Text*	Removes the two leading control characters, replaces keywords with their respective values, and then copies the line to standard output.
:on or **:off**	Turns on or off keyword replacement on all lines.
:ctl *Character*	Changes the control character to the *Character* value.
:msg *Message*	Writes a message to standard error output in the form: Message(n): message `where n is number of the input line on which the message appeared.`
:err *Message*	Writes an error message to standard error. The **vc** command stops processing and returns an exit value of 1. The error message is in the form:

```
ERROR: message
ERROR: err statement on line n (vc15)
```

Condition Syntax

The items and statements allowed are:

```
condition              ::=OR statement
                       ::=NOR statement
OR statement           ::=AND statement
                       ::=AND statement | OR statement
AND statement          ::=expression
                       ::=expression & AND statement
expression             ::=( OR statement )
                       ::=value operator value
operator value         ::= = or != or < or >
                       ::= ASCII string
                       ::= numeric string
```

The available condition operators and their meanings are:

=	Equal
!=	Not equal
&	AND
&|	OR
>	Greater than
<	Less than
( )	Used for logical groupings
NOT	May only occur immediately after the *if*, and when present, inverts the value of the entire condition.

The > and < (greater−than and less−than) operate only on unsigned integer values; for example, 012 > 12 is false. All other operators take strings as modifiers; for example, 012 ! = 12 is true. The precedence of the operators, from highest to lowest precedence, is as follows:

- = ! = > < (all of equal precedence)
- &
- &|

Parentheses can be used to alter the order of precedence.

Values must be separated from operators or parentheses by at least one blank or tab.

Keyword Replacement

A keyword must begin and end with the same control character used in control statements. A keyword may be up to nine alphanumeric characters, where the first character must be alphabetic. Keyword values can be any ASCII string. A numeric keyword *Value* is an unsigned string of digits. Values cannot contain tabs or spaces.

Flags

−a	Replaces keywords surrounded by control characters with their assigned value in all text lines (not just those beginning with two control characters).
−c*Character*	Uses the *Character* value as the control character. The *Character* parameter must specify an ASCII character.

−s	Does not display the warning messages normally displayed to standard error.
−t	Ignores all characters from the beginning of a line up to and including the first tab character for detecting a control statement. If the **vc** command finds a control character, it ignores all characters up to and including the tab.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Examples

1. Examples of *Keyword*=*Value* assignments are:
   ```
   numlines=4
   prog=acctg
   pass4=yes
   ```
   The **vc** command removes all control characters and keywords from input text lines marked with two control characters as it writes the text to standard output.

2. To prevent a control character from being interpreted, precede it with a backslash, as in the following example:
   ```
   ::the :prog: program includes several of the following\:
   ```
   The **:prog:** keyword is replaced by its value, but the `\:` is passed to standard output as `:` (colon).

   Input lines beginning with a \ (backslash) followed by a control character are not control lines, and are copied to standard output without the backslash. However, the **vc** command writes lines beginning with a backslash and no following control character without any changes (including the initial backslash).

File

/usr/bin/vc Contains the **vc** command.

Related Information

The **admin** command, **delta** command, **get** command.

List of SCCS Commands in *AIX General Programming Concepts: Writing and Debugging Programs*.

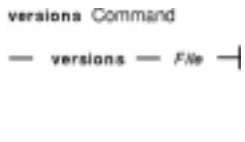
Source Code Control System (SCCS) Overview in *AIX General Programming Concepts: Writing and Debugging Programs*.

versions Command

Purpose

Prints the modification dates of an INed structured file.

Syntax



versions*File*

Description

The **versions** command displays a record of the modification dates and times from a structured file. These are the dates and times that the file was opened for modification. You can use these dates and times when you reconstruct the file using the **ghost** command. The **versions** command also displays the user ID and group ID of the user who modified the file.

Related Information

The **e** command, **ghost** command, **rmhist** command.

How to Access Versions of a File with the INed Editor in *AIX Version 4.3 INed Editor User's Guide*.

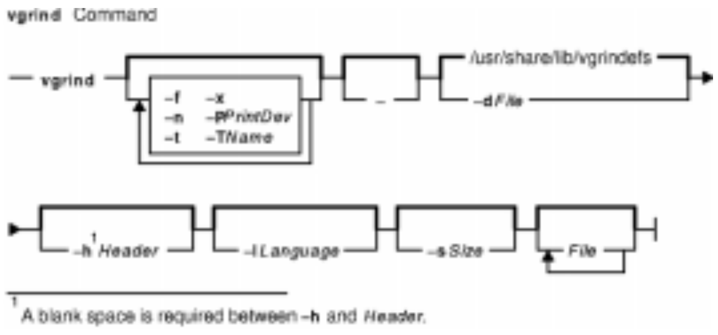
INed Editor Overview in *AIX Version 4.3 INed Editor User's Guide*.

vgrind Command

Purpose

Formats listings of programs that are easy to read.

Syntax



vgrind [**−f**] [**−n**] [**−t**] [**−x**] [**−P***Printdev*] [**−T***Name*] [**−**] [**−d***File*] [**−h** *Header*] [**−l***Language*] [**−s***Size*] [*File* ...]

Description

The **vgrind** command formats (grinds) the program sources specified by the *File* parameters in an easily readable style using the **troff** command. Comments are placed in italics, keywords in boldface, and the name of the current function is listed down the margin of each page as it is encountered.

The **vgrind** command runs in either filter mode or regular mode.

In filter mode, the **vgrind** command acts as a filter in a manner similar to the **tbl** command. Standard input is passed directly to standard output except for lines bracketed by the following **troff**−like macros:

.vS	Starts processing.
.vE	Ends processing.

The preceding lines are formatted according to the **vgrind** command conventions. The output from this filter can be passed to the **troff** command for output. There is no particular ordering with the **eqn** or **tbl** command.

In regular mode, the **vgrind** command accepts input files, processes them, and passes them in order to the **troff** command, the appropriate postprocessor, and then the printer.

In both modes, the **vgrind** command passes without converting lines, beginning with a decimal point.

The **vgrind** command supports only ASCII keywords defined in either the standard **/usr/share/lib/vgrindefs** language definitions file or any alternately specified file by the **−d** flag.

Flags

−f	Forces filter mode.
−n	Forces no keyword bolding.

−t	Causes formatted text to go to standard output; similar to the same flag in the **troff** command.
−x	Outputs the index file in an easily readable format. The index file itself is produced whenever the **vgrind** command is run with the **index** file in the current directory. The index of function definitions can then be run off by running the **vgrind** command with the **−x** flag and the *File* parameter.
−P*PrintDev*	Sends the output to *Printdev* Printer using the **qprt** command. If this flag is not specified, the **PRINTER** environment variable is used. If the **PRINTER** environment variable is not set, the system default is used.
−T*Name*	Creates output for a **troff** device as specified by the *Name* parameter. The output is sent through the appropriate postprocessor. The default is the **ibm3816** postprocessor.
−	Forces input to be taken from standard input (default if the **−f** flag is specified).
−d*File*	Specifies an alternate language definitions file (default is the **/usr/share/lib/vgrindefs** file).
−h *Header*	Specifies a particular header to put on every output page (default is the file name). **Note:** A blank space is required after the **−h** flag before the *Header* variable.
−l*Language*	Specifies the language to use. Currently known languages are:

c
C (the default). Function names can be preceded on a line only by spaces, tabs, or an asterisk. The parenthetical options must also be on the same line.

csh
CSH.

p
PASCAL. Function names must be displayed on the same line as the **function** or **procedure** keywords.

m
MODEL. Function names must be displayed on the same line as the **isbeginproc** keyword phrase.

sh
SHELL.

r
RATFOR.

mod2
MODULA2.

yacc
YACC.

isp
ISP.

I
ICON.

−s *Size*
Specifies a point size to use on output (exactly the same as a **.ps** request).

Files

index	Contains the file the where source for the index is created.
/usr/bin/vgrind	Contains the **vgrind** command.
/usr/share/lib/tmac/tmac.vgrind	Contains the macro package.
/usr/share/lib/vfontedpr	Contains the preprocessor.
/usr/share/lib/vgrindefs	Contains the language descriptions.

Related Information

The **qprt** command, **tbl** command, **troff** command.

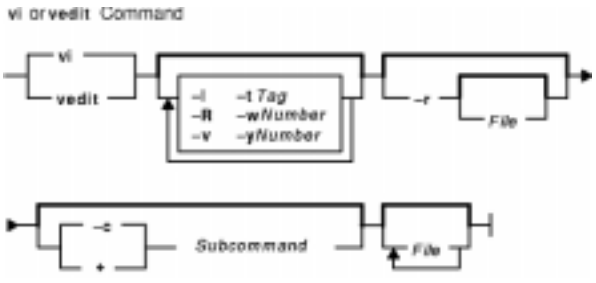
The **vgrindefs** File Format.

vi or vedit Command

Purpose

Edits files with a full−screen display.

Syntax



{ **vi** | **vedit** } [**−l**] [**−R**] [**−t***Tag*] [**−v**] [**−w***Number*] [**−y***Number*] [**−r** [*File*]] [{ **+**| **−c** } { *Subcommand* }] [*File ...*]

Description

The **vi** command starts a full−screen editor based on the underlying ex editor. Therefore, ex subcommands can be used within the vi editor. The **vedit** command starts a version of the vi editor intended for beginners. In the vedit editor, the **report** option is set to 1, the **showmode** option is set, and the **novice** option is set, making it a line editor.

You start the vi editor by specifying the name of the file or files to be edited. If you supply more than one *File* parameter on the command line, the vi editor edits each file in the specified order. The vi editor on an existing file displays the name of the file, the number of lines, and the number of characters at the bottom of the screen. In case of multibyte locales the number of characters need to be interpreted as the number of bytes.

Since the vi editor is a full−screen editor, you can edit text on a screen−by−screen basis. The vi editor makes a copy of the file you are editing in an edit buffer, and the contents of the file are not changed until you save the changes. The position of the cursor on the display screen indicates its position within the file, and the subcommands affect the file at the cursor position.

vi Editor Limitations

The following list provides the maximum limits of the vi editor. These counts assume single−byte characters.

- {LINE_MAX} characters per line
- 256 characters per global command list
- 128 characters in the previously inserted and deleted text
- 128 characters in a shell escape command
- 128 characters in a string−valued option
- 30 characters in a tag name
- 128 map macros with 2048 characters total
- 1,048,560 lines of {LINE_MAX} characters per line silently enforced
  Note: Running the vi editor on a file larger than 64MB may cause the following error message to display:
  ```
  0602−103 file too large to place in /tmp
  ```

vi Editing Modes

The vi editor operates in the following modes:

command mode	When you start the vi editor, it is in command mode. You can enter any subcommand except those designated for use only in the text input mode. The vi editor returns to command mode when subcommands and other modes end. Press the Esc key to cancel a subcommand.
text−input mode	You use the vi editor in this mode to add text. Enter text input mode with any of the following subcommands: the **a** subcommand, **A** subcommand, **i** subcommand, **I** subcommand, **o** subcommand, **O** subcommand, **c***x*subcommands (where the *x* represents the scope of the subcommand), **C** subcommand, **s** subcommand, **S** subcommand, and **R** subcommand. After entering one of these subcommands, you can enter text into the editing buffer. To return to command mode, press the Esc key for normal exit or press Interrupt (the Ctrl−C key sequence) to end abnormally.
last−line mode	Subcommands with the prefix **:** (colon), **/** (slash), **?** (question mark), **!** (exclamation point), or **!!** (two exclamation points) read input on a line displayed at the bottom of the screen. When you enter the initial character, the vi editor places the cursor at the bottom of the screen, where you enter the remaining characters of the command. Press the Enter key to run the subcommand, or press Interrupt (the Ctrl−C key sequence) to cancel it. When the **!!** prefix is used, the cursor moves only after both exclamation points are entered. When you use the **:** prefix to enter the last−line mode, the vi editor gives special meaning to the following characters when they are used before commands that specify counts: ***%*** All lines regardless of cursor position; ***$*** Last line; **.** Current line

Customizing the vi Editor

You can customize the vi editor by:

- Setting vi editor options
- Defining macros
- Mapping keys
- Setting abbreviations

Setting vi Editor Options

The following list describes the vi editor options you can change with the **set** command. The default setting for these options is **off**. If you turn on one of these toggle options, you can turn it off again by entering the word **no** before the option. If you want to discontinue the **autowrite** vi option, enter **noaw**, where **no** turns off the option and **aw** specifies the **autowrite** option.

Note: Do not include parentheses when entering vi options.

vi Option (Abbreviation)	Description
autoindent (ai)	Indents automatically in text input mode to the indentation of the previous line by using the spacing between tab stops specified by the **shiftwidth** option. The default is **noai**. To back the cursor up to the previous tab stop, press the Ctrl−D key sequence. This option is not in effect for global commands.
autoprin (ap)	Prints the current line after any command that changes the editing buffer. The default is **ap**. This option applies only to the last command in a sequence of

	commands on a single line and is not in effect for global commands.
autowrite (aw)	Writes the editing buffer to the file automatically before the **:n** subcommand, the **:ta** subcommand, the Ctrl−A key sequence, and the **!** subcommand if the editing buffer changed since the last **write** subcommand. The default is **noaw**.
beautifying text (bf)	Prevents the user from entering control characters in the editing buffer during text entry (except for tab, new−line, and form−feed indicators). The default is **nobf**. This option applies to command input.
closepunct (cp=)	Handles a list of closing punctuation, especially when wrapping text (**wraptype** option). Precedes multicharacter punctuation with the number of characters; for example, `cp=3..;)}`. The **vi** command does not split closing punctuation when wrapping.
directory (dir=)	Displays the directory that contains the editing buffer. The default is **dir = /var/tmp**.
edcompatible (ed)	Retains **g** (global) and **c** (confirm) subcommand suffixes during multiple substitutions and causes the **r** (read) suffix to work like the **r** subcommand. The default is **noed.**
exrc (exrc)	If not set, ignores any **.exrc** file in the current directory during initialization, unless the current directory is that named by the **HOME** environment variable. The default is **noexrc**.
hardtabs (ht=)	Tells the vi editor the distance between the hardware tab stops on your display screen. (This option must match the tab setting of the underlying terminal or terminal emulator.) The default is **ht=8**.
ignorecase (ic)	Ignores distinction between uppercase and lowercase while searching for regular expressions. The default is **noic**.
linelimit (ll=)	Sets the maximum number of lines, as per the **−y** command−line option. This option only is effective if used with the **.exrc** file or the **EXINIT** environment variable.
lisp (lisp)	Removes the special meaning of ( ), { }, [[, and]] and enables the = (formatted print) operator for s−expressions, so you can edit list processing (LISP) programs. The default is **nolisp.**
list (list)	Displays text with tabs (^I) and the marked end of lines ($). The default is **nolist.**
magic (magic)	Treats the . (period), [(left bracket), and * (asterisk) characters as special characters when searching for a pattern. In off mode, only the ( ) (parentheses) and $ (dollar sign) retain special meanings. However, you can evoke special meaning in other characters by preceding them with a \ (backslash). The default is **magic**.
mesg (mesg)	Turns on write permission to the terminal if set while in visual mode. This option only is effective if used with the **.exrc** file or the **EXINIT** environment variable. The default is **on**.
modeline (modeline)	Runs a vi editor command line if found in the first five or the last five lines of the file. A vi editor command line can be anywhere in a line. For the vi editor to recognize a command line, the line must contain a space or a tab followed by the `ex:` or `vi:` string. The command line is ended by a second **:** (colon). The vi editor tries to interpret any data between the first and second colon as vi editor commands. The default is **nomodeline**.
novice	Indicates whether you are in **novice** mode. You cannot change the value by using the **set** command.
number (nu)	Displays lines prefixed with their line numbers. The default is **nonu**.
optimize (opt)	Speeds the operation of terminals that lack cursor addressing. The default is **noopt**.
paragraphs (para=)	Defines vi macro names that start paragraphs. The default is **para=IPLPPPQPP\LIpplpipnpbp**. Single−letter **nroff** macros, such as the

	.P macro, must include the space as a quoted character if respecifying a paragraph.
partialchar (pc=)	Appears in the last display column where a double−wide character would not be displayed completely. The default character is **−** (minus sign).
prompt	Prompts for a new vi editor command when in command mode by printing a **:** (colon). The default is **on**.
readonly (ro)	Sets permanent read−only mode. The default is **noreadonly**.
redraw (redraw)	Simulates a smart workstation on a dumb workstation. The default is **nore**.
remap	Allows defining macros in terms of other macros. The default is **on**.
report (re=)	Sets the number of times you can repeat a command before a message is displayed. For subcommands that produce many messages, such as global subcommands, the messages are displayed when the command sequence completes. The default is **report=5.**
scroll (scr=)	Sets the number of lines to be scrolled when the user scrolls up or down. The default is 1/2 of the window size, rounded down.
sections (sect=)	Defines vi macro names that start sections. The default is **sect=NHSHHH\ HUuhsh+c**. Single−letter **nroff** macros, such as the **.P** macro, must include the space as a quoted character if respecifying a paragraph.
shell (sh=)	Defines the shell for the **!** subcommand or the **:!** subcommand. The default is the login shell.
shiftwidth (sw=)	Sets the distance for the software tab stops used by the **autoindent** option, the shift commands **(** > and < **)**, and the text input commands (the Ctrl−D and Ctrl−T key sequences). This vi option only affects the indentation at the beginning of a line. The default is **sw=8.**
showmatch (sm)	Shows the ((matching left parenthesis) or { (left bracket) as you type the) (right parenthesis) or } (right bracket). The default is **nosm**.
showmode (smd)	Displays a message to indicate when the vi editor is in input mode. The default is **nosmd**.
slowopen (slow)	Postpones updating the display screen during inserts. The default is **noslow.**
tabstop (ts=)	Sets the distance between tab stops in a displayed file. The default is **ts=8**.
tags (tags =)	Defines the search path for the database file of function names created using the **ctags** command. The default is **tags=tags\/usr/lib/tags**.
term (term=)	Sets the type of workstation you are using. The default is **term=$TERM**, where **$TERM** is the value of the **TERM** shell variable.
terse (terse)	Allows the vi editor to display the short form of messages. The default is **noterse**.
timeout (to)	Sets a time limit of two seconds on an entry of characters. This limit allows the characters in a macro to be entered and processed as separate characters when the **timeout** option is set. To resume use of the macro, set the **notimeout** option. The default is **to**.
ttytype	Indicates the tty type for the terminal being used. You cannot change this value from the vi editor.
warn (warn)	Displays a warning message before the **!**subcommand executes a shell command if it is the first time you issued a shell command after changes were made in the editing buffer but not written to a file. The default is **warn**.
window (wi=)	Sets the number of lines displayed in one window of text. The default depends on the baud rate at which you are operating: 600 baud or less, 8 lines; 1200 baud, 16 lines; higher speeds, full screen minus 1 line.
wrapmargin (wm=)	Sets the margin for automatic word wrapping from one line to the next. The default is **wm=0**. A value of 0 turns off word wrapping.
wrapscan (ws)	Allows string searches to wrap from the end of the editing buffer to the

	beginning. The default is **ws**.
wraptype (wt=)	Indicates the method used to wrap words at the end of a line. The default value is **general**. You can specify one of the following four values: ***general*** Allows wraps on word breaks as white space between two characters. This setting is the default. ***word*** Allows wraps on words. ***rigid*** Allows wraps on columns and before closing punctuation. ***flexible*** Allows wraps on columns, but one character of punctuation can extend past the margin.
writeany (wa)	Turns off the checks usually made before a **write** subcommand. The default is **nowa**.

To see a list of the vi editor settings that have changed from the default settings, enter `set` and press the spacebar. Press the Enter key to return to the command mode.

To see a complete list of the vi editor settings, enter `set all`. Press the Enter key to return to the command mode.

To turn on a vi editor option, enter `set Option`. This command automatically returns you to the command mode.

To turn on multiple vi editor options, enter `set OptionOptionOption`. This command turns on the three designated vi editor options and returns you to the command mode.

To turn off a vi editor option, enter `set noOption`. This command automatically returns you to the command mode.

To change the value of a vi editor option, enter `set Option=Value`. This command automatically returns you to the command mode.

You can use the **:set** subcommand of the vi editor to set options for this editing session only, or to set options for this editing session and all future editing sessions.

To set or change vi editor options *for this editing session only*, enter the **:set** subcommand from the command line.

To set vi options for *all editing sessions*, put the **:set** subcommand in the **EXINIT** environment variable in the **.profile** file (read by the shell on login) or put the **set** subcommand into a **.exrc** file. The vi editor first looks for the **EXINIT** environment variable and runs its commands. If the **EXINIT** environment variable does not exist, the vi editor then looks for the **$HOME/.exrc** file and runs its commands. Last, and regardless of any previous results, the vi editor looks for the local **.exrc** file and runs its commands.

> **Note:** This process is true except with the **tvi** command (trusted vi). In this instance, the vi editor looks for and runs only the **/etc/.exrc** file.

For information about changing an option by setting the **EXINIT** environment variable, see the description of environment variables in the **environment** file.

The **.exrc** file can contain subcommands of the form **set***Option*=*Value*; for example:

```
set cp=3 . . ;
```

To include a comment in the **.exrc** file, use a `"` (double quotation mark) as the first character in the line.

Defining Macros

If you use a subcommand or sequence of subcommands frequently, you can use the vi editor to define a macro that issues that subcommand or sequence.

To define a macro, enter the sequence of subcommands into a buffer named with a letter of the alphabet. The lowercase letters a through z overlay the contents of the buffer, and the uppercase letters A through Z append text to the previous contents of the buffer, allowing you to build a macro piece by piece.

For example, to define a buffer macro named c that searches for the word corner and makes the third line after the word corner the current line, enter the following command:

```
o /corner/+3
```

Then press the Esc key and enter the following command:

```
"c
```

where c is the name of the buffer macro.

To add text to the previous contents of the defined buffer, enter the `o viSubcommand`, press the Esc key, and enter `"CapitalLetter`, where the *CapitalLetter* variable specifies an uppercase letter A through Z. For example, to build a buffer macro named T that searches for the word corner and allows you to add more commands, enter the following command:

```
o corner
```

Then press the Esc key and enter the following command:

```
"T
```

where T is the name of the buffer macro. You can repeat this process at any time to add more vi subcommands to the same buffer.

For example, to add commands that move the cursor to the previous line and delete that line, enter the following command:

```
o −dd
```

where − (minus sign) means to move the cursor up one line, and dd means to delete the current line. Press the Esc key and enter the following command:

```
"Tdd
```

To start the macro, enter `@Letter`, where the *Letter* variable specifies the letter name of the buffer macro you want to use. To use the same macro again, enter `@@` (two at symbols). For example, enter `@T` to start the T buffer macro and run the **search**, **move cursor**, and **delete line** commands. Enter `@@T` to start the T buffer macro again.

The character set used by your system is defined by the collation table. This table affects the performance of vi macros.

Mapping Keys

You can use the **:map**, **:map!**, and **:ab** subcommands to map a keystroke to a command or a sequence of commands. The **:map** subcommand is used in the command mode. The **:map!** and **:ab** subcommands are used in the text input mode. You can map keys for this editing session and all future editing sessions or only for the current editing session from either mode.

To map keys *for all future editing sessions*, put the subcommand into a **$HOME/.exrc** file. Each time you start the vi editor, it reads this file. The mapping remains in effect for every editing session.

To map keys *for the current editing session only* from the *command mode,* start the subcommand during the vi editor session. To map keys for the current editing session only from the *text input mode*, enter the subcommand on the command line during the vi editor session. The mapping remains in effect only for the current editing session.

> **Attention:** If you use an IBM 3161 ASCII display station, IBM 3163 ASCII display station, or IBM 3101 ASCII display station, the default key−mapping of the vi editor can cause you to lose data. To see the default mapping, issue a **:map** subcommand. Specific problems arise with the Esc−J or Shift−J key sequence. These key sequences delete all information from the current position of the cursor to the end of the file. To avoid problems, change this key sequence using a **.exrc** file.

The **:map**, **:map!**, and **:ab** subcommands are defined and used as follows:

:map

Defines macros in the command mode. The **:map** subcommand allows you to run a specified command or sequence of commands by pressing a single key while in the vi editor.

To map keys in the command mode, start the vi editor with an empty editing buffer and do not name a vi file using the **vi** command or type anything into the buffer after the vi editor starts. You can use the **:map** subcommand to do the following:

- To map a character to a sequence of editing commands, enter:
  ```
  :map Letter viSubcommand
  ```
- To unmap a character previously mapped in command mode, enter:
  ```
  :unmap Letter
  ```
- To display a list of current mappings for the command mode, enter
  ```
  :map
  ```

The following keys are not used by the vi editor, but are available for use with the **:map** subcommand in the command mode:

- Letters g, K, q, V, and v
- Control key sequences Ctrl−A, Ctrl−K, Ctrl−O, Ctrl−T, Ctrl−W, and Ctrl−X
- Symbols _ (underscore), * (asterisk), \ (backslash), and = (equal sign)

Although you can map a key that is already used by the vi editor, the key's usual function is not available as long as the map is in effect. Some terminals allow you to map command sequences to function keys. If you are in LISP mode, the = (equal sign) cannot be used because it is used by the vi editor.

To map the letter v to the sequence of commands that would locate the next occurrence of the word `map` and change it to the word `MAP`, enter the following command:

```
:map v /map<Ctrl−V><Enter>cwMAP<Ctrl−V><Esc><Ctrl−V><Enter>
```

The previous example instructs the vi editor to locate the next occurrence of `map` (`/map<Ctrl−V><Enter>`), change `map` to `MAP` (`cwMAP`), end the change−word subcommand (`<Ctrl−V><Esc>`), and enter the command (`<Ctrl−V><Enter>`).

Note: To prevent the vi editor from interpreting the Enter key, it must be preceded by the Ctrl−V key sequence when being mapped. This condition is also true of the Esc, Backspace, and Delete keys.

To map the control characters Ctrl−A, Ctrl−K, and Ctrl−O, simultaneously press the Ctrl key and the letter. For example, to map the Ctrl−A key sequence to the sequence of commands that saves a file and edits the next one in a series, enter the following command:

```
:map <Ctrl−A> :w<Ctrl−V><Enter>:n<Ctrl−V><Enter>
```

To map the control characters Ctrl−T, Ctrl−W, and Ctrl−X, you must first escape them with the Ctrl−V key sequence.

To map the | (pipe symbol), you must first escape it with the two Ctrl−V key sequences, as illustrated by the following example that maps the character g to the sequence of commands that escapes to the shell, concatenates the file **/etc/motd**, and pipes the output to the **wc** command:

```
:map g :!cat /etc/motd <Ctrl−V><Ctrl−V>| wc<Ctrl−V><Enter>
```

If your terminal permits you to map function keys, you must reference them with the #*number* key sequence to designate the number of the function key that you want to map. In the following example, the F1 function key is mapped to the sequence of commands that deletes a word and moves the cursor three words down:

```
:map #1 dwwww
```

In order for function key mapping to work, the output of the function key for your terminal type must match the output defined in the **terminfo** file. On AIX operating systems, these definitions are denoted by the kf*number* entries, where kf1 represents the F1 function key, kf2 represents the F2 function key, and so on. If the output that you get when you press the function key does not match this entry, you must use the terminal's setup mode to correct the settings to match these terminal database entries before any mapping can occur.

You can also map certain keyboard special keys, such as the Home, End, Page Up, and Page Down keys. For most terminals, these keys are already mapped in the vi editor. You can verify this mapping by using the **:map** subcommand. If these keys are not already mapped, you can use the **:map** subcommand as follows:

```
:map <Ctrl−V><End> G
:map <Ctrl−V><Home> 1G
:map <Ctrl−V><PageUp> <Ctrl−F>
:map <Ctrl−V><PageDown> <Ctrl−B>
```

To get a listing of all current maps in the command mode, enter the **:map** subcommand. The preceding examples are then displayed as follows:

```
v         v          /map<Ctrl−M>cwMAP<Ctrl−[>Ctrl−M>
<Ctrl−A>  <Ctrl−A>   :w<Ctrl−M>:n<Ctrl−M>
g         g          :!cat /etc/motd | wc <Ctrl−M>
```

Note: The Ctrl−V and Enter key sequence is displayed as the Ctrl−M key sequence, and the Ctrl−V and Esc key sequence is displayed as the Ctrl−[key sequence.

:map! Maps character strings to single keys while in text input mode. To map keys in the text input mode, start the vi editor with an empty editing buffer and do not name a vi file using the **vi** command or type anything into the buffer after the vi editor starts. You can use the **:map!** subcommand to do the following:

- To map a letter to one or more vi strings in text input mode, enter:
  ```
  :map! Letter String
  ```
- To unmap a letter previously mapped in text input mode, enter:
  ```
  :unmap! Letter
  ```
- To display a list of existing strings that are mapped to specific keys in text input mode, enter:
  ```
  :map!
  ```

Typing the mapped key while in text input mode produces the specified string. The Ctrl−V and Esc key sequence puts you into command mode, backs up to the beginning of the current word (**bbw**), and starts the **cw** (change−word) subcommand. For example:

```
:map! % <Ctrl−V><Esc>bbwcw
```

When typing text, if you realize that you have mistyped a word, you can change it by pressing the % (percent) key and retyping the word. You are automatically returned to insert mode.

Note: Be careful when choosing keys to be used for the **:map!** subcommand. Once keys have been mapped, they can no longer be input as text without first issuing the **:unmap!** subcommand.

:ab Maps a key or sequence of keys to a string of characters for use in the text input mode. The **:ab** subcommand is useful when inputting text that possesses several repetitive phrases, names, or titles.

The following example replaces the word `city` with the phrase `Austin, Texas 78759` whenever it is typed in text input mode and followed by a white space, period, or comma:

```
:ab city Austin, Texas 78759
```

For example, if while inputting text, you type the following:

```
My current residence is city.
```

Pressing the Tab key expands the word `city` to read:

```
My current residence is Austin, Texas 78759.
```

The abbreviation is not expanded within a word. For example, if you type `My current residence iscity`, the word iscity is not expanded.

If the **:map!** subcommand is used to map abbreviations for insert mode, then all occurrences of the abbreviations are expanded regardless of where it occurs. If you used the **:map!** subcommand for the preceding example (`:map! city Austin, Texas 78759`), then whenever you type the word `city`, regardless of what precedes or follows, the word will be expanded to `Austin, Texas 78759`. Therefore, the word `iscity` becomes `isAustin, Texas 78759`.

Note: Be careful when choosing the keys that are used for the **:ab** subcommand. Once keys are defined, they can no longer be input as text without first issuing the **:unab** subcommand.

Setting Abbreviations

The **set** command has behavior similar to the **map!** command except that the **set** command substitutes the string for the abbreviation only when the abbreviation is a separate word. You can use the **set** command of the vi editor to:

- List existing abbreviations
- Remove an abbreviation
- Set (define) an abbreviation

Note: Start the vi editor with an empty editing buffer. Do not name a vi file using the **vi** command or type anything into the buffer after the vi editor starts. Press the Esc key to be sure you are in the command mode.

To list abbreviations	Enter the **:ab** command to list existing abbreviations. Press the Enter key to return to command mode.
To remove abbreviations	Enter the **:anab***Abbreviation* command to remove an abbreviation, where the *Abbreviation* variable specifies the character string you do not want abbreviated any more.
To set (define) an abbreviation	Enter the **:ab** *Abbreviation String* command to set an abbreviation, where the *Abbreviation* variable specifies the character string being defined as an abbreviation and the *String* variable specifies the character string being abbreviated. The abbreviation can be substituted for the string only when the abbreviation is a separate word. For example, if you enter the **:ab kn upper** command and then type `acknowledge` while in the text input mode, the set abbreviation string is not started because the kn string in the word acknowledge is not a separate word. However, if you type the **:ab kn upper** command and then type `make the kn line all kncase` while in the text input mode, the result is `make the upper line all uppercase`.

Flags

−c*Subcommand*	Carries out the ex editor subcommand before viewing with **vi** begins. The cursor moves to the line affected by the last subcommand to be carried out. When a null operand is entered, as in **−c**'', the vi editor places the cursor on the first line of the file. The **−c** flag is incompatible with the + flag. Do not specify both flags at the same time.
−l	Enters the vi editor in LISP mode. In this mode, the vi editor creates indents appropriate for LISP code, and the **(**, **)**, **{**, **}**, **[[**, and **]]** subcommands are modified to act appropriately for LISP.
−r[*File*]	Recovers a file after a vi editor or system malfunction. If you do not specify the *File* variable, the vi editor displays a list of all saved files.
−R	Sets the **readonly** option to protect the file against overwriting.
−t*Tag*	Edits the file containing the *Tag* variable and positions the vi editor at its definition. To use this flag, you must first create a database of function names and their locations using the **ctags** command.
−v	Enters the vi editor in the verbose mode.
−w*Number*	Sets the default window size to the value specified by the *Number* variable. This flag is useful when you use the vi editor over a low−speed line.
−y*Number*	Overrides the maximum line setting of 1,048,560 with any value greater than 1024. You

	should request twice the number of lines that you require because the vi editor uses the extra lines for buffer manipulation.
+[*Subcommand*]	Carries out the ex editor subcommand before editing begins. If you do not specify the *Subcommand* variable, the cursor is placed on the first line of the file. This **+** flag is incompatible with the **−c** flag. Do not specify both flags at the same time.

vi General Subcommand Syntax

Use the following general syntax to enter subcommands:

[*Named_Buffer*] [*Operator*] [*Number*] *Object*

Note: Square brackets indicate optional items.

[*Named_Buffer*]	Specifies a temporary text storage area.
[*Operator*]	Specifies the subcommand or action; instructs the vi editor.
[*Numbe*r]	Specifies either the extent of the action or a line address as a whole number.
Object	Specifies what to act on, such as a text object (a character, word, sentence, paragraph, section, character string) or a text position (a line, position in the current line, screen position).

Counts before Subcommands

You can put a number in front of many subcommands. The vi editor interprets this number in one of the following ways:

- Go to the line specified by the *Number* parameter:

```
5G
10Z
```

- Go to the column specified by the *Number* parameter:

```
25|
```

- Scroll the number of lines up or down specified by the *Number* parameter:

```
10Ctrl−U
10Ctrl−D
```

vi Editor Subcommands

Use the subcommands to perform these kinds of actions:

- Moving the cursor
- Editing text
- Manipulating files
- Other actions

Moving the Cursor

Use subcommands to move the cursor within a file in these ways:

- Moving within a line
- Moving within a line by character position
- Moving to words

- Moving by line position
- Moving to sentences, paragraphs, or sections
- Moving by redrawing the screen
- Paging and scrolling
- Searching for patterns
- Marking a specific location in a file and returning

Moving within a Line

Enter the following subcommands in command mode. You can cancel an incomplete command by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

Left Arrow or **h** or **Ctrl−H**	Moves the cursor one character to the left.
Down Arrow or **j** or **Ctrl−J** or **Ctrl−N**	Moves the cursor down one line (it remains in the same column).
Up Arrow or **k** or **Ctrl−P**	Moves the cursor up one line (it remains in the same column).
Right Arrow or **l**	Moves the cursor one character to the right.

Moving within a Line by Character Position

Enter the following subcommands in command mode. You can cancel an incomplete command by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

^	Moves the cursor to the first nonblank character.
0	Moves the cursor to the beginning of the line.
$	Moves the cursor to the end of the line.
f*x*	Moves the cursor to the next *x* character.
F*x*	Moves the cursor to the last *x* character.
t*x*	Moves the cursor to one column before the next *x* character.
T*x*	Moves the cursor to one column after the last *x* character.
;	Repeats the last **f**, **F**, **t**, or **T** subcommand.
,	Repeats the last **f**, **F**, **t**, or **T** subcommand in the opposite direction.
*Number***|**	Moves the cursor to the specified column.

Moving to Words

Enter the following subcommands in command mode. If you need information about the format of vi subcommands, "vi General Subcommand Syntax."

w	Moves the cursor to the next small word.
b	Moves the cursor to the previous small word.
e	Moves the cursor to the next end of a small word.
W	Moves the cursor to the next big word.
B	Moves the cursor to the previous big word.
E	Moves the cursor to the next end of a big word.

Moving by Line Position

Enter the following subcommands in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

H	Moves the cursor to the top line on the screen.
L	Moves the cursor to the last line on the screen.
M	Moves the cursor to the middle line on the screen.
+	Moves the cursor to the next line at its first nonblank character.
−	Moves the cursor to the previous line at its first nonblank character.
Enter	Moves the cursor to the next line at its first nonblank character.

Moving to Sentences, Paragraphs, or Sections

Enter the following subcommands in command mode. You can cancel an incomplete subcommand by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

(	Places the cursor at the beginning of the previous sentence, or the previous s−expression if you are in LISP mode.
)	Places the cursor at the beginning of the next sentence, or the next s−expression if you are in LISP mode.
{	Places the cursor at the beginning of the previous paragraph, or at the next list if you are in LISP mode.
}	Places the cursor at the beginning of the next paragraph, at the next section if you are in C mode, or at the next list if you are in LISP mode.
]]	Places the cursor at the next section, or function if you are in LISP mode.
[[	Places the cursor at the previous section, or function if you are in LISP mode.

Moving by Redrawing the Screen

Enter the following subcommands in command mode. You can cancel an incomplete subcommand by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

z	Redraws the screen with the current line at the top of the screen.
z−	Redraws the screen with the current line at the bottom of the screen.
z.	Redraws the screen with the current line at the center of the screen.
/*Pattern*/**z−**	Redraws the screen with the line containing the character string, specified by the *Pattern* parameter, at the bottom.

Paging and Scrolling

Enter the following subcommands in command mode. You can cancel an incomplete subcommand by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

Ctrl−U	Scrolls up one−half screen.
Ctrl−D	Scrolls down one−half screen.
Ctrl−F	Scrolls forward one screen.
Ctrl−B	Scrolls backward one screen.
Ctrl−E	Scrolls the window down one line.
Ctrl−Y	Scrolls the window up one line.
z+	Pages up.
z^	Pages down.

Searching for Patterns

Enter the following subcommands in command mode. You can cancel an incomplete subcommand by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

[*Number***]G**	Places the cursor at the line number specified by the *Number* parameter or at the last line if the *Number* parameter is not specified.
/*Pattern*	Places the cursor at the next line containing the character string specified by the *Pattern* parameter.
?*Pattern*	Places the cursor at the next previous line containing the character string specified by the *Pattern* parameter.
n	Repeats the last search for the text specified by the *Pattern* parameter in the same direction.
N	Repeats the last search for the text specified by the *Pattern* parameter in the opposite direction.
/*Pattern***/+***Number*	Places the cursor the specified number of lines after the line matching the character string specified by the *Pattern* parameter.
?*Pattern***?−***Number*	Places the cursor the specified number of lines before the line matching the character string specified by the *Pattern* parameter.
%	Finds the parenthesis or brace that matches the one at current cursor position.

Editing Text

The subcommands for editing enable you to perform the following tasks:

- Marking a specific location in a file and returning
- Adding text to a file
- Changing text while in input mode
- Changing text from command mode
- Copying and moving text
- Restoring and repeating changes

Marking a Specific Location in a File and Returning

Enter the following subcommands in command mode. You can cancel an incomplete subcommand by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

"	Moves the cursor to the previous location of the current line.
"	Moves the cursor to the beginning of the line containing the previous location of the current line.
m*x*	Marks the current position with the letter specified by the *x* parameter.
`*x*	Moves the cursor to the mark specified by the *x* parameter.
'*x*	Moves the cursor to the beginning of the line containing the mark specified by the *x* parameter.

Adding Text to a File (Text Input Mode)

Enter the following subcommands in command mode to change the vi editor into text input mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

a*Text*	Inserts text specified by the *Text* parameter after the cursor. End text input mode by pressing the Esc key.
A*Text*	Adds text specified by the *Text* parameter to the end of the line. End text input mode by pressing the

	Esc key.
i*Text*	Inserts text specified by the *Text* parameter before the cursor. End text input mode by pressing the Esc key.
I*Text*	Inserts text specified by the *Text* parameter before the first nonblank character in the line. End text input mode by pressing the Esc key.
o	Adds an empty line below the current line. End text input mode by pressing the Esc key.
O	Adds an empty line above the current line. End text input mode by pressing the Esc key.

Changing Text While in Input Mode

Use the following subcommands only while in text input mode. These commands have different meanings in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

Ctrl−D	Goes back to previous autoindent stop.
^ **Ctrl−D**	Ends autoindent for this line only.
0Ctrl−D	Moves cursor back to left margin.
Esc	Ends insertion and returns to command state.
Ctrl−H	Erases the last character.
Ctrl−Q	Enters any character if xon is disabled.
Ctrl−V	Enters any character.
Ctrl−W	Erases the last small word.
\	Quotes the erase and kill characters.
Ctrl−?	Interrupts and ends insert or the Ctrl−D key sequence.

Changing Text from Command Mode

Use the following subcommands in command mode. An incomplete subcommand can be canceled by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

C	Changes the rest of the line (same as **c$**).
cc	Changes a line.
cw	Changes a word.
cw*Text*	Changes a word to the text specified by the *Text* parameter.
D	Deletes the rest of the line (same as **d$**).
dd	Deletes a line.
dw	Deletes a word.
J	Joins lines.
r*x*	Replaces the current character with the character specified by *x*.
R*Text*	Overwrites characters with the text specified by the *Text* parameter.
s	Substitutes characters (same as **cl**).
S	Substitutes lines (same as **cc**).
u	Undoes the previous change.
x	Deletes a character at the cursor.
X	Deletes a character before the cursor (same as **dh**).
<<	Shifts one line to the left.
<L	Shifts all lines from the cursor to the end of the screen to the left.
>>	Shifts one line to the right.

>L	Shifts all lines from the cursor to the end of the screen to the right.
~	Changes letter at the cursor to the opposite case.
!	Indents for LISP.

Copying and Moving Text

Use the following subcommands in command mode. An incomplete subcommand can be canceled by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

p	Puts back text from the undo buffer after the cursor.
P	Puts back text from the undo buffer before the cursor.
"*x***p**	Puts back text from the *x* buffer.
"*x***d**	Deletes text into the *x* buffer.
y	Places the object that follows (for example, **w** for word) into the undo buffer.
"*x***y**	Places the object that follows into the *x* buffer, where *x* is any letter.
Y	Places the line in the undo buffer.

Restoring and Repeating Changes

Use the following subcommands in command mode. An incomplete subcommand can be canceled by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

u Undoes the last change.

> **Note:** After an undo, the cursor moves to the first non−blank character on the updated current line.

U Restores the current line if the cursor has not left the line since the last change.

. Repeats the last change or increments the **"***n***p** command.

> **Notes:**
> 1. This subcommand will repeat the last change, including an undo. Therefore, after an undo, repeat performs an undo rather than repeat the last change.
> 2. This subcommand is not meant for use with a macro. Enter **@@** (two at signs) to repeat a macro.

"*n***p** Retrieves the *n*th last delete of a complete line or block of lines.

Manipulating Files

The subcommands for manipulating files allow you to do the tasks outlined in the following sections:

- Saving changes to a file
- Editing a second file
- Editing a list of files
- Finding file information

Saving Changes to a File

Use the following subcommands in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

:w	Writes the edit buffer contents to the original file. If you are using this subcommand within the ex editor, you do not need to type the : (colon).
:w *File*	Writes the edit buffer contents to the file specified by the *File* parameter. If you are using this

	subcommand within the ex editor, you do not need to type the : (colon).
:w!*File*	Overwrites the file specified by the *File* parameter with the edit buffer contents. If you are using this subcommand within the ex editor, you do not need to type the : (colon).

Editing a Second File

Enter the following subcommands in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

:e*File*	Edits the specified file. If you are using this subcommand from the ex editor, you do not need to type the : (colon).
:e!	Re−edits the current file and discards all changes.
:e + *File*	Edits the specified file starting at the end.
:e + *Number File*	Edits the specified file starting at the specified line number.
:e #	Edits the alternate file. The alternate file is usually the previous file name before accessing another file with a **:e** command. However, if changes are pending on the current file when a new file is called, the new file becomes the alternate file. This subcommand is the same as the **Ctrl−A** subcommand.
:r *File*	Reads the file into the editing buffer by adding new lines below the current line. If you are using this subcommand from the ex editor, you do not need to type the **:** (colon).
:r!*Command*	Runs the specified AIX command and places its output into the file by adding new lines below the current cursor position.
:ta*Tag*	Edits a file containing the *Tag* tag starting at the location of the tag. To use this subcommand, you must first create a database of function names and their locations using the **ctags** command. If you are using this subcommand from the ex editor, you do not need to type the **:** (colon).
Ctrl−A	Edits the alternate file. The alternate file is usually the previous current file name. However, if changes are pending on the current file when a new file is called, the new file becomes the alternate file. This subcommand is the same as the **:e #** subcommand.

Editing a List of Files

Enter the following subcommands in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

:n	Edits the next file in the list entered on the command line. If you are using this subcommand from the ex editor, a : (colon) is not needed.
:n*Files*	Specifies a new list of files to edit. If you are using this subcommand from the ex editor, a **:** (colon) is not needed.

Finding File Information

Enter the following subcommand in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax".

Ctrl−G	Shows the current file name, current line number, number of lines in the file, and percentage of the way through the file where the cursor is located.

Other Actions

The vi editor provides the subcommands described in the following sections:

- Adjusting the screen

- Entering shell commands
- Interrupting and ending the vi editor

Adjusting the Screen

Enter the following subcommands in command mode. An incomplete subcommand can be canceled by pressing the Esc key. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

Ctrl−L	Clears and redraws the screen.
Ctrl−R	Redraws the screen and eliminates blank lines marked with @ (at sign).
z*Number*	Makes the window the specified number of lines long.

Entering Shell Commands

The following subcommands allow you to run a command within the vi editor. Enter these subcommands in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

:sh	Enters the shell to allow you to run more than one AIX command. You can return to the vi editor by pressing the Ctrl−D key sequence. If you are using this subcommand within the ex editor, a : (colon) is not needed.
:!*Command*	Runs the specified AIX command and then returns to the vi editor. If you are using this subcommand within the ex editor, a : (colon) is not needed. **Note:** The # (alternate file), **%** (current file), and **!** (previous command) special characters are expanded when following a **:!** subcommand. To prevent any of these characters from being expanded, use the \ (backslash).
:!!	Repeats the last **:!***Command* subcommand**.**
*Number***!!***Command*	Runs the specified AIX command and replaces the lines specified by *Number* with the output of the command**.** If a number is not specified, the default value is 1. If the command expects standard input, the specified lines are used as input.
!*Object Command*	Runs the specified AIX command and replaces the object specified by the *Object* parameter with the output of the command**.** If the command expects standard input, the specified object is used as input.

Interrupting and Ending the vi Editor

Enter the following subcommands in command mode. If you need information about the format of vi subcommands, see "vi General Subcommand Syntax."

Q	Enters the ex editor in command mode.
ZZ	Exits the vi editor, saving changes.
:q	Quits the vi editor. If you have changed the contents of the editing buffer, the vi editor displays a warning message and does not quit. If you are using this subcommand from the ex editor, a : (colon) is not needed.
:q!	Quits the vi editor, discarding the editing buffer. If you are using this subcommand from the ex editor, a : (colon) is not needed.
Esc	Ends text input or ends an incomplete subcommand.
Ctrl−?	Interrupts a subcommand.

Exit Status

The following exit values are returned:

0	Indicates successful completion.
>0	Indicates an error occurred.

Input Files

Input files must be text files or files that are similar to text files except for an incomplete last line that is no longer than LINE_MAX −1 bytes in length and contains no null characters.

The **.exrc** files must be text files consisting of **ex** commands.

By default, the vi editor reads lines from the files to be edited without interpreting any of those lines as any form of vi editor command.

Related Information

The **ctags** command, **ed** command, **ex** command, **sed** command, **tvi** command, **view** command.

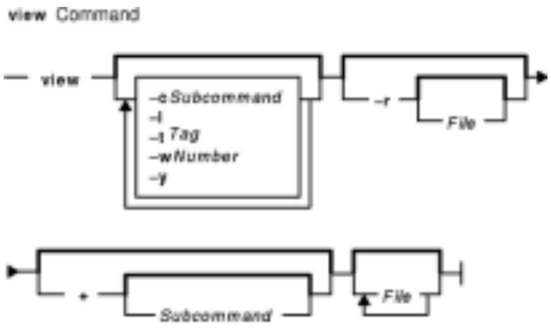
The **.profile** file.

view Command

Purpose

Starts the vi editor in read−only mode.

Syntax



view [**−c***Subcommand*] [**−l**] [**−t** *Tag*] [**−w***Number*] [**−y**] [**−r**[*File*]] [+[*Subcommand*]] [*File* ...]

Description

The **view** command starts the vi full−screen editor in read−only mode. The read−only mode is only advisory to prevent accidental changes to the file. To override read−only mode, use the `!` (exclamation point) when executing a command. The *File* parameter specifies the name of the file you want to browse. Use vi subcommands for moving within the file. Use the **:q** subcommand to exit the **view** command. If you modify the file you can save your modifications by pressing the Esc key and `wq!`.

Flags

−c*Subcommand*	Carries out the ex editor subcommand before viewing with vi begins. When a null operand is entered, as in `−c ''`, the editor places the cursor on the last line of the file.
−l	Enters a version of the vi editor with specialized features designed for writing programs in the LISP language. In this mode, the vi editor indents appropriately for LISP programming, and the **(**, **)**, **{**, **}**, **[[**, and **]]** subcommands are modified to act appropriately for LISP.
−r [*File*]	Recovers a file after an editor or system crash. If you do not specify a *File* parameter, the editor displays a list of all saved files.
−t*Tag*	Edits the file containing the tag specified by the *Tag* parameter and positions the editor at its definition. To use this flag, you must first create a database of function names and their locations using the **ctags** command.
−w*Number*	Sets the default window size to the value specified by the *Number* parameter. This is useful when your terminal communicates with the system running the editor over a slow communications line.
−y	Overrides the maximum line setting of 1,048,560 with any value greater than 1024.
+[*Subcommand*]	Carries out the ex editor subcommand specified by the *Subcommand* parameter before viewing with vi begins. If you do not specify a subcommand, the cursor is placed on the last line of the file.

Related Information

The **vi** command, **ctags** command.

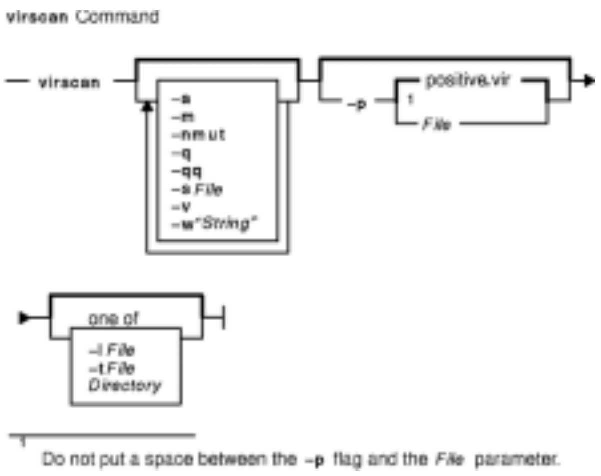
Editor Overview in *AIX Version 4.3 INed Editor User's Guide*.

virscan Command

Purpose

Scans files for viruses.

Syntax



virscan [**−a**] [**−m**] [**−nmut**] [**−q**] [**−qq**] [**−s***File*] [**−v**] [**−w"***String***"**] [**−p** [*File*]] [**−l***File* | **−t***File* | *Directory*]

Description

The **virscan** command is used to detect the presence of computer viruses in a file system. The **virscan** command scans the directory (and all of its subdirectories) indicated by the *Directory* variable, if specified.

The **virscan** command does not attempt to remove viral infections from a system. If the command discovers a virus, seek competent technical assistance to clean up the infection safely and prevent it from spreading to other systems.

The **virscan** command cannot find virus signatures in files that are compressed or encrypted. This includes files that have been compressed by archiving programs. To scan such files, unpack them first and then scan their constituent files.

On systems with damaged directory trees, the **virscan** command terminates with an error. Though not caused by the **virscan** command, this condition will prevent the **virscan** command from scanning the disk correctly. Run the **fsck** command to diagnose any error conditions.

The **virscan** command was originally developed to detect the presence of known computer viruses in MS−DOS or PC−DOS systems. It was adapted for use in an AIX environment, but at this time contains no known AIX virus signatures. The virus signature file contains only known DOS−based virus signatures.

Flags

−a	Scans all files on the indicated path. This is useful for cleaning up after a virus infection because absolutely every file on a file system is checked for the presence of viruses. By default,

	the **virscan** command only scans executable files.
−h	Displays a brief summary of command−line options.
−hh	Displays usage examples.
−l*File*	Scans all files listed in the specified *File* for viral signatures. The file should contain one file name per line. The files to be scanned may be specified relative to the current directory or may be given full path names.
−m	Attempts to detect mutant viruses. With this flag, the **virscan** command tries to detect larger variations on the viruses listed in the signature files. Virus signatures are broken into random fragments, and the **virscan** command scans for the fragments as well as for the original signatures. With this flag, the **virscan** command need not match an entire signature. The number of mismatched bytes allowed is a function of the signature length; the longer the signature, the more mismatched bytes are allowed. There is a small possibility of false alarms if this option is used, since short fragments may be found in files that do not contain viruses. Be prepared to investigate in more detail any reports of signatures found. By default, the **virscan** command scans for the entire signature string.
−nmut	Disables the default mutant detection. This option is useful should you encounter false virus warnings.
−p*File*	Creates a list of files that tested positive. This is useful if you want to have a list of infected files for use in a cleanup process. If the *File* variable is not specified, the **positive.vir** default output file will be created in the current directory. However, the file will not be created unless a virus signature is found.
−q	Enables the display of only those messages that are indications that a viral signature has been found, error messages, and warnings that troublesome viruses have been found.
−qq	Disables the display of all messages except fatal error messages and warnings that troublesome viruses have been found. The only indication that viral signatures have been found is the error level returned by the **virscan** command.
−s*File*	Uses a non−default signature file for this scan. By default, the **virscan** command uses the signatures in the **/usr/lib/security/scan/virsig.lst** file and the **/usr/lib/security/scan/addenda.lst** file (if present) for its scan. However, this flag disables the use of these default signature files and causes the **virscan** command to use the signature file specified by the *File* variable. To use a default signature file as well as a user−defined signature file, the default signature file must be separately and explicitly specified with the **−s** flag.
−t*File*	Scans only the specified file for viral signatures.
−v	Causes the **virscan** command to display both a list of files as they are scanned and a hexadecimal display of any virus signatures found. If a scan terminates early due to an error, this flag can be used to help diagnose the problem.
−w"*String***"**	Causes the **virscan** command to scan files that match the specified *String* wildcard file name. By default, the **virscan** command only scans executable files. This flag is used to force scanning of arbitrary files.
?	Displays a brief summary of command−line options.
??	Displays usage examples.

Error Codes

The **virscan** command sets the error level upon exit to one of the following:

0 No virus signatures were found and no other fatal errors occurred.

1 No virus signatures were found, but the program terminated with an error before the scan was complete.

2 One or more virus signatures were found.

Examples

1. To scan all files in the `/usr` file system, enter:
   ```
   virscan −a /usr
   ```
   To scan all files in the `/usr` file system and put the names of any infected files into the file `positive.vir` in the current directory, enter:
   ```
   virscan −a −p /usr
   ```
2. To scan the files listed in the `files.dat` file for viral signatures, enter:
   ```
   virscan −lfiles.dat
   ```
3. To scan the `/usr` file system using the signatures in both the `mysig.dat` and `virsig.lst` files, enter:
   ```
   virscan −s/usr/lib/security/scan/virsig.lst −smysig.dat /usr
   ```
4. To scan the `/usr` file system for files matching the `*.o` wildcard specification, enter:
   ```
   virscan /usr −w"*.o"
   ```
5. To scan an entire system, enter:
   ```
   virscan /
   ```

Files

positive.vir	Contains a list of files that tested positive. This file is created in the current directory.
/usr/bin/virscan	Contains the **virscan** command.
/usr/lib/security/scan/virsig.lst	Contains signatures of known computer viruses. These are the viruses known about when this version of the program was distributed. The file currently includes only known PC−DOS based virus signatures.
/usr/lib/security/scan/addenda.lst	A user−created file containing signatures of additional viruses.

Related Information

The **fsck** command.

Testing Files for Viruses (virscan Command) in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

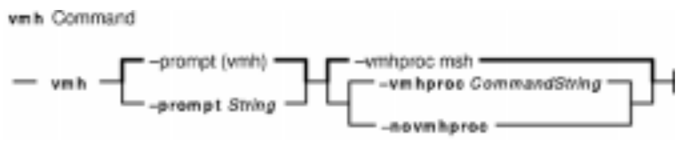
Security Administration in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

vmh Command

Purpose

Starts a visual interface for use with MH commands.

Syntax



vmh [**−prompt** *String*] [**−vmhproc** *CommandString* | **−novmhproc**]

Description

The **vmh** command starts a visual interface for use with MH commands. The **vmh** command implements the server side of the MH window management protocol and maintains a split−screen interface to any program that implements the client side of the protocol.

The **vmh** command prompts for commands and sends them to the client side of the protocol. If the command produces a window with more than one screen of output, the **vmh** command prompts the user for a subcommand. The **vmh** subcommands enable you to display specific portions of the command output.

vmh Subcommands

Ctrl−L	Refreshes the screen.
Space	Advances to the next screen.
[*Number*] **Enter**	Advances the specified number of lines. The default is one line.
[*Number*] **d**	Advances 10 times the specified number of lines. The default for the *Number* variable is 1, for a total of 10 lines.
[*Number*] **g**	Goes to the specified line.
[*Number*] **G**	Goes to the end of the window. If the *Number* variable is specified, this command acts like the **g** flag.
[*Number*] **u**	Goes back 10 times the specified number of lines. The default for the *Number* variable is 1, for a total of 10 lines.
[*Number*] **y**	Goes back the specified number of lines. The default is one line.
h	Displays a help message.
q	Ends output.

Flags

−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For MH, the name of this flag must be fully spelled out.
−novmhproc	Runs the default **vmproc** without the window management protocol.
−prompt *String*	Uses the specified string as the prompt.

−vmhproc *CommandString*	Specifies the program that implements the client side of the window management protocol. The default is the **msh** program.

Profile Entries

The following entries are entered in the *UserMhDirectory*/**.mh_profile** file:

`Path:`	Specifies the user's MH directory.
`mshproc:`	Specifies the program used for the MH shell.

Files

$HOME/.mh_profile	Contains the MH user profile.
/usr/bin/vmh	Contains the **vmh** command.

Related Information

The **msh** command.

The **mh_alias** file format, **mh_profile** file format.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

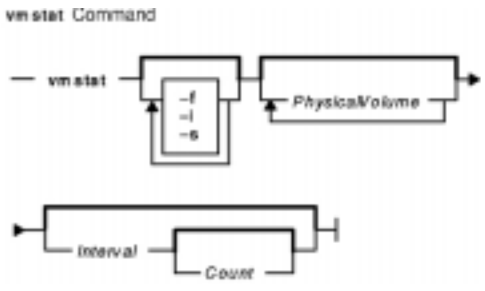
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

vmstat Command

Purpose

Reports virtual memory statistics.

Syntax



vmstat [**−f**] [**−i**] [**−s**] [*PhysicalVolume* ...] [*Interval* [*Count*]]

Description

The **vmstat** command reports statistics about kernel threads, virtual memory, disks, traps and CPU activity. Reports generated by the **vmstat** command can be used to balance system load activity. These system−wide statistics (among all processors) are calculated as averages for values expressed as percentages, and as sums otherwise.

If the **vmstat** command is invoked without flags, the report contains a summary of the virtual memory activity since system startup. If the **−f** flag is specified, the **vmstat** command reports the number of forks since system startup. The *PhysicalVolume* parameter specifies the name of the physical volume.

The *Interval* parameter specifies the amount of time in seconds between each report. The first report contains statistics for the time since system startup. Subsequent reports contain statistics collected during the interval since the previous report. If the *Interval* parameter is not specified, the **vmstat** command generates a single report and then exits. The *Count* parameter can only be specified with the *Interval* parameter. If the *Count* parameter is specified, its value determines the number of reports generated and the number of seconds apart. If the *Interval* parameter is specified without the *Count* parameter, reports are continuously generated. A *Count* parameter of 0 is not allowed.

The kernel maintains statistics for kernel threads, paging, and interrupt activity, which the **vmstat** command accesses through the use of the **knlist** subroutine and the **/dev/kmem** pseudo−device driver. The disk input/output statistics are maintained by device drivers. For disks, the average transfer rate is determined by using the active time and number of transfers information. The percent active time is computed from the amount of time the drive is busy during the report.

The following example of a report generated by the **vmstat** command contains the column headings and their description:

`kthr:` kernel thread state changes per second over the sampling interval.

`r`	Number of kernel threads placed in run queue.
`b`	Number of kernel threads placed in wait queue (awaiting resource, awaiting input/output).

`Memory`: information about the usage of virtual and real memory. Virtual pages are considered active if they have been accessed. A page is 4096 bytes.

`avm` Active virtual pages.

`fre` Size of the free list.

> **Note:** A large portion of real memory is utilized as a cache for file system data. It is not unusual for the size of the free list to remain small.

`Page`: information about page faults and paging activity. These are averaged over the interval and given in units per second.

`re` Pager input/output list.

`pi` Pages paged in from paging space.

`po` Pages paged out to paging space.

`fr` Pages freed (page replacement).

`sr` Pages scanned by page−replacement algorithm.

`cy` Clock cycles by page−replacement algorithm.

`Faults`: trap and interrupt rate averages per second over the sampling interval.

`in` Device interrupts.

`sy` System calls.

`cs` Kernel thread context switches.

`Cpu`: breakdown of percentage usage of CPU time.

`us` User time.

`sy` System time.

`id` CPU idle time.

`wa` CPU cycles to determine that the current process is wait and there is pending disk input/output.

`Disk`: Provides the number of transfers per second to the specified physical volumes that occurred in the sample interval. The *PhysicalVolume* parameter can be used to specify one to four names. Transfer statistics are given for each specified drive in the order specified. This count represents requests to the physical device. It does not imply an amount of data that was read or written. Several logical requests can be combined into one physical request.

Flags

> **Note:** Both the **−f** and **−s** flags can be entered on the command line, but the system will only accept the first flag specified and override the second flag.

−f Reports the number of forks since system startup.

−i Displays the number of interrupts taken by each device since system startup.

−s Writes to standard output the contents of the sum structure, which contains an absolute count of paging events since system initialization. The **−s** option is exclusive of the other **vmstat** command options. These events are described as follows:

address translation faults
: Incremented for each occurrence of an address translation page fault. I/O may or may not be required to resolve the page fault. Storage protection page faults (lock misses) are not included in this count.

page ins

Incremented for each page read in by the virtual memory manager. The count is incremented for page ins from page space and file space. Along with the page out statistic, this represents the total amount of real I/O initiated by the virtual memory manager.

page outs
: Incremented for each page written out by the virtual memory manager. The count is incremented for page outs to page space and for page outs to file space. Along with the page in statistic, this represents the total amount of real I/O initiated by the virtual memory manager.

paging space page ins
: Incremented for VMM initiated page ins from paging space only.

paging space page outs
: Incremented for VMM initiated page outs to paging space only.

total reclaims
: Incremented when an address translation fault can be satisfied without initiating a new I/O request. This can occur if the page has been previously requested by VMM, but the I/O has not yet completed; or if the page was pre−fetched by VMM's read−ahead algorithm, but was hidden from the faulting segment; or if the page has been put on the free list and has not yet been reused.

zero−filled page faults
: Incremented if the page fault is to working storage and can be satisfied by assigning a frame and zero−filling it.

executable−filled page faults
: Incremented for each instruction page fault.

pages examined by the clock
: VMM uses a clock−algorithm to implement a pseudo least recently used (lru) page replacement scheme. Pages are *aged* by being examined by the clock. This count is incremented for each page examined by the clock.

revolutions of the clock hand
: Incremented for each VMM clock revolution (that is, after each complete scan of memory).

pages freed by the clock
: Incremented for each page the clock algorithm selects to free from real memory.

backtracks
: Incremented for each page fault that occurs while resolving a previous page fault. (The new page fault must be resolved first and then initial page faults can be *backtracked*.)

lock misses
: VMM enforces locks for concurrency by removing addressability to a page. A page fault can occur due to a lock miss, and this count is incremented for each such occurrence.

free frame waits
: Incremented each time a process is waited by VMM while free frames are gathered.

extend XPT waits
: Incremented each time a process is waited by VMM due to a commit in progress for the segment being accessed.

pending I/O waits
: Incremented each time a process is waited by VMM for a page−in I/O to complete.

start I/Os
: Incremented for each read or write I/O request initiated by VMM. This count should equal the sum of page−ins and page−outs.

iodones
: Incremented at the completion of each VMM I/O request.

CPU context switches
: Incremented for each CPU context switch (dispatch of a new process).

device interrupts
: Incremented on each hardware interrupt.

software interrupts
: Incremented on each software interrupt. A software interrupt is a machine instruction similar to a hardware interrupt that saves some state and branches to a service routine. System calls are implemented with software interrupt instructions that branch to the system call handler routine.

traps

Not maintained by the AIX operating system.

syscalls
Incremented for each system call.

Examples

1. To display a summary of the statistics since boot, enter:
   ```
   vmstat
   ```
2. To display five summaries at 2−second intervals, enter:
   ```
   vmstat 2 5
   ```
   The first summary contains statistics for the time since boot.
3. To display a summary of the statistics since boot including statistics for logical disks scdisk13 and scdisk14, enter:
   ```
   vmstat scdisk13 scdisk14
   ```
4. To display fork statistics, enter:
   ```
   vmstat −f
   ```
5. To display the count of various events, enter:
   ```
   vmstat −s
   ```

Files

/unix	Symbolic link to the kernel boot image.
/usr/bin/vmstat	Contains the **vmstat** command.

Related Information

The **iostat** command.

The **knlist** subroutine.

The **/dev/kmem** special file.

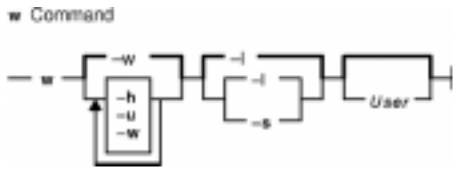
Monitoring and Tuning Memory Use in *AIX Versions 3.2 and 4 Performance Tuning Guide*.

w Command

Purpose

Prints a summary of current system activity.

Syntax



w [**−h**] [**−u**] [**−w**] [**−l** | **−s**] [*User*]

Description

The **w** command prints a summary of the current activity on the system. The summary includes the following:

User	Who is logged on.
tty	Name of the tty the user is on.
login@	Time of day the user logged on.
idle	Number of minutes since a program last attempted to read from the terminal.
JCPU	System unit time used by all processes and their children on that terminal.
PCPU	System unit time used by the currently active process.
What	Name and arguments of the current process.

The heading line of the summary shows the current time of day, how long the system has been up, the number of users logged into the system, and the load average. The load average is the number of runnable processes over the preceding 1−, 5−, 15−minute intervals.

The following examples show the different formats used for the login time field:

`10:25am`	The user logged in within the last 24 hours.
`Tue10am`	The user logged in between 24 hours and 7 days.
`12Mar91`	The user logged in more than 7 days ago.

If a user name is specified with the *User* parameter, the output is restricted to that user.

Flags

−h	Suppresses the heading.
−l	Prints the summary in long form. This is the default.
−s	Prints the summary in short form. In the short form, the tty is abbreviated, and the login time, system unit time, and command arguments are omitted.
−u	Prints the time of day, amount of time since last system startup, number of users logged on, and number of processes running. This is the default. Specifying the **−u** flag without specifying the **−w** or **−h** flag is

equivalent to the **uptime** command.

−w The equivalent of specifying the **−u** and **−l** flags, which is the default.

Files

/etc/utmp
Contains the list of users.

Related Information

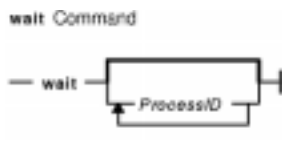
The **who** command, **finger** command, **ps** command, **uptime** command.

wait Command

Purpose

Waits until the termination of a process ID.

Syntax



wait [*ProcessID* ...]

Description

The **wait** command waits (pauses execution) until the process ID specified by the *ProcessID* variable terminates. If the *ProcessID* variable is not specified, the **wait** command waits until all process IDs known to the invoking shell have terminated and exit with a 0 exit status. If a *ProcessID* variable represents an unknown process ID, the **wait** command treats them as known process IDs that exited with exit status 127. The **wait** command exits with the exitstatus of the last process ID specified by the *ProcessID* variable.

Flag

ProcessID	Specifies an unsigned decimal integer process ID of a command, which the **wait** command waits on until termination.

Exit Status

If one or more operands were specified, all of the operands terminated or were not known by the invoking shell, and the status of the last operand specified is known, then the exit status of the **wait** command is the same as the exit status information of the command indicated by the last operand specified. If the process terminated abnormally due to the receipt of a signal, then the exit status is greater than 128 and distinct from the exit status information generated by other signals, although the exact status value is unspecified (see the **kill−l** command option). Otherwise, the **wait** command exits with one of the following values:

0	The **wait** command was invoked with no operands and all process IDs known by the invoking shell have terminated.
1−126	The **wait** command detected an error.
127	The command identified by the last *ProcessID* operand specified is unknown.

File

/usr/bin/wait	Contains the **wait** command.

Related Information

The **shutdown** command, **sleep** command, **wall** command.

The **alarm** subroutine, **pause** subroutine, **sigaction** subroutine.

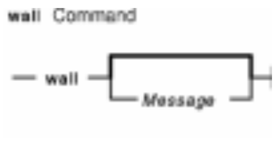
Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

wall Command

Purpose

Writes a message to all users that are logged in.

Syntax



wall [*Message*]

Description

The **wall** command writes a message to all users that are logged in. If the *Message* parameter is not specified, the **wall** command reads the message from standard input until it reaches an end−of−file character. The message is then sent to all logged in users. The following heading precedes the message:

```
Broadcast message from
user@node

 (tty) at hh:mm:ss ...
```

`hh:mm:ss` represents the hours, minutes, and seconds when the message was sent.

To override any protections set up by other users, you must operate with root user authority. Typically, the root user uses the **wall** command to warn all other users of an impending system shutdown.

Notes:

1. The **wall** command only sends messages to the local node.
2. Messages can contain multibyte characters.

Files

/dev/tty Specifies a device.

Related Information

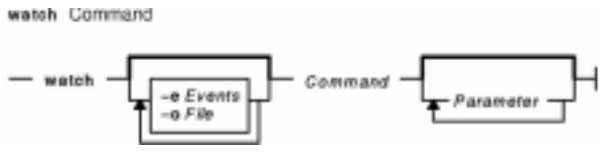
The **mesg** command, **su** command, **write** command.

watch Command

Purpose

Observes a program that may be untrustworthy.

Syntax



watch [**−e** *Events*] [**−o** *File*] *Command* [*Parameter* ...]

Description

The **watch** command permits the root user or a member of the audit group to observe the actions of a program that is thought to be untrustworthy. The **watch** command executes the program you specify with the *Command* parameter, with or without any *Parameter* fields, and records all audit events or the audit events you specify with the **−e** flag.

The **watch** command observes all the processes that are created while the program runs, including any child process. The **watch** command continues until all processes exit, including the process it created, to observe all the events that occur.

The **watch** command formats the audit records and writes them to standard output or to a file you specify with the **−o** flag.

For the **watch** command to work, the auditing subsystem must not have been configured and enabled.

Flags

−e *Events*	Specifies the events to be audited. The *Events* parameter is a comma−separated list of audit events that are defined in the **/etc/security/audit/events** file. The default value is all events.
−o*File*	Specifies the path name of the output file. If the **−o** flag is not used, output is written to standard output.

Security

Access Control: This command should grant execute (x) access to the root user and members of the audit group. The command should be **setuid** to the root user so it can access other audit subsystem commands and files, and have the **trusted computing base** attribute.

Files Accessed:

Mode	**File**
r	**/dev/audit**
x	**/usr/sbin/auditstream**
x	**/usr/sbin/auditselect**

x	**/usr/sbin/auditpr**

Examples

1. To watch all files opened by the **bar** command, enter:

   ```
   watch −e FILE_Open /usr/lpp/foo/bar −x
   ```

   This command opens the audit device and executes the **/usr/lpp/foo/bar** command. It then reads all records and selects and formats those with the event type of `FILE_Open`.

2. To watch the installation of the `xyzproduct` program, that may be untrustworthy, enter:

   ```
   watch /usr/sbin/installp xyzproduct
   ```

This command opens the audit device and executes the **/usr/sbin/installp** command. It then reads all records and formats them.

Files

/usr/sbin/watch	Contains the **watch** command.
/dev/audit	Specifies the audit device from which the audit records are read.

Related Information

The **audit** command, **auditbin** daemon, **auditcat** command, **auditpr** command, **auditselect** command, **auditstream** command, **login** command, **logout** command, **su** command.

The **auditread** subroutine.

To see the steps you must take to establish an Auditing System, refer to Setting Up Auditing in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

For more information about the identification and authentication of users, discretionary access control, the trusted computing base, and auditing, refer to Security Administration in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

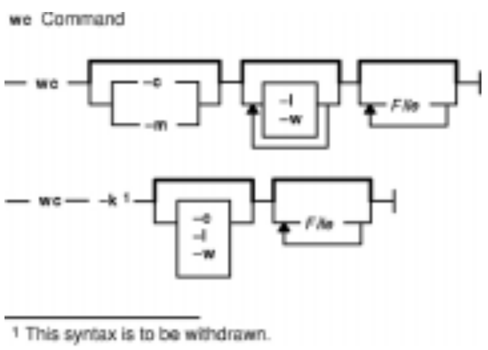
For general information about auditing, refer to Auditing Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

wc Command

Purpose

Counts the number of lines, words, and bytes or characters in a file.

Syntax



wc [**−c** | **−m**] [**−l**] [**−w**] [*File* ...]

wc −k [**−c**] [**−l**] [**−w**] [*File* ...]

Description

By default, the **wc** command counts the number of lines, words, and bytes in the files specified by the *File* parameter. The command writes the number of newline characters, words, and bytes to the standard output and keeps a total count for all named files.

When you use the *File* parameter, the **wc** command displays the file names as well as the requested counts. If you do not specify a file name for the *File* parameter, the **wc** command uses standard input.

The **wc** command is affected by the **LANG**, **LC_ALL**, **LC_CTYPE**, and **LC_MESSAGES** environment variables.

Flags

−c	Counts bytes unless the **−k** flag is specified. If the **−k** flag is specified, the **wc** command counts characters.
−k	Counts characters. Specifying the **−k** flag is equivalent to specifying the **−klwc** flag. If you use the **−k** flag with other flags, then you must include the **−c** flag. Otherwise, the **−k** flag is ignored. For more information, see examples 4 and 5. **Note:** This flag is to be withdrawn in a future release.
−l	Counts lines.
−m	Counts characters. This flag cannot be used with the **−c** flag.
−w	Counts words. A word is defined as a string of characters delimited by spaces, tabs, or newline characters.

Exit Status

This command returns the following exit values:

0	The command ran successfully.
>0	An error occurred.

Examples

1. To display the line, word, and byte counts of a file, enter:

   ```
   wc chap1
   ```

   The **wc** command displays the number of lines, words, and bytes in the `chap1` file.
2. To display only byte and word counts, enter:

   ```
   wc −cw chap*
   ```

   The **wc** command displays the number of bytes and words in each file that begins with `chap`. The command also displays the total number of bytes and words in these files.
3. To display the line, word, and character counts of a file, enter:

   ```
   wc −k chap1
   ```

   The **wc** command displays the number of lines, words, and characters in the `chap1` file.
4. To display the word and character counts of a file, enter:

   ```
   wc −kcw chap1
   ```

   The **wc** command displays the number of characters and words in the `chap1` file.
5. To use the **wc** command on standard input, enter:

   ```
   wc −klw
   ```

   The **wc** command displays the number of lines and words in standard input. The **−k** flag is ignored.
6. To display the character counts of a file, enter:

   ```
   wc −m chap1
   ```

   The **wc** command displays the number of characters in the `chap1` file.
7. To use the **wc** command on standard input, enter:

   ```
   wc −mlw
   ```

The **wc** command displays the number of lines, words, and characters in standard input.

Files

/usr/bin/wc, /bin/wc	Contains the **wc** command.
/usr/ucb/wc	Contains the symbolic link to the **wc** command.

Related Information

Files Overview and Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

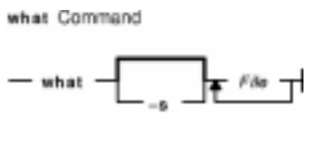
National Language Support Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

what Command

Purpose

Displays identifying information in files.

Syntax



what [**−s**] *File ...*

Description

The **what** command searches specified files for all occurrences of the pattern that the **get** command substitutes for the **%Z%** keyletter (see the **get** or **prs** command for a description of identification keywords). By convention, the value substituted is "@(#)" (double quotation marks, at sign, left parenthesis, pound sign, right parenthesis, double quotation marks). If no file is specified, the **what** command reads from standard input.

The **what** command writes to standard output whatever follows the pattern, up to but not including the first double quotation mark ("), greater than symbol (>), new−line character, backslash (\), or null character.

The **what** command should be used in conjunction with the **get** command, which automatically inserts the identifying information. You can also use the **what** command on files where the information is inserted manually.

Note: The **what** command may fail to find SCCS identification strings in executable files.

Flags

−s	Searches for only the first occurrence of the **%Z%** pattern.

Exit Status

This command returns the following exit values:

0	Any matches were found.
1	Otherwise.

Examples

Suppose that the file `test.c` contains a C program that includes the line:

```
char ident[ ] = "@(#)Test Program";
```

If you compile `test.c` to produce `test.o`, then the command:

```
what test.c test.o
```

displays:

```
test.c:
Test Program
test.o:
Test Program
```

Files

/usr/bin/what Contains the **what** command.

Related Information

The **get** command, **sccshelp** command.

The **sccsfile** file format.

List of SCCS Commands in *AIX General Programming Concepts: Writing and Debugging Programs*.

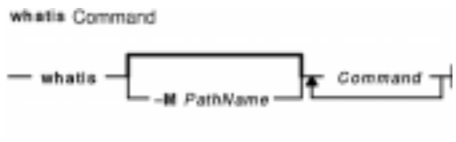
Source Code Control System (SCCS) Overview in *AIX General Programming Concepts: Writing and Debugging Programs*.

whatis Command

Purpose

Describes what function a command performs.

Syntax



whatis [**−M***PathName*] *Command* ...

Description

The **whatis** command looks up a given command, system call, library function, or special file name, as specified by the *Command* parameter, from a database you create using the **catman −w** command. The **whatis** command displays the header line from the manual section. You can then issue the **man** command to obtain additional information.

The **whatis** command is equivalent to using the **man−f** command.

> **Note:** When the **/usr/share/man/whatis** database is built from the HTML library using the **catman −w** command, section 3 is equivalent to section 2 or 3. See the **man** command for further explanation of sections.

Flags

−M*PathName*	Specifies an alternative search path. The search path is specified by the *PathName* parameter, and is a colon−separated list of directories in which the **whatis** command expects to find the standard manual subdirectories.

Examples

To find out what the **ls** command does, enter:

```
whatis ls
```

This produces the following output:

```
ls(1)  −Displays the contents of a directory.
```

Files

/usr/share/man/whatis Contains the **whatis** database.

Related Information

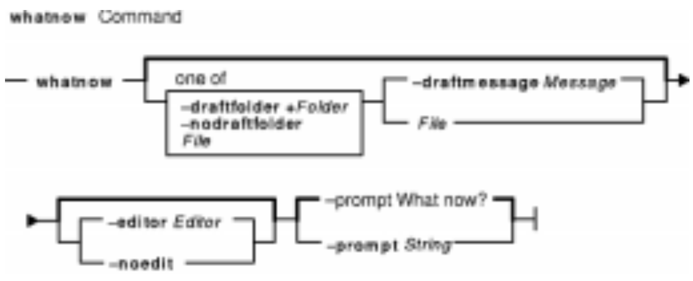
The **apropos** command, **catman** command, **ls** command, **man** command.

whatnow Command

Purpose

Starts a prompting interface for draft disposition.

Syntax



whatnow [{ **−draftfolder** +*Folder* | **−nodraftfolder** | *File* } { **−draftmessage** *Message* | *File* }]
[**−editor** *Editor* | **−noedit**] [**−prompt** *String*]

Description

The **whatnow** command provides an interface for the disposition of messages. By default, the interface operates on the current draft message. When you enter the **whatnow** command, the system places you in the interface and returns the following prompt:

```
What now?
```

Within the interface you can manipulate message drafts using the **whatnow** subcommands. To see a listing of the subcommands, press the Enter key at the `What now?` prompt. To exit the interface, press `q`.

If you do not specify the **−draftfolder** flag or if the `Draft−Folder:` entry in the **$HOME/.mh_profile** file is undefined, the **whatnow** command searches your MH directory for a **draft** file. Specifying a message after the **−draftfolder** +*Folder* flag is the same as specifying the **−draftmessage** flag.

To change the default editor for the **whatnow** command, use the **−editor** flag or define the `Editor:` entry in the *UserMhDirectory*/**.mh_profile** file.

> **Note:** The **comp**, **dist**, **forw**, or **repl** commands use the same interface as the **whatnow** command.

Flags

−draftfolder +*Folder*	Specifies the folder containing the message. By default, the system uses the *UserMhdirectory*/**draft** file. Specifying a message after the **−draftfolder** +*Folder* is the same as using the **−draftmessage** flag.
−draftmessage *Message*	Specifies the draft message.
−editor *Editor*	Specifies that the value of the *Editor* variable is the initial editor for composing or revising the message.
−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For MH, the name of this flag must be fully spelled out.

File	User selected draft file.
Message	Specifies the message. Use the following references to specify messages:

Number
: Number of the message.

cur *or* **.** *(period)*
: Current message. This is the default.

first
: First message in a folder.

last
: Last message in a folder.

next
: Message following the current message.

prev
: Message preceding the current message.

−nodraftfolder
: Places the draft in the *UserMhDirectory*/**draft** file.

−noedit
: Suppresses the initial edit.

−prompt *String*
: Uses the specified string as the prompt. The default string is `What now?`.

whatnow Subcommands

The **whatnow** subcommands enable you to edit the message, direct the disposition of the message, or end the processing of the **whatnow** command.

display [*Flags*]	Displays the message being redistributed or replied to. You can specify any *Flags* parameter that is valid for the listing program. (Use the `lproc:` entry in the **$HOME/.mh_profile** file to set a default listing program.) If you specify flags that are invalid for the listing program, the **whatnow** command does not pass the path name of the draft.
edit [*CommandString*]	Specifies with the *CommandString* parameter an editor for the message. You can specify the editor and any valid flags to that editor. If you do not specify an editor, the **whatnow** command uses the editor specified by the `Editor:` entry in your *UserMhDirectory*/**.mh_profile** file. If your `Editor:` entry is undefined, the **whatnow** command starts the editor used in the previous editing session.
list [*Flags*]	Displays the draft. You can specify any *Flags* parameter that is valid for the listing program. (To specify a default listing program, set a default `lproc:` entry in the **$HOME/.mh_profile** file.) If you specify any flags that are invalid for the listing program, the **whatnow** command does not pass the path name of the draft.
push [*Flags*]	Sends the message in the background. You can specify any valid flag for the **send** command.
quit [**−delete**]	Ends the **whatnow** session. If you specify the **−delete** flag, the **whatnow** command deletes the draft. Otherwise, the **whatnow** command stores the draft.
refile [*Flags*] +*Folder*	Files the draft in the specified folder and supplies a new draft having the previously specified form. You can specify any *Flags* parameter that is valid for the command serving as the **fileproc**. (You can set a default `fileproc:` entry in the **$HOME/.mh_profile** file.)

send [*Flags*]	Sends the message. You can specify any valid flags for the **send** command.
whom [*Flags*]	Displays the addresses to which the message would be sent. You can specify any valid flags for the **whom** command.

Profile Entries

The following entries are entered in the *UserMhDirectory*/**.mh_profile** file:

`Draft-Folder:`	Sets the default folder for drafts.
`Editor:`	Sets the default editor.
`fileproc:`	Specifies the program used to refile messages.
`LastEditor-next:`	Specifies the editor used after exiting the editor specified by the *LastEditor* variable.
`lproc:`	Specifies the program used to list the contents of a message.
`Path:`	Specifies the *UserMhDirectory*.
`sendproc:`	Specifies the program used to send messages.
`whomproc:`	Specifies the program used to determine the users to whom a message would be sent.

Examples

1. To display the original message when you are replying to a message, enter the following at the `What now?` prompt:

   ```
   display
   ```

   The system displays the original message. If you enter the **display** subcommand from a command other than the **dist** or **repl** command, you will receive a system message stating that there is no alternate message to display.

2. To edit the draft message with the `vi` editor, enter the following at the `What now?` prompt:

   ```
   edit vi
   ```

3. To edit the draft message with the default editor specified in your **.mh_profile** file, enter the following at the `What now?` prompt:

   ```
   edit
   ```

4. To list the contents of the draft message you have composed, enter the following at the `What now?` prompt:

   ```
   list
   ```

   The draft message you are composing is displayed.

5. To send the draft message in the background and get a shell prompt immediately, enter the following at the `What now?` prompt:

   ```
   push
   ```

   The draft message is sent and you immediately receive the shell prompt.

6. To quit composing a draft message and save it to a file so that you can later finish composing the message, enter the following at the `What now?` prompt:

   ```
   quit
   ```

The system responds with a message similar to the following.

```
whatnow: draft left on /home/dale/Mail/draft
```

In this example, user `dale`'s draft message is saved to the **/home/dale/Mail/draft** file.

7. To quit composing a draft message and delete the message, enter the following at the `What now?` prompt:

   ```
   quit −delete
   ```

   The shell prompt is displayed when the draft message is deleted.
8. To file the draft message you are composing before you send it, enter the following at the `What now?` prompt:

   ```
   refile +tmp
   ```

   The system responds with a message similar to the following:

   ```
   Create folder "home/dale/Mail/tmp"?
   ```

   In this example, if you answer `yes`, the draft message is filed in user `dale`'s folder `tmp`.
9. To send the draft message you have composed, enter the following at the `What now?` prompt:

   ```
   send
   ```

   The shell prompt is displayed when the message is sent.
10. To verify that all addresses in the draft message are recognized by the mail delivery system, enter the following at the `What now?` prompt:

    ```
    whom
    ```

    The system responds with a message similar to the following:

    ```
    jeanne... User unknown
    dale@venus... deliverable
    ```

In this example, the mail delivery system recognized `dale@venus` as a correct address, but did not recognize `jeanne` as a correct address.

Files

$HOME/.mh_profile	Specifies the MH user profile.
UserMhDirectory/**draft**	Contains the current message draft.
/usr/bin/whatnow	Contains the **whatnow** command.

Related Information

The **comp** command, **dist** command, **forw** command, **prompter** command, **refile** command, **repl** command, **rmm** command, **scan** command, **send** command, **whom** command.

The **mh_alias** file format, **mh_profile** file format.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

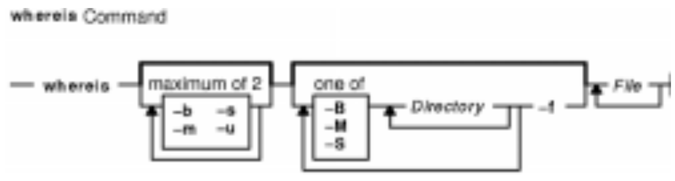
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

whereis Command

Purpose

Locates source, binary, or manual for program.

Syntax



whereis [**−s**] [**−b**] [**−m**] [**−u**] [{ { **−S** | **−B** | **−M** } *Directory* ... }... **−f**] *File* ...

Description

The **whereis** command locates the source, binary, and manuals sections for specified files. The supplied names are first stripped of leading path name components and any (single) trailing extension of the form *.ext* (for example, **.c**). Prefixes of **s.** resulting from use of the Source Code Control System (see **SCCS**) are also dealt with. The command then attempts to find the desired program from a list of standard locations.

A usage message is returned if a bad option is entered. In other cases, no diagnostics are provided.

Flags

If any of the **−b, −s,−m** or **−u** flags are given, the **whereis** command searches only for binary, source, manual, or unusual sections respectively (or any two thereof).

−b	Searches for binary sections of a file.
−m	Searches for manual sections of a file.
−s	Searches for source sections of a file.
−u	Searches for unusual files. A file is said to be unusual if it does not have one entry of each requested type.

The **−B, −M,** and **−S** flags can be used to change or otherwise limit the places where the **whereis** command searches. Since the program uses the **chdir** subroutine to run faster, path names given with the **−M, −S** and **−B** flag directory list must be full; for example, they must begin with a **/** (slash).

−B	Like **−b**, but adds a directory to search.
−M	Like **−m**, but adds a directory to search.
−S	Like **−s**, but adds a directory to search.
−f	Terminates the last **−M, −S** or **−B** directory list and signal the start of file names.

Examples

To find all of the files in the **/usr/ucb** directory that either are not documented in the **/usr/man/man1** directory or do not have source in the **/usr/src/cmd** directory, enter:

```
cd /usr/ucb
whereis −u −M /usr/man/man1 −S /usr/src/cmd −f *
```

Files

/usr/share/man/*	Directories containing manual files.
/sbin, **/etc**, **/usr/**{**lib**,**bin**,**ucb**,**lpp**}	Directories containing binary files.
/usr/src/*	Directories containing source code files.

Related Information

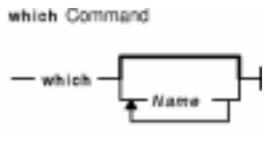
The **chdir** subroutine.

which Command

Purpose

Locates a program file, including aliases and paths.

Syntax



which [*Name* ...]

Description

The **which** command takes a list of program names and looks for the files that run when these names are given as commands. The **which** command expands each argument, if it is aliased, and searches for it along the user's path. The aliases and paths are taken from the **.cshrc** file in the user's home directory. If the **.cshrc** file does not exist, or if the path is not defined in the **.cshrc** file, the **which** command uses the path defined in the user's environment.

A diagnostic is given if a name is aliased to more than a single word or if an executable file with the argument name is not found in the path.

In the Korn shell, you can use the **whence** command to produce a more verbose report. See "Korn Shell Special Commands" in *AIX Version 4.3 System User's Guide: Operating System and Devices* for more information on the **whence** command.

Examples

To find the executable file associated with a command name of `lookup`:

```
which lookup
```

Files

$HOME/.cshrc	Contains the source of aliases and path values.

Related Information

The **csh** command, **find** command, **file** command, **ksh** command, **sh** command, **whereis** command.

Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes shells, the different types, and how they affect the way commands are interpreted.

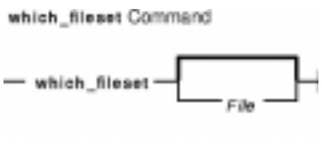
Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

which_fileset Command

Purpose

Searches the **/usr/lpp/bos/AIX_file_list** file for a specified file name or command. This command only applies to AIX Version 4.2.1 or later.

Syntax



which_fileset [*File*]

Description

The **which_fileset** command searches the **/usr/lpp/bos/AIX_file_list** file for a specified file name or command name, and prints out the name of the fileset that the file or command is shipped in.

The **/usr/lpp/bos/AIX_file_list** file is large and not installed automatically. You must install the **bos.content_list** fileset to receive this file.

The *File* parameter can be the command name, the full path name, or a regular expression search pattern.

Examples

1. To display which fileset the dbx command is shipped in, enter:

   ```
   which_fileset dbx
   ```

   The screen displays the following:

   ```
   /usr/bin/dbx > /usr/ccs/bin/dbx            bos.adt.debug 4.2.1.0
   /usr/ccs/bin/dbx                            bos.adt.debug 4.2.1.0
   ```

2. To display all commands and paths containing the *sendmail* string, enter:

   ```
   which_fileset sendmail.*
   ```

   T he screen displays the following:

   ```
   /usr/ucb/mailq > /usr/sbin/sendmail    bos.compat.links 4.2.0.0
   /usr/ucb/newaliases > /usr/sbin/sendmail bos.compat.links 4.2.0.0
   /usr/lib/nls/msg/Ca_ES/sendmail87.cat  bos.msg.Ca_Es.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/ca_ES/sendmail87.cat  bos.msg.ca_Es.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/cs_CZ/sendmail87.cat  bos.msg.cs_CZ.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/De_DE/sendmail87.cat  bos.msg.De_DE.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/de_DE/sendmail87.cat  bos.msg.de_DE.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/En_US/sendmail87.cat  bos.msg.En_US.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/en_US/sendmail87.cat  bos.msg.en_US.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/Es_ES/sendmail87.cat  bos.msg.Es_ES.net.tcp.client 4.2.0.0
   /usr/lib/nls/msg/es_ES/sendmail87.cat  bos.msg.es_ES.net.tcp.client 4.2.0.0
   ```

```
/usr/lib/nls/msg/Fr_FR/sendmail87.cat  bos.msg.Fr_FR.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/fr_FR/sendmail87.cat  bos.msg.fr_FR.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/hu_HU/sendmail87.cat  bos.msg.hu_HU.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/It_IT/sendmail87.cat  bos.msg.It_IT.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/it_IT/sendmail87.cat  bos.msg.it_IT.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/Ja_JP/sendmail87.cat  bos.msg.Ja_JP.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/ja_JP/sendmail87.cat  bos.msg.ja_JP.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/ko_KR/sendmail87.cat  bos.msg.ko_KR.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/pl_PL/sendmail87.cat  bos.msg.pl_PL.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/ru_RU/sendmail87.cat  bos.msg.ru_RU.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/Sv_SE/sendmail87.cat  bos.msg.Sv_SE.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/sv_SE/sendmail87.cat  bos.msg.sv_SE.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/ZH_CN/sendmail87.cat  bos.msg.ZH_CN.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/zh_CN/sendmail87.cat  bos.msg.zh_CN.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/Zh_TW/sendmail87.cat  bos.msg.Zh_TW.net.tcp.client 4.2.0.0
/usr/lib/nls/msg/zh_TW/sendmail87.cat  bos.msg.zh_TW.net.tcp.client 4.2.0.0
/etc/sendmail.cf                       bos.net.tcp.client.4.2.1.0
/usr/lib/sendmail > /usr/sbin/sendamil bos.net.tcp.client.4.2.1.0
/usr/sbin/mailq > /usr/sbin/sendamil   bos.net.tcp.client.4.2.1.0
/usr/sbin/newaliases > /usr/sbin/sendmail bos.net.tcp.client.4.2.1.0
/usr/sbin/sendmail                     bos.net.tcp.client.4.2.1.0
```

3. To find where the **/usr/sbin/which_fileset** command is shipped, enter:

   ```
   which_fileset /usr/bin/which_fileset
   ```

   The screen displays:

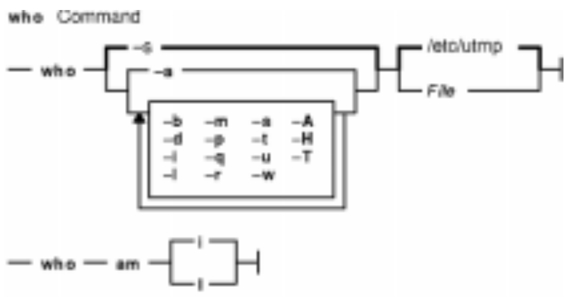
   ```
   /usr/sbin/which_fileset      bos.rte.install 4.2.1.0
   ```

who Command

Purpose

Identifies the users currently logged in.

Syntax



who [**−a** | **−b−d−i−l−m−p−q−r−s−t−u −w−A−H−T**] [*File*]

who am { **i** | **I** }

Description

The **who** command displays information about all users currently on the local system. The following information is displayed: login name, tty, date and time of login. Entering `who am i` or `who am I` displays your login name, tty, date and time you logged in. If the user is logged in from a remote machine, then the host name of that machine is displayed as well.

The **who** command can also display the elapsed time since line activity occurred, the process ID of the command interpreter (shell), logins, logoffs, restarts, and changes to the system clock, as well as other processes generated by the initialization process.

The general output format of the **who** command is as follows:

```
Name [State] Line Time [Activity] [Pid] [Exit] (Hostname)
```

where:

`Name`	Identifies the user's login name.
`State`	Indicates whether the line is writable by everyone (see the **−T** flag).
`Line`	Identifies the line name as found in the /dev directory.
`Time`	Represents the time when the user logged in.
`Activity`	Represents the hours and minutes since activity last occurred on that user's line. A . (dot) here indicates line activity within the last minute. If the line has been quiet more than 24 hours or has not been used since the last system startup, the entry is marked as old.
`Pid`	Identifies the process ID of the user's login shell.
`Term`	Identifies the process termination status (see the **−d** flag). For more information on the termination values, refer to the **wait** subroutine or to the **/usr/include/sys/signal.h** file.
`Exit`	Identifies the exit status of ended processes (see the **−d** flag).

`Hostname` Indicates the name of the machine the user is logged in from.

To obtain information, the **who** command normally examines the **/etc/utmp** file. If you specify another file with the *File* parameter, the **who** command examines that file instead. This new file is usually the **/var/adm/wtmp** or **/etc/security/failedlogin** file.

If the *File* parameter specifies more than one file name, only the last file name will be used.

Note: This command only identifies users on the local node.

Flags

−a	Processes the **/etc/utmp** file or the named file with all information. Equivalent to specifying the **−bdlprtTu** flags.
−b	Indicates the most recent system startup time and date.
−d	Displays all processes that have expired without being regenerated by init. The exit field appears for dead processes and contains the termination and exit values (as returned by wait) of the dead process. (This flag is useful for determining why a process ended by looking at the error number returned by the application.)
−l	Lists any login process.
−m	Displays information about the current terminal only. The **who −m** command is equivalent to the **who am i** and **who am I** commands.
−p	Lists any active process that is currently active and has been previously generated by init.
−q	Prints a quick listing of users and the number of users on the local system.
−r	Indicates the current run−level of the process.
−s	Lists only the name, line, and time fields. This flag is the default; thus, the **who** and **who −s** commands are equivalent.
−t	Indicates the last change to the system clock by the root user using the **date** command. If the **date** command has not been run since system installation, the **who −t** command produces no output.
−u or **−i**	Displays the user name, tty, login time, line activity, and process ID of each current user.
−A	Displays all accounting entries in the **/etc/utmp** file. These entries are generated through the **acctwtmp** command.
−H	Displays a header (title).
−T or **−w**	Displays the state of the tty and indicates who can write to that tty as follows:

+
: Writable by anyone.

−
: Writable only by the root user or its owner.

?
: Bad line encountered.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

1. To display information about who is using the local system node, enter:

   ```
   who
   ```

   Information similar to the following is displayed:

   ```
   joe lft/0 Jun 8 08:34
   ```

2. To display your user name, enter:

   ```
   who am i
   ```

   Information similar to the following is displayed:

   ```
   george lft/0 Jun 8 08:34
   ```

3. To display a history of logins, logouts, system startups, and system shutdowns, enter:

   ```
   who /var/adm/wtmp
   ```

   Information similar to the following is displayed:

   ```
   hank   lft/0   Jun   8   08:34  (ausnix5)
   john   lft/0   Jun   8   08:34  (JIKey)
   mary   lft/0   Jun   8   08:22  (machine.austin.ibm)
   jan    pts4    Jun   8   09:19  (puff.wisc.edu)
   ```

4. To display the run−level of the local system node, enter:

   ```
   who −r
   ```

   Information similar to the following is displayed:

   ```
   . run−level 2 Jun 8 04:15 2 0 s
   ```

5. To display any active process that is currently actively and has been previously generated by init, enter:

   ```
   who −p
   ```

   Information similar to the following is displayed:

   ```
   srcmstr   .    Jun 8  04:15  old  2896
   cron      .    Jun 8  04:15  old  4809
   uprintfd  .    Jun 8  04:15  old  5158
   ```

6. To process the **/var/adm/wtmp** file with the **−bdlprtTu** flags specified, enter:

   ```
   who −a /var/adm/wtmp
   ```

   Information similar to the following is displayed:

   ```
      .        system boot Jun 19 10:13
      .        run−level 2 Jun 19 10:13
   ```

```
      .            .       Jun 19 10:14    old
      .            .       Jun 19 10:14    old
      .            .       Jun 19 10:14    old
   rc         −    .       Jun 19 10:13    old
      .            .       Jun 19 10:16    old
      .            .       Jun 19 10:14    old
   srcmstr    −    .       Jun 19 10:14    old
   rctcpip    −    .       Jun 19 10:14    old
   rcdce      −    .       Jun 19 10:14    old
   rccm       −    .       Jun 19 10:15    old
   dceupdt    −    .       Jun 19 10:15    old
   rcnfs      −    .       Jun 19 10:15    old
   cron       −    .       Jun 19 10:16    old
   piobe      −    .       Jun 19 10:16    old
   qdaemon    −    .       Jun 19 10:16    old
   writesrv   −    .       Jun 19 10:16    old
   uprintfd   −    .       Jun 19 10:16    old
      .            .       Jun 19 10:16    old
   LOGIN      − lft0       Jun 19 10:16    old
      .            .       Jun 19 10:16    old
      .            .       Jun 19 10:16    old
```

Files

/etc/utmp	Contains user and accounting information.
/etc/security/failedlogin	Contains the history of all invalid logins.
/var/adm/wtmp	Contains the history of all logins since the file was last created.
/usr/include/sys/signal.h	Contains a list of termination values.

Related Information

The **date** command, **mesg** command, **whoami** command **su** command.

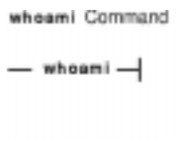
The **wait** subroutine.

whoami Command

Purpose

Displays your login name.

Syntax



whoami

Description

The **whoami** command displays your login name. Unlike using the command **who** and specifying **am i**, the **whoami** command also works when you have root authority since it does not examine the **/etc/utmp** file.

Files

/etc/passwd Contains user IDs.

Related Information

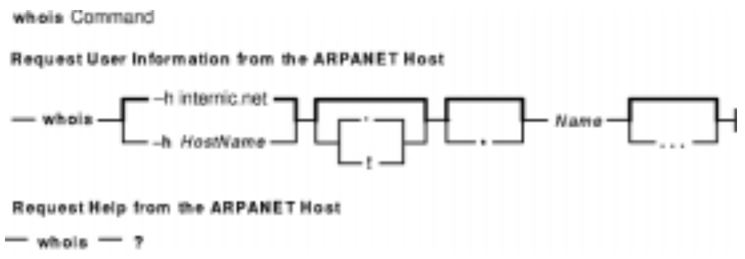
The **who** command.

whois Command

Purpose

Identifies a user by user ID or alias.

Syntax


whois Command
Request User Information from the ARPANET Host
whois
-h internic.net
-h HostName
.
!
.
Name
. . .
Request Help from the ARPANET Host
whois
?

whois [**−h** *HostName*] [**.** | **!**] [*****] *Name* [**. . .**]

whois ?

Description

The **/usr/bin/whois** command searches a user name directory and displays information about the user ID or nickname specified in the *Name* parameter. The **whois** command tries to reach ARPANET host `internic.net` where it examines a user−name database to obtain information. The **whois** command should be used only by users on ARPANET. Refer to RFC 812 for more complete information and recent changes to the **whois** command.

> **Note:** If your network is on a national network, such as ARPANET, the host name is hard−coded as `internic.net`.

The *Name* [**. . .**] parameter represents the user ID, host name, network address, or nickname on which to perform a directory search. The **whois** command performs a wildcard search for any name that matches the string preceding the optional ... (three periods).

Flags

.	Forces a name−only search for the name specified in the *Name* parameter.
!	Displays help information for the nickname or handle ID specified in the *Name* parameter.
*****	Displays the entire membership list of a group or organization. If there are many members, this can take some time.
?	Requests help from the ARPANET host.
−h*HostName*	Specifies an alternative host name. The default host name on the ARPANET is `internic.net`. You can contact the other major ARPANET user−name database, `nic.ddn.mil`, by specifying the **−h***HostName* flag.

Examples

1. To display information about ARPANET registered users by the name of Smith, enter:

   ```
   whois Smith
   ```

2. To display information about ARPANET registered users that use the handle Hobo, enter:

   ```
   whois !Hobo
   ```

3. To display information about ARPANET registered users with the name of John Smith, enter:

   ```
   whois .Smith, John
   ```

4. To display information about ARPANET registered users whose names or handles begin with the letters HEN, enter:

   ```
   whois HEN ...
   ```

5. To get help information for the **whois** command, enter:

   ```
   whois ?
   ```

Related Information

The **who** command.

The **named.conf** file format.

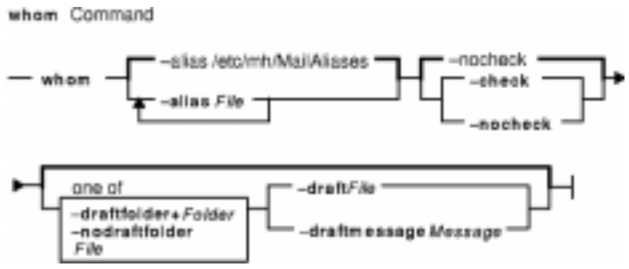
Network Overview in *AIX Version 4.3 System Management Guide: Communications and Networks*.

whom Command

Purpose

Manipulates Message Handler (MH) addresses.

Syntax



whom [**−alias** *File* ...] [**−nocheck** | **−check**]
[{ **−draftfolder** +*Folder* | **−nodraftholder** | *File* }{ **−draftmessage** *Message* | **−draft***File* }]

Description

The **whom** command does the following:

- Expands the headers of a message into a set of addresses.
- Lists the addresses of the proposed recipients of a message.
- Verifies that the addresses are deliverable to the transport service.

  Note: The **whom** command does not guarantee that addresses listed as being deliverable will actually be delivered.

A message can reside in a draft folder or in a file. To specify where a message resides, use the **−draft**, **−draftfolder**, or **−draftmessage** flag.

If you do not specify the **−draftfolder** flag or if the `Draft−Folder:` entry in the **$HOME/.mh_profile** file is undefined, the **whom** command searches your MH directory for a **draft** file. Specifying a message after the **−draftfolder** +*Folder* flag is the same as specifying the **−draftmessage** flag.

Flags

−alias *File*	Specifies a file to search for mail aliases. By default, the system searches the **/etc/mh/MailAliases** file.
−draft	Uses the header information in the *UserMhDirectory*/**draft** file if it exists.
−draftfolder +*Folder*	Uses the header information from the draft message in the specified folder. If you specify a draft folder that doesn't exist, the system creates one for you.
−draftmessage *Message*	Uses the header information from the specified draft message.
−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For MH, the name of this flag must be fully spelled out.
Message	Specifies the message draft. Use the following to specify messages: *Number* Number of the message. ***cur** or **.** (period)*

	Current message. This is the default.
first	First message in a folder.
last	Last message in a folder.
next	Message following the current message.
prev	Message preceding the current message.

−nodraftfolder	Undoes the last occurrence of the **−draftfolder** +*Folder* flag.

Note: Two other flags, **−check** and **−nocheck**, are also available. These flags have no effect on how the **whom** command performs verification. The **−check** and **−nocheck** flags are provided for compatibility only.

Profile Entries

The following entries are entered in the *UserMhDirectory*/**.mh_profile** file:

`Draft−Folder:`	Sets your default folder for drafts.
`postproc:`	Specifies the program used to post messages.

Examples

To list and verify the addresses of the proposed recipients of a message, enter the addressees and subject of the message at the respective prompt, as follows:

```
To: d77@nostromo
Subject: a test
```

When prompted again, enter the text of the message:

```
-------Enter initial text
test
-------
```

After the `whatnow` prompt, enter the **whom** command:

```
whatnow>>> whom
```

The address of the proposed recipients of the message is then displayed:

```
lance...
d77@nostromo... deliverable
```

Files

$HOME/.mh_profile	Specifies the MH user profile.
/usr/bin/whom	Contains the **whom** command.

Related Information

The **ali** command**, post** command**, whatnow** command.

The **mh_alias** file format, **mh_profile** file format.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

wlmcntrl Command

Purpose

Starts or stops the Workload Manager.

Syntax

wlmcntrl [**−d** *Config_dir*] [**−a** | **−p** | **−u** | **−o** | **−q**]

Description

The **wlmcntrl** command loads the Workload Manager (WLM) properties files and starts the Workload Manager subsystem. WLM can be started in two different modes:

- An active mode where the WLM monitors and regulates the CPU and memory utilization of the processes in the various classes.
- A passive mode where the WLM only monitors the resource utilization without interfering with the standard operating system resource allocation mechanisms.

The active mode is the normal operating mode of the WLM.

The classes, their limits and shares are described respectively in the files **classes**, **limits** and **shares**. The automatic assignment rules are taken from the **rules** file. These files are normally located in a subdirectory of **/etc/wlm**. The standard configuration shipped with the operating system is in **/etc/wlm/standard**. The current configuration is the one in the directory pointed to by the symbolic link **/etc/wlm/current**.

When the **−d***Config_dir* flag is not used, **wlmcntrl** uses the configuration files in the directory pointed to by the symbolic link **/etc/wlm/current**.

When the **−d***Config_dir* flag is used, **wlmcntrl** uses the configuration files in **/etc/wlm/Config_dir** and updates the **/etc/wlm/current** symbolic link to point to **/etc/wlm/Config_dir**, making **/etc/wlm/Config_dir** the current configuration. This is the recommended way to make **/etc/wlm/Config_dir** the current configuration.

Flags

−a	Starts the WLM in active mode or switches from passive to active mode. This is the default when no flag other than **−d** is specified.
−d*Config_dir*	Uses **/etc/wlm/Config_dir** as an alternate directory for the classes, limits, shares and rules files, and makes **/etc/wlm/Config_dir** the current configuration. This flag is effective when starting the WLM in active or passive mode, or when updating the WLM. This flag is ignored if used with the **−o** and **−q** flags or when switching from active to passive mode or vice versa.
−u	Updates the WLM; request to change the limits, shares, tier number, or assignment rules of the running classes. Update can be used to switch to an alternate configuration, provided that the alternate configuration has the same classes as the current configuration. Classes cannot be added or removed in this way.
−o	Stops the Workload Manager.
−p	Starts the WLM in passive mode or switches from active to passive mode.
−q	Queries the WLM state. Returns 0 if the WLM is running in active mode, 1 if the WLM is not

started or 2 if the WLM is running in passive mode. A message indicating the current state of the WLM is printed on STDOUT.

Files

/etc/wlm/current/classes	Contains the names and definitions of the classes for the current Workload Manager configuration.
/etc/wlm/current/limits	Contains the resource limits enforced on the classes for the current Workload Manager configuration.
/etc/wlm/current/rules	Contains the automatic assignment rules for the current Workload Manager configuration.
/**etc/wlm/current/shares**	Contains the resource shares allocated to the classes for the current Workload Manager configuration.
/etc/wlm/current/description	Contains the description text for each configuration.

Related Information

The **chclass** command, **lsclass** command, **mkclass** command, and **rmclass** command.

wlmstat Command

Purpose

Shows wlm class status.

Syntax

wlmstat [**−l class**] [**−c** | **−m**] [**interval**] [**count**]

Description

The wlmstat command symbolically displays the contents of wlm data structures fetched from the kernel. If a count is specified, wlmstat loops *count* times and sleeps *interval* seconds after each block is displayed. A summary of operation is also displayed after each loop.

Flags

−l class	Class name. If not specified, all classes are displayed, along with a summary for appropriate fields.
−c	Show only CPU statistics.
−m	Show only memory statistics.
interval	Specifies an interval in seconds (defaults to 1).
count	Specifies how many times wlmstat will print a report (defaults to 1).

Display

Results are tabulated, with the following fields:

Name	Class name
CPU	Percentage of total CPU time comsumed by the class.
MEM	Percentage of physical memory consumed by the class.

Examples

1. To get a printout of wlm activity right now, type:
   ```
   wlmstat
   ```

   This produces the following output:

   ```
      Name  CPU  MEM
       nyc   65   2
    system    1  13
   default    0   7
    procsA    7   4
    procsB   13   5
   student   10  67
   ```
2. To get a report for class *student*, enter:
   ```
   wlmstat −l student
   ```
3. To get a report for class *student* updated every second, and this for one minute, enter:

```
wlmstat −l student 1 60
```

This produces the following output:

```
     Name  CPU  MEM
  student    9   12
  student    9   14
  student   10   17
  student    9   22
  student    9   27
  student   10   30
    .......
```

Errors

No error can be reported by wlmstat.

Related Information

The *wlmcntrl* command.

write Command

Purpose

Opens a line of communication to send messages to other users on the system in real time.

Syntax

To Query All Messages Awaiting Replies From Users on a Host and Display them with their Handles

write−q [**−n** *Host*]

To Reply to a Message Sent by a Utility or a Shell Script, or Redisplay the Message Associated with a Given handle

write −h*Handle,* { ok | cancel | query } [**−n** *Host*]

To Send Messages to a User, Optionally on Another Host or a Particular Device

write [**−r**] { [**−n** *Host*] *User* | *User@Host* } [*Line*]

Description

The **write** command enables message sending over the system in real time. It provides conversation−like communication with another logged−in user. Each user alternately sends and receives short messages from the other workstation. Long messages can be sent by putting the complete message in a file and then redirecting that file as input to the **write** command.

For another user (as specified by the *User* parameter) to receive a message, that user must be logged in and must not have refused message permission. When a message is sent to a user who is not logged in, the message `user not logged in` appears. If the message is sent to a user who has refused message permission by setting the **mesg** command to no, the message `write: permission denied` appears.

When the **write** command is issued, it immediately sends the following message, along with an attention−getting sound (the ASCII BEL character) to the message recipient or target:

```
Message from SenderID on SenderHostname (ttynn) [Date] ...
```

With a successful connection, the **write** command sends two ASCII BEL characters to both workstations. The beep alerts the sender that the message can begin and it alerts the receiving user that a message is coming.

Sending occurs one line at a time as the Enter key is pressed. The communication link from the sender to the receiver remains open and sending continues until the Ctrl−D key sequence ends the sending link. Then an end−of−text character (<EOT>) is sent to the target workstation and the **write** command mode is terminated.

The receiving or target user can respond by sending a **write** command to the originating user. This opens a line of communication from the receiver back to the sender, enabling message responses in return. For this type of exchange, the following convention is useful: When you first write to others, wait for a response before sending any text. End a message with a signal such as `o` (over) to alert the other person to reply. Use `oo` (over and out) when the conversation is finished.

If the character `!` (exclamation point) is found at the beginning of a line, the **write** command calls the shell to execute the rest of the line as a command. For example, while waiting for a response, precede the operating system **li** command with an ! (!li) and the directory list appears on your workstation. Typing the **li** command without the preceding ! is interpreted by the system as text to be sent to the target user.

When you write to a user who is logged in at more than one workstation or multi−using more than one process, the **write** command uses the first login instance found in the **/etc/utmp** file as the message delivery point (usually the login or console shell), and you get the message:

```
UserID is logged on more than one place.
You are connected to "Workstation".
Other locations are:
Workstation
```

When this message is received, if you wish to send the message to a location other than the initial login location, the target user can be contacted at a different location by specifying the *Line* of the location (tty00, for example).

Permission to write to another user is granted or denied by the individual user with the **mesg** command. Some commands deny message permission while they are running to prevent interference with their output. A user with root user authority can write to any workstation regardless of the workstation's message permission.

You can use the **write** command to converse with users on other hosts. You can identify a user on a remote host by using the **−n***HostName* flag or the *User@Host* parameter. In order to write to a user on a remote host, the **writesrv** daemon must be running on both the current host and the remote host.

The **write** command is also used by the **qdaemon** daemon to send messages to users on other hosts and to wait for replies. There are only three valid replies:

`ok`	The original write exits with a status of 0.
`cancel`	The original write exits with a status of 1.
`query`	The message associated with the given handle is displayed.

Parameters

User	Specifies the user ID of the person to receive the message text.
User@Host	Specifies the user ID and remote host of the person to receive the message text.
Line	Contacts the target user at another location (`tty00`, for example).

Flags

−h *Handle***,***Reply*	Replies to a message sent by a utility or shell script using write with the reply option. The value to be used for the *Handle* variable is generated internally and supplied to the user in the text of the original message. The reply can be `ok`, `cancel`, or `query`.
−n*Host*	Specifies a remote host. The *Host* variable may be a nickname or an internet address.
−q	Queries all messages awaiting replies from users on a host and displays them with their handles.
−r	Generates a message handle, places it in the message header, sends the message, and waits for a reply. This flag is used by the **qdaemon** daemon for operator messages and can be put in shell scripts. It is not used for interactive conversations. An exit status of 0 indicates that the reply was `ok`, a status of 1 indicates that the reply was `cancel`, and an exit status

of 2 indicates that the user could not be contacted.

Notes:

1. The **writesrv** daemon must be running on the target host in order for any of the flags to work. If you are not using either the **−n** flag or **@***Host*, but using **−h**, **−q**, or **−r**, the **writesrv** daemon must be running on your host.
2. If TCP/IP is not installed on your machine but the *HostName* is set, in order to converse with users on the local host using the **write** command with the **−h**, **−q**, or **−r** flag, you must append your host name to the end of the `loopback` entry in the **/etc/hosts** file. The original entry should read:

   ```
   127.0.0.1 loopback LocalHostName
   ```

   The new entry should read:

   ```
   127.0.0.1 loopback LocalHostName HostName
   ```

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	The addressed user either is not logged on or denies permission.

Examples

1. To write a message to a user who is logged in, enter:

   ```
   write june
   ```

   Press the Enter key and type,

   ```
   I need to see you! Meet me in the computer room at 12:30.
   ```

   Then press the Ctrl−D key sequence to terminate the **write** command mode.

   If your user ID is `karen` and you are using workstation `tty3`, `june`'s workstation displays:

   ```
   Message from karen on trek tty3 Aug 17 11:55:24  ...
   I need to see you!  Meet me in the computer room at 12:30.
   <EOT>
   ```
2. To hold a conversation, enter:

   ```
   write june
   ```

   Press the Enter key and type,

   ```
   Meet me in the computer room at 12:30.
   o
   ```

   This starts the conversation. The `o` at the beginning of the next line means the message is over. It tells June that you are waiting for a response. Do not press Ctrl−D if you wish to continue.

   Now June replies by typing:

```
write karen
```

Presses the Enter key and types,

```
I'm running tests at 12:30. Can we meet at 3?
o
```

And you might respond:

```
OK−−the computer room at 3.
oo
```

The `oo` means *over and out*, telling June that you have nothing more to say. If June is also finished `oo`, then you both press Ctrl−D to end the conversation.

3. To write someone a prepared message, enter:

   ```
   write june < message.text
   ```

   This writes the contents of the **message.text** file to `june`'s workstation.

4. To write to the person using a certain workstation, enter:

   ```
   write −n console
   ```

   Press the Enter key and type,

   ```
   The printer in building 998 has jammed.
   Please send help.
   ```

   Then press the Ctrl−D key sequence.

   This writes the message to the person logged in at the workstation `/dev/console`.

5. To send a message to user `spuds` at host `partya`, enter:

   ```
   write −n partya spuds
   ```

   Press the Enter key and type,

   ```
   Your new tape has just arrived,
   come see me to pick it up.
   Thanks!
   ```

   Then press the Ctrl−D key sequence.

   OR

   ```
   write spuds@partya
   ```

   Press the Enter key and type,

   ```
   Your new tape has just arrived,
   come see me to pick it up.
   Thanks!
   ```

Then press the Ctrl−D key sequence.

6. Here is an example of a message sent by the **qdaemon** daemon:

```
Message from mary on trek (tty10) Aug 17 10:03:34 ...
Use "write −h 6398492,reply" to reply
Please insert tape number 5 into rmt0.
<EOT>
```

   To reply in the affirmative, enter:

```
write −h 6398492,ok
```

   Then press the Ctrl−D key sequence.

   To reply in the negative, enter:

```
write −h 6398492,cancel
```

   Then press the Ctrl−D key sequence.

   With the **−h** flag, there is no need to supply the host name or user ID. This information is tracked with the handle.

Files

/etc/hosts	Contains TCP/IP host information.
/etc/utmp	Contains user and accounting information for the **who**, **write**, and **login** commands.

Related Information

The **mesg** command, **wall** command, **who** command, **writesrv** command.

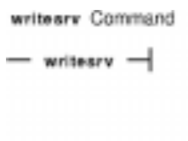
Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

writesrv Daemon

Purpose

Allows users to send messages to and receive messages from a remote system.

Syntax



writesrv

Description

The **writesrv** daemon allows users to send messages to users on a remote system and receive responses from users on a remote system with the **write** command.

The **writesrv** utility receives incoming requests from a **write** command and creates a server process to handle the request. This server process communicates with the client process (**write**) and provides whatever services are requested.

To perform these services, the **writesrv** daemon creates a socket that is attached to the port defined in the **/etc/services** file. All requests for service are sent as messages to this socket.

> **Note:** If the **writesrv** daemon terminates abnormally (such as a system crash, power failure, or the **kill −9** command), the **/var/spool/writesrv** directory must be manually cleaned out to remove any files left behind by the **writesrv** daemon.

Examples

1. To start the **writesrv** daemon from the **/etc/rc** script, enter:

   ```
   /usr/sbin/writesrv
   ```

   The **writesrv** daemon is started from the **/etc/rc** script. This is the usual way the daemon is started.

2. To start the **writesrv** daemon using the System Resource Controller (SRC), enter:

   ```
   startsrc −s writesrv &
   ```

The **writesrv** daemon is started using SRC.

Files

/etc/services Contains the Network Services directory.

Related Information

The **kill** command, **write** command

Using Remote Host Access for Printing, Printer Overview for System Management, and Remote Printing Overview in *AIX Version 4.3 Guide to Printers and Printing*.

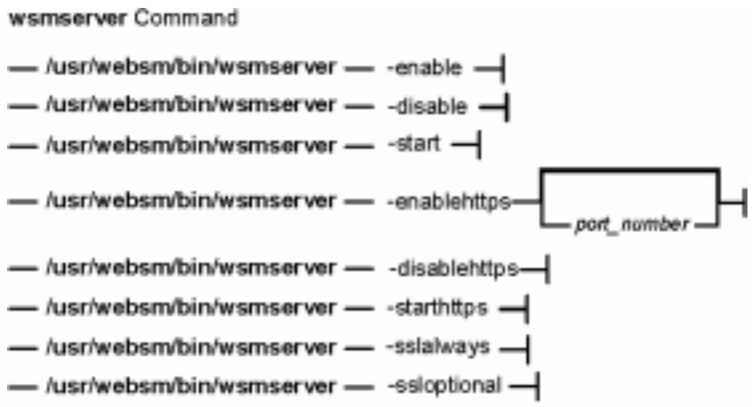
System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

wsmserver Command

Purpose

Configures the functionality of the Web−based System Manager servers.

Syntax



/usr/websm/bin/wsmserver −enable

/usr/websm/bin/wsmserver −disable

/usr/websm/bin/wsmserver −start

/usr/websm/bin/wsmserver −enablehttps [*port_number*]

/usr/websm/bin/wsmserver −disablehttps

/usr/websm/bin/wsmserver −starthttps

/usr/websm/bin/wsmserver −sslalways

/usr/websm/bin/wsmserver −ssloptional

Description

The **wsmserver** command is used to control the server processes used by the Web−based System Manager. The servers are used to enable applet and client−server modes of execution. In addition, if the security functionality is installed, the SMGate utility can be configured.

Note: The full pathname of this command, **/usr/websm/bin/wsmserver**, must be specified.

Flags

−enable	Enables the applet and client−server modes.
−disable	Disable the applet and client−server modes
−start	Start a session of the Web−based System Manager server. This is normally only used by inetd.

The following flags can only be used if the security functionality has been installed:

−enablehttps [*port_number*]	Starts the SMGate utility. An optional *port_number* for the SMGate server can be specified. If specified, the SMGate server listens on that port instead of the default of 9092.
−disablehttps	Disables the SMGate utility.
−starthttps	Starts the SMGate utility. This is normally started by the **init** process.
−sslalways	Allows only secure connections. This flag is for a system with security configured.
−ssloptional	Allows both secure and non−secure connections to the Web−based System Manager.

Examples

1. To enable Web−based System Manager for applet and client−server mode, enter:
   ```
   /usr/websm/bin/wsmserver −enable
   ```
2. To enable the SMGate utility, enter:
   ```
   /usr/websm/bin/wsmserver −enablehttps
   ```

Related Information

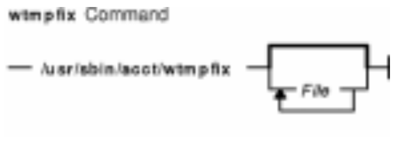
Setting up and Running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

wtmpfix Command

Purpose

Manipulates connect−time accounting records by correcting date and time stamp inconsistencies.

Syntax



/usr/sbin/acct/wtmpfix [*File* ...]

Description

The **wtmpfix** command is called by the **runacct** procedure to examine standard input or *File*s that contain records in **wtmp** format, and correct problems that could make the **acctcon1** or **acctcon2** commands fail. The **wtmpfix** command corrects date and time stamp inconsistencies, and writes the corrected records to standard output. If the date and time stamps are not consistent when the **acctcon1** command runs, the **acctcon1** command generates an error and stops.

The **wtmpfix** command also checks the validity of the name field to ensure that it consists only of alphanumeric characters, a $ (dollar sign), or spaces. If the name is invalid, the **wtmpfix** command changes the login name to **INVALID** and writes a diagnostic message to standard error. In this way, the **wtmpfix** command reduces the chance that the **acctcon2** command will fail.

Each time the date is set (on system startup or with the **date** command), a pair of date change records is written to the **/var/adm/wtmp** file. The first record is the old date, denoted by the *old time* string. The *old time* string is placed in the line field and the **OLD_TIME** flag is placed in the type field. The second record is the new date, denoted by the string *new time*. The *new time* string is placed in the line field and the **NEW_TIME** flag is placed in the type field. The **wtmpfix** command uses these records to synchronize all date and time stamps in the file.

Flags

None.

Parameters

File	Specifies the file to examine that contains records in **wtmp** format.

Security

Access Control: These commands should grant execute (x) access only to members of the **adm** group.

Examples

1. To convert a binary record in **wtmp** format to an ASCII record called `dummy.file`, enter:

```
/usr/sbin/acct/fwtmp < /var/adm/wtmp > dummy.file
```

The content of a binary **wtmp** file is redirected to a dummy ASCII file.

2. To convert an ASCII `dummy.file` to a binary file in **wtmp** format called `/var/adm/wtmp`, enter the `fwtmp` command with the `−ic` switch:

   ```
   /usr/sbin/acct/fwtmp −ic < dummy.file  > /var/adm/wtmp
   ```

The dummy ASCII file is redirected to a binary **wtmp** file.

Files

/usr/sbin/acct/wtmpfix	Contains the **wtmpfix** command.
/var/adm/wtmp	Contains records of date changes that include an old date and a new date.
/usr/include/utmp.h	Contains history records that include a reason, date, and time.

Related Information

The **acctcon1** or **acctcon2** command, **acctmerg** command, **acctwtmp** command, **fwtmp** command, **runacct** command.

Setting Up an Accounting System in *AIX Version 4.3 System Management Guide: Operating System and Devices* describes the steps you must take to establish an accounting system.

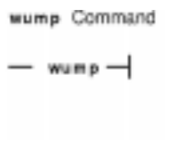
See the Accounting Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* for a list of accounting commands that can be run automatically or entered from the keyboard and about the preparation of daily and monthly reports, and the accounting files.

wump Command

Purpose

Starts the hunt the wumpus game.

Syntax



wump

Description

A wumpus is a creature living in a cave with many rooms interconnected by tunnels. You move among the rooms trying to shoot the wumpus with an arrow and trying to avoid being eaten by the wumpus or falling into bottomless pits. There are also super bats that may pick you up and drop you in some randomly selected room. For moving among the rooms and shooting arrows, the game prompts you with appropriate questions and follows your instructions. For example:

```
You are in room 14.
I feel a draft.
There are tunnels to 1 13 18.
Move or shoot? (m−s) m
Which room? 1
You are in room 1.
I feel a draft.
There are tunnels to 14 17 18.
Move or shoot? (m−s) m
Which room? 17
You are in room 17.
You fell into a pit!
Another game? (y−n)
```

In the above example, you start out in room 14. The computer displays `I feel a draft.` This is the hint that a pit is nearby. You choose to move to room 1. Again you are warned of the pit. You then choose to move to room 17 where you fall into a pit and die.

At the beginning of the game, you are prompted `Instructions? (y−n)`. Choosing `y` provides an explanation of the warnings, how to move, and how to shoot.

The game ends and you are prompted `Another game? (y−n)` if:

- You kill the wumpus.
- The wumpus eats you.
- You fall into a bottomless pit.
- You run out of arrows.

To quit the game at any time, press the interrupt (Ctrl−C) key sequence.

Files

/usr/games Contains the location of the system's games.

Related Information

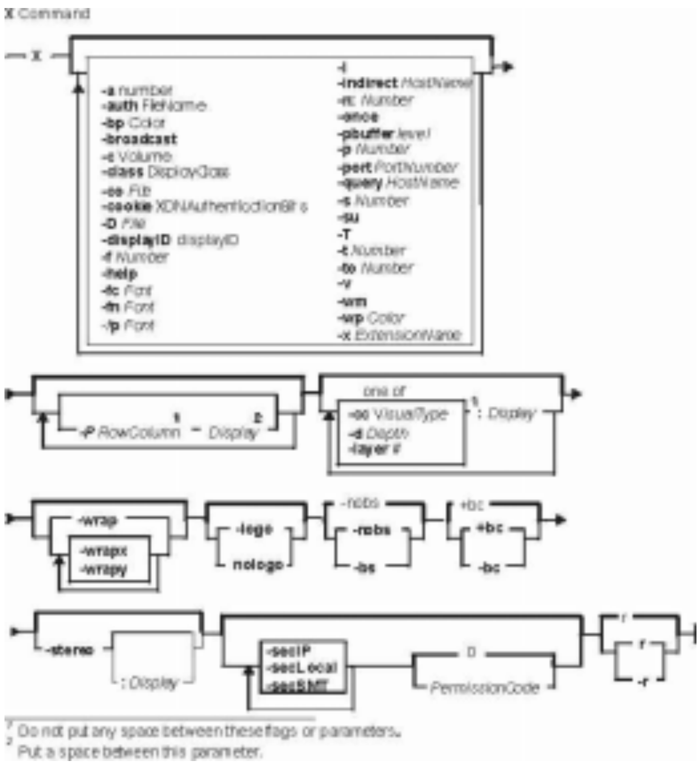
The **arithmetic** command, **back** command, **bj** command, **craps** command, **fish** command, **fortune** command, **hangman** command, **moo** command, **number** command, **quiz** command, **ttt** command, **turnoff** command, **turnon** command.

X Command

Purpose

Starts the X server.

Syntax



X [**−a** *Number*] [**−auth** *FileName*] [**−bc** | **+bc**] [**−bp** *Color*] [**−broadcast**]
[**−bs** | **−nobs**] [**−c** *Volume*] [**−cc** *VisualType* [**:***Display*]] [**−class** *DisplayClass*]
[**−co** *File*] [**−cookie** *XDMAuthenticationBit*] [**−D** *File*]
[**−d** *Depth* [**:***Display*]] **−displayID** *DisplayID*] [**−f** *Number*] [**−fc** *Font*] [**−fn** *Font*]
[**−fp** *Font*] [**−help**] [**−I**] [**−indirect** *HostName*] [**−layer** *#* [**:***Display*]] [**−logo** | **nologo**]
[**−n** **:***Number*] [**−once**] [**−P** *RowColumn Display* }] [**−pbuffer***level* [**:display***name* |
:display*number*]] [**−p** *Number*] [**−port** *PortNumber*] [**−query** *HostName*] [**−r** | **r**]
[**−s** *Number*] [**−secIP** [*PermissionCode*]] [**−secLocal** [*PermissionCode*]] [**−secSMT** [*PermissionCode*]]
[**−stereo** [**:***Display*]] [**−su**] [**−T**] [**−t** *Number*] [**−to** *Number*] [**−v**] [**−wm**] [**−wp** *Color*]
[**−wrap** | [**−wrapx**] [**−wrapy**]] [**−x** *ExtensionName*]

Description

The **X** command starts the X server, a display server that runs on bitmapped terminals. The X server distributes input and output requests to or from programs located on either the host system or systems connected to it through a network.

End an Enhanced X−Windows session by using the Ctrl−Alt−Backspace key sequence.

You can specify one or more display devices. If none are specified, the default is all. The default configuration order is determined by the adapter slot order. The adapter in the first slot is initialized as the left most screen, the adapter in the second slot is the next screen to the right. To rearrange the layout of the screens, use the **−P** flag. The **−P** flag associates the row and column of the device with the device name. You can determine the device name by using the **lsdisp** command.

The two displays are arranged either vertically or horizontally. The following example shows **−P** flags specifying a horizontal arrangement:

```
−P11 ppr0 −P12 ppr1
```

The `2` in the right position of the second **−P** flag indicates that the second monitor view is along the x−axis. This produces the horizontal arrangement:

```
         Display                        Display
                  1                                  2
```

To see two monitors in a vertical arrangement, the **−P** flags should read:

```
−P11 ppr0 −P21 ppr1
```

The `2` in the first position indicates that the monitors are in a vertical configuration along the y−axis:

```
         Display
                  1
         Display
                  2
```

In the horizontal configuration, when a mouse is traveling from left to right in Display 1 and reaches the border of Display 1 and 2, the cursor continues into Display 2 at the same y−axis position. When it reaches the edge of Display 2 and the **−wrapx** flag is set, it appears at the leftmost edge of Display 1 in the same y−axis position. If the **−wrapx** flag is not set, the mouse stops at the far edge of Display 2.

In a vertical configuration, when the mouse is traveling from top to bottom in Display 1 and reaches the border of Display 1 and Display 2, the cursor continues into Display 2 at the same x−axis position. When the cursor reaches the bottom of the display 2 and the **−wrapy** flag is set, the cursor appears at the top edge of Display 1 in the same x−axis position. If the **−wrapy** flag is not set, the mouse stops at the bottom of Display 2.

Flags

−a *Number*	Specifies the acceleration multiplier for mouse movement. For example, a value of 5 causes the cursor to move five times as fast as the mouse. The default is 4 pixels; any value specified must be a positive value greater than 0.
−auth*FileName*	Specifies to X the file from which to read the MIT (Massachusetts Institute of Technology) magic cookie.
−bc	Turns off backward compatibility with Enhanced X−Windows version 1.1.
+bc	Turns on backward compatibility with Enhanced X−Windows version 1.1. This is the default.
−bp *Color*	Specifies a black pixel color for the display. The default is display dependent.
−bs	Enables backing store support on all screens. Backing store support is disabled by default.

−c*Volume*	Specifies key click volume.
−cc *VisualType*[**:***Display*]	Specifies the type of visual to use for the root window of the screen specified by the display name. Not all visual types are available on all adapters at all depths. The **:***Display* parameter is optional, but useful when using the multihead option. The **:***Display* parameter is the name of the display as shown in the **lsdisp** command. If no display number or name is supplied, the specified visual is selected for all screens. To specify the visual type and depth for the default visual, use the **−cc** and **−d** flags, respectively. Values for the *VisualType* parameter are specified as a string or a number as follows:

StringNumeric equivalent	
StaticGray	0
GrayScale	1
StaticColor	2
PseudoColor	3
TrueColor	4
DirectColor	5

−co*File*	Sets the name of the red, green, and blue (RGB) color database. This is the default flag for the color database.
−D *File*	Specifies the full path name of the color definition database file. The default is **/usr/lib/X11/rgb**.
−d *Depth*[**:***Display*]	Specifies the root depth for the screen specified by the display name. Not all visual types will be available on all adapters at all depths. The **:***Display* parameter is optional, but useful when using the multihead option and must correspond to the values passed with the **−P** flag. The **:***Display* parameter is the name of the display as shown in the **lsdisp** command. In the absence of the **:***Display* parameter, the specified depth is selected for all the selected displays in the multihead option, as specified in the **−P** flag.
−f *Number*	Specifies the beep volume. The default is −1 or medium. The supported values are as follows:

Value	**Setting**
0	Off
1−33	Low
−1 or **34−66**	Medium
67−100	High

−fc *Font*	Specifies the cursor font for cursor glyphs and cursor masks. The default depends on the operating system and the display.
−fn *Font*	Specifies the default text font. The default depends on the operating system and the display.
−fp *Font*	Specifies the font path.
−I	Causes all remaining command line arguments to be ignored. (Uppercase i)

−help	Prints a usage message.
−layer #[**:***Display*]	Specifies that the default visual should be in the # (number sign) layer. The **:***Display* parameter is the name of the display as shown in the **lsdisp** command. Specifying this flag for an adapter that does not have overlays, or has less than 8 bits of overlay, has no effect. Specifying this flag with a # higher than the number of supported layers results in the default visual residing in the default layer of the screen (as if no **−layer** flag had been used).
−logo	Turns on the X Window System logo display in the screen saver. There is currently no way to change this from a client.
−n :*Number*	Specifies the connection number. Valid values for the *Number* parameter are 0 to 255. The default is the next available number. The *Number* parameter is used by programs to communicate with a specific X server. For example, the command: `X −n :18` specifies that communication to the activated X server takes place by unix:18 or by *Hostname*:18.
−nobs	Disables backing store support on all screens. This is the default.
nologo	Turns off the X Window System logo display in the screen saver. There is currently no way to change this from a client.
−once	Instructs the server to exit after the first session ends. Normally, the server starts sessions automatically.
−P*RowColumnDisplay*	Specifies the physical positioning of the displays in a multihead configuration. The *Row* parameter indicates the row in which the display is located. The *Column* parameter indicates the column in which the display is located. The *Display* parameter is the device name of the display as shown in the first column of output from the **Isdisp** command. The first **−P***RowColumnDisplay* occurrence on the command line describes screen 0 to the X server, the second describes screen 1, and so on. The **−P** flag is for use with multiple head support.
−pbuffer*level* [**:display***name* | **:display***number*]	Specifies the **pbuffer** memory allocation level for the screen specified by **:display**. This flag is only useful when used in conjunction with the GLX extention. The *level* parameter indicates the relative amount of frame buffer memory to be reserved for pbuffers. Specified values must be in the range of [0..2]. A value of 0 indicates that no memory should be reserved for pbuffers. A value of 1 indicates that a low amount of

	memory should be reserved. A value of 2 indicates that a high amount of memory should be reserved. Not all adapters support pbuffers. For those that do, not all screen configurations support pbuffers. The actual amount of frame buffer memory reserved for pbuffers is device dependent, and may be influenced by other factors, such as screen resolution or default pixel depth. The **:display** parameter is optional, but useful when using the multihead option. The **:display** parameter is the name of the display as shown in the **lsdisp** command. If no display *number* or *name* is supplied, the specified **pbuffer** width is selected for all screens.
−p *Number*	Specifies the time interval, in minutes, between changes of the X Window System logo position. This flag is used with the **−s** (screen saver timeout) flag to control the blanking of the screen.
−r	Disables autorepeat. The default is autorepeat enabled.
r	Turns on autorepeat.
−s*Number*	Specifies the number of minutes to wait before blanking the screen. The default is 10 minutes. If this value is set to 0, the screen−saver is disabled.
−secIP [*PermissionCode*]	Sets local access control on the internet socket. The *PermissionCode* is 3 octal digits which can set read, write, and execute bits. If no *PermissionCode* is specified after a security flag, then permission is defaulted to 0 for that socket.
−secLocal [*PermissionCode*]	Sets access control on the unix socket. The *PermissionCode* is 3 octal digits which can set read, write, and execute bits. If no *PermissionCode* is specified after a security flag, then permission is defaulted to 0 for that socket.
−secSMT [*PermissionCode*]	Sets access control on the shared memory transport socket. The *PermissionCode* is 3 octal digits which can set read, write, and execute bits. If no *PermissionCode* is specified after a security flag, then permission is defaulted to 0 for that socket.
−stereo [**:***Display*]	Configures the graphics adapter for optimum stereo support for the screen specified by *Display*. Supported screens will configure the adapter to provide the best available support for stereo. This may decrease other resources such as texture memory. The actual amount of memory affected is device dependent, and may be influenced by other factors, such as screen resolution or default pixel depth. The *Display* parameter is optional, but useful when using the multihead option. The *Display* parameter is the name of the display as shown in the **lsdisp** command. If no display number or name is supplied, the **−stereo** flag pertains to all supported screens.

	Non supported screens will ignore the **−stereo** flag.
−su	Disables save under support on all screens.
−T	Disables the Ctrl−Alt−Backspace key sequence that, by default, ends the AIXwindows session and all windows opened from it.
−t*Number*	Specifies the mouse threshold. The default is 2 pixels. Acceleration takes effect only if the mouse is moved beyond the mouse threshold in one time interval and only applies to the amount beyond the threshold.
−to *Number*	Specifies the number of minutes to elapse between connection checks. The default is 60 minutes. A specified value must be greater than 0.
−v	Specifies that the display be replaced with the current background color after the time specified by the **−s** flag expires. By default, if the **−v** flag is not used, the entire display is painted with the background tile after the time specified by the **−s** flag expires.
−wm	Forces the default backing store of all windows to have the **WhenMapped** value. This is a convenient way of applying backing store to all windows.
−wp *Color*	Specifies a white pixel display color. The default depends on the display.
−wrap	Specifies the behavior of the mouse when its hotspot reaches the left or right border or the top or bottom of any root window. If this flag is set and the hotspot of the mouse reaches the left border of the leftmost root window, the mouse is automatically positioned at the right border of the rightmost root window at the same y position. Conversely, if this flag is set and the hotspot of the mouse reaches the right border of the rightmost root window, the mouse is automatically positioned at the left border of the leftmost root window at the same y position. If this flag is not set, the mouse stops at the left or right border of any root window. If this flag is set and the hotspot of the mouse reaches the top border of the topmost root window, the mouse is positioned at the bottom border of the bottommost root window at the same x position. Conversely, if this flag is set and the hotspot of the mouse reaches the bottom border of the bottommost root window, the mouse is positioned at the top border of the topmost root window at the same x position. The **−wrap** flag is for use with multiple head support.
−wrapx	Specifies the behavior of the mouse when its hotspot reaches the left or right border of any root window. If this flag is set and the hotspot of the mouse reaches the left border of the leftmost root window, the mouse is positioned at the right border of the rightmost root window at the same y position. Conversely, if this flag

	is set and the hotspot of the mouse reaches the right border of the rightmost root window, the mouse is positioned at the left border of the leftmost root window at the same y position. If this flag is not set, the mouse stops at the left or right border of any root window. The **−wrapx** flag is for use with multiple head support.
−wrapy	Specifies the behavior of the mouse when its hotspot reaches the top or bottom border of any root window. If this flag is set and the hotspot of the mouse reaches the top border of the topmost root window, the mouse is positioned at the bottom border of the bottommost root window at the same x position. Conversely, if this flag is set and the hotspot of the mouse reaches the bottom border of the bottommost root window, the mouse is positioned at the top border of the topmost root window at the same x position. If this flag is not set, the mouse stops at the top or bottom border of any root window. The **−wrapy** flag is for use with multiple head support.
−x *ExtensionName*	Specifies that the extension name should be loaded when the server is initialized. This is particularly useful for large extensions, such as the Display PostScript Level 2 (**dps**). This flag can be specified more than once with multiple extension names.
−query *HostName*	Enables Enhanced X−Windows Display Manager Control Protocol (**XDMCP**) and sends a **Query** packet to the specified host. The **−query** flag is for use with **XDMCP**.
−broadcast	Enables **XDMCP** and broadcasts **BroadcastQuery** packets to the network. The first responding display manager is chosen for the session. The **−broadcast** flag is for use with **XDMCP**.
−indirect *HostName*	Enables **XDMCP** and sends **IndirectQuery** packets to the specified host. The **−indirect** flag is for use with **XDMCP**.
−port *PortNumber*	Specifies an alternative port number for **XDMCP**. This flag must be specified before any **−query**, **−broadcast**, or **−indirect** flags. Normally, the server starts sessions one after another. This flag causes the server to exit after the first session ends. The **−port** flag is for use with **XDMCP**.
−class *DisplayClass*	Sets the value for an additional display qualifier used by **XDMCP** in resource lookup for display−specific options. The **−class** flag is for use with **XDMCP**.
−cookie *XDMAuthenticationBits*	Specifies a private key to be shared between the server

	and the manager when testing XDM−AUTHENTICATION−1. The **−cookie** flag is for use with **XDMCP**.
−displayID *DisplayID*	Allows the display manager to identify each display so that it can locate the shared key specified by the **−cookie** flag. The **−displayID** flag is for use with **XDMCP**.

Related Information

The **aixterm** command, **xclock** command, **xhost** command, **xinit** command, **xlsfonts** command, **xwd** command, **xwud** command.

The **lsdisp** shell command.

x_add_fs_fpe Command

Purpose

Adds a network font server to a font path.

Syntax

x_add_fs_fpe *Host Port Position TypeName*

Description

The **x_add_fs_fpe** command adds a font path element to the font path of the selected network type name for a font server to access fonts.

Host	Specifies the name of the system where the font server resides.
Port	Specifies the number of the font server port. This number must be in the **/etc/services** file and specified in decimal.
Position	Specifies where to insert this element in the font path.
TypeName	Specifies the name of the network type. Each network type has a font path consisting of one or more font path elements. (To see a list of the network types and their font path elements, press F4 in SMIT at the **Xstation Network TYPE Name** option). Specify the name of the network type to which the font path element will be added, or choose to have it added to all network type names by specifying `All`. If a font path element is added to `All` network types, will be placed at the end of each font path.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add the font server to the start of the font path for network type `x_st_mgr.ether`, enter:

```
x_add_fs_fpe winter 7500 1 x_st_mgr.ether
```

In this example, the font server on host `winter` has been added to the start of the font path for network type `x_st_mgr.ether`. The font server port is `7500`.

Files

/usr/lpp/x_st_mgr/bin/x_add_fs_fpe	Contains the **x_add_fs_fpe** command.
/etc/x_st_mgr/ether.cf	Contains the network type **x_st_mgr.ether** configuration file (sample).

Related Information

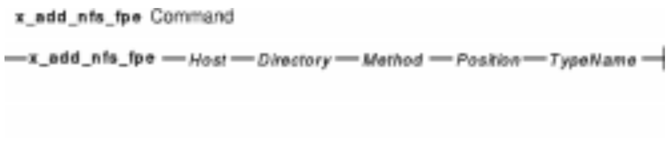
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command,**x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_nfs_fpe Command

Purpose

Adds a NFS/TFTP accessed font directory to a font path.

Syntax



x_add_nfs_fpe *Host Directory Method Position TypeName*

Description

The **x_add_nfs_fpe** command adds a font path element to the font path of the selected network type name. This font directory will be accessed using Network File System (NFS) or Trivial File Transfer Protocol (TFTP).

Host	Specifies the system name to access for the font directory.
Directory	Specifies the complete path to the directory that contains the fonts.
Method	Specifies either `nfs` or `tftp` to be used to access the fonts.
Position	Specifies where to insert this element in the font path.
TypeName	Specifies the name of the network type. Each network type has a font path consisting of one or more font path elements. (To see a list of the network types and their font path elements, press F4 in SMIT at the **Xstation Network TYPE Name** option). Specify the name of the network type to which the font path element will be added, or choose to have it added to all network type names by specifying `All`. If a font path element is added to `All` network types, it will be placed at the end of each font path.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add the fonts in `/usr/lib/X11/fonts/100dpi` to the network type `x_st_mgr.ether`, enter:

```
x_add_nfs_fpe cedar /usr/lib/X11/fonts/100dpi nfs Last \ x_st_mgr.ether
```

In this the font path element `/usr/lib/X11/fonts/100dpi` is added to the end of the font path for network type `x_st_mgr.ether`. The font directory is on the host `cedar`, which is accessed using NFS.

Files

/usr/lpp/x_st_mgr/bin/x_add_nfs_fpe	Contains the **x_add_nfs_fpe** command.
/etc/x_st_mgr/ether.cf	Contains the network type **x_st_mgr.ether** configuration file (sample).

Related Information

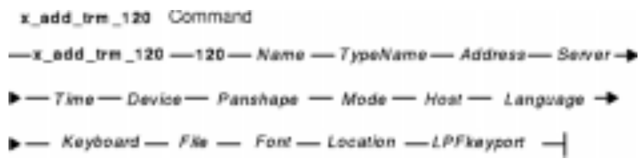
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_fs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_trm_120 Command

Purpose

Adds an Xstation 120 to the host.

Syntax



x_add_trm_120 120*NameTypeName Address ServerTime Device PanShape Mode Host Language Keyboard File Font Location LPFkeyport*

Description

The **x_add_trm_120** command adds the Xstation 120 specified by the *Name* parameter to the current host, and stores the configuration in the **/etc/x_st_mgr/x_st_mgrd.cf** file, the **/etc/x_st_mgr/x_st_mgrd.tmty** file, and the **/etc/bootptab** file.

Parameters

Mandatory parameters are:

120	Specifies that this command is used only for an Xstation 120.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs-2.`The terminal name must be known to the host system. **Note:** *Name* should not start with a uppercase or lowercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network Type** option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether120** for Ethernet and an Xstation 120.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether or not the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time*, listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.
Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, because there is

no delay time.) In SMIT, press the F4 key to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server, and a secondary server may be selected even when the primary server is available. A value greater than the maximum value may lead to a time out.

Device
: Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**.

You can attach a 6093 tablet device (Model 11 or Model 12) to the Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse.

X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an event generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.

PanShape
: Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**.

With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window.

> **Note:** The window size for panning is always a power of 2. With minimum VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.

Mode
: Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP also allows the user to turn an Xterminal off and on again and maintain an established connection to the remote host. Valid options are:

broadcast
: Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Host
: Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.

Language
: Sets the language used for system messages, the **LANG** environment variable. Press the F4 key in SMIT to select an option.

Keyboard
: Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.

Font
: Sets the font used in the login window. Press the F4 key in SMIT to select an option.

File
: Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`

Location
: Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid entries are **Upper left**, **Upper right**, **Lower left**, and **Lower right**.

LPFkeyport
: Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to

select an option. The valid options are **none** and **com1**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add Xstation `taylor` to the current host as a primary server, enter a command such as the following:

```
x_add_trm_120 120 taylor x_st_mgr.ether 10005ac38e9 y \
00 mouse 'none' off none \
'English    (United States) IBM−850' 'English (United States)' \
'keyboard' Rom14 'Upper left' 'none'
```

Xstation `taylor` is added to the current host, as defined by the parameters: Model 120, a network type of `x_st_mgr.ether`, a hardware address of `10005ac38e9`, primary server status, no delay time, input from a mouse, no hardware pan feature, xdmcp mode off, no host name, United States English LANG environment variable, United States English keyboard layout, standard keyboard file, login window font Rom14, and the login window in the upper left corner of the screen, and no LPF keys.

Files

/usr/lpp/x_st_mgr/bin/x_add_trm_120	Contains the **x_add_trm_120** command.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the boot protocol table.

Related Information

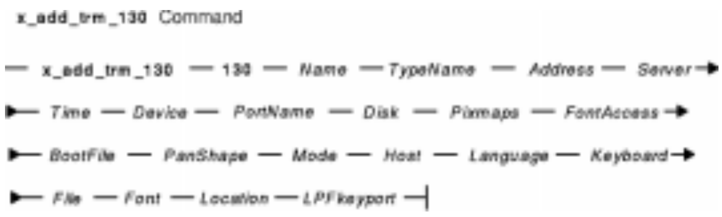
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_trm_130 Command

Purpose

Adds an Xstation 130 to the host.

Syntax



x_add_trm_130 130*NameTypeName Address ServerTime Device PortName Disk Pixmaps FontAccess Bootfile Pan Mode Host Language Keyboard File Font Location LPFkeyport*

Description

The **x_add_trm_130** command adds the Xstation 130 specified by the *Name* parameter to the current host, and stores the configuration in the **/etc/x_st_mgr/x_st_mgrd.cf** file, the **/etc/x_st_mgr/x_st_mgrd.tmty** file, and the **/etc/bootptab** file.

Parameters

Mandatory parameters are:

130	Specifies that this command is used only for an Xstation 130.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2.`The terminal name must be known to the host system. **Note:** *Name* should not start with a uppercase or lowercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network Type** option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether130** for Ethernet and an Xstation 130.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether or not the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time*, listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.

Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, as there is no delay time.) In SMIT, press F4 to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server, and a secondary server may be selected although the primary server is available. A value greater than the maximum value may lead to a time out.
Device	Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**. You can attach a 6093 tablet device (Model 11 or Model 12) to the Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse. X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an even generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.
PortName	Specifies the serial port on an Xstation 130 to which the tablet is attached. In SMIT, press the F4 key to select an option. The valid options are: **com1**, **com2**, **com3**, and **com4**. The default option is **com1**.
Disk	Specifies whether or not an Xstation 130 has a fixed disk installed. Valid options are: **y** if there is a fixed disk and **n** if there is no fixed disk. The default option is **n**.
Pixmaps	Specifies whether or not the PIXMAPS are paged to the fixed disk. Two options are valid: **y** for yes and **n** for no. The default option is **n**.
FontAccess	Specifies the way to access the font files. In SMIT, press the F4 key to select an option. Valid options are: • **Use network only.** • **Use disk only.** • **Try disk first, try network second.** • **Try network first, try disk second.** • **Try disk first, try network second and store to disk.** • **Use most recent copy and update disk.** The default option is **Use network only**.
BootFile	Specifies the way to access the boot file. In SMIT, press the F4 key to select a option. Valid options are: • **Use network only.** • **Use disk only.** • **Try disk first, try network second.** • **Try network first, try disk second.** • **Try disk first, try network second and store to disk.** • **Use most recent copy and update disk.** The default option is **Use network only**.
PanShape	Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of 2. With minimum

VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.

Mode
: Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are:

broadcast
: Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Host
: Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.

Language
: Sets the language used for system messages, the LANG environment variable. Press the F4 key in SMIT to select a option.

Keyboard
: Sets the map for the keyboard layout. Press the F4 key in SMIT to select a option.

File
: Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`

Font
: Sets the font used in the login window. Press the F4 key in SMIT to select a option.

Location
: Sets the position of the login window on the display. Press the F4 key in SMIT to select a option. Valid entries are **Upper left**, **Lower left**, **Upperright**, and **Lower right**.

LPFkeyport
: Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are: **none**; **com1**; **com2**; **com3**; and **com4**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add Xstation `taylor` to the current host as a primary server, enter a command such as the following:

```
x_add_trm_130 130 taylor x_st_mgr.ether 10005ac38e9 y \
00 mouse com1 n n 'Use network only' 'Use network only' \
'none' off none English    (United States) IBM−850' \
'English (United States)' 'keyboard' Rom14 'Upper left' 'none'
```

Xstation `taylor` is added to the current host, as defined by the parameters: Model 130, a network type of `ethernet`, a hardware address of `10005ac38e9`, primary server status, no delay time, input from a mouse, tablet port is ignored, no fixed disk, default fixed disk configuration, no hardware pan feature, xdmcp mode off, no host name, United States English **LANG** environment variable, United States English keyboard layout, standard keyboard file, login window font Rom14, the login window in the upper left corner of the screen, and no LPF keys.

Files

/usr/lpp/x_st_mgr/bin/x_add_trm_130	Contains the **x_add_trm_130** command.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the boot protocol table.

Related Information

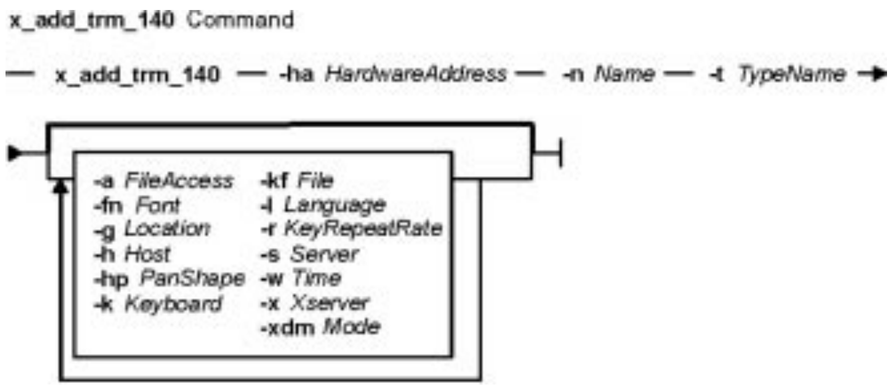
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_trm_140 Command

Purpose

Adds an Xstation 140 workstation to the host.

Syntax



x_add_trm_140 **−n***Name***−t** *TypeName* **−ha** *HardwareAddress* **−s** *Server***−w** *Time* **−a** *FileAccess* **−x** *Xserver* **−hp** *PanShape* **−xdm** *Mode* **−h** *Host* **−l** *Language* **−k** *Keyboard* **−kf** *File* **−fn** *Font* **−g** *Location* **−r** *KeyRepeatRate*

Description

The **x_add_trm_140** command adds the Xstation140 workstation to the current host, using the *Name* variable of the **−n** flag The **x_add_trm_140** command also stores the configuration in the **/etc/x_st_mgr/xs140/cfg/***IPaddress* file, the **/etc/x_st_mgr/x_st_mgrd.tmty** file, and the **/etc/x_st_mgr/x_st_mgrd.cf** file.

Flags

The following flags are required when using the **x_add_trm_140** command:

−ha *HardwareAddress*	Specifies the local−area network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you turn on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
−n *Name*	Specifies the name of the Xstation. The *Name* variable can be up to 8 characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash), and the . (period). The value of the *Name* variable can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2.`The terminal name must be known to the host system. **Note:** The *Name* variable value should not start with an uppercase or lowercase o or x followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. For example, in `x3` and `xE4`, the `3` and the `E4` are interpreted as hexadecimal numerics.
−t *TypeName*	Specifies the name you defined for this network Xstation model subnet combination with the **Define an Xstation Network Type** option in SMIT or with the

x_def_net command. Press the F4 key in SMIT to select the network type. An example is `x_st_mgr.ether140` for Ethernet and an Xstation 140.

The following flags are optional when using the **x_add_trm_140** command:

−a *FileAccess*	Specifies the process for accessing the font files. In SMIT, press the F4 key to select an option. The default option is **x_st_mgrd**.
−fn *Font*	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
−g *Location*	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid entries are **Upper left**, **Lower left**, **Upperright**, and **Lower right**.
−h *Host*	Specifies the name of the X Display Manager Control Protocol (XDMCP) host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an XDMCP host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an XDMCP host must be specified if *Mode* is **direct** or **indirect**. The default value is **none**.
−hp *PanShape*	Specifies how the hardware pan feature is to be used. Valid options are **none**, **square**, **horizontal**, and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video random access memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of two. With 2MB of VRAM, expanding the window dimensions to a power of two may not leave enough memory for the shape selected.
−k *Keyboard*	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
−kf *File*	Sets the name of the keyboard file. The default is **keyboard**. Some countries have a second keyboard file, usually named **keyboard.alt**.
−l *Language*	Sets the **LANG** variable, which specifies system messages. Press the F4 key in SMIT to select a value.
−r *KeyRepeatRate*	Sets the rate, in characters per second, of automatically transmitted duplicate characters. A prolonged stay on any character key will activate the typematic operation and continue to transmit duplicate characters until the key is released. The arrow keys will move at twice the speed of character keys, up to 30 characters per second. The default rate is **28**.
−s *Server*	Specifies whether or not the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see the −w *Time* flag, below). Two values are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default value is **y**.
−w *Time*	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, as there is no delay time.) In SMIT, press F4 to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server, and a secondary server may be selected although the primary server is available. A value greater than the maximum value can lead to a timeout.
−x *Xserver*	Specifies the way to access the Xserver file list. In SMIT, press the F4 key to select an option. The default value is **Base FLASH**.

−xdm *Mode*
: Specifies the mode used by XDMCP. XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are:

broadcast
: Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Examples

1. To add an Xstation 140 named `taylor` with all configuration performed on the host, enter the following:

   ```
   x_add_trm_140 −n taylor −t x_st_mgr.ether −ha 10005ac38e9 −s y \
   −w 00 −d mouse −tp S1 −a=none n −x 'Base FLASH'
   −hp 'none' −xdm off \−h none −l 'English  (United States)
   IBM−850' \−k 'English (United States)' −kf 'keyboard' −fn Rom14 \
   −g 'Upper left' −lp 'none' −r '20'
   ```

   This entry adds Xstation `taylor` to the current host with the following characteristics:

   - Model 140
   - A network type of **ethernet**
   - A hardware address of `10005ac38e9`
   - Primary server status
   - No delay time
   - Input from a mouse
   - Tablet port is ignored
   - Bootfile from **Base FLASH** boot option
   - No hardware pan feature
   - XDMCP mode off
   - No host name
   - United States English **LANG** variable
   - United States English keyboard layout
   - Standard keyboard file
   - Login window font Rom14
   - The login window in the upper−left corner of the screen
   - No LPF keys
   - A key repeat rate of 20 characters per second
2. To add an Xstation 140 named `taylor` with customizing performed on the local Xstation, enter the following:

   ```
   x_add_trm_140 −n taylor −t x_st_mgr.ether −ha 10005ac38e9 −s n \
   −w 20 −d mouse −l 'English (United States) IBM−850' \
   −xdm broadcast
   ```

   This entry adds Xstation `taylor` to the current host with the following characteristics:

- Model 140
- A network type of **ethernet**
- A hardware address of `10005ac38e9`
- Primary server status
- No delay time
- Input from a mouse
- United States English **LANG** variable
- United States English keyboard layout
- Standard keyboard file
- Broadcast xdm mode

Files

/usr/lpp/x_st_mgr/bin/x_add_trm_140	Contains the **x_add_trm_140** command.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the Boot Protocol table.

Related Information

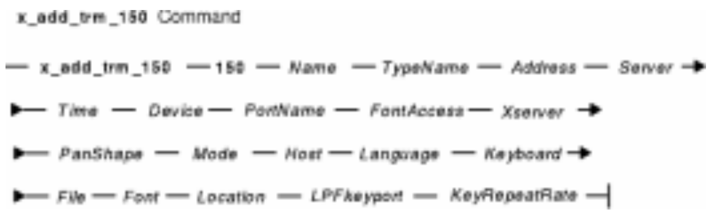
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_trm_150 Command

Purpose

Adds an Xstation 150 to the host.

Syntax



x_add_trm_150 150*NameTypeName Address ServerTime Device PortName FontAccess Xserver PanShape Mode Host Language Keyboard File Font Location LPFkeyport KeyRepeatRate*

Description

The **x_add_trm_150** command adds the Xstation 150 specified by the *Name* parameter to the current host, and stores the configuration in the **/etc/x_st_mgr/xs150/cfg/<IPaddress>** file, and the **/etc/x_st_mgr/x_st_mgrd.tmty** file.

Parameters

Mandatory parameters are:

150	Specifies that this command is used only for an Xstation 150.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2.`The terminal name must be known to the host system. **Note:** *Name* should not start with a uppercase or lowercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network** `Type` option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether150** for Ethernet and an Xstation 150.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether or not the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time*, listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.

Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, as there is no delay time.) In SMIT, press F4 to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server, and a secondary server may be selected although the primary server is available. A value greater than the maximum value may lead to a time out.
Device	Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**. You can attach a 6093 tablet device (Model 11 or Model 12) to an Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse. X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an even generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.
PortName	Specifies the serial port on an Xstation 150 to which the tablet is attached. In SMIT, press the F4 key to select an option. The valid options are: **T1**, **T2**, **S1** or **S2**. The default option is **T1**.
FontAccess	Specifies the way to access the font files. In SMIT, press the F4 key to select an option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH**.
Xserver	Specifies the way to access the Xserver file list. In SMIT, press the F4 key to select a option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH.**
PanShape	Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of 2. With 2MB VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.
Mode	Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are: ***broadcast***

Sends a message to the network and waits for an xdmcp host to respond.

direct
Directs a request to an xdmcp manager known to the Xstation.

indirect
Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Host	Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.
Language	Sets the language used for system messages, the LANG environment variable. Press the F4 key in SMIT to select an option.
Keyboard	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
File	Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`
Font	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
Location	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid entries are: **Upper left**, **Lower left**, **Upperright**, and **Lower right**.
LPFkeyport	Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are: **none**, **T1**, **T2**, **S1** or **S2**.
KeyRepeatRate	Sets the rate, in characters per second, of automatically transmitted duplicate characters. A prolonged stay on any character key will activate the typematic operation and continue to transmit duplicate characters until the key is released. The arrow keys will move at twice the speed of character keys, up to 30 characters per second. The default rate is **28**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add Xstation `taylor` to the current host as a primary server, enter a command such as the following:

```
x_add_trm_150 150 taylor x_st_mgr.ether 10005ac38e9 y \
00 mouse S1 n n 'Base FLASH' 'Base FLASH' \
'none' off none 'English    (United States) IBM−850' \
'English (United States)' 'keyboard' Rom14 'Upper left' 'none' '20'
```

Xstation `taylor` is added to the current host, as defined by the parameters: Model 150, a network type of `ethernet`, a hardware address of `10005ac38e9`, primary server status, no delay time, input from a mouse, tablet port is ignored, fonts and bootfile from Base FLASH, no hardware pan feature, xdmcp mode off, no host name, United States English **LANG** variable, United States English keyboard layout, standard keyboard file, login window font Rom14, the login window in the upper left corner of the screen, no LPF keys, and a key repeat rate of 20 characters per second.

Files

/usr/lpp/x_st_mgr/bin/x_add_trm_150	Contains the **x_add_trm_150** command.
/etc/x_st_mgr/ibm/xs150/cfg/<IPADDRESS>	Contains the Xstation configuration file.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.

/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the Boot Protocol table.

Related Information

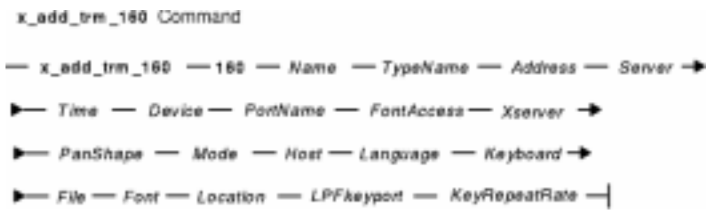
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_trm_160 Command

Purpose

Adds an Xstation 160 to the host.

Syntax



x_add_trm_160 160*NameTypeName Address ServerTime Device PortName FontAccess Xserver PanShape Mode Host Language Keyboard File Font Location LPFkeyport KeyRepeatRate*

Description

The **x_add_trm_160** command adds the Xstation 160 specified by the *Name* parameter to the current host, and stores the configuration in the **/etc/x_st_mgr/xs160/cfg/<IPaddress>** file, and the **/etc/x_st_mgr/x_st_mgrd.tmty** file.

Parameters

Mandatory parameters are:

160	Specifies that this command is used only for an Xstation 160.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2.`The terminal name must be known to the host system. **Note:** *Name* should not start with a uppercase or lowercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network** `Type` option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether160** for Ethernet and an Xstation 160.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether or not the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time*, listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.

Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, as there is no delay time.) In SMIT, press F4 to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server, and a secondary server may be selected although the primary server is available. A value greater than the maximum value may lead to a time out.
Device	Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**. You can attach a 6093 tablet device (Model 11 or Model 12) to an Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse. X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an even generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.
PortName	Specifies the serial port on an Xstation 160 to which the tablet is attached. In SMIT, press the F4 key to select an option. The valid options are: **T1**, **T2**, **S1** or **S2**. The default option is **T1**.
FontAccess	Specifies the way to access the font files. In SMIT, press the F4 key to select an option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH**.
Xserver	Specifies the way to access the Xserver file list. In SMIT, press the F4 key to select a option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH.**
PanShape	Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of 2. With 2MB VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.
Mode	Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are: ***broadcast***

Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Host	Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.
Language	Sets the language used for system messages, the LANG environment variable. Press the F4 key in SMIT to select an option.
Keyboard	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
File	Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`
Font	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
Location	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid entries are: **Upper left**, **Lower left**, **Upperright**, and **Lower right**.
LPFkeyport	Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are: **none**, **T1**, **T2**, **S1** or **S2**.
KeyRepeatRate	Sets the rate, in characters per second, of automatically transmitted duplicate characters. A prolonged stay on any character key will activate the typematic operation and continue to transmit duplicate characters until the key is released. The arrow keys will move at twice the speed of character keys, up to 30 characters per second. The default rate is **28**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add Xstation `taylor` to the current host as a primary server, enter a command such as the following:

```
x_add_trm_160 160 taylor x_st_mgr.ether 10005ac38e9 y \
00 mouse S1 n n 'Base FLASH' 'Base FLASH' \
'none' off none 'English    (United States) IBM−850' \
'English (United States)' 'keyboard' Rom14 'Upper left' 'none' '20'
```

Xstation `taylor` is added to the current host, as defined by the parameters: Model 160, a network type of `ethernet`, a hardware address of `10005ac38e9`, primary server status, no delay time, input from a mouse, tablet port is ignored, fonts and bootfile from Base FLASH, no hardware pan feature, xdmcp mode off, no host name, United States English **LANG** variable, United States English keyboard layout, standard keyboard file, login window font Rom14, the login window in the upper left corner of the screen, no LPF keys, and a key repeat rate of 20 characters per second.

Files

/usr/lpp/x_st_mgr/bin/x_add_trm_160	Contains the **x_add_trm_160** command.
/etc/x_st_mgr/ibm/xs160/cfg/<IPADDRESS>	Contains the Xstation configuration file.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.

/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the Boot Protocol table.

Related Information

The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_add_xst_fpe Command

Purpose

Adds an Xstation Manager accessed font directory to a font path.

Syntax

x_add_xst_fpe *Host Port Directory Position TypeName*

Description

The **x_add_xst_fpe** command adds an Xstation Manager accessed font directory to a font path.

Parameters

Host	Specifies the name of the system to access for the font directory.
Port	Specifies the number of the **x_st_mgrd** server port. This number must be in the **/etc/services** file and is specified in decimal.
Directory	Specifies the complete path to the directory that contains the fonts.
Position	Specifies where to insert this element in the font path.
TypeName	Specifies the name of the network type. Each network type has a font path consisting of one or more font path elements. (To see a list of the network types and their font path elements, press F4 in SMIT at the **Xstation Network TYPE Name** option). Specify the name of the network type to which the font path element will be added, or choose to have it added to all network type names by specifying `All`. If a font path element is added to `All` network types, it will be placed at the end of each font path.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add the fonts in `/usr/lib/X11/fonts/75dpi` to the font path for network type `x_st_mgr.ether`, enter:

```
x_add_xst_fpe waco 9000 /usr/lib/X11/fonts/75dpi Last \
x_st_mgr.ether
```

In this example, the font path element `/usr/lib/X11/fonts/75dpi` is added to the end of the font path for network type `x_st_mgr.ether`. It is on host `waco`, which is accessed using the Xstation Manager daemon on port `9000`.

Files

/usr/lpp/x_st_mgr/bin/x_add_xst_fpe	Contains the **x_add_xst_fpe** command.
/etc/x_st_mgr/ether.cf	Contains the network type **x_st_mgr.ether** configuration file (sample).

Related Information

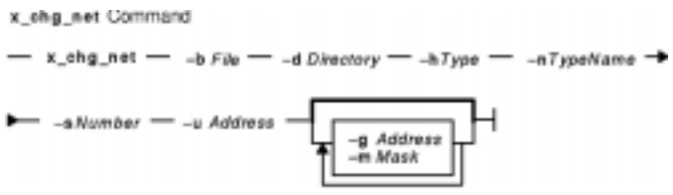
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_chg_net Command

Purpose

Changes an existing Xstation network type.

Syntax



x_chg_net −b*File***−d***Directory* [**−g***Address*] −h*Type* [**−m***Mask*] **−n***TypeName* −s*Number* **−u***Address*

Description

The **x_chg_net** command changes, for the current host, the characteristics of the Xstation network type specified by the *TypeName* parameter, and stores the changed definition in the **/etc/bootptab** file. The *TypeName* parameter must contain **x_st_mgr.** as a prefix, for example, **x_st_mgr.ether**, and be used with the **−n** flag.

Flags

−b*File*	Specifies the name of the bootfile. Because the bootfile program is downloaded into the Xstation, the bootfile entry differs for each Xstation model. Press the F4 key in SMIT to select a bootfile. The valid option for an Xstation 120 is **bootfile3**. The valid option for an Xstation 130 is **bootfile4**.
−d*Directory*	Specifies the directory where the Xstation Network Type configuration files reside. This directory must exist, with root having write permission. The default home directory is **/etc/x_st_mgr**.
−g*Address*	This optional parameter specifies the gateway address. The default option is the Internet address of the host system that establishes a communication connection to another Ethernet, IEEE 802.3, or token−ring system. This address is an Internet address unique to the gateway, in dotted decimal format: *ddd.ddd.ddd.ddd*, where 0<*ddd*<255. To designate a default gateway, select a gateway that is on the same local network as the Xstation. If the Xstation has more than one network connection, you can set a gateway for each network. When multiple gateways are defined for an Xstation, only one default gateway can be used. The configured gateway is determined during the boot process for the Xstation. If the Xstation is booted from a token−ring network, the token−ring gateway is selected; otherwise, the Ethernet gateway address is selected.
−h*Type*	Specifies the type of physical network connection used for the terminal, Ethernet, or token−ring or IEEE802.3. Press the F4 key in SMIT to select a network type. Valid options are **ethernet**, or **tokenring** or **ieee802**. The default is **ethernet**. An Xstation network type must be defined for each network. The same Xstation can be on multiple networks, but must be configured with a different name and Internet address for each

	network.
−m*Mask*	Specifies the subnet mask. A network subnet mask is required for each gateway entry to tell the system what the subnet partitioning scheme is. This 4−byte bit mask, in dotted decimal format consists of the Network Address portion and the Subnet Address portion of the Internet address. The Xstation uses the subnet mask to determine if the destination address is on the local network. If the destination address is not local, then the Xstation directs the packet to the gateway. The gateway then forwards the packet.
−n*TypeName*	Specifies the name you choose to identify a network type for a specific network−Xstation model−subnet combination. An example is **x_st_mgr.ether130** for an Ethernet−Xstation 130 combination.
−s*Number*	Specifies the number of the server port. This number must be in the **/etc/services** file. The default value is 9000.
−u*Address*	Specifies the full Internet address of the machine that performs name resolution for the Xstation.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To change the characteristics of a network type named `x_st_mgr.ether`, enter a command such as the following:

```
x_chg_net −nx_st_mgr.ether −bbootfile3 \
−d/etc/x_st_mgr −hethernet −s9000
```

In this example, the characteristics include the following: the bootfile name is `bootfile3`, the bootfile home directory is `/etc/x_st_mgr`, the network type is `ethernet` and the server port number is `9000`.

Files

/usr/lpp/x_st_mgr/bin/x_chg_net	Contains the **x_chg_net** command.
/etc/bootptab	Contains the boot protocol table.
/etc/x_st_mgr/<TypeName>.cf	Contains the network configuration file.

Related Information

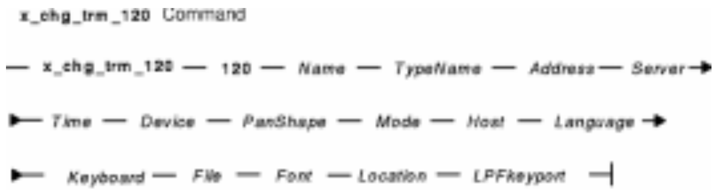
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_chg_trm_120 Command

Purpose

Changes the characteristics of an Xstation 120.

Syntax


x_chg_trm_120 Command
x_chg_trm_120 — 120 — Name — TypeName — Address — Server
Time — Device — PanShape — Mode — Host — Language
Keyboard — File — Font — Location — LPFkeyport

x_chg_trm_120 120*NameTypeName Address ServerTime Device PanShape Mode Host Language Keyboard File Font Location LPFkeyport*

Description

The **x_chg_trm_120** command changes, for the current host, the characteristics of the Xstation specified by the *Name* parameter, and stores the changed configuration in the **/etc/x_st_mgr/x_st_mgrd.cf** file, the **/etc/x_st_mgr/x_st_mgrd.tmty** file, and the **/etc/bootptab** file.

Parameters

Parameters that can be changed are:

120	Specifies that this command is used only for an Xstation 120.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2`, and should identify an Xstation by its location in the work place or by the primary user's name. *Name* is stored in the **/etc/hosts** file. **Note:** *Name* should not start with a uppercase or an lowercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies a name you defined for this network−Xstation model combination with the **Define an Xstation Network** `Type` option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select a network type. An example is **x_st_mgr.ether120** for Ethernet and an Xstation 120.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see the *Time* parameter below). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.
Time	Specifies the number of seconds a secondary boot server must wait before answering a

boot−protocol broadcast request. (The valid number for a primary server is 0, because there is no delay time.) In SMIT, press the F4 key to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server and a secondary server may be selected even when the primary server is available. A value greater than the maximum value may lead to a time out.

Device
: Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**.

You can attach a 6093 tablet device (Model 11 or Model 12) to the Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse.

X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an event generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.

PanShape
: Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**.

With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window.

> **Note:** The window size for panning is always a power of 2. With minimum VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.

Mode
: Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are:

broadcast
: Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Host
: Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.

Language
: Sets the language used for system messages, the **LANG** environment variable. Press the F4 key in SMIT to select an option.

Keyboard
: Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.

File
: Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`

Font
: Sets the font used in the login window. Press the F4 key in SMIT to select an option.

Location
: Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid entries are **Upper left**, **Upper right**, **Lower left**, and **Lower right**.

LPFkeyport	Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are **none** and **com1**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To change the characteristics of Xstation `xor1` for the current host, so the new hardware address is `10005ac9999` but the other characteristics remain unchanged from those defined with the **x_add_trm_120** command, enter:

```
x_chg_trm_120 120 taylor 'x_st_mgr.ether' 10005ac9999 y \00 mouse 'none' off none \'English
```

All parameters must be entered.

Files

/usr/lpp/x_st_mgr/bin/x_chg_trm_120	Contains the **x_chg_trm_120** command.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the boot protocol table.

Related Information

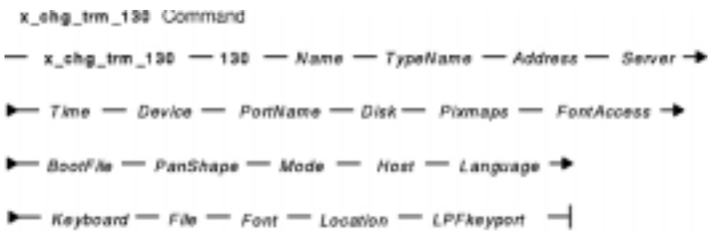
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_chg_trm_130 Command

Purpose

Changes the characteristics of an Xstation 130.

Syntax



x_chg_trm_130 130*NameTypeName Address ServerTime Device PortName Disk Pixmaps FontAccess BootFile PanShape Mode Host Language Keyboard File Font Location LPFkeyport*

Description

The **x_chg_trm_130** command changes, for the current host, the characteristics of the Xstation specified by the *Name* parameter, and stores the changed configuration in the **/etc/x_st_mgr/x_st_mgrd.cf** file, the **/etc/x_st_mgr/x_st_mgrd.tmty** file, and the **/etc/bootptab** file.

Parameters

Parameters that can be changed are:

130	Specifies that this command is used only for an Xstation 130.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2`, and should identify an Xstation by its location in the work place or by the primary user's name. *Name* is stored in the **/etc/hosts** file. **Note:** *Name* should not start with a lowercase or an uppercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network Type** option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether130** for Ethernet and an Xstation 130.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time* listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.

Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, because there is no delay time.) In SMIT, press the F4 key to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server and a secondary server may be selected even when the primary server is available. A value greater than the maximum value may lead to a time out.
Device	Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**. You can attach a 6093 tablet device (Model 11 or Model 12) to the Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse. X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an event generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.
PortName	Specifies the serial port on an Xstation 130 to which the tablet is attached. In SMIT, press the F4 key to select an option. The valid options are: **com1**, **com2, com3,** and **com4**. The default option is **com1**.
Disk	Specifies whether or not an Xstation 130 has a fixed disk installed. Two options are valid: **y** if there is a fixed disk and **n** if there is no fixed disk. The default option is **n**.
Pixmaps	Specifies whether or not the PIXMAPS are paged to the fixed disk. Two options are valid: **y** for yes and **n** for no. The default option is **n**.
FontAccess	Specifies the way to access the font files. In SMIT, press the F4 key to select an option. Valid options are: • **Use network only.** • **Use disk only.** • **Try disk first, try network second.** • **Try network first, try disk second.** • **Try disk first, try network second and store to disk.** • **Use most recent copy and update disk.** The default option is **Use network only**.
BootFile	Specifies the way to access the boot file. In SMIT, press the F4 key to select an option. Valid options are: • **Use network only.** • **Use disk only.** • **Try disk first, try network second.** • **Try network first, try disk second.** • **Try disk first, try network second and store to disk.** • **Use most recent copy and update disk.** The default option is **Use network only**.
PanShape	Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of 2. With minimum

VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.

Mode	Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are: ***broadcast*** Sends a message to the network and waits for an xdmcp host to respond. ***direct*** Directs a request to an xdmcp manager known to the Xstation. ***indirect*** Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation. ***off*** No X Display Manager Control Protocol (XDMCP). The default option is **off**.
Host	Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.
Language	Sets the language used for system messages, the **LANG** environment variable. Press the F4 key in SMIT to select an option.
Keyboard	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
File	Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`
Font	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
Location	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid entries are **Upper left**, **Upper right**, **Lower left**, and **Lower right**.
LPFkeyport	Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are: **none**; **com1**; **com2**; **com3**; and **com4**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To change the characteristics of Xstation `taylor` for the current host, so the new hardware address is `10005ac9999` but the other characteristics remain unchanged from those defined with the **x_add_trm_130** command, enter:

```
x_chg_trm_130 130 taylor x_st_mgr.ether 10005ac9999 y \00 mouse com1  'Use network only' 'Use n
```

All parameters must be entered.

Files

/usr/lpp/x_st_mgr/bin/x_chg_trm_130	Contains the **x_chg_trm_130** command.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/bootptab	Contains the boot protocol table.

Related Information

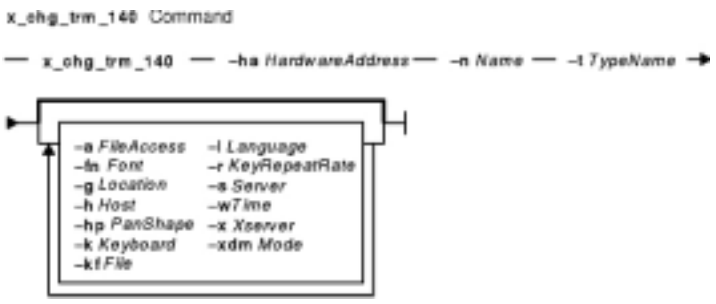
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_chg_trm_140 Command

Purpose

Changes the characteristics of an Xstation140.

Syntax



x_chg_trm_140 −n*Name***−t** *TypeName* **−ha** *HardwareAddress* **−s** *Server***−w** *Time* **−a** *FileAccess* **−x** *Xserver* **−hp** *PanShape* **−xdm** *Mode* **−h** *Host* **−l** *Language* **−k** *Keyboard* **−kf** *File* **−fn** *Font* **−g** *Location* **−r** *KeyRepeatRate*

Description

The **x_chg_trm_140** command changes the characteristics of the Xstation140 for the current host, using the *Name* variable of the **−n** flag. The **x_chg_trm_140** command then stores the changed configuration in the **/etc/x_st_mgr/xs140/cfg/***IPaddress* file, the **/etc/x_st_mgr/x_st_mgrd.tmty** file, and the **/etc/x_st_mgr/x_st_mgrd.cf** file.

Flags

The following flags are required when using the **x_chg_trm_140** command to change the Xstation 140:

−ha *Address*	Specifies the local−area network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you turn on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
−n *Name*	Specifies the name of the Xstation. The *Name* variable can be up to 8 characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash), and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2`, and should identify an Xstation by its location in the work place or by the primary user's name. The *Name* parameter is stored in the **/etc/hosts** file. **Note:** The *Name* variable should not start with a lowercase or uppercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. For example, in `x3` and `xE4`, the `3` and the `E4` are hexadecimal numerics.
−t*TypeName*	Specifies the name you defined for this network Xstation−model subnet combination with the **Define an Xstation Network Type** option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the Network Type. An example is `x_st_mgr.ether140` for Ethernet and an Xstation 140.

The following flags are optional when using the **x_chg_trm_140** command to change the Xstation 140:

−a *FileAccess*	Specifies the process for accessing the font files. In SMIT, press the F4 key to select an option. The default option is **x_st_mgrd**.
−fn *Font*	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
−g *Location*	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid options are **Upper left**, **Upper right**, **Lower left**, and **Lower right**.
−h *Host*	Specifies the name of the X Display Manager Control Protocol (XDMCP) host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an XDMCP host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an XDMCP host must be specified if *Mode* is **direct** or **indirect**. The default value is **none**.
−hp *PanShape*	Specifies how the hardware pan feature is to be used. Valid options are **none**, **square**, **horizontal**, and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video random access memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in the direction of the cursor provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of two. With 2MB of VRAM, expanding the window dimensions to a power of two may not leave enough memory for the shape selected.
−k *Keyboard*	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
−kf *File*	Sets the name of the keyboard file. The default is the **keyboard** option. Some countries have a second keyboard file usually named **keyboard.alt**.
−l *Language*	Sets the **LANG** environment variable, which specifies system messages. Press the F4 key in SMIT to select a value.
−r *KeyRepeatRate*	Sets the rate, in characters per second, of automatically transmitted duplicate characters. A prolonged stay on any character key will activate the typematic operation and continue to transmit duplicate characters until the key is released. The arrow keys will move at twice the speed of character keys, up to 30 characters per second. The default rate is **28**.
−s *Server*	Specifies whether the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see the **−w***Time* flag below). Two values are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default value is **y**.
−w *Time*	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, because there is no delay time.) In SMIT, press the F4 key to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server and a secondary server may be selected even when the primary server is available. A value greater than the maximum value may lead to a timeout.
−x *Xserver*	Specifies the way to access the Xserver file list. In SMIT, press the F4 key to select an option. The default value is **Base FLASH**.
−xdm *Mode*	Specifies the mode used by XDMCP uses the xdm program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are: ***broadcast***

Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To change the hardware access of Xstation `taylor` for the current host to `10005ac9999`, without changing other characteristics defined with the **x_add_trm_140** command, enter:

```
x_chg_trm_140 −n=taylor −ha=10005ac9999
```

Only changed variables must be entered.

Files

/usr/lpp/x_st_mgr/bin/x_chg_trm_140	Contains the **x_chg_trm_140** command.
/etc/x_st_mgr/xs140/cfg/*IPaddress*	Contains the Xstation configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager configuration file.
/etc/bootptab	Contains the Boot Protocol table.

Related Information

The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_chg_trm_150 Command

Purpose

Changes the characteristics of an Xstation 150.

Syntax

x_chg_trm_150 Command
x_chg_trm_150
150
Name
TypeName
Address
Server
Time
Device
PortName
FontAccess
Xserver
PanShape
Mode
Host
Language
Keyboard
File
Font
Location
LPFkeyport
KeyRepeatRate

x_chg_trm_150 150*NameTypeName Address ServerTime Device PortName FontAccess Xserver PanShape Mode Host Language Keyboard File Font Location LPFkeyport KeyRepeatRate*

Description

The **x_chg_trm_150** command changes, for the current host, the characteristics of the Xstation specified by the *Name* parameter, and stores the changed configuration in the **/etc/x_st_mgr/xs150/cfg/<IPaddress>** file, and the **/etc/x_st_mgr/x_st_mgrd.tmty** file.

Parameters

Parameters that can be changed are:

150	Specifies that this command is used only for an Xstation 150.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2`, and should identify an Xstation by its location in the work place or by the primary user's name. *Name* is stored in the **/etc/hosts** file. **Note:** *Name* should not start with a lowercase or an uppercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network Type** option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether150** for Ethernet and an Xstation 150.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time* listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.

Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, because there is no delay time.) In SMIT, press the F4 key to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server and a secondary server may be selected even when the primary server is available. A value greater than the maximum value may lead to a time out.
Device	Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**. You can attach a 6093 tablet device (Model 11 or Model 12) to the Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse. X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an event generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.
PortName	Specifies the serial port on an Xstation 150 to which the tablet is attached. In SMIT, press the F4 key to select an option. The valid options are: **T1**, **T2, S1,** or **S2**. The default option is **T1**.
FontAccess	Specifies the way to access the font files. In SMIT, press the F4 key to select an option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH**.
Xserver	Specifies the way to access the Xserver file list. In SMIT, press the F4 key to select an option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH**.
PanShape	Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of 2. With 2MB VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.
Mode	Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are: ***broadcast***

	Sends a message to the network and waits for an xdmcp host to respond. ***direct*** Directs a request to an xdmcp manager known to the Xstation. ***indirect*** Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation. ***off*** No X Display Manager Control Protocol (XDMCP). The default option is **off**.
Host	Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.
Language	Sets the language used for system messages, the LANG environment variable. Press the F4 key in SMIT to select an option.
Keyboard	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
File	Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`
Font	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
Location	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid options are **Upper left**, **Upper right**, **Lower left**, and **Lower right**.
LPFkeyport	Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are: **none**, **T1**, **T2**, **S1,** or **S2.**
KeyRepeatRate	Sets the rate, in characters per second, of automatically transmitted duplicate characters. A prolonged stay on any character key will activate the typematic operation and continue to transmit duplicate characters until the key is released. The arrow keys will move at twice the speed of character keys, up to 30 characters per second. The default rate is **28**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To change the characteristics of Xstation `taylor` for the current host, so the new hardware address is `10005ac9999` but the other characteristics remain unchanged from those defined with the **x_add_trm_150** command, enter:

```
x_chg_trm_150 150 taylor x_st_mgr.ether 10005ac9999 y \
00 mouse T1 n n 'Base FLASH' 'Base FLASH' \
'none' off none 'English    (United States)  IBM−850' \
'English (United States)' 'keyboard' Rom14 'Upper left' \
'none' '20'
```

All parameters must be entered.

Files

/usr/lpp/x_st_mgr/bin/x_chg_trm_150	Contains the **x_chg_trm_150** command.
/etc/x_st_mgr/ibm/xs150/cfg/<IPADDRESS>	Contains the Xstation configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.

Related Information

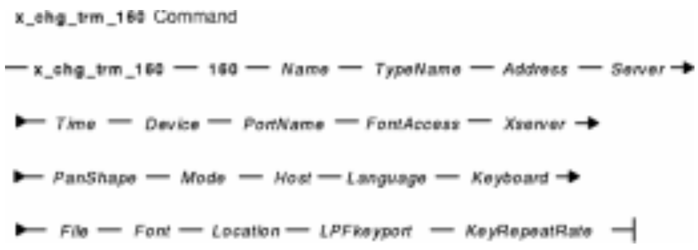
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_chg_trm_160 Command

Purpose

Changes the characteristics of an Xstation 160.

Syntax



x_chg_trm_160 160*NameTypeName Address ServerTime Device PortName FontAccess Xserver PanShape Mode Host Language Keyboard File Font Location LPFkeyport KeyRepeatRate*

Description

The **x_chg_trm_160** command changes, for the current host, the characteristics of the Xstation specified by the *Name* parameter, and stores the changed configuration in the **/etc/x_st_mgr/xs160/cfg/<IPaddress>** file, and the **/etc/x_st_mgr/x_st_mgrd.tmty** file.

Parameters

Parameters that can be changed are:

160	Specifies that this command is used only for an Xstation 160.
Name	Specifies the name of the Xstation. The *Name* parameter can be up to eight characters long and include the uppercase or lowercase letters a through z, the numbers 0 through 9, the − (dash) and the . (period). *Name* can be a user name, such as `taylor`, or a group name with a number appended, such as `graphs−2`, and should identify an Xstation by its location in the work place or by the primary user's name. *Name* is stored in the **/etc/hosts** file. **Note:** *Name* should not start with a lowercase or an uppercase o or x, followed by an octal or hexadecimal numeric. These characters are interpreted as octal or hexadecimal numbers, instead of as a terminal name. In the examples x3 and xE4, the 3 and the E4 are hexadecimal numerics.
TypeName	Specifies the name you defined for this network−Xstation model−subnet combination with the **Define an Xstation Network Type** option in SMIT or with the **x_def_net** command. Press the F4 key in SMIT to select the network type. An example is **x_st_mgr.ether160** for Ethernet and an Xstation 160.
Address	Specifies the Local Area Network (LAN) hardware address of the Xstation. This address appears on the LAN Statistics screen when you power−on the Xstation. Each Xstation has a unique 6−byte hexadecimal hardware address, in *XXXXXXXXXXXX* format, that cannot be changed by the user.
Server	Specifies whether the host system is a primary boot server. A primary boot server responds immediately to a boot−protocol broadcast request from an Xstation; for other (secondary) boot servers, a delay time is imposed (see *Time* listed next). Two options are valid: **y** if the server is a primary server, and **n** if the server is not a primary server. The default option is **y**.

Time	Specifies the number of seconds a secondary boot server must wait before answering a boot−protocol broadcast request. (The valid number for a primary server is 0, because there is no delay time.) In SMIT, press the F4 key to see the recommended range of values. Generally, a value less than the minimum value does not distinguish between a primary and secondary server and a secondary server may be selected even when the primary server is available. A value greater than the maximum value may lead to a time out.
Device	Specifies the input device. Device must be **mouse** or **tablet**. In SMIT, press the F4 button to select the input device. The default option is **mouse**. You can attach a 6093 tablet device (Model 11 or Model 12) to the Xstation serial port. A tablet uses absolute positioning, as opposed to the relative positioning of a mouse, and cannot change the initial cursor location. The *threshold* and *acceleration* parameters of the **xset** command apply only to the mouse. X Windows protocol supports five button signals from a mouse or tablet. Buttons 1, 2, and 3 correspond to the left, middle, and right buttons respectively. Button 4 is used as an event generating button. If required by specific application programs, button 5 sends the required messages. Buttons 6 through 16, if present, are disabled.
PortName	Specifies the serial port on an Xstation 160 to which the tablet is attached. In SMIT, press the F4 key to select an option. The valid options are: **T1**, **T2, S1,** or **S2**. The default option is **T1**.
FontAccess	Specifies the way to access the font files. In SMIT, press the F4 key to select an option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH**.
Xserver	Specifies the way to access the Xserver file list. In SMIT, press the F4 key to select an option. Valid options are: • **Base FLASH** • **Network** • **NFS** • **Optional FLASH** The default option is **Base FLASH**.
PanShape	Specifies how the hardware pan feature is to be used. Valid options are **none, square, horizontal,** and **vertical**. The default value is **none**. With the hardware pan feature enabled, the physical screen shows a portion of a larger base window whose size is dependent on the amount of video memory (VRAM) installed on the Xstation. When the cursor is moved past the edge of the display, the screen will automatically scroll in that direction provided it has not already reached the edge of the base window. **Note:** The window size for panning is always a power of 2. With 2MB VRAM, expanding the window dimensions to a power of 2 may not leave enough memory for the shape selected.
Mode	Specifies the mode used by X Display Manager Control Protocol (XDMCP). XDMCP uses the **xdm** program to facilitate the connection of an Xstation to a remote host. XDMCP allows the user to turn an Xstation off and on again and maintain an established connection to the remote host. Valid options are: ***broadcast***

Sends a message to the network and waits for an xdmcp host to respond.

direct
: Directs a request to an xdmcp manager known to the Xstation.

indirect
: Sends an indirect request to an xdmcp manager that maintains a list of xdmcp hosts. The manager assigns an xdmcp host to respond to the Xstation.

off
: No X Display Manager Control Protocol (XDMCP). The default option is **off**.

Host	Specifies the name of the xdmcp host used for direct or indirect communication with the Xstation. Valid options are **none** or the name of an xdmcp host. If XDMCP is not used or if **broadcast** mode is used, the value of *Host* is **none**. The name of an xdmcp host must be specified if *Mode* is **direct** or **indirect**. The default option is **none**.
Language	Sets the language used for system messages, the LANG environment variable. Press the F4 key in SMIT to select an option.
Keyboard	Sets the map for the keyboard layout. Press the F4 key in SMIT to select an option.
File	Sets the name of the keyboard file. The default is `'keyboard.'` Some countries have a second keyboard file usually named `'keyboard.alt.'`
Font	Sets the font used in the login window. Press the F4 key in SMIT to select an option.
Location	Sets the position of the login window on the display. Press the F4 key in SMIT to select an option. Valid options are **Upper left**, **Upper right**, **Lower left**, and **Lower right**.
LPFkeyport	Specifies the serial port on an Xstation to which the LPF keys are attached. Press the F4 key to select an option. The valid options are: **none**, **T1**, **T2**, **S1,** or **S2.**
KeyRepeatRate	Sets the rate, in characters per second, of automatically transmitted duplicate characters. A prolonged stay on any character key will activate the typematic operation and continue to transmit duplicate characters until the key is released. The arrow keys will move at twice the speed of character keys, up to 30 characters per second. The default rate is **28**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To change the characteristics of Xstation `taylor` for the current host, so the new hardware address is `10005ac9999` but the other characteristics remain unchanged from those defined with the **x_add_trm_160** command, enter:

```
x_chg_trm_160 160 taylor x_st_mgr.ether 10005ac9999 y \
00 mouse T1   'Base FLASH' 'Base FLASH' \
'none' off none 'English    (United States)  IBM−850' \
'English (United States)' 'keyboard' Rom14 'Upper left' \
'none' '20'
```

All parameters must be entered.

Files

/usr/lpp/x_st_mgr/bin/x_chg_trm_160	Contains the **x_chg_trm_160** command.
/etc/x_st_mgr/ibm/xs160/cfg/<IPADDRESS>	Contains the Xstation configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.

Related Information

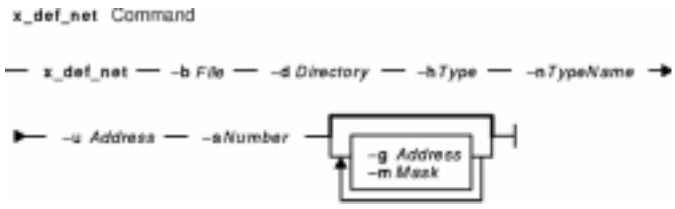
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_def_net Command

Purpose

Defines an Xstation network type.

Syntax



x_def_net −b*File***−d***Directory* [**−g***Address*] **−h***Type* [**−m***Mask*] **−n***TypeName* **−s***Number* −u*Address*

Description

The **x_def_net** command defines, for the current host, the Xstation network type specified by the *TypeName* parameter, and stores the definition in the **/etc/bootptab** file. The *TypeName* parameter must contain **x_st_mgr.** as a prefix, for example, **x_st_mgr.ether**. Use the **−n** flag with the *TypeName* parameter.

You can use this network type when you add an Xstation to the host with the **x_add_trm_120** command or the **x_add_trm_130** command.

Flags

−b*File*	Specifies the name of the bootfile. Because the bootfile program is downloaded into the Xstation, the bootfile entry differs for each Xstation model. The valid option for an Xstation 120 is **bootfile3.** The option for an Xstation 130 is **bootfile4.**
−d*Directory*	Specifies the directory where the Xstation Network Type configuration files reside. This directory must exist, with root having write permission. The default home directory is **/etc/x_st_mgr**.
−g*Address*	This optional parameter specifies the gateway address. The default option is the Internet address of the host system that establishes a communication connection to another Ethernet, IEEE 802.3, or token−ring system. This address is an Internet address unique to the gateway, in dotted decimal format: *ddd.ddd.ddd.ddd,* where 0<*ddd*<255. To designate a default gateway, select a gateway that is on the same local network as the Xstation. If the Xstation has more than one network connection, you can set a gateway for each network. When multiple gateways are defined for an Xstation, only one default gateway can be used. The configured gateway is determined during the boot process for the Xstation. If the Xstation is booted from a token−ring network, the token−ring gateway is selected; otherwise, the Ethernet gateway address is selected.
−h*Type*	Specifies the type of physical network connection used for the terminal, Ethernet, or token−ring or IEEE802.3. Press the F4 key in SMIT to select a network type. Valid options are **ethernet,tokenring** or **ieee802**. The default option is **ethernet.**

	An Xstation network type must be defined for each network. The same Xstation can be on multiple networks, but must be configured with a different name and Internet address for each network.
−m*Mask*	Specifies the subnet mask. A network subnet mask is required for each gateway entry to tell the system what the subnet partitioning scheme is. This 4−byte bit mask, in dotted decimal format, consists of the Network Address portion and the Subnet Address portion of the Internet address. The Xstation uses the subnet mask to determine if the destination address is on the local network. If the destination address is not local, then the Xstation directs the packet to the gateway. The gateway then forwards the packet. For more information, refer to Subnet Masks in "TCP/IP Addressing" in *AIX Version 4.3 System Management Guide: Communications and Networks*.
−n*TypeName*	Specifies the name you choose to identify a network type for a specific network−Xstation model−subnet combination. The *TypeName* parameter must begin with the prefix **x_st_mgr.** and have a unique postfix, which can include the uppercase and lowercase letters a through z, the numbers 0 through 9, the _ (underscore), the − (dash) and the . (period). An example is **x_st_mgr.ether130** for an Ethernet−Xstation 130 combination.
−s*Number*	Specifies the number of the server port. The default value is 9000. This value must match the value in **/etc/services** file.
−uAddress	Specifies the full Internet address of the machine that performs name resolution for the Xstation.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To add a network type named `x_st_mgr.ether`, enter a command like the following:

```
x_def_net −nx_st_mgr.ether −bbootfile4 \
−d/etc/x_st_mgr −hethernet −s9000
```

In this example, the characteristics include the following: the bootfile name is `bootfile4`, the home directory is `/etc/x_st_mgr`, the network type is `ethernet` and the server port number is 9000.

Files

/usr/lpp/x_st_mgr/bin/x_def_net	Contains the **x_def_net** command.
/etc/bootptab	Contains the boot protocol table.
/etc/x_st_mgr/<TypeName>.cf	Contains the network configuration file.

Related Information

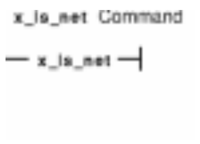
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_ls_net Command

Purpose

Lists Xstation network types for the current host.

Syntax



x_ls_net

Description

The **x_ls_net** command displays, for the current host, all the Xstation network types defined in the **/etc/bootptab** file. These are the network types you use when you add an Xstation to the host with the **x_add_trm_120** or **x_add_trm_130** command. The network type is displayed in the Type column, followed by the network, server port, and bootfile for each network type.

Security

Access Control: Only the root user should have execute (x) access to this command.

Example

To display the network type of each Xstation configured for the current host enter:

```
x_ls_net
```

An example of a listing for a host with one Xstation network type follows:

```
Type            Network         Server port       Bootfile
x_st_mgr.ether   ethernet         9000             bootfile4
```

Files

/usr/lpp/x_st_mgr/bin/x_ls_net	Contains the **x_ls_net** command.
/etc/bootptab	Contains the boot protocol table.

Related Information

The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command,

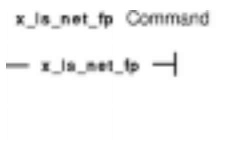
x_rm_trm command.

x_ls_net_fp Command

Purpose

Lists the font path elements for each network type.

Syntax



x_ls_net_fp

Description

The **x_ls_net_fp** command displays, for the current host, information about each network type configured in the **/etc/bootptab** file. The network type and font path elements are displayed.

Security

Access Control: Only the root user should have execute (x) access to this command.

Examples

To display the font path elements of each network type enter:

```
x_ls_net_fp
```

An example of a listing of the font path elements with one network type defined follows:

```
Network Type            Font Path Elements
x_st_mgr.ether          /usr/lib/X11/fonts
```

Files

/usr/lpp/x_st_mgr/bin/x_ls_net_fp	Contains the **x_ls_net_fp** command.
/etc/bootptab	Contains the boot protocol table.

Related Information

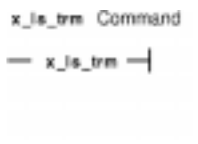
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_ls_trm Command

Purpose

Lists the Xstations configured for the current host.

Syntax



x_ls_trm

Description

The **x_ls_trm** command displays, for the current host, information about each Xstation configured in the **/etc/bootptab** file. The name, network type, hardware address, and boot priority of each Xstation are displayed.

Security

Access Control: Only the root user should have execute (x) access to this command.

Examples

To display the name, network type, and hardware address of each Xstation configured for the current host enter:

```
x_ls_trm
```

An example of a listing for a host with one Xstation follows:

```
Name    Network          Hardware address         Boot priority
taylor  ethernet         10005ac38e9              primary
```

Files

/usr/lpp/x_st_mgr/bin/x_ls_trm	Contains the **x_ls_trm** command
/etc/bootptab	Contains the boot protocol table.

Related Information

The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command,

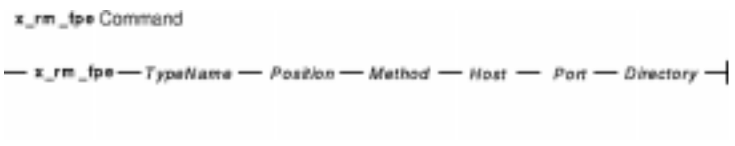
x_rm_trm command.

x_rm_fpe Command

Purpose

Removes a font path element from a font path.

Syntax



x_rm_fpe *TypeName Position Method Host Post Directory*

Description

The **x_rm_fpe** command removes a font path element from the font path of the selected network type name.

TypeName	Specifies from which network type name the element is to be removed.
Position	Specifies where the element is in the font path.
Method	Specifies the method used to access the font path element. The valid options are: **xst** for Xstation Manager Daemon; **tcp** for Network Font Server; **default** for initial default font path element; **nfs** for NFS; and **tftp** for TFTP.
Host	Specifies the name of the system specified in the font path element. For elements using the default method, specify **None**.
Port	Specifies the number of the server port specified in the font path element. For elements using the `nfs` or `tftp` method, specify **None**.
Directory	Specifies the complete path to the directory that contains the fonts. For a Network Font Server element, specify **None**.

Security

Access Control: Only the root user should have execute (x) access to this command.

Examples

To remove the font element `/usr/lib/X11/fonts/100dpi` from the font path for network type `x_st_mgr.ether`, enter:

```
x_rm_fpe x_st_mgr.ether 3 nfs waco None /usr/lib/X11/fonts/100dpi
```

In this example, the font path element `/usr/lib/X11/fonts/100dpi` that is accessed on host `waco` using NFS has been removed from the third position of the font path for network type `x_st_mgr.ether`. Because a port number is not used for NFS, this parameter was set to `None`.

Files

/usr/lpp/x_st_mgr/bin/x_rm_fpe Contains the **x_rm_fpe** command.

/etc/x_st_mgr/ether.cf	Contains the network type **x_st_mgr.ether** configuration file (sample).

Related Information

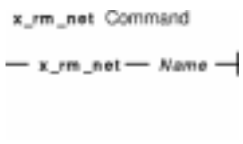
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

x_rm_net Command

Purpose

Removes an Xstation network type.

Syntax



x_rm_net*Name*

Description

The **x_rm_net** command removes, from the current host, the Xstation network type specified by the *Name* parameter and defined in the **/etc/bootptab** file. Before you enter the **x_rm_net** command, make sure that no Xstation definitions use that network type.

To see a list of the currently defined network types, use the **x_ls_net** command.

Security

Access Control: Only the root user should have execute (x) access to this command.

Examples

To remove the `x_st_mgr.ether` network type from those defined for the current Xstation host, enter:

```
x_rm_net x_st_mgr.ether
```

The `x_st_mgr.ether` network type is removed from the `/etc/bootptab` file. The `/etc/x_st_mgr/ether.cf` file is removed.

Files

/usr/lpp/x_st_mgr/bin/x_rm_net	Contains the **x_rm_net** command.
/etc/bootptab	Contains the boot protocol table.
/etc/x_st_mgr/<typename>.cf	Contains the network configuration file.

Related Information

The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command,

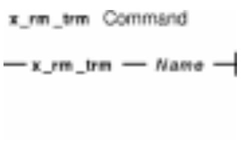
x_rm_trm command.

x_rm_trm Command

Purpose

Removes an Xstation.

Syntax



x_rm_trm*Name*

Description

The **x_rm_trm** command removes, from the current host, the Xstation specified by the *Name* parameter. To do this, the command removes the *Name* entry from the **/etc/x_st_mgr/xs150/cfg** directory, **/etc/x_st_mgr/x_st_mgrd.cf** file, **/etc/x_st_mgr/x_st_mgrd.tmty** file and the **/etc/bootptab** file.

Security

Access Control: Only the root user should have execute (x) access to this command.

Examples

To remove the `taylor` Xstation from the current bootserver host, enter:

```
x_rm_trm taylor
```

Files

/etc/x_st_mgr/x_st_mgrd.cf	Contains the Xstation Manager daemon configuration file.
/etc/x_st_mgr/x_st_mgrd.tmty	Contains the terminal type file.
/usr/lpp/x_st_mgr/bin/x_rm_trm	Contains the **x_rm_trm** command.
/etc/bootptab	Contains the boot protocol table.
/etc/x_st_mgr/xs150/cfg/<IPADDRESS>	Contains the Xstation configuration file.

Related Information

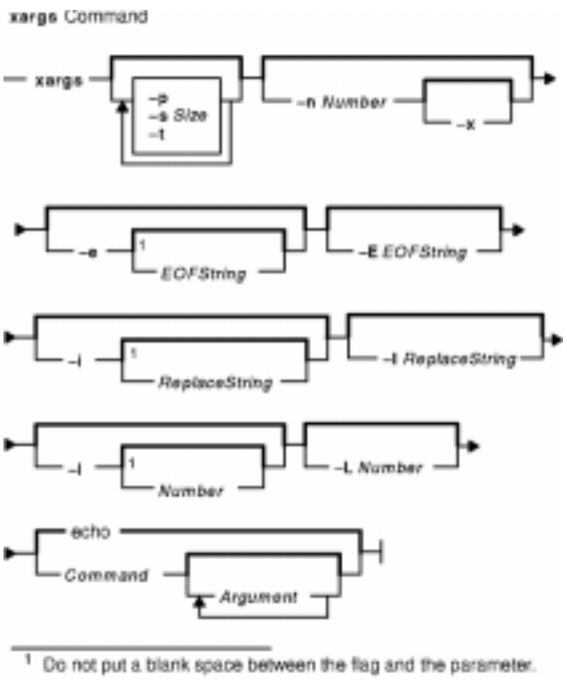
The **aixterm** command, **bootpd** daemon, **login** command, **pclient** command, **x_add_nfs_fpe** command, **x_add_trm_120** command, **x_add_trm_130** command, **x_add_trm_140** command, **x_add_trm_150** command, **x_add_trm_160** command, **x_add_xst_fpe** command, **x_chg_net** command, **x_chg_trm_120** command, **x_chg_trm_130** command, **x_chg_trm_140** command, **x_chg_trm_150** command, **x_chg_trm_160** command, **x_def_net** command, **x_ls_net** command, **x_ls_net_fp** command, **x_ls_trm** command, **x_rm_fpe** command, **x_rm_net** command, **x_rm_trm** command.

xargs Command

Purpose

Constructs parameter lists and runs commands.

Syntax



xargs [**−p**] [**−t**] [**−e** [*EOFString*]] [**−E** *EOFString*] [**−i** [*ReplaceString*]]
[**−I** *ReplaceString*] [**−l** [*Number*]] [**−L***Number*] [**−n** *Number* [**−x**]] [**−s** *Size*]
[*Command* [*Argument ...*]]

Note: Do not put a blank space between the lowercase flags and the parameter.

Description

The generated command line length is the sum of the size, in bytes, of the *Command* and each *Argument* treated as strings, including a null byte terminator for each of these strings. The **xargs** command limits the command line length. When the constructed command line runs, the combined *Argument* and environment lists can not exceed **ARG_MAX** bytes. Within this constraint, if you do not specify the **−n** or the **−s** flags, the default command line length is at least the value specified by **LINE_MAX**.

Flags

−e[*EOFString*]	Obsolete flag. Use the **−E** flag. Uses the *EOFString* parameter as the logical EOF string. If you do not specify the **−e** or the **−E** flags, underscore (_) is assumed for the logical EOF string. If you do not specify the *EOFString* parameter, the logical EOF string capability is disabled, and underscores are taken literally. The **xargs** command reads from standard input until either EOF or the specified string is reached.

−E*EOFString*	Specifies a logical EOF string to replace the default underscore(_). The **xargs** command reads standard input until either EOF or the specified string is reached.
−i[*ReplaceString*]	Obsolete flag. Use the **−I** (Uppercase i) flag. If you do not specify the *ReplaceString* parameter, the string "{}" is used. **Note:** The **−I** (Uppercase i), and the **−i** flags are mutually exclusive; the last flag specified takes effect.
−I*ReplaceString*	(Uppercase i). Inserts each line of standard input as an argument for the *Command* parameter, inserting it in *Argument* for each occurence of *ReplaceString*. *ReplaceStrings* can not be used in more than 5 arguements. Blank characters at the beginning of each standard input line are ignored. Each *Argument* can contain one or more *ReplaceStrings,* but may not be larger than 255 bytes. The **−I** flag also turns on the **−x** flag. **Note:** The **−I** (Uppercase i), and the **−i** flags are mutually exclusive; the last flag specified takes effect.
−l[*Number*]	(Lowercase L). Obsolete flag. Use the **−L** flag. If you do not specify the *Number* parameter, a value of 1 is used. The **−l** flag also turns on the **−x** flag. **Note:** The **−L**, **−I** (Lowercase L), and **−n** flags are mutually exclusive; the last flag specified takes effect.
−L *Number*	Runs the *Command* parameter with the specified number of nonempty parameter lines read from standard input. The last invocation of the *Command* parameter can have fewer parameter lines if fewer than the specified *Number* remain. A line ends with the first new−line character unless the last character of the line is a space or a tab. A trailing space indicates a continuation through the next nonempty line. **Note:** The **−L**, **−I** (Lowercase L), and **−n** flags are mutually exclusive; the last flag specified takes effect.
−n *Number*	Runs the *Command* parameter using as many standard input arguments as possible, up to the maximum specified by the *Number* parameter. The **xargs** command uses fewer arguments if: 1. If the accumulated command line length exceeds the bytes specified by the **−s** *Size* flag. 2. The last iteration has fewer than *Number*, but not zero, arguments remaining. **Note:** The **−L**, **−I** (Lowercase L), and **−n** flags are mutually exclusive; the last flag specified takes effect.
−p	Asks whether to run the *Command* parameter. It displays the constructed command line, followed by a `?...` (question mark, ellipsis) prompt. Enter an affirmative response specific to the locale to run the *Command* parameter. Any other response causes the **xargs** command to skip that particular invocation of the parameter. You are asked about each invocation. The **−p** flag also turns on the **−t** flag.
−s *Size*	Sets the maximum total size of the constructed *Command* line. The *Size* parameter must be a positive intege. Fewer arguments are used if: 1. The total number of arguments exceeds those specified by the **−n** flag. 2. The total number of lines exceeds those specified by the **−L** or **−I** (Lowercase L) flags. 3. EOF is reached before the number of bytes specified by the *Size* parameter are accumulated.
−t	Enables the trace mode and echoes the constructed *Command* line to standard error before running.
−x	Stops running the **xargs** command if any *Command* line is greater than the number of bytes specified by the **−s***Size* flag. This **−x** flag is turned on if you specify either the

−I (Uppercase i) or **−l** (Lowercase L) flag. If you do not specify the **−i**, **−I** (Uppercase i), **−l** (Lowercase L), **−L**, or**−n** flag, the total length of the *Command* line must be within the limit specified by the −s *Size* flag.

Exit Status

This command returns the following exit values:

0	All invocations of the *Command* parameter returned exit status 0.
1−125	A command line meeting the specified requirements could not be assembled, one or more of the invocations of the *Command* parameter returned a non−zero exit status, or some other error occurred.
126	*Command* was found but could not be invoked.
127	*Command* could not be found.

If a command line meeting the specified requirements cannot be assembled, the command cannot be invoked, an invocation of the command is terminated by a signal, or an invocation of the command exits with exit status 255. The **xargs** command will write a diagnostic message and exit without processing any remaining input.

Examples

1. To use a command on files whose names are listed in a file, enter:

   ```
   xargs lint −a <cfiles
   ```

   If the `cfiles` file contains the following text:

   ```
   main.c readit.c
   gettoken.c
   putobj.c
   ```

   the **xargs** command constructs and runs the following command:

   ```
   lint −a main.c readit.c gettoken.c putobj.c
   ```

   If the `cfiles` file contains more file names than fit on a single shell command line (up to **LINE_MAX**), the **xargs** command runs the **lint** command with the file names that fit. It then constructs and runs another **lint** command using the remaining file names. Depending on the names listed in the `cfiles` file, the commands might look like the following:

   ```
   lint −a main.c readit.c gettoken.c . . .
   lint −a getisx.c getprp.c getpid.c . . .
   lint −a fltadd.c fltmult.c fltdiv.c . . .
   ```

   This command sequence is not quite the same as running the **lint** command once with all the file names. The **lint** command checks cross−references between files. However, in this example, it cannot check between the `main.c` and the `fltadd.c` files, or between any two files listed on separate command lines.

   For this reason you may want to run the command only if all the file names fit on one line. To specify this to the **xargs** command use the **−x** flag by entering:

   ```
   xargs −x lint −a <cfiles
   ```

If all the file names in the `cfiles` file do not fit on one command line, the **xargs** command displays an error message.

2. To construct commands that contain a certain number of file names, enter:

   ```
   xargs −t −n 2 diff <<EOF
   starting chap1 concepts chap2 writing
   chap3
   EOF
   ```

   This command sequence constructs and runs **diff** commands that contain two file names each (**−n 2**):

   ```
   diff starting chap1
   diff concepts chap2
   diff writing chap3
   ```

   The **−t** flag causes the **xargs** command to display each command before running it, so you can see what is happening. The `<<EOF` and `EOF` pattern−matching characters define a *here document*, which uses the text entered before the end line as standard input for the **xargs** command.
3. To insert file names into the middle of command lines, enter:

   ```
   ls | xargs −t −I {} mv {} {}.old
   ```

   This command sequence renames all files in the current directory by adding `.old` to the end of each name. The **−I** flag tells the **xargs** command to insert each line of the **ls** directory listing where {} (braces) appear. If the current directory contains the files `chap1`, `chap2`, and `chap3`, this constructs the following commands:

   ```
   mv chap1 chap1.old
   mv chap2 chap2.old
   mv chap3 chap3.old
   ```
4. To run a command on files that you select individually, enter:

   ```
   ls | xargs −p −n 1 ar r lib.a
   ```

   This command sequence allows you to select files to add to the `lib.a` library. The **−p** flag tells the **xargs** command to display each **ar** command it constructs and to ask if you want to run it. Enter `y` to run the command. Press the any other key if you do not want to run the command.

   Something similar to the following displays:

   ```
   ar r lib.a chap1 ?...
   ar r lib.a chap2 ?...
   ar r lib.a chap3 ?...
   ```
5. To construct a command that contains a specific number of arguments and to insert those arguments into the middle of a command line, enter:

   ```
   ls | xargs −n6 | xargs −I{} echo {} − some files in the directory
   ```

   If the current directory contains files chap1 through chap10, the output constructed will be the following:

   ```
   chap1 chap2 chap3 chap4 chap5 chap6 − some files in the directory
   chap7 chap8 chap9 chap10 − some file in the directory
   ```

File

/usr/bin/xargs Contains the **xargs** command.

Related Information

The **ar** command, **diff** command, **echo** command, **ksh** command, **lint** command, **ls** command, **mv** command.

Shells Overview and Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

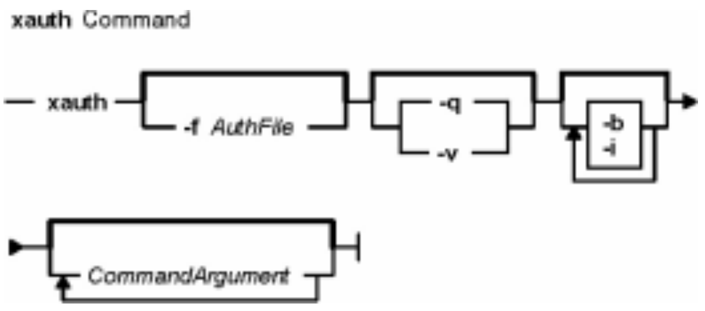
Input and Output Handling Programmer's Overview in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

xauth Command

Purpose

Edits and displays the authorization information used in connecting to the X server.

Syntax



xauth [**−f** *AuthFile*] [**−v** | **−q**] [**−i**] [**−b**] [*CommandArgument* ...]

Description

The **xauth** command is usually used to edit and display the authorization information used in connecting to the X server. This program extracts authorization records from one machine and merge them into another (for example, when using remote logins or granting access to other users).

The following commands can be entered interactively, on the **xauth** command line, or in scripts. Note that this program does not contact the X server.

add*DisplayName ProtocolName Hexkey*	An authorization entry is added to the authorization file for the indicated display using the given protocol and key data. The data is specified as an even−length string of hexadecimal digits, each pair representing one octet. The first digit of each pair gives the most significant 4 bits of the octet, and the second digit of the pair gives the least significant 4 bits. For example, a 32−character hexkey would represent a 128−bit value. A protocol name consisting of just a single period is treated as an abbreviation for **MIT−MAGIC−COOKIE−1**.
extract*FileName DisplayName...*	Authorization entries for each of the specified displays are written to the indicated file. The extracted entries can be read back in using the **merge** and **nmerge** commands. If the file name consists of just a single dash, the entries are written to the binary output.
generate*DisplayName ProtocolName* [*trusted* | *untrusted*] [*timeout seconds*] [*group group−id*] [*data hexdata*]	This command is similar to **add**. The main difference is that instead of requiring the user to supply the key data, it connects to the server specified in *displayname* and uses the `SECURITY` extension in order to get the key data to store in the authorization file. If the server cannot be contacted or if it does not support the `SECURITY` extension, the command fails. Otherwise, an authorization entry for the indicated display using the given protocol is added to the authorization file. A protocol name consisting of just a single period is treated as an abbreviation for `MIT−MAGIC−COOKIE−1`.

If the trusted option is used, clients that connect using this authorization will have full run of the display, as usual. If untrusted is used, clients that connect using this authorization will be considered untrusted and prevented from stealing or tampering with data belonging to trusted clients. See the `SECURITY` extension specification for full details on the restrictions imposed on untrusted clients. The default is untrusted.

The timeout option specifies how long in seconds this authorization will be valid. If the authorization remains unused (no clients are connected with it) for longer than this time period, the server purges the authorization, and future attempts to connect using it will fail. Note that the purging done by the server does not delete the authorization entry from the authorization file. The default timeout is 60 seconds.

The group option specifies the application group that clients connecting with this authorization should belong to. See the application group extension specification for more details. The default is to not belong to an application group.

The data option specifies data that the server should use to generate the authorization. Note that this is not the same data that gets written to the authorization file. The interpretation of this data depends on the authorization protocol. The *hexdata* is in the same format as the *hexkey* described in the **add** command. The default is to send no data.

list [*DisplayName...*]
: Authorization entries for each of the specified displays (or all displays if none are named) are printed on the standard output in a textual format. Key data is always displayed in the hexadecimal format given in the description of the **add** command.

merge [*FileName...*]
: Authorization entries are read from the specified files and are merged into the authorization database, superceding any matching existing entries. If a file name consists of just a single dash, the binary input is read if it has not been read before.

[n]extract*Filename DisplayName...*
: Authorization entries for each of the specified displays are written to the indicated file. The entries are written in a numeric format suitable for non−binary transmission (such as secure electronic mail). The extracted entries can be read back in using the **merge** and **nmerge** commands. If the file name consists of just a single dash, the entries are written to the standard output.

[n]list [*DisplayName...*]
: Authorization entries for each of the specified displays (or all displays if none are named) are printed on the standard output in the numeric format used by the **nextract** command. Key data is always displayed in the hexadecimal format given in the description of the **add** command.

[n]merge [*FileName...*]
: Authorization entries are read from the specified files and are merged into the authorization database, superceding any matching existing entries. The numeric format given in the description of the **extract** command is used. If a file name consists of just a single dash, the standard input is read if it has not been read before.

remove*DisplayName...*
: Authorization entries matching the specified displays are removed from the authority file.

source*FileName*
: The specified file is treated as a script containing **xauth** commands

	to execute. Blank lines and lines beginning with a # (pound sign) are ignored. A single dash can be used to indicate the standard input, if it has not already been read.
info	Information describing the authorization file, whether or not any changes have been made, and from where **xauth** commands are being read is printed on the standard output.
exit	If any modifications have been made, the authority file is written out (if allowed), and the program exits. An end of file is treated as an implicit exit command.
quit	The program exits, ignoring any modifications. This may also be accomplished by pressing the interrupt character.
help [*String*]	A description of all commands that begin with the given string (or all commands if no string is given) is printed on the standard output.
?	A short list of the valid commands is printed on the standard output.

Display names for the **add**, [**n**]**extract**, [**n**]**list**, [**n**]**merge**, and **remove** commands use the same format as the **DISPLAY** environment variable and the common *display* command−line argument. Display−specific information (such as the screen number) is unnecessary and is ignored. Same−machine connections (such as local−host sockets, shared memory, and the Internet Protocol *HostName LocalHost*) are referred to as `HostName/unix:DisplayNumber` so that local entries for different machines can be stored in one authority file.

> **Note:** Users that have unsecure networks should take care to use encrypted file transfer mechanisms to copy authorization entries between machines. Similarly, the MIT−MAGIC−COOKIE−1 protocol is not very useful in unsecure environments. Sites that are interested in additional security may need to use encrypted authorization mechanisms such as Kerberos. Spaces are currently not allowed in the protocol name. Quoting could be added.

Flags

The following options are used with the **xauth** command. They can be given individually (for example, **−q−i**) or combined (for example, **−qi**).

−f *AuthFile*	Specifies the name of the authority file to use. By default, **xauth** uses the file specified by the **XAUTHORITY** environment variable or .xauthority in the user's home directory.
−v	Indicates that **xauth** should operate verbosely and print status messages indicating the results of various operations (for example, how many records have been read in or written out). This is the default if **xauth** is reading commands from its standard input and its standard output is directed to a terminal.
−q	Indicates that **xauth** should operate quietly and not print unsolicited status messages. This is the default if an **xauth** command is given on the command line or if the standard output is not directed to a terminal.
−i	Indicates that **xauth** should ignore any authority file locks. Normally, **xauth** refuses to read or edit any authority files that have been locked by other programs (usually **xdm** or another **xauth**).
−b	Indicates that **xauth** should attempt to break any authority file locks before proceeding. Use this option only to clean up stale locks.

Example

The most common use for the **xauth** command is to extract the entry for the current display, copy it to another machine, and merge it into the user's authority file on the remote machine:

```
% xauth extract \− $DISPLAY | rsh otherhost xauth merge \−
```

Files

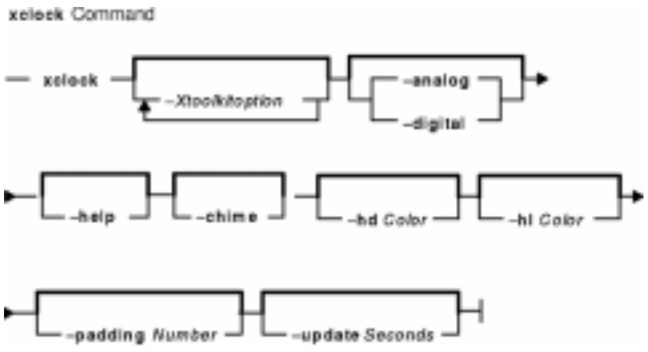
$HOME/.Xauthority	Contains the default authority file if the **XAUTHORITY** environment variable is not defined.

xclock Command

Purpose

Continuously displays the current time of day.

Syntax



xclock [*−Xtoolkitoption* ...] [**−analog** | **−digital**] [**−chime**] [**−hd** *Color*] [**−help**]
[**−hl** *Color*] [**−padding** *Number*] [**−update** *Seconds*]

Description

The **xclock** command gets the time from the system clock, then displays and updates it in the form of a digital or analog clock. Select the **−analog** or **−digital** flag to display the clock in analog or digital formats. You can also select flags to specify the presentation of the clock, including chime and update frequency, colors, and border width.

This command uses the Athena clock widget, which understands core resource names and classes. To specify these resources, you need to know the hierarchy of the widgets that comprise the **xclock** command. In the following example, the indented items indicate the hierarchical structure. The widget class name is given first, followed by the widget instance name:

```
XClock xclock
        Clock clock
```

The following examples demonstrate the possible ways to specify resources for this client:

```
xclock.clock.background
```

```
XClock*background
```

```
xclock*background
```

> **Note:** Specifying resources as xclock.background which worked with the previous version of xclock will not work with this version.

Flags

−*Xtoolkitoption*	The **xclock** command accepts all of the standard X Toolkit command−line option flags in addition to the specific flags listed. See the List of Enhanced X−Windows Protocols, Toolkit, and Extension Functions for detailed information on the available options.
−analog	Sets the analog display mode, which is the default mode. Draws a conventional 12−hour clock face with ticks for each minute and stroke marks on each hour.
−chime	Specifies the sounding of a chime once on the half hour and twice on the hour.
−digital	Sets the 24−hour digital display mode. Displays the date and time in digital form.
−hd *Color*	Specifies the color of the hands in analog mode on color displays. The default is black.
−help	Prints a brief summary of the allowed options.
−hl *Color*	(lowercase HL) Specifies the highlight color of the edges of the hands of the analog clock. The default is black.
−padding*Number*	Specifies the width in pixels of the padding between the window border and the clock text or picture. The default is 8.
−update *Seconds*	Specifies the frequency in seconds that the **xclock** command updates its display. If the **xclock** window is obscured and then exposed, the **xclock** command redisplays immediately. The specification of an update frequency less than 30 seconds enables the second hand in the analog mode. The default update frequency is 60 seconds.

.Xdefaults Keywords

Use the following keywords to set the defaults for the **xclock** command.

analog (class Boolean)	Specifies an analog clock instead of a digital clock. The default is true.
chime (class Boolean)	Specifies whether a bell sounds on the hour and half hour.
fontSet (class FontSet)	Specifies the fontset for the digital clock. Variable−width fonts do not always display correctly.
foreground (class Foreground)	Specifies the color of tick marks on color displays. If **reverseVideo** is specified, the default is white, otherwise the default is black.
hands (class Foreground)	Specifies the color on the inside of the hands in the analog clock on color displays. If **reverseVideo** is specified, the default is white, otherwise the default is black.
highlight (class Foreground)	Specifies the color used to highlight the clock's hands. If **reverseVideo** is specified, the default is white, otherwise the default is black.
height (class Height)	Specifies the height of the clock. The default for the analog clock is 164 pixels. The default for the digital clock is whatever is required to hold the clock when displayed in the chosen font.
padding (class Margin)	Specifies the amount of internal padding in pixels. The default is 8.
update (class Interval)	Specifies the frequency in seconds in which the **xclock** command updates its display.
width (class Width)	Specifies the width of the clock. The default for the analog clock is 164 pixels. The default for the digital clock is whatever is needed to hold the clock when displayed in the chosen font.

Environment Variables

DISPLAY	Gets the default host and display number.
XENVIRONMENT	Gets the name of a resource file that overrides the global resources stored in the RESOURCE_MANAGER property.

Examples

1. To specify a digital clock display, enter:

   ```
   xclock −digital
   ```

2. To specify red hands on an analog clock, enter:

   ```
   xclock −hd red
   ```

File

/usr/lib/X11/app−defaults/XClock Specifies the required resources.

Related Information

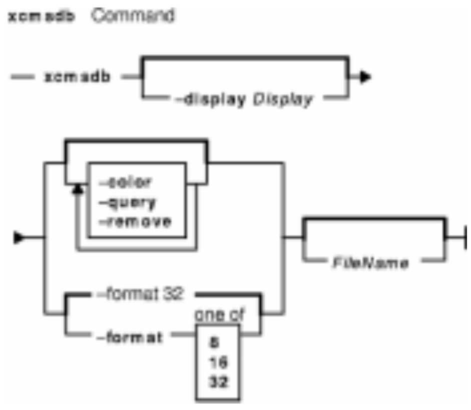
xcmsdb Command

Purpose

Loads, queries, or removes Screen Color Characterization Data stored in properties on the root window of the screen.

> **Note:** The **xcmsdb** command is only supported in X11R5 (AIXwindows Version 1.2.3).

Syntax



xcmsdb [**−display** *Display*] [[**−query**] [**−remove**] [**−color**]] | [**−format 32** | **16** | **8**]
[*FileName*]

Description

The **xcmsdb** command is used to load, query, or remove Screen Color Characterization Data stored in properties on the root window of the screen. Screen Color Characterization Data is an integral part of **Xlib**, which is necessary for proper conversion between device−independent and device−dependent color specifications. **Xlib** uses the **XDCCC_LINEAR_RGB_MATRICES** and **XDCCC_LINEAR_RGB_CORRECTION** properties to store color characterization data for color monitors. It uses **XDCCC_GRAY_SCREENWWHITEPOINT** and **XDCCC_GRAY_CORRECTION** properties for gray scale monitors. Because **Xlib** allows the addition of Screen Color Characterization Function Sets, added function sets may place their Screen Color Characterization Data on other properties. This utility is unaware of these other properties; therefore, you will need to use a similar utility provided with the function set, or use the example **xprop** utility.

The ASCII readable contents of the *FileName* parameter (or the standard input if no input file is given) are appropriately transformed for storage in properties, provided the **−query** or **−remove** flag options are not specified.

> **Note:** The Xcms API in **libX11.a** is supported; however, the client side color name data base, **/usr/lib/X11/Xcms.txt**, and a device color characterization file, **/usr/lib/X11/XcmsIBM5081.dcc**, are provided as unsupported samples.

Flags

−display*Display*	Specifies the server to which you are converting.
− query	Reads or attempts to read the XDCCC properties off the screen's root window. If

	successful, it transforms the data into a more readable format, and then sends the data to standard output.
−remove	Removes or attempts to remove the XDCCC properties on the screen's root window.
−color	Sets the **−query** and **−remove** options to only check for the **XDCCC_LINEAR_RGB_MATRICES** and **XDCCC_LINEAR_RGB_CORRECTION** properties. If the **−color** option is not set, the **−query** and **−remove** options check for all the properties.
−format 32 | **16** | **8**	Specifies the property format (32, 16, or 8 bits per entry) for the **XDCCC_LINEAR_RGB_CORRECTION** property. Precision of encoded floating−point values increases with the increase in bits per entry. The default is 32 bits per entry.

Parameter

FileName Specifies the ASCII readable contents of a Screen Color Characterization Data file.

Examples

1. Use the following example to put Screen Color Characterization Data on the root window by telling the **xcmsdb** command to read it from a file:

   ```
   xcmsdb /usr/lib/X11/XcmsIBM5081.dcc
   ```

2. Use the following example after you have already put Screen Color Characterization Data on the root window to tell the **xcmsdb** command to read the data back if it exists:

   ```
   xcmsdb −query
   ```

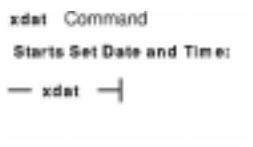
xdat Command

Purpose

Starts Set Date and Time, Schedule a Job, or Remove or View Scheduled Jobs, three of the Visual System Management (VSM) applications.

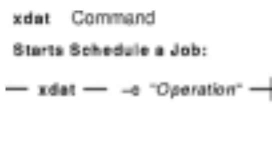
Syntax

To start Set Date and Time



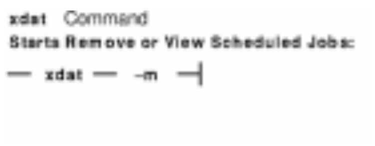
xdat

To start Schedule a Job



xdat −c*"Operation"*

To start Remove or View Scheduled Jobs



xdat [−m]

Description

The **xdat** command starts Set Date and Time, Schedule a Job, or Remove or View Scheduled Jobs, three of the Visual System Management (VSM) applications. Set Date and Time and Remove or View Scheduled Jobs can also be started from the AIX Common Desktop Environment. From the Front Panel, select the Application Manager. Within Application Manager, select the **System_Admin** directory. Within **System_Admin**, select the desired application icon.

Set Date Time enables you to view or change your system date, time, or time zone. Much of the system processing depends on accurate date and time settings. For example, accuracy is important if you schedule jobs to run at a later time or if your system communicates with other systems.

Schedule a Job enables you to schedule operations for future processing. You can specify what shell to run the job in and if you want to be notified when the jobs starts. This graphical dialog can also be started from an application using a Schedule action or a Schedule button. The job is scheduled using the **at** command.

Remove or View Scheduled Jobs enables you to review and delete previously scheduled operations. The application displays the user's scheduled jobs, the date and time they are scheduled, a description and umask for each job, and directory from where each job will run.

Flags

−c*"Operation"*	Specifies the job (operation) you want to schedule in the Schedule a Job application.
−m	Starts the Remove or View Scheduled Jobs application.

Example

1. To start Set Date and Time and change your system time, enter:

   ```
   xdat
   ```

   Enter the correct time, and click the Set Date/Time button. If you want help on a field, click the ? button and move the cursor over the field.

2. To use Schedule a Job to schedule a backup of the **/** (root) file system, enter:

   ```
   xdat −c "backup −0 −u −f /dev/rmt0 /"
   ```

   Set the date and time for the operation to run. Specify the shell and mail options or accept the defaults.

3. To start Remove or View Scheduled Jobs and remove a scheduled job, enter:

   ```
   xdat −m
   ```

Select the job you want to remove from the Scheduled Jobs field, and click the Remove button.

Related Information

Using the Visual System Management Applications in *AIX Version 4.3 Quick Beginnings*.

at command

xdevicem Command

Purpose

Starts Device Manager, a Visual System Management (VSM) application.

Syntax

xdevicem

Description

The **xdevicem** command starts Device Manager, one of the Visual System Management (VSM) applications. Device Manager is a graphical interface that enables you to perform device management tasks through direct manipulation of objects (icons), freeing you from entering complex command syntax or from searching through menus.

Device Manager displays system objects and dialogs based on what is contained in your system's Device Configuration database. This enables you to manage some devices not covered by the System Management Interface Tool (SMIT) such as ports, buses, expansion drawers, non−SCSI adapters, standard adapters, and memory cards. However, Device Manager does not include the following SMIT functions: trace, printer subsystem management, keyboards, displays, fonts, speakers, Xstation configuration, and communication applications and services.

The Device Manager session creates or adds to the **smit.log** and **smit.script** files in your home directory. (These are the same files appended when you run a SMIT session.) The commands built and run by Device Manager are added to the end of the **smit.log** file along with the command output. The time, name of the task, and the command (flags and parameters included) are added to the end of the **smit.script** file in a format that can easily be used to create executable shell scripts.

Example

To start Device Manager, enter:

```
xdevicem
```

To see a list tasks you can perform for an object or area, press the right mouse button to display its pop−up menu. Read the text in the Information Area for help on the objects and areas.

Files

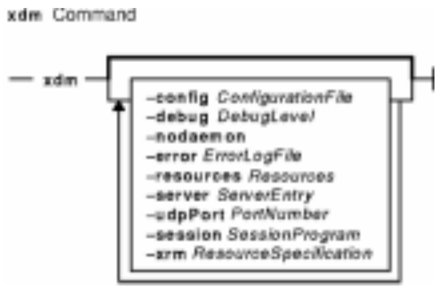
smit.log	Specifies detailed information on your session, with time stamps.
smit.script	Specifies the task commands run during your session, with time stamps.

xdm Command

Purpose

Manages a collection of X Displays with support for XDMCP.

Syntax



xdm [**−config** *ConfigurationFile*] [**−debug** *DebugLevel*] [**−nodaemon**] [**−error** *ErrorLogFile*]
[**−resources** *ResourceFile*] [**−server** *ServerEntry*] [**−udpPort** *PortNumber*]
[**−session** *SessionProgram*] [**−xrm** *ResourceSpecification*]

Description

The **xdm** (X Display Manager) command manages a collection of X displays, which may be on the local host or remote servers. The design of the **xdm** command was guided by the needs of X terminals as well as the X Consortium standard XDMCP, the *X Display Manager Control Protocol*. The **xdm** command provides services similar to those provided by the **init**, **getty**, and **login** commands on character terminals: prompting for login name and password, authenticating the user, and running a session.

A *session* is defined by the lifetime of a particular process; in the traditional character−based terminal world, it is the user's login shell. In the **xdm** context, it is an arbitrary session manager. This is because in a windowing environment, a user's login shell process does not necessarily have any terminal−like interface with which to connect. When a real session manager is not available, a window manager or terminal emulator is typically used as the *session manager*, meaning that ending this process ends the user's session.

When the session is ended, **xdm** resets the X server and (optionally) restarts the whole process.

When the **xdm** command receives an **Indirect** query by way of XDMCP, it can run a **chooser** process to perform an XDMCP **BroadcastQuery** (or an XDMCP Query to specified hosts) on behalf of the display and offer a menu of possible hosts that offer XDMCP display management. This feature is useful with X terminals that do not offer a host menu themselves.

Because the **xdm** command provides the first interface that users see, it is designed to be simple to use and easy to customize to the needs of a particular site.

Typical Usage

The **xdm** command is designed to operate in a wide variety of environments.

First, the **xdm** configuration file should be set up. Make a directory (usually **/usr/lib/X11/xdm**) to contain all of the relevant files. The following is a reasonable configuration file, which could be named **xdm−config**:

```
DisplayManager.servers:    /usr/lib/X11/xdm/Xservers
DisplayManager.errorLogFile:       /usr/lib/X11/xdm/xdm−errors
DisplayManager*resources:          /usr/lib/X11/xdm/Xresources
DisplayManager*startup:    /usr/lib/X11/xdm/Xstartup
DisplayManager*session:    /usr/lib/X11/xdm/Xsession
DisplayManager.pidFile:    /usr/lib/X11/xdm/xdm−pid
DisplayManager._0.authorize:       true
DisplayManager*authorize:          false
```

Note that this file simply contains references to other files. Note also that some of the resources are specified with an * (asterisk) separating the components. These resources can be made unique for each display by replacing the * (asterisk) with the display name, but normally this is not very useful. See the Resources section on the next page for a complete discussion.

The first file, **/usr/lib/X11/xdm/Xservers**, contains the list of displays to manage that are not using **XDMCP**. Most workstations have only one display, numbered 0 (zero), so the file looks something like this:

```
:0 Local local /usr/bin/X11/X −force
```

This keeps **/usr/bin/X11/X** running on this display and manages a continuous cycle of sessions.

The **/usr/lib/X11/xdm/xdm−errors** file contains error messages from **xdm** and anything output to standard error by **Xsetup**, **Xstartup**, **Xsession** or **Xreset** scripts. If you have trouble starting the **xdm** command, check the **/usr/lib/X11/xdm/xdm−errors** file to see if the **xdm** command has any clues to the trouble.

The next configuration entry, **/usr/lib/X11/xdm/Xresources**, is loaded onto the display as a resource database using the **xrdb** command. As the authentication widget reads this database before starting up, it usually contains parameters for that widget.

Flags

All of these options (except **−config**) specify values that can also be specified in the configuration file as resources.

−config*ConfigurationFile*	Names the configuration file, which specifies resources to control the behavior of the **xdm** command. The **/usr/lib/X11/xdm/xdm−config** file is the default.
−debug *DebugLevel*	Specifies the numeric value for the **DisplayManager.debugLevel** resource. A nonzero value causes **xdm** to print debugging statements to the terminal and disables the **DisplayManager.daemonMode** resource, forcing **xdm** to run synchronously. These error messages may be unclear. To interpret them, check the X11R4 source code for the **xdm** command.
−nodaemon	Specifies False as the value for the **DisplayManager.daemonMode** resource. This suppresses the normal daemon behavior, in which the **xdm** command closes all file descriptors, disassociates itself from the controlling terminal, and puts itself in the background when it first starts up.
−error *ErrorLogFile*	Specifies the value for the **DisplayManager.errorLogFile** resource. This file contains errors from **xdm** as well as anything written to standard error by the various scripts and programs run during the progress of the session.
−resources *ResourceFile*	Specifies the value for the **DisplayManager*resources** resource. This file is loaded using the **xrdb** command to specify configuration parameters for the authentication widget.
−server *ServerEntry*	Specifies the value for the **DisplayManager.servers** resource. See the section Server Specification for a description of this resource.
−udpPort *PortNumber*	Specifies the value for the **DisplayManager.requestPort** resource. This sets the port number that the **xdm** command monitors for **XDMCP** requests.

	XDMCP uses the registered well−known UDP port 177. Do not change this resource except when debugging.
−session *SessionProgram*	Specifies the value for the **DisplayManager*session** resource. This indicates the program to run as the session after the user has logged in.
−xrm *ResourceSpecification*	Allows an arbitrary resource to be specified, as in most X Toolkit applications.

Resources

At many stages, the actions of **xdm** can be controlled through the use of its configuration file, which is in the X resource format. Some resources modify the behavior of **xdm** on all displays, while others modify its behavior on a single display. When actions relate to a specific display, the display name is inserted into the resource name between "DisplayManager" and the final resource name segment. For example, **DisplayManager.expo_0.startup** is the name of the resource that defines the startup shell file on the "expo:0" display. Because the resource manager uses colons to separate the name of the resource from its value and dots to separate resource name parts, **xdm** substitutes underscores for both dots and colons when generating the resource name.

DisplayManager.servers	Specifies either a file name full of server entries, one per line (if the value starts with a slash), or a single server entry. See the section Server Specification for details.
DisplayManager.requestPort	Indicates the UDP port number which the **xdm** command uses to listen for incoming **XDMCP** requests. Unless you need to debug the system, leave this with its default value of 177.
DisplayManager.errorLogFile	Redirects error messages to go to the named file rather than to the console. This file also contains any output directed to standard error by the **Xsetup**, **Xstartup**, **Xsession**, and **Xreset** files, so it will contain descriptions of problems in those scripts as well.
DisplayManager.debugLevel	If the integer value of this resource is greater than 0 (zero), the **xdm** command outputs a large amount of debugging information. It also disables daemon mode, which would discard the information and allow nonroot users to run the **xdm** command, which would normally not be useful.
DisplayManager.daemonMode	The **xdm** command attempts to make itself into a daemon process unassociated with any terminal. This is accomplished by forking and leaving the parent process to exit, and then closing file descriptors and releasing the controlling terminal. In some environments this is not desired (in particular, when debugging). Setting this resource to False disables this feature.
DisplayManager.pidFile	The file name specified is created to contain an ASCII representation of the process ID of the main **xdm** process. The **xdm** command also uses file locking on this file to attempt to eliminate multiple daemons running on the same machine, which would have unpredictable results.
DisplayManager.lockPidFile	Controls whether the **xdm** command uses file locking to keep multiple display managers from running simultaneously. System V and AIX use the **lockf** library call, while BSD uses **flock**.
DisplayManager.authDir	Names a directory in which the **xdm** command stores authorization files while initializing the session. The default value is **/usr/lib/X11/xdm**.

DisplayManager.autoRescan	A Boolean value that controls whether the **xdm** command rescans the configuration, servers, access control, and authentication keys files after a session ends and the files have changed. By default the value is True. You can force the **xdm** daemon to reread these files by sending a **SIGHUP** signal to the main process.
DisplayManager.removeDomainname	When computing the display name for **XDMCP** clients, the name resolver typically creates a fully qualified host name for the terminal. As this is sometimes confusing, the **xdm** command removes the domain name portion of the host name if it is the same as the domain name of the local host when this variable is set. The default value is True.
DisplayManager.keyFile	XDM−AUTHENTICATION−1 style **XDMCP** authentication requires that a private key be shared between the **xdm** daemon and the terminal. This resource specifies the file containing those values. Each entry in the file consists of a display name and the shared key. By default, the **xdm** command does not include support for XDM−AUTHENTICATION−1 because it requires the data encryption method (DES), which is not generally distributable because of United States export restrictions.
DisplayManager.accessFile	To prevent unauthorized **XDMCP** service and to allow forwarding of **XDMCPIndirectQuery** requests, this file contains a database of host names that are allowed direct access to this machine or have a list of hosts to which queries should be forwarded. The format of this file is described in the XDMCP Access Control section.
DisplayManager.exportList	A whitespace−separated list of additional environment variables to pass on to the **Xsetup**, **Xstartup**, **Xsession**, and **Xreset** programs.
DisplayManager.randomFile	A file to checksum to generate the seed of authorization keys. This should be a file that changes frequently. The default is **/dev/mem**.
DisplayManager.choiceTimeout	Number of seconds to wait for the display to respond after a user has selected a host from the chooser. If the display sends an `XDMCP IndirectQuery` within this time, the request is forwarded to the chosen host. Otherwise, it is assumbed to be from a new session and the chooser is offered again. The default is 15.
DisplayManager.DISPLAY.resources	Specifies the name of the file to be loaded by the **xrdb** command as the resource database onto the root window of screen 0 of the display. The Login widget, **Xsetup**, and **chooser** programs use the resources set in this file. This resource data base is loaded just before the authentication procedure is started, so it can control the appearance of the login window. See the section Authentication Client , which describes the various resources that are appropriate to place in this file. There is no default value for this resource, but **/usr/lib/X11/xdm/Xresources** is the conventional name.
DisplayManager.DISPLAY.chooser	Specifies the program run to offer a host menu for indirect queries redirected to the special host name **CHOOSER**. **/usr/lib/X11/xdm/chooser** is the default. See the sections **XDMCP Access Control** and **Chooser**.
DisplayManager.DISPLAY.xrdb	Specifies the program used to load the resources. By default,

	the **xdm** command uses **/usr/bin/X11/xrdb**.
DisplayManager.DISPLAY.cpp	Specifies the name of the C preprocessor that is used by the **xrdb** command.
DisplayManager.DISPLAY.setup	Specifies a program that is run (as root) before offering the login window. This resource may be used to change the appearance of the screen around the login window or to put up other windows (for example, you may want to run **xconsole** here). By default, no program is run. The conventional name for a file used here is **Xsetup**. See the section Setup Program .
DisplayManager.DISPLAY.startup	Specifies a program that is run (as root) after the authentication process succeeds. By default, no program is run. The conventional name for a file used here is **Xstartup**. See the section Startup Program .
DisplayManager.DISPLAY.session	Specifies the session to be run (when not running as root). By default, **/usr/bin/X11/xterm** is run. The conventional name is the **Xsession** script. See the section Session Program .
DisplayManager.DISPLAY.reset	Specifies a program that is run (as root) after the session ends. By default, no program is run. The conventional name is the **Xreset** script. See the section Reset Program .
DisplayManager.DISPLAY.openDelay	Controls the behavior of the **xdm** command when attempting to open intransigent servers by specifying the length of the pause (in seconds) between successive attempts.
DisplayManager.DISPLAY.openRepeat	Controls the behavior of the **xdm** command when attempting to open intransigent servers by specifying the number of attempts to make.
DisplayManager.DISPLAY.openTimeout	Controls the behavior of the **xdm** command when attempting to open intransigent servers by specifying the number of seconds to wait while actually attempting the open (that is, the maximum time spent in the **connect(2)** system call).
DisplayManager.DISPLAY.startAttempts	Controls the behavior of the **xdm** command when attempting to open intransigent servers by specifying the number of times that the entire process is completed before giving up on the server. After the number of attempts specified by the Display Manager **openRepeat** resource have been made, or if the number of seconds specified by the Display Manager **openTimeout** resource elapse in any particular attempt, the **xdm** command ends and restarts the server, attempting to connect again. This process is repeated *startAttempts* times, at which point the display is declared inactive and disabled. Although this behavior may seem arbitrary, it has been empirically developed and works well on most systems. The default is a value of **5** for *openDelay*, a value of **5** for *openRepeat*, a value of **30** for *openTimeout*, and a value of **4** for *startAttempts*.
DisplayManager.DISPLAY.pingInterval	To discover when remote displays disappear, the **xdm** command occasionally pings them, using an X connection and **XSync** calls. This resource specifies the time (in minutes) between ping attempts. By default, it is set to 5 minutes. If you frequently use X terminals, which can become isolated from the managing host, you may wish to increase this value.

	Note: AIXwindows sessions may continue to exist after the terminal has been accidentally disabled. The **xdm** command does not ping local displays. A workstation session can be ended if the server hangs for NFS service and does not respond to the ping.
DisplayManager.DISPLAY.pingTimeout	To discover when remote displays disappear, the **xdm** command occasionally pings them, using an X connection and **XSync** calls. This resource specifies the maximum amount of time (in minutes) to wait for the terminal to respond to the request. If the terminal does not respond, the session is declared inactive and ended. By default, it is set to 5 minutes. If you frequently use X terminals, which can become isolated from the managing host, you may wish to increase this value. **Note:** AIXwindows sessions may continue to exist after the terminal has been accidentally disabled. The **xdm** command does not ping local displays. A workstation session could be ended if the server hangs for NFS service and does not respond to the ping.
DisplayManager.DISPLAY.terminateServer	Specifies whether the X server should be canceled when a session ends (instead of resetting it). This option can be used when the server tends to grow without bound over time, in order to limit the amount of time the server is run. The default value is False.
DisplayManager.DISPLAY.userPath	The **xdm** command sets the **PATH** environment variable for the session to this value. It should be a list of directories separated by colons; see the **sh** command in *AIX Commands Reference* for a full description. **:/bin:/usr/bin:/usr/bin/X11:/usr/ucb** is a common setting. The default value can be specified at build time in the AIXwindows system configuration file with the **DefaultUserPath** resource.
DisplayManager.DISPLAY.systemPath	The **xdm** command sets the **PATH** environment variable for the startup and reset scripts to the value of this resource. The default for this resource is specified at build time by the **DefaultSystemPath** resource entry in the system configuration file; **/etc:/bin:/usr/bin:/usr/bin/X11:/usr/ucb** is a common choice. Note the absence of . (period) (the current directory) from this entry. This is a good practice to follow for root; it avoids many common "Trojan Horse" system penetration schemes.
DisplayManager.DISPLAY.systemShell	The **xdm** command sets the **SHELL** environment variable for the startup and reset scripts to the value of this resource. It is **/bin/sh** by default.
DisplayManager.DISPLAY.failsafeClient	If the default session fails to run, the **xdm** command returns to this program. This program is run with no arguments, using the same environment variables as the session would have had (see the section Session Program). By default, **/usr/bin/X11/xterm** is used.

DisplayManager.DISPLAY.grabServer **DisplayManager.DISPLAY.grabTimeout**	To improve security, the **xdm** command grabs the server and keyboard while reading the login name and password. The **grabServer** resource specifies if the server should be held for the duration of the name/password reading. When set to False, the server is ungrabbed after the keyboard grab succeeds, otherwise the server is grabbed until just before the session begins. The default value is False. The **grabTimeout** resource specifies the maximum time that the **xdm** command waits for the grab to succeed. The grab may fail if some other client has the server grabbed, or possibly if the network latencies are very high. This resource has a default value of 3 seconds; you should be cautious when raising it, as a user may be confused by a look−alike window on the display. If the grab fails, the **xdm** command becomes inactive and restarts the server (if possible) and the session.
DisplayManager.DISPLAY.authorize	
DisplayManager.DISPLAY.authName	authorize is a Boolean resource that controls whether the **xdm** command generates and uses authorization for the local server connections. If authorization is used, the **xdm** command uses the authorization mechanisms indicated as a whitespace−separated list as the value of the **authName** resource. **XDMCP** connections dynamically specify which authorization mechanisms are supported, so the **authName** resource is ignored in this case. When the **authorize** resource is set for a display and authorization is not available, the user is informed by a different message displayed in the Login widget. By default, the **authorize** resource is True; **authName** is **MIT−MAGIC−COOKIE−1**.
DisplayManager.DISPLAY.authFile	Indicates the file is used to communicate the authorization data from the **xdm** command to the server, using the **−auth** server command−line option. It should be kept in a directory with restricted write permissions as it could easily be removed, disabling the authorization mechanism in the server.
DisplayManager.DISPLAY.authComplain	If set to a value of False, this disables the use of the **unsecureGreeting** in the login window. See the section Authentication Client . The default is a value of True.
DisplayManager.DISPLAY.resetSignal	The number of the signal that the **xdm** command sends to reset the server. See the section Controlling the Server . The default is **1(SIGHUP)**.
DisplayManager.DISPLAY.termSignal	The number of the signal that the **xdm** command sends to end the server. See the section Controlling the Server . The default is **15(SIGTERM)**.
DisplayManager.DISPLAY.resetForAuth	Causes the **xdm** command to send SIGHUP to the server after setting up the authorization file, causing an additional server reset to occur, during which time the new authorization information is read. The default is a value of False, which works for all AIXwindows servers.
DisplayManager.DISPLAY.userAuthDir	When the **xdm** command is unable to write to the usual user authorization file (**$HOME/.Xauthority**), it creates a unique file name in this directory and sets the **XAUTHORITY** environment variable to the name of the created file. It uses **/tmp** by default.

XDMCP Access Control

The database file specified by the **DisplayManager.accessFile** resource provides information that the **xdm** command uses to control access from displays requesting **XDMCP** service. This file contains three types of entries:

- Entries that control the response to **Direct** and **Broadcast** queries.
- Entries that control the response to **Indirect** queries.
- Macro definitions.

Direct query entries contain either a host name or a pattern, which is distinguished from a host name by the inclusion of one or more pattern−matching characters. An * (asterisk) matches any sequence of 0 (zero) or more characters, and a ? (question mark) matches any single character. These are compared against the host name of the display device. If the entry is a host name, all comparisons are done using network addresses, so that any name which converts to the correct network address may be used. For patterns, only actual host names are used in the comparison, so ensure that you do not attempt to match aliases. Preceding either a host name or a pattern with an ! (exclamation point) causes hosts that match that entry to be excluded.

An Indirect entry also contains a host name or pattern, but follows it with a list of host names or macros to which **indirect** queries should be sent.

A macro definition contains a macro name and a list of host names and other macros that the macro expands to. To distinguish macros from host names, macro names start with a % (percent) character. Macros may be nested.

Indirect entries may also specify to have the **xdm** command run the **chooser** command to offer a menu of hosts to which to connect. See the section Chooser on the next page.

When checking access for a particular display host, each entry is scanned in turn and the first matching entry determines the response. For example, a **Direct** query entry is ignored when scanning for an **Indirect** entry. A **Broadcast** query entry is ignored when scanning for a **Direct** entry.

Blank lines are ignored. The **#** (number symbol) is treated as a comment delimiter causing the rest of that line to be ignored, and a \ (backslash) at the end of the line causes the new line to be ignored, allowing indirect host lists to span multiple lines.

The following is an example **Xaccess** file:

```
#
# Xaccess − XDMCP access control file
#


#
# Direct/Broadcast query entries
#


!xtra.lcs.mit.edu       # disallow direct/broadcast service for xtra
bambi.ogi.edu     # allow access from this particular display
*.lcs.mit.edu     # allow access from any display in LCS


#
# Indirect query entries
#


%HOSTS          expo.lcs.mit.edu xenon.lcs.mit.edu \\
               excess.lcs.mit.edu kanga.lcs.mit.edu


extract.lcs.mit.edu    xenon.lcs.mit.edu    #force extract to contact xenon
!xtra.lcs.mit.edu         dummy     #disallow indirect access
*.lcs.mit.edu     %HOSTS           #all others get to choose
```

Chooser

For X terminals that do not offer a host menu for use with **Broadcast** or **Indirect** queries, the **chooser** program can do this for them. In the **Xaccess** file, specify **CHOOSER** as the first entry in the Indirect host list. The **chooser** program sends a **Query** request to each of the remaining host names in the list and offers a menu of all the hosts that respond.

The list may consist of the word **BROADCAST**, in which case **chooser** sends a **Broadcast** query instead, again offering a menu of all hosts that respond.

The following is an example **Xaccess** file using **chooser**:

```
extract.lcs.mit.edu       CHOOSER   %HOSTS         #offer a menu of these hosts
xtra.lcs.mit.edu          CHOOSER   BROADCAST      #offer a menu of all hosts
```

The program to use for **chooser** is specified by the **DisplayManager.DISPLAY.chooser** resource. Resources for this program can be put into the file named by the **DisplayManager.DISPLAY.resources** resource.

The **chooser** has been implemented using a Motif **SelectionBoxWidget**. Refer to the **XmSelectionBoxWidget Class** documentation for a description of resources and widget or gadget names.

Server Specification

The resource **DisplayManager.servers** gives a server specification or, if the values starts with a / (slash), the name of a file containing server specifications, one per line.

Each specification indicates a display that should constantly be managed and that is not using **XDMCP**. Each consists of at least three parts:

- Display name
- Display class
- Display type
- For local servers, a command line to start the server.

A typical entry for local display number 0 would be:

```
:0 IBM−GT local /usr/bin/X11/X :0
```

The display types are:

local	local display: \fIxdm\fP must run the server
foreign	remote display: \fIxdm\fP opens an X connection to a running server

The display name must be something that can be passed in the **−display** option to an X program. This string is used to generate the display−specific resource names, so be careful to match the names (for example, use "`:0 local /usr/bin/X11/X :0`" instead of "``` `localhost:0 local /usr/bin/X11/X :0 ```" if your other resources are specified as "`DisplayManager._0.session`"). The display class portion is also used in the display−specific resources as the class of the resource. This is useful if you have a large collection of similar displays (like a corral of X terminals) and would like to set resources for groups of them.

When using XDMCP, the display is required to specify the display class, so the manual for your particular X terminal should document the display class string for your device. If it does not, you can run the **xdm** command in debug mode and look at the resource strings that it generates for that device, which will include the class string.

Setup Program

The **Xsetup** file is run after the server is reset, but before the login window is offered. The file is typically a shell script. It is run as root, so you should be careful about security. This is the place to change the root background or bring up other windows that should appear on the screen along with the Login widget. Note that since **xdm** grabs the keyboard, other windows will not be able to receive keyboard input. They will be able to interact with the mouse, however; beware of potential security holes here. If **DisplayManager.DISPLAY.grabServer** is set, **Xsetup** will not be able to connect to the display at all. Resources for this program can be put into the file named by **DisplayManager.DISPLAY.resources**.

In addition to any specified by **DisplayManager.exportList**, the following environment variables are passed:

DISPLAY	Specifies the associated display name.
PATH	Specifies the value of **DisplayManager.DISPLAY.systemPath**.
SHELL	Specifies the value of **DisplayManager.DISPLAY.systemShell**.
XAUTHORITY	Specifies that it may be set to an authority file.

Authentication Client

The MIT authentication widget has been replaced by an authentication client composed of standard Motif widgets. The following is a list of the widget names (and their widget class):

```
outframe(xmFrameWidget)
  inframe(xmFrameWidget)
    main(XmFormWidget)
      tframe(xmFrameWidget)
        greeting(xmLabelGadget)
      logoline(xmFormWidget)
        dpyname(xmLabelWidget)
      userline(xmRowColumnWidget)
        userlabel(xmLabelWidget)
        username(xmTextWidget)
        passlabel(xmLabelWidget)
        password(xmTextWidget)
      failsafeline(xmFormWidget)
        failsafe(xmToggleButtonWidget)
      cancelline(xmFormWidget)
        cancel(xmPushButtonWidget)
      message(xmLabelWidget)
```

The authentication client reads a name/password pair from the keyboard. Resources for this client should be put into the file named by **DisplayManager.DISPLAY.resources**. All of these have reasonable default values, so it is not necessary to specify any of them. See **/usr/lib/X11/xdm/Xresources** for more information on default values for authentication client resources as well as the appropriate widget class documentation. The following resources are also supported by the authentication client:

Xlogin*foreground	Specifies the color used for the foreground.
Xlogin*background	Specifies the color used for the background.
Xlogin*greeting	Specifies a string that identifies this window. The default is AIXwindows environment.
Xlogin*greetFont	Specifies the font used to display the greeting.

Xlogin*frameColor	Specifies the background color used to display the greeting.
Xlogin*titleMessage	Specifies the string displayed in the title. The default is the hostname of the machine on which the authentication client is running.
Xlogin*titleFont	Specifies the font used to display the title.
Xlogin*namePrompt	Specifies the string displayed to prompt for a user name. The Xrdb program strips trailing white space from resource values. Add spaces escaped with backslashes at the end of the prompt. The default is "login:".
Xlogin*passwdPrompt	Specifies the string displayed to prompt for a password. The default is "password:".
Xlogin*promptFont	Specifies the font used to display both prompts.
Xlogin*failPrompt	Specifies the label for the failsafe button.
Xlogin*failFont	Specifies the font used for the failsafe button.
Xlogin*cancelPrompt	Specifies the label for the cancel button.
Xlogin*cancelFont	Specifies the font used for the cancel button.
Xlogin*fail	Specifies a message displayed to indicate that the authentication fails. The default is "Login was incorrect."
Xlogin*messageFontlist	Specifies the font used to display the failure message.
Xlogin*failColor	Specifies the color used to display the failure message.
Xlogin*failTimeout	Specifies the number of seconds that the failure message is displayed. The default is thirty seconds.
Xlogin*sessionArgument	Specifies the argument to be passed to the session program.
Xlogin*XmText.translations	This specifies the translations use for the authentification client. Refer to the X Toolkit documentation for a complete discussion on translations. The default translation table is:

```
Ctrl<Key>b: backward-character()\n\
Ctrl<Key>a: beginning-of-line()\n\
Ctrl<Key>e: end-of-line()\n\
Ctrl<Key>f: forward-character()\n\
Ctrl<Key>d: kill-next-character()\n\
Ctrl<Key>k: kill-to-end-of-line()\n\
Ctrl<Key>u: kill-to-start-of-line()\n
```

You may setup XDM to use the standard XDM translations by replacing the XmText translations as defined in Xresources:

> **Note:** Use `<Key>osfHelp` instead of `<Key>F1` due to the Motif default virtual bindings.)

```
Xlogin*XmText.translations: #override\n\

<Key>osfHelp:    set-session-argument(failsafe) finish-field()\n\
Ctrl<Key>Return: set-session-argument(failsafe) finish-field()\n\
Ctrl<Key>H:      delete-previous-character() \n\
Ctrl<Key>D:      delete-character() \n\
Ctrl<Key>B:      move-backward-character() \n\
Ctrl<Key>F:      move-forward-character() \n\
Ctrl<Key>A:      move-to-beginning() \n\
Ctrl<Key>E:      move-to-end() \n\
Ctrl<Key>K:      erase-to-end-of-line() \n\
Ctrl<Key>U:      erase-line() \n\
Ctrl<Key>X:      erase-line() \n\
<Key>Return:     finish-field() \n
<Key>BackSpace:  delete-previous-character() \n\
<Key>Delete:     delete-previous-character() \n
```

In addition to the normal XmText actions, the following actions are also supported by the client in order to be compatible with the standard XDM translations:

delete−previous−character
Erases the character before the cursor.

delete−character
Erases the character after the cursor.

move−backward−character
Moves the cursor backward.

move−forward−character
Moves the cursor forward.

move−to−beginning
Moves the cursor to the beginning of the editable text.

move−to−end
Moves the cursor to the end of the editable text.

erase−to−end−of−line
Erases all text after the cursor.

erase−line
Erases the entire text.

finish−field
If the cursor is in the name field, proceeds to the password field; if the cursor is in the password field, checks the current name/password pair. If the name/password pair is valid, xdm starts the session. Otherwise the failure message is displayed and the user is prompted again.

insert−char
Inserts the character typed.

set−session−argument
Specifies a single word argument which is passed to the session at startup. See the sections Session Program and Typical Usage.

Startup Program

The **Xstartup** file is typically a shell script. Since it is run as the root user, be careful about security when it runs. It usually contains commands that add entries to **/etc/utmp**, mount users' home directories from file servers, display the message of the day, or cancel the session if logins are not allowed.

In addition to the environment variables specified by **DisplayManager.exportList**, the following variables are passed:

DISPLAY	Specifies the associated display name.
HOME	Specifies the initial working directory of the user.
USER	Specifies the user name.
PATH	Specifies the value of **DisplayManager.DISPLAY.systemPath**.
SHELL	Specifies the value of **DisplayManager.DISPLAY.systemShell**.
XAUTHORITY	May be set to an authority file.

No arguments are passed to the script. The **xdm** command waits until this script exits before starting the user session. If the exit value of this script is nonzero, the **xdm** command discontinues the session and starts another authentication cycle.

Session Program

The **Xsession** program establishes the style of the user's session. It is run with the permissions of the authorized user.

In addition to any specified by **DisplayManager.exportList**, the following environment variables are passed:

DISPLAY	Specifies the associated display name.
HOME	Specifies the initial working directory of the user.
USER	Specifies the user name.
PATH	Specifies the value of **DisplayManager.DISPLAY.userPath**.
SHELL	Specifies the user's default shell (from **getpwnam**).
XAUTHORITY	May be set to a nonstandard authority file.

At most installations, the **Xsession** program should look in the user's home directory (**$HOME**) for a file **.xsession**, which contains the commands that the user would like to use as a session. The **Xsession** program should also implement a system default session if no user−specified session exists. See the section Typical Usage .

An argument may be passed to this program from the authentication widget using the `set−session−argument' action. This can be used to select different styles of session. Usually, this feature is used to allow the user to escape from the ordinary session when it fails. This allows users to repair their own **.xsession** if it fails, without requiring administrative intervention. The section Typical Usage demonstrates this feature.

Reset Program

The **Xreset** script is run after the user session has ended. Run as root, it should contain commands that undo the effects of commands in **Xstartup** by removing entries from **/etc/utmp** or unmounting directories from file servers. The environment variables that are passed to **Xstartup** are also passed to **Xreset**. This program is symmetrical with the **Xstartup** program.

Controlling the Server

The **xdm** command controls local servers using POSIX signals. The **SIGHUP** signal is expected to reset the server, closing all client connections and performing other cleanup duties. The **SIGTERM** signal is expected to cancel the server. If these signals do not perform the expected actions, the resources **DisplayManager.DISPLAY.resetSignal** and **DisplayManager.DISPLAY.termSignal** can specify alternate signals.

To control remote terminals that are not using **XDMCP**, the **xdm** command searches the window hierarchy on the display and uses the protocol request **KillClient** in an attempt to clean up the terminal for the next session. This may not actually cause all of the clients to become inactive, as only those which have created windows will be noticed. **XDMCP** provides a more sure mechanism; when the **xdm** command closes its initial connection, the session is over and the terminal is required to close all other connections.

Controlling XDM

The **xdm** command responds to two signals: **SIGHUP** and **SIGTERM**. When sent a SIGHUP, **xdm** rereads the configuration file, the access control file, and the servers file. For the servers file, it notices if entries have been added or removed. If a new entry has been added, the **xdm** command starts a session on the associated display. Entries that have been removed are disabled immediately, meaning that any session in progress is ended without notice and no new session is started.

When sent a **SIGTERM**, the **xdm** command stops all sessions in progress and exits. This can be used when shutting down the system.

The **xdm** command attempts to mark its various subprocesses for use by the **ps** command in *AIX Commands Reference* by editing the command−line argument list in place. Because the **xdm** command cannot allocate additional space for this task, it is useful to start the **xdm** command with a reasonably long command line (using the full path name should be enough). Each process that is servicing a display is marked **−display**.

Other Possibilities

You can use the **xdm** command to run a single session at a time, using the **xinit** command options or other suitable daemons by specifying the server on the command line:

```
xdm −server ":0 local /usr/bin/X11/X :0 −force"
```

It might also run a file server and a collection of X terminals. The configuration for this is identical to the previous sample, except the **Xservers** file would look like the following:

```
        extol:0 VISUAL−19 foreign
        exalt:0 NCD−19 foreign
        explode:0 NCR−TOWERVIEW3000 foreign
```

This directs the **xdm** command to manage sessions on all three of these terminals. See the section Controlling XDM for a description of using signals to enable and disable these terminals.

> **Note:** The **xdm** command does not coexist well with other window systems. To use multiple window systems on the same hardware, use the **xinit** command.

Examples

1. The sample **xstartup** script that follows prevents login while the file **/etc/nologin** exists. As there is no provision for displaying any messages here (there is no core X client that displays files), the setup in this example is not recommended since the login would fail without explanation. Thus this is not a complete example, but simply a demonstration of the available functionality.

   ```
   #!/bin/sh
   #
   # Xstartup
   #
   # This program is run as root after the user is verified
   #
   if [ \−f /etc/nologin ]; then
           exit 1
   fi
   exit 0
   ```

2. This **Xsession** script recognizes the special **failsafe** mode, specified in the translations in the preceding **Xresources** file, to provide an escape from the ordinary session:

   ```
   #!/bin/sh
   exec > $HOME/.xsession−errors 2>&1
   case $# in
   1)
           case $1 in failsafe)
                  exec aixterm −geometry 80x24−0−0
                  ;;
           esac
   esac
   startup=$HOME/.xsession
   resources=$HOME/.Xresources
   if [ −f /usr/bin/X11/startx ]; then
          exec /usr/bin/X11/startx −t −wait
   elif [ −f $startup]; then
   ```

```
        exec $startup
else
        if [ −f $resources ]; then
                xrdb −load $resources
        fi
        mwm &
        exec aixterm −geometry 80x24+10+10 −ls
fi
```

3. To have **xdm** come up from system startup, as root enter the following:

   ```
   /usr/lib/X11/xdm/xdmconf
   ```

4. To disable **xdm** on reboot, as root enter the following:

   ```
   /usr/lib/X11/xdm/xdmconf −d
   ```

5. When usin **xdm** to manage your display, an authentication procedure insures that only clients that are allowed can connect to your display. Clients that are built using X11 R4 and X11 R5 libraries understand this protocol. Clients that are built with X11 R3 or earlier libraries do not support this authentication protocol and are not allowed to connect to the Xserver unless **xhost** permission is granted. Enter the following to allow local clients to connect:

   ```
   xhost =localhost
   ```

   or

   ```
   xhost =machine
   ```

where *machine* is the hostname of the local client.

Files

/usr/lib/X11/xdm/xdm−config	The default configuration file.
/usr/lib/X11/xdm/Xaccess	The default access file, listing authorized displays.
/usr/lib/X11/xdm/Xservers	The default server file, listing non−XDMCP servers to manage.
$(HOME)/.Xauthority	User authorization file where **xdm** stores keys for clients to read.
/usr/lib/X11/xdm/chooser	The default chooser.
/usr/bin/X11/xrdb	The default resource database loader.
/usr/bin/X11/X	The default server.
/usr/bin/X11/xterm	The default session program and failsafe client.
/usr/lib/X11/xdm/A<host>\−<suffix>	The default place for authorization files.

Related Information

The **X** command, **xinit** command, **startx** command.

xfindproxy Command

Purpose

Locates proxy services.

Syntax

xfindproxy −manager managerAddr **−name** serviceName **−server** serverAddr [**−auth**] [**−host** hostAddr] [**−options** opts]

Description

xfindproxy is a program used to locate available proxy services. It utilizes the Proxy Management Protocol to communicate with a proxy manager. The proxy manager keeps track of all available proxy services, starts new proxies when necessary, and makes sure that proxies are shared whenever possible.

If **xfindproxy** is successful in obtaining a proxy address, it will print it to stdout. The format of the proxy address is specific to the proxy service being used. For example, for a proxy service of `LBX`, the proxy address would be the X display address of the proxy (e.g, `blah.x.org:63`).

If **xfindproxy** is unsuccessful in obtaining a proxy address, it will print an error to **stderr**.

Flags

−manager	This argument is required, and it specifies the network address of the proxy manager. The format of the address is a standard ICE network id (for example, `tcp/blah.x.org:6500`).
−name	This argument is required, and it specifies the name of the desired proxy service (for example, `LBX`). The name is case insensitive.
−server	This argument is also required, and it specifies the address of the target server. The format of the address is specific to the proxy service specified with the **−name** argument. For example, for a proxy service of `LBX`, the address would be an X display address (e.g, `blah.x.org:0`).
−auth	This argument is optional. If specified, **xfindproxy** will read 2 lines from standard input. The first line is an authorization/authentication name. The second line is the authorization/authentication data in hex format (the same format used by xauth). **xfindproxy** will pass this auth data to the proxy, and in most cases, will be used by the proxy to authorize/authenticate itself to the target server.
−host	This argument is optional. If **xfindproxy** starts a new proxy service, it will pass the host specified. The proxy may choose to restrict all connections to this host. In the event that **xfindproxy** locates an already existing proxy, the host will be passed, but the semantics of how the proxy uses this host are undefined.
−options	This argument is optional. If **xfindproxy** starts a new proxy service, it will pass any options specified. The semantics of the options are specific to each proxy server and are not defined here. In the event that **xfindproxy** locates an already existing proxy, the options will be passed, but the semantics of how the proxy uses these options are undefined.

Related Information

The **proxymngr** command.

xfs Command

Purpose

Supplies fonts to X Window System display servers.

Syntax

xfs [**−config** *ConfigurationFile*] [**−ls** *ListenSocket*] [**−port** *Number*]

Description

xfs is the AIXwindows font server. It supplies fonts to AIXwindows display servers.

The **xfs** server responds to the following signals:

SIGTERM	Causes the font server to exit cleanly.
SIGUSR1	Causes the server to re−read its configuration file.
SIGUSR2	Causes the server to flush any cached data it may have.
SIGHUP	Causes the server to reset, closing all active connections and re−reading the configuration file.

The server is usually run by a system administrator, and started by way of boot files such as **/etc/rc.tcpip**. Users may also wish to start private font servers for specific sets of fonts.

The configuration language is a list of keyword and value pairs. Each keyword is followed by an = (equal sign) and the desired value.

The following list shows recognized keywords and the types and descriptions of valid values:

#	A comment character when located in the first column.
catalogue (List of string)	Ordered list of font path element names. The current implementation only supports a single catalogue ("all"), containing all of the specified fonts.
alternate−servers (List of string)	List of alternate servers for this font server.
client−limit (Cardinal)	Number of clients that this font server will support before refusing service. This is useful for tuning the load on each individual font server.
clone−self(Boolean)	Whether this font server should attempt to clone itself when it reaches the client−limit.
default−point−size(Cardinal)	The default point size (in decipoints) for fonts that do not specify.
default−resolutions(List of resolutions)	Resolutions the server supports by default. This information may be

	used as a hint for pre−rendering and substituted for scaled fonts which do not specify a resolution. A resolution is a comma−separated pair of **x** and **y** resolutions in pixels per inch. Multiple resolutions are separted by commas.
error−file (String)	Filename of the error file. All warnings and errors are logged here.
port (Cardinal)	TCP port on which the server will listen for connections. The default is 7100.
use−syslog (Boolean)	Whether the **syslog** function (on supported systems) is to be used for errors.
deferglyphs (String)	Set the mode for delayed fetching and caching of glyphs. Value is `none`, meaning defered glyphs is disabled. `all`, meaning defered glyphs is enabled for all fonts, and `16` , meaning defered glyphs is enabled only for 16−bit fonts.

One of the following forms can be used to name a font server that accepts TCP connections:

```
tcp/hostname:port
tcp/hostname:port/cataloguelist
```

The hostname specifies the name (or decimal numeric address) of the machine on which the font server is running. The port is the decimal TCP port on which the font server is listening for connections. The cataloguelist specifies a list of catalogue names, with '+' as a separator. The following are some examples:

```
tcp/expo.lcs.mit.edu:7100, tcp/18.30.0.212:7101/all
```

One of the following forms can be used to name a font server that accepts DECnet connections:

```
decnet/nodename::font$objname
decnet/nodename::font$objname/cataloguelist
```

The nodename specifies the name (or decimal numeric address) of the machine on which the font server is running. The objname is a normal, case−insensitive DECnet object name. The cataloguelist specifies a list of catalogue names, with '+' as a separator.

Flags

−config*ConfigurationFile*	Specifies the configuration file the font server will use.
−ls*ListenSocket*	Specifies a file descriptor that is already set up to be used as the listen socket. This option is only intended to be used by the font server itself when automatically spawning another copy of itself to handle additional connections.
−port*Number*	Specifies the TCP port number on which the server will listen for connections.

Examples

```
#
# sample font server configuration file
#


# allow a max of 10 clients to connect to this font server
client−limit = 10
```

```
# when a font server reaches its limit, start up a new one
clone−self = on


# alternate font servers for clients to use
alternate−servers = hansen:7101,hansen:7102


# where to look for fonts
# the first is a set of Speedo outlines, the second is a set of
# misc bitmaps and the last is a set of 100dpi bitmaps
#
catalogue = /usr/lib/fonts/type1,
   /usr/lib/X11/ncd/fonts/misc,
   /usr/lib/X11/ncd/fonts/100dpi/


# in 12 points, decipoints
default−point−size = 120


# 100 x 100 and 75 x 75
default−resolutions = 100,100,75,75
```

Files

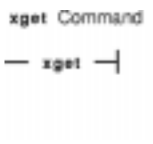
/usr/lib/X11/fs/config The default configuration file.

xget Command

Purpose

Receives secret mail in a secure communication channel.

Syntax



xget

Description

The **xget** command is used to receive secret mail in a secure communication channel. The messages can be read only by the intended recipient. The **xget** command asks for your password and enables you to read your secret mail.

The **xget** command is used with the **enroll** command and the **xsend** command to send and receive secret mail. The **enroll** command sets up the password used to receive secret mail. The **xsend** command sends mail that can be read only by the intended recipient.

When you issue the **xget** command, you are prompted for your encryption key. Enter the password you previously set up using the **enroll** command.

The prompt for the **xget** command is a ? (question mark). The following subcommands control message disposition:

q (quit)	Writes any mail not yet deleted to the user's mailbox and exits. Pressing End Of File (Ctrl−D) has the same effect.
n (delete) or **d** (delete) or **Enter**	Deletes the current message and displays the next message.
!*Command*	Runs the specified workstation command.
s[*Filename*]	Saves the message in the named *File* parameter instead of in the default mail file, **mbox**.
w[*Filename*]	Saves the message, without its header, in the specified *File* parameter instead of in the default mail file **mbox**.
? (help)	Displays a subcommand summary.

Examples

1. To receive secret mail, enter:

   ```
   xget
   ```

   You are prompted for the password, established with the **enroll** command. After entering your password, the **xget** command prompt (?) and a listing of any secret mail is displayed.

2. To display your secret mail, at the **xget** prompt (?), press the Enter key.

   After the most recent message is displayed, a ? (question mark) indicates the **xget** command is waiting for one of the **xget** subcommands. Enter `help` or a ? (question mark) to list the subcommands available.

3. To save a message or a file to the default mail file, enter:

   ```
   xget
   ```

   Press the Enter key after the ? (question mark) prompt until the desired file is displayed. When the appropriate file is displayed, enter:

   ```
   s
   ```

   In this example, the file is saved in the default mail file, **mbox**.

4. To save a message or a file to a specific file, enter:

   ```
   xget
   ```

   Press the Enter key after the ? (question mark) prompt until the desired file is displayed. When the appropriate file is displayed, enter:

   ```
   s mycopy
   ```

   In this example, the file is saved in a file named `mycopy`, instead of the default mail file.

5. To delete a message, enter:

   ```
   xget
   ```

   Press the Enter key after the ? (question mark) prompt until the desired file is displayed. When the appropriate file is displayed, enter:

   ```
   d
   ```

In this example, the current file is deleted.

Files

/var/spool/secretmail/*User***.key**	Contains the encrypted key for *User*.
/var/spool/secretmail/*User***.[0−9]**	Contains the encrypted mail messages for *User*.
/usr/bin/xget	Contains executable files.

Related Information

The **enroll** command, **mail** command, **xsend** command.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

Sending and Receiving Secret Mail in *AIX Version 4.3 System User's Guide: Communications and Networks*.

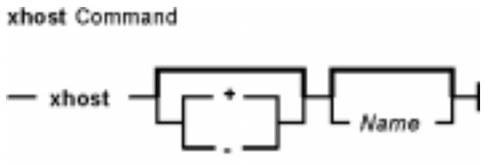
Mail Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks*.

xhost Command

Purpose

Controls who accesses Enhanced X−Windows on the current host machine.

Syntax



xhost [+ | −] [*Name*]

Description

The **xhost** command adds or deletes host names on the list of machines from which the X Server accepts connections.

This command must be run from the machine with the display connection. You can remove a name from the access list by using the −*Host* parameter. Do not remove the current name from the access list. If you do, log off the system before making any corrections.

Entering the **xhost** command with no variables shows the current host names with access your X Server and a message indicating whether or not access is enabled.

For security, options that affect access control may only be run from the *controlling host*. For workstations, this is the same machine as the server. For X terminals, it is the login host.

To enable a remote name by default, the name can be defined in the **/etc/X**?**.hosts** file, where ? is the display number to which you enable access.

For example, the display `jeanne:0` can be accessed by systems defined in the **/etc/X0.hosts** file on a system that uses the default host name of `jeanne`. In both the display name and the file name, 0 indicates the display number that the defined remote systems are allowed to access through Enhanced X−Windows.

Flags

+*Name*	Defines the host name (the plus sign is optional) to be added to the X Server access list.
−*Name*	Defines the host name to be removed from the X Server access list. Existing connections are not broken, but new connection attempts will be denied. Note that you can remove the current machine; however, further connections (including attempts to add it back) are not permitted. The only way to allow local connections again is to reset the server (thereby breaking all connections).
+	Specifies that access is unlimited. Access control is turned off.
−	Turns access control on.

The complete *Name* has a the following *family*:*name* syntax:

inet

Internet host

local

Contains only one name, the empty string

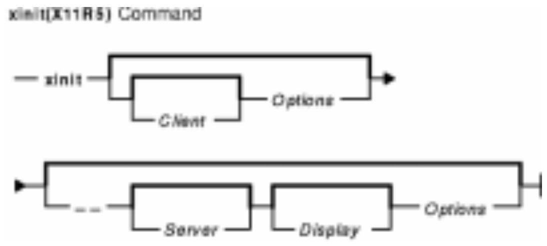
Note: The family is case sensitive. The format of the name varies with the family.

xinit Command

Purpose

Initializes the X Window System.

Syntax



xinit [[*Client*] *Options*] [− − [*Server*] [*Display*] *Options*]

Description

The **xinit** command starts the AIXwindows server and a first client program on systems that cannot start X directly from **/etc/init** or in environments that use multiple window systems. When this first client exits, the **xinit** command stops the X server and then ends.

If no specific client program is given on the command line, the **xinit** command looks for a file to run to start up client programs. The **xinit** command looks for the **$XINITRC** environment variable. If the file is not there, it then looks for the **$HOME/.xinitrc** file. If it still does not find the file, it follows these steps:

1. The **xinit** command looks next to **/usr/lib/X11/$LANG/xinitrc .**
2. Next, it looks to **/usr/lpp/X11/defaults/$LANG/xinitrc**.
3. And finally, it looks to **/usr/lpp/X11/defaults/xinitrc**.

If no such file exists, **xinit** uses the following as a default:

```
aixterm \−geometry +1+1 \−n login \−display :0
```

If no specific server program is given on the command line, the **xinit** command follows these steps:

1. The **xinit** command looks for a file to run as a shell script to start up the server. The **xinit** command looks for files first in the **$XSERVERRC** environment variable.
2. If the file is not there, it looks for the **$HOME/.xserverrc** file.
3. If it still does not find the **$HOME/.xserverrc** file, it looks next to **/usr/lpp/X11/defaults/xserverrc** file.
4. And finally, if it does not find any of the previous files, the **xinit** command runs the **X** command to start the X server and uses the following as a default:

   ```
   X :0
   ```

Note that this assumes that there is a program named X in the current search path. However, servers are usually named X*displaytype* where *displaytype* is the type of graphics display which is driven by this server. The site administrator should, therefore, make a link to the appropriate type of server on the machine, or create a shell script that runs the **xinit** command with the appropriate server.

Note: If you attempt to start AIXwindows without an available pointer device, such as a mouse or a tablet, AIXwindows will not open. Some devices can be plugged in but not defined and thus not available to the system, as well as the reverse.

An important point is that programs which are run by **.xinitrc** should be run in the background if they do not exit right away, so that they do not prevent other programs from starting up. However, the last long−lived program started (usually a window manager or terminal emulator) should be left in the foreground so that the script does not exit (which indicates that the user is done and that xinit should exit).

An alternate client and/or server may be specified on the command line. The desired client program and its arguments should be given as the first command line arguments to **xinit**. To specify a particular server command line, add a −− (double dash) to the **xinit** command line (after any client and arguments) followed by the desired server command.

Both the client program name and the server program name must begin with a / (slash) or a . (period). Otherwise, they are treated as an arguments to be added to their respective startup lines. This makes it possible to add arguments (for example, foreground and background colors) without having to retype the whole command line.

If a clear server name is not given and the first argument following the −− (double dash) is a : (colon) followed by a number, **xinit** uses that number as the display number instead of zero. All remaining arguments are added to the server command line.

The following environment variables are used with the **xinit** command:

DISPLAY	This variable gets set to the name of the display to which clients should connect.
XINITRC	This variable specifies an init file containing shell commands to start up the initial windows. By default, **.xinitrc** in the home directory is used.
Options	List any option you wish that is available to the client you specified.
Client	Specify the client with which you are working. For example, xterm or aixterm. The client you specify must begin with a . (dot) or a / (slash).
Server	Use any valid xserver. The server you specify must begin with a . (dot) or a / (slash).

Examples

1. To start up a server named X and run the user's **xinitrc** program, if it exists, or else start an **aixterm** command enter:

   ```
   xinit
   ```

2. To start a specific type of server on an alternate display, enter:

   ```
   xinit −− /usr/bin/X11/X qdss:1
   ```

3. To start up a server named X, and add the given arguments to the default **xinitrc** or **aixterm** command, enter:

   ```
   xinit −geometry =80x65+10+10 −fn 8x13 −j −fg white −bg navy
   ```

4. To use the command **/Xsun −l −c** to start the server and add the arguments **−e widgets** to the default **xinitrc** or **aixterm** command, enter:

   ```
   xinit −e widgets −− ./Xsun −l −c
   ```

5. To start a server named X on display 1 with the arguments **−a 2 −t 5**, then start a remote shell on the machine **fasthost** in which it runs the command **cpupig**, telling it to display back on the local workstation, enter:

```
xinit /usr/ucb/rsh fasthost cpupig −display ws:1 −− :1 −a 2 −t 5
```

6. The following sample of the **.xinitrc** script starts a clock, several terminals, and leaves the window manager running as the last application. Assuming that the window manager has been configured properly, the user then chooses the **Exit** menu item to end the AIXwindows session.

   ```
   xrdb −load $HOME/.Xresources
   xsetroot −solid gray &
   xclock −g 50x50−0+0 −bw 0 &
   xload −g 50x50−50+0 −bw 0 &
   xterm −g 80x24+0+0 &
   xterm −g 80x24+0−0 &
   mwm
   ```

7. Sites that want to create a common startup environment could simply create a default **.xinitrc** script that references a site−wide startup file:

   ```
   #!/bin/sh . /usr/local/lib/site.xinitrc
   ```

8. Another approach is to write a script that starts the **xinit** command with a specific shell script. Such scripts are usually named `x11`, `xstart`, or `startx` and are a convenient way to provide a simple interface for novice users:

   ```
   #!/bin/sh xinit /usr/local/lib/site.xinitrc −− /usr/bin/X11/X bc
   ```

Files

.xinitrc	Contains the default client script files.
aixterm	Contains the command the client runs if **.xinitrc** does not exist.
.xserverrc	Contains the default server script.
X	Contains the command the server runs if **.xserverrc** does not exist.

Related Information

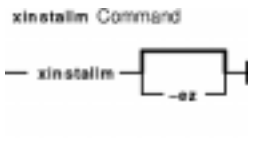
The **startx** command, **X** command.

xinstallm Command

Purpose

Starts Install and Update Software Manager or Easy Install, two of the Visual System Management (VSM) applications.

Syntax



xinstallm [−ez]

Description

The **xinstallm** command starts Install and Update Software Manager, one of the Visual System Management (VSM) applications. Install and Update Software Manager is a graphical interface that enables you to install (or schedule an install) software bundles, products, packages, filesets, fixes, or maintence levels through direct manipulation of objects (icons), freeing you from entering complex command syntax or from searching through menus.

xinstallm −ez starts Easy Install, a simplified version of the Install and Update Software Manager. Easy Install installs only at the bundle level.

The Install Manager sessions create or add to the **smit.log** and **smit.script** files in your home directory. (These are the same files appended when you run a SMIT session.) The commands built and run by the Install Managers are added to the end of the **smit.log** file along with the command output. The time, name of the task, and the command (flags and parameters included) are added to the end of the **smit.script** file in a format that can easily be used to create executable shell scripts.

Example

1. To start Install and Update Software Manager, enter:

   ```
   xinstallm
   ```

   To see a list tasks you can perform on an object or area, press the right mouse button to display its pop−up menu. Read the text in the Information Area for help on the objects and areas.

2. To start Easy Install, enter:

   ```
   xinstallm −ez
   ```

Files

smit.log	Specifies detailed information on your session, with time stamps.
smit.script	Specifies the task commands run during your session, with time stamps.

Related Information

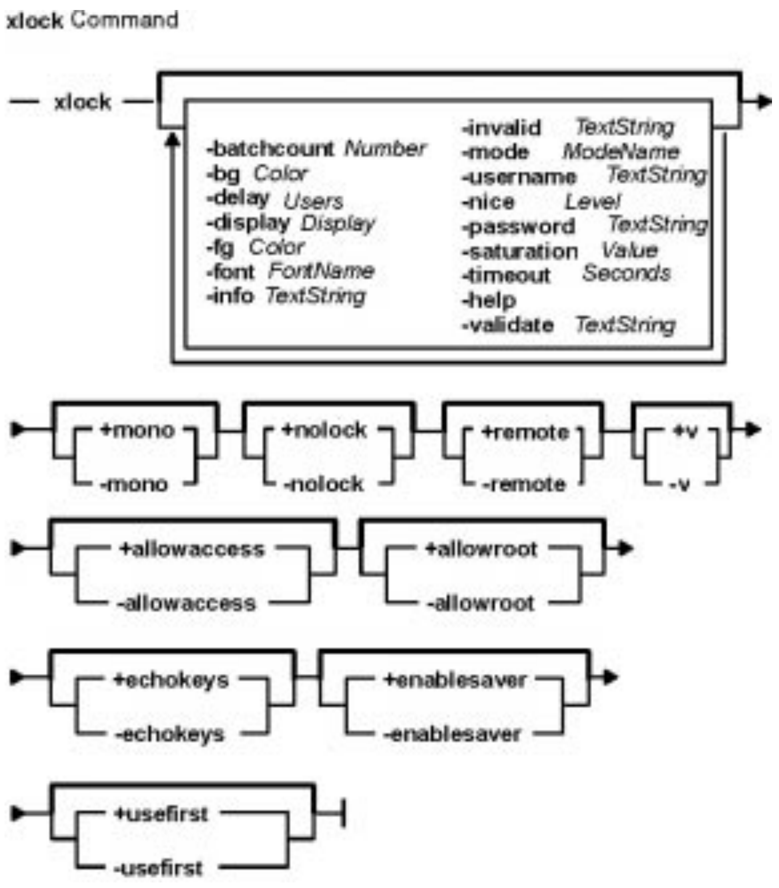
Installing Optional Software in *AIX Installation Guide*.

xlock Command

Purpose

Locks the local X display until a password is entered.

Syntax



xlock [**−batchcount** *Number*] [**−bg** *Color*] [**−delay** *Users*] [**−display** *Display*]
[**−fg** *Color*] [**−font** *FontName*] [**−info** *TextString*] [**−invalid** *TextString*]
[**−mode** *ModeName*] [**+mono** | **−mono**] [**−username** *TextString*] [**−nice** *Level*]
[**+nolock** | **−nolock**] [**−password** *TextString*] [**+remote** | **−remote**]
[**+allowaccess** | **−allowaccess**] [**+allowroot** | **−allowroot**] [**+echokeys** | **−echokeys**]
[**+enablesaver** | **−enablesaver**] [**−help**] [**−saturation** *Value*] [**−timeout** *Seconds*]
[**+usefirst** | **−usefirst**] [**+v** | **−v**] [**−validate** *TextString*]

Description

The **xlock** command locks the X server until the user enters a password at the keyboard. While the **xlock** command is running, all new server connections are refused. The screen saver is disabled, the mouse cursor is turned off, the screen is blanked, and a changing pattern is displayed. If a key or a mouse button is pressed, a prompt asks for the password of the user who started the **xlock** command**.**

If the correct password is typed, the screen is unlocked and the X server is restored. When typing the password, Ctrl−U and Ctrl−H are active as kill and erase, respectively. To return to the locked screen, click in the small icon version of the changing pattern.

In order to function properly on AIX, **xlock** needs to run with root permission since AIX restricts access to the password and access control files. To give **xlock** root permission, perform the following steps:

1. Log in as root.
2. Go to the directory that contains the **xlock** program file.
3. Run these two commands:
    a. **chownroot xlock**
    b. **chmodu+s xlock**

Flags

−batchcount *Number*	Sets the number of things to do per batch. *Number* refers to different things depending on the mode: ***qix*** Refers to the number of lines rendered in the same color. ***hop*** Refers to the number of pixels rendered in the same color. ***image*** Refers to the number of sunlogos on screen at once. ***swarm*** Refers to the number of bees ***life*** *and* ***blank*** Does not apply.
−bg *Color*	Sets the color of the background on the password screen.
−delay *Number*	Sets the speed at which a mode operates to the number of microseconds to delay between batches of **hopalong** pixels, **qix** lines, **life** generations, **image** bits, and **swarm** motions. In the **blank** mode, it is important to set this to a small number because the keyboard and mouse are only checked after each delay. A delay of zero would needlessly consume the processing unit while checking for mouse and keyboard input in a tight loop since the **blank** mode has no work to do.
−display *Display*	Sets the X11 display to lock. The **xlock** command locks all available screens on the server and restricts you to locking only a local server, such as **unix:0**, **localhost:0**, or **:0** (unless you set the **−remote** flag).
−fg *Color*	Sets the color of the text on the password screen.
−font *FontName*	Sets the font to be used on the prompt screen.
−help	Prints a brief description of available options.
−info *TextString*	Defines an informational message. The default is `Enter password to unlock; select icon to lock`.
−invalid *TextString*	Specifies an password message. The default is `Invalid login`.
−mode *ModeName*	Specifies one the following six display modes: ***blank*** Displays a black screen. ***hop*** Displays the real plane fractals from the September, 1986 issue of *Scientific American*. ***image*** Displays several randomly appearing sun logos. ***life*** Displays Conway's game of life. ***qix*** Displays spinning lines.

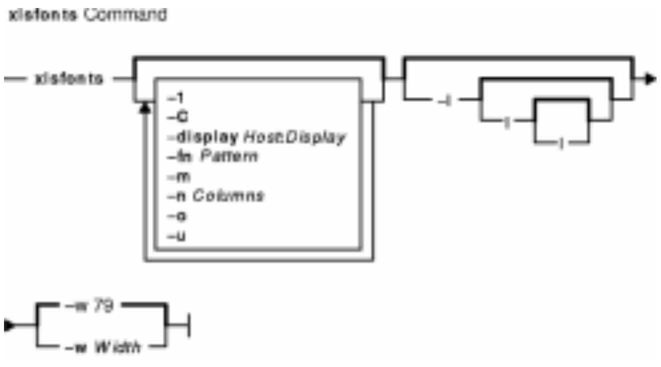
	swarm Displays a swarm of bees following a wasp.
−nice *NiceLevel*	Sets system nicelevel of the **xlock** process.
−password *TextString*	Specifies the password prompt string. The default is `Password:`.
−saturation *Value*	Sets saturation of the color ramp. A value of 0 (zero) is grayscale and a value of 1 is very rich color. A value of 0.4 is a medium pastel.
−timeout *Seconds*	Sets the number of seconds before the password screen times out.
−username *TextString*	Specifies the message shown in front of the user name. The default is `Name:`.
−validate *TextString*	Specifies the message that is shown while validating the password. The default is `Validating login...`.
−/+allowaccess	Allows the disabling of the access control list, but still causes the local server to prompt for a password. If **xlock** is killed using the **−KILL** command, the access control list is not lost. This flag is also needed when running the **xlock** command remotely if your display server is an AIX machine since access to the control list is restricted.
−/+allowroot	Allows the root password to unlock the server as well as the user who started the **xlock** command.
−/+echokeys	Causes the **xlock** command to echo to screen a '?' (question mark) character for each key typed into the password prompt. The default is no echo.
+/−enablesaver	Enables the default screensaver. It is possible to set delay parameters long enough to cause phosphor burn on some displays. This flag can be used as an added precaution.
+/−mono	Causes the **xlock** command to display monochrome (black and white) pixels rather than the default colored ones on color displays.
+/−nolock	Causes the **xlock** command to only draw the patterns and not to lock the display. A keypress or a mouse click terminates the screen saver.
+/−remote	Allows remote locking of X11 servers. This flag should be used with care. It is intended mainly to lock X11 terminals that cannot run the **xlock** command locally. If you lock a workstation other than your own, that person will need your password to unlock it.The **−remote** option does not disable your ability to toggle to another shell.
+/−usefirst	Allows using the keystroke which obtained the password screen as the first input character in the password. The default ignores the first keystroke.
+/−v	Minus prefix enables the verbose mode to tell which options the **xlock** command is going to use. The plus prefix is the default.

xlsfonts Command

Purpose

Displays the font list for X−Windows.

Syntax



xlsfonts [**−display** *Host*:*Display*] [−**l** [**l** [**l**]]] [**−m**] [**−C**] [**−1**] [**−w** *Width*] [**−n** *Columns*] [**−u**] [**−o**] [**−fn** *Pattern*]

Description

The **xlsfonts** command lists the fonts that match a specified *Pattern* parameter. Use the wildcard character "*" (asterisk) to match any sequence of characters (including none), and the "?" (question mark) to match any single character. If no pattern is given, "*" is assumed.

Note: The "*" and "?" characters must be placed within quotation marks to prevent them from being expanded by the shell.

You can use flags to specify servers, number and width of columns to print, size of font listings, whether the output should be sorted, and whether to use **OpenFont** instead of **ListFonts**.

Flags

Note: Using the **−l** (lowercase L) flag of the **xlsfonts** command can tie up your server for a long time. This is typical of single−threaded non−preemptable servers, and not a program error.

−1	Indicates that listings should use a single column. This flag is the same as the **−n***1* flag.
−C	Indicates that listings should use multiple columns. This flag is the same as the **−n***0* flag.
−display*Host*:*Display*	Identifies the X Server to contact by specifying the host name and display number.
−fn*Pattern*	Specifies the fontname *Pattern* that **xlsfonts** will list.
−l [**l** [**l**]]	(lowercase L) Indicates that medium, long, and very long listings, respectively, should be generated for each font.
−m	Indicates that long listings should also print the minimum and maximum bounds of each font.

−n*Columns*	Specifies the number of columns to use to display the output. By default, the **xlsfonts** command tries to fit as many columns of font names into the number of characters specified by the **−w***Width* flag.
−o	Instructs the **xlsfonts** command to perform **OpenFont** (and **QueryFont**, if appropriate) instead of **ListFonts**. The **−o** flag is useful if the **ListFonts** or **ListFontsWithInfo** fails to list a known font, as is the case with some scaled font systems.
−u	Indicates that the output should remain unsorted.
−w*Width*	Specifies the width in characters that should be used to determine how many columns to print. The default is 79.

Environment Variable

DISPLAY Gets the default host and display to use.

Examples

1. To specify a medium−sized list of each font, use a lowercase L and enter:

   ```
   xlsfonts -l
   ```

2. To specify a three−column list of each font, enter:

   ```
   xlsfonts -n 3
   ```

3. To display all fonts with the string iso8859 within their names, enter:

   ```
   xlsfonts -ll "*"iso8859"*"
   ```

4. To list all fonts with rom1 plus one following character in their names, enter:

   ```
   xlsfonts rom1"?"
   ```

   This obtains a listing similar to:

   ```
   rom10  rom11  rom14  rom16  rom17
   ```

Related Information

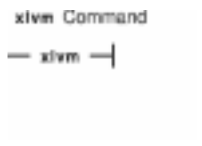
The **X** command, **xset** command.

xlvm Command

Purpose

Starts Storage Manager, a Visual System Management (VSM) application.

Syntax



xlvm

Description

The **xlvm** command starts Storage Manager, one of the Visual System Management (VSM) applications. Storage Manager is a graphical interface that enables you to manage physical volumes, volume groups, logical volumes, and file systems through direct manipulation of objects (icons). This frees you from entering complex command syntax or from searching through menus. In addition, the VSM interface provides an easy way to view the contents of a logical volume − something that was previously only possible from the command line.

The Storage Manager session creates or adds to the **smit.log** and **smit.script** files in your home directory. (These are the same files appended when you run a SMIT session.) The commands built and run by Storage Manager are added to the end of the **smit.log** file along with the command output. The time, name of the task, and the command (flags and parameters included) are added to the end of the **smit.script** file in a format that can easily be used to create executable shell scripts.

Example

To start Storage Manager, enter:

```
xlvm
```

To see a list tasks you can perform for an object or area, press the right mouse button to display its pop−up menu. Read the text in the Information Area for help on the objects and areas.

Files

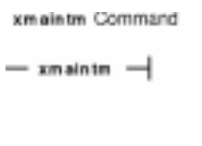
smit.log	Specifies detailed information on your session, with time stamps.
smit.script	Specifies the task commands run during your session, with time stamps.

xmaintm Command

Purpose

Starts Maintain Installed Software, a Visual System Management (VSM) application.

Syntax



xmaintm

Description

The **xmaintm** command starts Maintain Installed Software, one of the Visual System Management (VSM) applications. Maintain Installed Software is a graphical interface that enables you to perform installation maintence tasks through direct manipulation of objects (icons), freeing you from entering complex command syntax or from searching through menus.

The Maintain Installed Software session creates or adds to the **smit.log** and **smit.script** files in your home directory. (These are the same files appended when you run a SMIT session.) The commands built and run by Maintain Installed Software are added to the end of the **smit.log** file along with the command output. The time, name of the task, and the command (flags and parameters included) are added to the end of the **smit.script** file in a format that can easily be used to create executable shell scripts.

Example

To start Maintain Installed Software, enter:

```
xmaintm
```

To see a list tasks you can perform on an object or area, press the right mouse button to display its pop−up menu. Read the text in the Information Area for help on the objects and areas.

Files

smit.log	Specifies detailed information on your session, with time stamps.
smit.script	Specifies the task commands run during your session, with time stamps.

Related Information

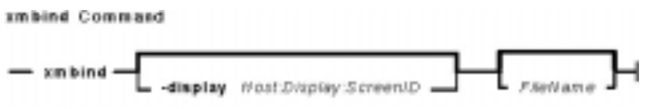
Maintaining Optional Software in *AIX Installation Guide*.

xmbind Command

Purpose

Configures virtual key bindings.

Syntax



xmbind [**−display***Host:Display:ScreenID*] [*FileName*]

Description

The **xmbind** command is an X Windows System client that configures the virtual key bindings for AIXwindows applications. This action is performed by the **mwm** command at its startup, so the **xmbind** client is only needed when **mwm** is not in use or when you want to change bindings without restarting **mwm**. If a file is specified, its contents are used as the virtual key bindings. If a file is not specified, the **.motifbind** file in the user's home directory is used. If this file is not found, the **xmbind** command loads the default virtual key bindings.

Flags

−display *Host***:***Display***:***ScreenID*
: Specifies the display to use. The **−display** option has the following parameters:

Host
: Specifies the host name of a valid system on the network. Depending on the situation, this could be the host name of the user or the host name of a remote system.

Display
: Specifies the number (usually 0) of the display on the system on which the output is to be displayed.

ScreenID
: Specifies the number of the screen where the output is to be displayed. This number is 0 for single−screen systems.

Parameter

FileName	Specifies the file containing bindings for virtual mouse and key events.

Exit Status

This command returns the following exit values:

0	Indicates successful completion.
>0	Indicates an error occurred.

Related Information

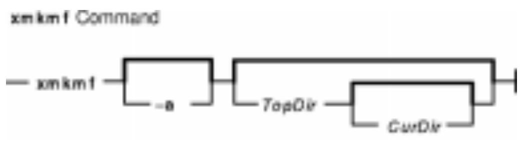
The **X** command.

xmkmf Command

Purpose

Creates a **Makefile** from an **Imakefile**.

Syntax



xmkmf [**−a**] [*TopDir* [*CurDir*]]

Description

The **xmkmf** command creates a **Makefile** from an **Imakefile** shipped with third−party software. When invoked with no arguments or variables in a directory containing an **Imakefile** file, the **imake** command runs with arguments appropriate for your system (configured into **xmkmf** when X was built) and generates a **Makefile**.

Flag

−a First builds the **Makefile** in the current directory, then automatically executes **makeMakefiles**, **makeincludes**, and **make depend**. This is how to configure software that is outside of the MIT X build tree.

Variables

Specify *TopDir* and *CurDir* if you are working inside the MIT X build tree (highly unlikely unless you are an X developer).

TopDir	Specify as the relative path name from the current directory to the top of the build tree.
CurDir	Specify as a relative path name from the top of the build tree to the current directory. The *CurDir* variable is required if the current directory has subdirectories; otherwise, the **Makefile** will not be able to build the subdirectories. If a *TopDir* variable is given in its place, **xmkmf** assumes nothing is installed on your system and searches for files in the build tree instead of using the installed versions.

Related Information

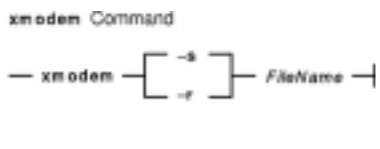
The **imake** command, **make** command.

xmodem Command

Purpose

Transfers files with the **xmodem** protocol, detecting data transmission errors during asynchronous transmission.

Syntax



xmodem { **−s** | **−r** } *FileName*

Description

The **xmodem** shell command is used with the Asynchronous Terminal Emulation (ATE) program to transfer a file, designated by the *FileName* parameter, using the **xmodem** protocol.

The **xmodem** protocol is an 8−bit transfer protocol to detect data transmission errors and retransmit the data. The workstation sending data waits until the remote system sends a signal indicating it is ready to receive data.

After the receiving system get data, it returns an acknowledgment to the sending system. In the ATE program the receiving system times out if data is not received within 90 seconds after the file transfer is initiated.

Sending and receiving with the **xmodem** command are complementary operations. One system must be set to send while the other is set to receive. Use the **xmodem** command on the remote system in combination with the **send** subcommand or the **receive** subcommand from the ATE Connected Main Menu on the local system.

To interrupt an **xmodem** file transfer, press the Ctrl−X key sequence.

Flags

−r	Receives data from the local workstation.
−s	Sends data to the local workstation.

Examples

Sending a File with the xmodem Protocol

To send the file `myfile` with the **xmodem** protocol, use the **ate** command and the **connect** or **directory** subcommand to establish a connection to the remote system.

1. After logging in to the remote system and before pressing the MAINMENU_KEY (usually the Ctrl−Vkey sequence) to return to ATE on the local system, enter:

   ```
   xmodem −r myfile
   ```

   at the shell command line. The **xmodem** protocol starts receive mode on the remote system.

2. Press the MAINMENU_KEY to return to ATE on the local system.

   The ATE Connected Main Menu displays.
3. Enter the **send** subcommand at the prompt on the ATE Connected Main Menu:

   ```
   s myfile
   ```

The **send** subcommand instructs the local system to send `myfile` to the remote system. After transferring the file, the ATE Connected Main Menu displays.

Receiving a File with the xmodem Protocol

Receive the file `infile` from a remote system using **xmodem** protocol with the **ate** command and the **connect** or **directory** subcommand establishing a connection to the remote system.

1. After logging in to the remote system and before pressing the MAINMENU_KEY (usually the Ctrl−V key sequence) to return to ATE on the local system, enter:

   ```
   xmodem −s infile
   ```

   at the shell command line. The **xmodem** protocol starts, in send mode, on the remote system.
2. Press the MAINMENU_KEY to return to ATE on the local system.

   The ATE Connected Main Menu displays.
3. Enter the **receive** subcommand at the prompt on the ATE Connected Main Menu:

   ```
   r infile
   ```

The **receive** subcommand instructs the local system to receive `infile` from the remote system. After transferring the file, the ATE Connected Main Menu displays.

File

ate.def	Contains ATE default values.

Related Information

The **ate** command.

The **connect** subcommand, **directory** subcommand, **modify** subcommand, **send** subcommand, **receive** subcommand.

How to Edit the ATE Default File in *AIX Version 4.3 System User's Guide: Communications and Networks* explains how to permanently change ATE defaults.

ATE Overview in *AIX Version 4.3 System User's Guide: Communications and Networks* introduces the ATE program, its menus, and its control keys.

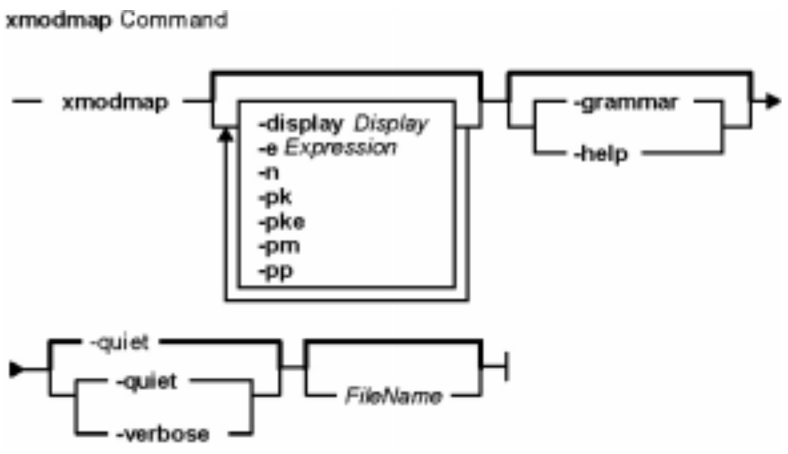
ATE Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks* discusses tasks involved in managing ATE.

xmodmap Command

Purpose

Modifies keymaps in the X Server.

Syntax



xmodmap [**−display** *Display*] [**−e** *Expression*] [**−grammar** | **−help**] [**−n**] [**−pk**] [**−pke**]
[**−pm**] [**−pp**] [**−quiet** | **−verbose**] [*FileName*]

Description

The **xmodmap** command edits and displays the keyboard modifier map and keymap table that client applications use to convert event keycodes into key symbols. It is usually run from the session startup script to configure the keyboard according to the personal tastes of the user.

Every time a keycode expression is evaluated, the server generates a **MappingNotify** event on every client. All of the changes should be batched together and done at once. Clients that receive keyboard input and ignore **MappingNotify** events will not notice any changes made to keyboard mappings.

The *FileName* parameter specifies a file containing the **xmodmap** command expressions to be run. This file is usually kept in the home directory of the user with a name like **.xmodmaprc**. If no file is specified, input is taken from **stdin**.

The **xmodmap** command program reads a list of expressions and parses them all before attempting to run any of them. This makes it possible to refer to key symbols that are being naturally redefined without having to worry as much about name conflicts.

add	The key symbol names are evaluated as the line is read. This permits you to remove keys from a modifier without worrying about whether they were reassigned.
add *ModifierName = KeySymbolName...*	
	Adds the given key symbols to the indicated modifier map. The key symbol names are evaluated after all input expressions are read to make it easy to write expressions to swap keys.
clear *ModifierName*	Removes all entries in the modifier map for the given modifier, where

the valid names are **Shift**, **Lock**, **Control**, **Mod1**, **Mod2**, **Mod3**, **Mod4**, and **Mod5** (case does not matter in modifier names, although it does matter for all other names). For example, **clear Lock** removes all keys bound to the **shift lock** modifier.

keycode *Number = KeySymbolName...*
: Assigns the list of key symbols to the indicated keycode (which can be specified in decimal, hex, or octal and be determined by running the **xev** program in the **/usr/lpp/X11/Xamples/demos** directory). Usually only one key symbol is assigned to a given code.

keysym *KeySymbolName = KeySymbolName...*
: The *KeySymbolName* on the left hand side is translated into matching keycodes used to perform the corresponding set of **keycode** expressions. The list of keysym names may be found in the keysym database **/usr/lib/X11/XKeysymDB** or the header file **X11/keysymdef.h** (without the *XK_* prefix). Note that if the same keysym is bound to multiple keys, the expression is run for each matching keycode.

pointer = default
: Sets the pointer map back to its default settings (such as, button 1 generates a code of 1, button 2 generates a 2, and so forth).

pointer = *Button1 Button2 Button3...*
: Sets the pointer map to contain the indicated button codes. The list always starts with the first physical button.

remove *ModifierName = KeySymbolName...*
: Removes all keys containing the given keysyms from the indicated modifier map. Unlike **add**, the keysym names are evaluated as the line is read in. This allows for the removal of keys from a modifier without having to worry about whether or not they have been reassigned.

Lines that begin with an ! (exclamation point) are taken as comments.

If you want to change the binding of a modifier key, you must also remove it from the appropriate modifier map.

Flags

−display *Display*	Specifies the host and display to use.
−e *Expression*	Specifies an expression to be run. You can specify any number of expressions from the command line.
−grammar	Prints a help message describing the expression grammar used in files and with the **−e***Expressions* flag prints to standard error.
−help	Prints a brief description of the command line arguments to standard error. This is done whenever an unhandled argument is given to the **xmodmap** command.
−n	Indicates that the **xmodmap** command should not change the mappings, but should display what it would do when given this flag.
−pk	Indicates that the current keymap table should print on the standard output.
−pke	Indicates that the current keymap table should be printed on the standard output in the form of expressions that can be fed back to **xmodmap**. This flag is specific to X11R5.
−pm	Indicates that the current modifier map should print on the standard output.
−pp	Indicates that the current pointer map should print on the standard output.
−quiet	Turns off the verbose logging. This is the default.
−verbose	Indicates that the **xmodmap** command should print logging information as it parses its

input.

Examples

1. The following command reverses the button codes that get generated so that the primary button is pressed using the index finger of the left hand on a 3 button pointer:

   ```
   xmodmap −e "pointer = 1 2 3 4 5"
   ```

2. The following command attaches meta to the multi−language key (sometimes labeled Compose Character). It also takes advantage of the fact that applications that need a Meta key simply need to get the keycode and do not require the key symbol to be in the first column of the keymap table. This means that applications that are looking for a Multi_key (including the default modifier map) will not notice any change.

   ```
   keysym Multi_key = Multi_key Meta_L
   ```

3. To automatically generate less than and greater than characters when the comma and period keys are shifted, reset the bindings for the comma and period with the following scripts:

   ```
   !
   ! make shift−, be < and shift−. be >
   !
   keysym comma = comma less
   keysym period = period greater
   ```

4. To swap the location of the Control and Shift Lock keys, use the following script:

   ```
   !
   ! Swap Caps_Lock and Control_L
   !
   remove Lock = Caps_Lock
   remove Control = Control_L
   keysym Control_L = Caps_Lock
   keysym Caps_Lock = Control_L
   add Lock = Caps_Lock
   add Control = Control_L
   ```

Related Information

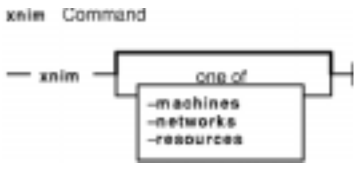
The **X** command.

xnim Command

Purpose

Starts the Network Installation Management (NIM) graphical user interface. This command only applies to AIX Version 4.2.1 or later.

Syntax



xnim [**−machines** | **−networks** | **−resources**]

Description

The **xnim** command starts the Network Installation Management (NIM) graphical user interface (GUI). The NIM GUI enables you to centrally manage the installation and maintenance of the AIX Base Operating System (BOS) and optionally software on machines within a networked environment. It also helps you to manage the initialization of diskless and dataless machines within the NIM environment. You can launch other windows from the initial NIM application window that allows you to define and manipulate machines, resources, and networks .

The NIM GUI also allows you to define custom tasks to represent operations that are performed frequently. You can perform the operations by dragging and dropping the custom tasks onto the targets. This eliminates providing the same input each time a common task is performed because the resources and options for the operation were specified when the custom task was created. In addition, machine and resource states are reflected in icons and status messages provided in the application information area that help provide a better visual view of the NIM environment. This reduces the need to use the **lsnim** command for status checking. For example, the NIM GUI provides progress indication for each machine during BOS installs by placing the percentage complete for the BOS installation below the target icon. Also, installation status messages for each client are provided in the information area.

The first time the NIM graphical user interface is started, it will invoke SMIT's Configure a Basic NIM Environment (Easy Startup) from AIX Version 4.2 if the NIM master is not configured. This allows you to define the basic elements needed for performing network installation operations.

In AIX Version 4.2.1, the **xinstallm** application allows you to install from a network device providing a graphical user interface for clients in a NIM environment.

Flags

−machines	Starts the NIM GUI to define and manipulate NIM machines and groups. You can also perform diag_boot, maint_boot, reset, and reboot operations on a machine or machine group.
−networks	Starts the NIM GUI to define and manipulate NIM networks and routes. It also provides a utility to display all of the machines defined on a particular network.
−resources	Starts the NIM GUI to define and manipulate NIM resources. You can also perform check and showres operations on NIM resources using this application.

Security

Access Control: You must have root authority to run the **xnim** command.

Related Information

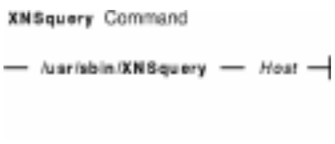
The **xinstallm** command.

XNSquery Command

Purpose

Queries a Xerox Network Systems (XNS) host or router for routing information.

Syntax



/usr/sbin/XNSquery*Host*

Description

The **/usr/sbin/XNSquery** command obtains routing information from the remote XNS host or router. The local host sends a datagram to the remote host or router, using the well−known routing−information socket to request routing information. The remote host returns the routing−table information maintained on that system. This information includes the networks that can be reached from the remote host and the required metrics. Metrics are the number of hops or routers needed to reach the destination network.

In the AIX implementation of the XNS protocol, the local host forwards all incoming datagrams to the local host, if possible. Thus, the local host can be used as a router if the routing table is properly maintained.

Examples

To obtain the routing information or table contained at remote host 02.4e.5f.70.83.65 on network 40, enter:

```
XNSquery 40:02.4e.5f.70.83.65
```

This displays the following:

```
from 28H.24e5f7708365.1h
          8, metric 1
          110, metric 1
          40, metric 1
          120, metric 1
```

where `8`, `110`, `40`, and `120` are the accessible networks from host `40:02.4e.5f.70.83.65` and `metric 1` specifies the number of hops or gateways between the host and the specified network.

Related Information

The **netstat** command, **route** command, **XNSrouted** daemon.

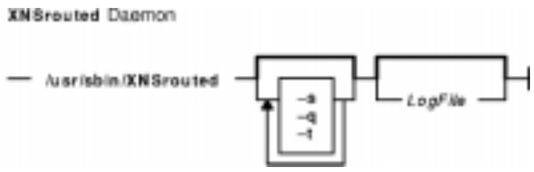
Xerox Network Systems (XNS) Overview for Programming in *AIX Version 4.3 Communications Programming Concepts*.

XNSrouted Daemon

Purpose

Manages the Xerox Network Systems (XNS) routing tables.

Syntax



/usr/sbin/XNSrouted [**−s**] [**−q**] [**−t**] [*LogFile*]

Description

The **/usr/sbin/XNSrouted** daemon is invoked during system startup to manage the Network Systems (NS) routing tables. This daemon uses the Xerox NS Routing Information Protocol (RIP) to maintain up−to−date kernel routing−table entries.

In normal operation, the **XNSrouted** daemon listens for routing information packets. If the host is connected to multiple NS networks, it can periodically supply copies of its routing tables to any directly connected hosts and networks.

When the **XNSrouted** daemon is started, it uses the **ioctl**(SIOGIFCONF) subroutine to find those directly connected interfaces configured into the system and marked up (the software loopback interface is ignored). If multiple interfaces are present, it is assumed the host forwards packets between networks. The **XNSrouted** daemon then transmits a request packet on each interface (using a broadcast packet if the interface supports it) and enters a loop, listening for request and response packets from other hosts.

When a request packet is received, the **XNSrouted** daemon formulates a reply based on the information maintained in its internal tables. The generated response packet contains a list of known routes, each marked with a hop count metric (a count of 16 or greater is considered infinite). The metric associated with each route returned provides a metric *relative to the sender*.

Response packets received by the **XNSrouted** daemon are used to update the routing tables if one of the following conditions is satisfied:

- No routing table entry exists for the destination network or host, and the metric indicates the destination is reachable; that is, the hop count is not infinite.
- The source host of the packet is the same as the router in the existing routing table entry. That is, updated information is being received from the very internetwork router through which packets for the destination are being routed.
- The existing entry in the routing table has not been updated for at least 90 seconds, and the route is at least as cost−effective as the current route.
- The new route describes a shorter route to the destination than the one currently stored in the routing tables. The **XNSrouted** daemon updates the route after comparing the metric of the new route against the one stored in the table.

When an update is applied, the **XNSrouted** daemon records the change in its internal tables and generates a response packet to all directly connected hosts and networks. The **XNSrouted** daemon waits a maximum 30 seconds before modifying the kernel's routing tables to allow possible unstable situations to settle.

In addition to processing incoming packets, the **XNSrouted** daemon also periodically checks the routing−table entries. If an entry has not been updated for 3 minutes, the entry's metric is set to infinity and marked for deletion. Deletions are delayed an additional 60 seconds to ensure that the invalidation is propagated to other routers.

Every 30 seconds, hosts acting as internetwork routers supply their routing tables to all directly connected hosts and networks.

The *LogFile* parameter interprets the name of the file in which the **XNSrouted** daemon's actions should be logged. This log contains information about any changes to the routing tables and a history of recently sent and received messages that are related to the changed route.

The **XNSrouted** daemon does not run as a background process unless an & (ampersand) is specified on the command line. Interrupts from the keyboard kill the process.

Flags

−s	Forces the **XNSrouted** daemon to supply routing information whether it is acting as an internetwork router or not.
−q	Processes all incoming XNS packets but does not supply any XNS routing information.
−t	Specifies that all packets sent or received are printed to standard output.

Related Information

The **netstat** command, **route** command, **XNSquery** command.

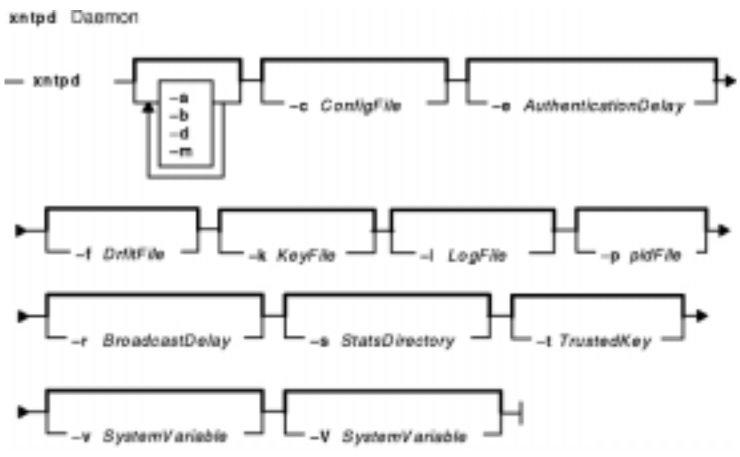
Xerox Network Systems (XNS) Overview for Programming in *AIX Version 4.3 Communications Programming Concepts*.

xntpd Daemon

Purpose

Starts the Network Time Protocol (NTP) daemon. This command only applies to AIX Version 4.2 or later.

Syntax



xntpd [**−a**] [**−b**] [**−d**] [**−m**] [**−c** *ConfigFile*] [**−e** *AuthenticationDelay*] [**−f** *DriftFile*]
[**−k** *KeyFile*] [**−l** *LogFile*] [**−p** *pidFile*] [**−r** *BroadcastDelay*] [**−s** *StatsDirectory*]
[**−t** *TrustedKey*] [**−v** *SystemVariable*] [**−V** *SystemVariable*]

Description

The **xntpd** daemon sets and maintains a Unix system time−of−day in compliance with Internet standard time servers. The **xntpd** daemon is a complete implementation of the Network Time Protocol (NTP) version 3 standard, as defined by RFC 1305, and also retains compatability with version 1 and 2 servers as defined by RFC 1059 and RFC 1119, respectively. The **xntpd** daemon does all computations in fixed point arithmetic and does not require floating point code.

The **xntpd** daemon reads from a configuration file (**/etc/ntp.conf** is the default) at startup time. You can override the configuration file name from the command line. You can also specify a working, although limited, configuration entirely on the command line, eliminating the need for a configuration file. Use this method when configuring the **xntpd** daemon as a broadcast or multicast client, that determines all peers by listening to broadcasts at runtime. You can display the **xntpd** daemon internal variables with the **ntpq** command (Network Time Protocol (NTP) query program). You can alter configuration options with the **xntpdc** command.

The **xntpd** daemon operates in several modes, including symmetric active/passive, client/server and broadcast/multicast. A broadcast/multicast client can automatically discover remote servers, compute one−way delay correction factors and comfigure itself automatically. This mode makes it possible to deploy a group of workstations without specifying a configuration file or configuration details specific to its environment.

> **Note:** When operating in a client mode running AIX Version 4.2.1 or later, the **xntpd** daemon will exit with an error if no configured servers are within 1000 seconds of local system time. Use the **date** or **ntpdate** command to set the time of a bad skewed system before starting **xntpd**.

Flags

−a	Runs in authenticate mode
−b	Listens for broadcast NTP and synchronizes to thems if available.
−c *ConfigFile*	Specifies the name of an alternate configuration file.
−d	Specifies debugging mode. This flag may occur multiple times (maximun of 10), with each occurance indicating greater detail of display.
−e *AuthenticationDelay*	Specifies the time, in seconds, it takes to compute the NTP encryption field on this computer.
−f *DriftFile*	Specifies the location of the drift file.
−k *KeyFile*	Specifies the location of the file which contains the NTP authentication keys.
−l*LogFile*	(lowercase L) Specifies the use of a log file instead of logging to syslog.
−m	Listens for multicast messages and synchronizes to them if available. Assumes mulitcast address 224.0.1.1.
−p *pidFile*	Specifies the name of the file to record the daemon's process id. There is no default.
−r *BroadcastDelay*	Specifies the default delay (in seconds) if the calibration procedure fails. Normally, the **xntpd** daemon automatically compensates for the network delay between the broadcast/multicast server and the client.
−s *StatsDirectory*	Specifies the directory to use for creating statistics files.
−t *TrustedKey*	Adds the specified key number to the trusted key list.
−v *SystemVariable*	Adds the specifed system variable
−V *SystemVariable*	Adds the specifed system variable listed by default.

Reference Clock Support

For the purposes of configuration, the **xntpd** daemon treats reference clocks in a manner analogous to normal NTP peers as much as possible. It refers to reference clocks by address, same as a normal peer is, though it uses an invalid IP address to distinguish them from normal peers. AIX Version 4.2 supports one type of reference clock, based on the system clock (type 1).

Reference clock addresses are of the form 127.127.*Type*.*Unit* where *Type* is an integer denoting the clock type and *Unit* indicates the type−specific unit number. You configure reference clocks by using a server statement in the configuration file where the *HostAddress* is the clock address. The key, version and ttl options are not used for reference clock support.

Reference clock support provides the **fudge** command, which configures reference clocks in special ways. This command has the following format:

fudge127.127.*Type***.***Unit* [**time1** *Seconds*] [**time2** *Seconds*] [**stratum** *Integer*] [**refid** *Integer*]
[**flag1 0** | **1**] [**flag2 0** | **1**] [**flag3 0** | **1**] [**flag4 0** | **1**]

The **time1** and **time2** options are in fixed point seconds and used in some clock drivers as calibration constants.

The **stratum** option is a number in the range zero to 15 and used to assign a nonstandard operating stratum to the clock. Since the **xntpd** daemon adds one to the stratum of each peer, a primary server ordinarily displays stratum one. In order to provide engineered backups, use the **stratum** option to specify the reference clock stratum as greater than zero. Except where noted, this option applies to all clock drivers.

The **refid** option is an ASCII string in the range one to four characters and used to assign a nonstandard reference identifier to the clock.

The binary flags: **flag1**, **flag2**, **flag3** and **flag4** are for customizing the clock driver. The interpretation of these values, and whether they are used at all, is a function of the needs of the particular clock driver.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: You must have root authority to run this command.

Auditing Events: N/A

Examples

1. To start the **xntpd** daemon, enter:

   ```
   startsrc -s xntpd
   ```

2. To stop the **xntpd** daemon, enter:

   ```
   stopsrc -s xntpd
   ```

3. To use the authentication key file `/etc/ntp.new.keys` when running the **xntpd** daemon, enter:

   ```
   /usr/sbin/xntpd -k /etc/ntp.new.keys
   ```

Files

/usr/sbin/xntpd	Contains the **xntpd** daemon.
/etc/ntp.conf	Contains the default configuration file.
/etc/ntp.drift	Contains the default drift file.
/etc/ntp.keys	Contains the default key file.

Related Information

The **ntpq**, **ntpdate**, **ntptrace**, and **xntpdc** commands.

xntpdc Command

Purpose

Starts the query/control program for the Network Time Protocol daemon, **xntpd**. This command only applies to AIX Version 4.2 or later.

Syntax

xntpdc Command
xntpdc
-i
-l
-n
-p
-s
-c SubCommand
Host

xntpdc [**−i**] [**−l**] [**−n**] [**−p**] [**−s**] [**−c** *SubCommand*] [*Host* ...]

Description

The **xntpdc** command queries the **xntpd** daemon about its current state and requests changes to that state. It runs either in interactive mode or by using command−line arguments. The **xntpdc** command interface displays extensive state and statistics information. In addition, nearly all the configuration options which you can specify at start−up using the **xntpd** daemon's configuration file, you can also specify at run−time using the **xntpdc** command.

If you enter the **xntpdc** command with one or more request flags, the NTP servers running on each of the hosts specified (or defaults to local host) receive each request. If you do not enter any request flags, the **xntpdc** command tries to read commands from standard input and run them on the NTP server running on the first host specified or on the local host by default. It prompts for subcommands if standard input is the terminal.

The **xntpdc** command uses NTP mode 7 packets to communicate with the NTP server and can query any compatable server on the network which permits it.

The **xntpdc** command makes no attempt to retransmit requests, and will time−out requests if the remote host does not respond within a suitable time.

Specifying a flag other than **−i** or **−n** sends the queries to the specified hosts immediately. Otherwise, the **xntpdc** command attempts to read interactive format commands from standard input.

Flags

−c *SubCommand*	Specifies an interactive format command. This flag adds *SubCommand* to the list of commands to run on the specified hosts. You can enter multiple **−c** flags.
−i	Specifies interactive mode. Standard output displays prompt and standard input reads commands.
−l	(lowercase L) Displays a list of the peers known to the servers. This is the same as the **listpeers** subcommand.
−n	Displays all host addresses in dotted decimal format (0.0.0.0) rather than the canonical host names.

−p	Displays a list of the peers known to the server and a summary of their state. This is the same as the **peers** subcommand.
−s	Displays a list of the peers known to the server and a summary of their state but in a format different from the **−p** flag. This is the same as the **dmpeers** subcommand.

Parameters

Host ... Specifies the hosts.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Security

Access Control: You must be part of the system group to run this command.

Auditing Events: N/A

Displays per−peer statistic counters associated with the specified peers.

Examples

1. To start the query/control program for the Network Time Protocol daemon, enter:

   ```
   xntpdc
   ```

2. To display the statistic counters of the peer at address 127.127.1.0 on host 9.3.149.107, enter:

   ```
   xntpdc −c "pstats 127.127.1.0" 9.3.149.107
   ```

   Output similar to the following appears:

   ```
   remote host:   LOCAL(0)
   local interface:   127.0.0.1
   time last received:   49s
   time until next send:   15s
   reachability change:   818s
   packets sent:   13
   packets received:   13
   bad authentication:   0
   bogus origin:   0
   duplicate:   0
   bad dispersion:   4
   bad reference time:   0
   candidate order:   1
   ```

xntpdc Internal Subcommands

You can run a number of interactive format subcommands entirely within the **xntpdc** command that do not send NTP mode 7 requests to a server. The following subcommands can only be used while running the **xntpdc** query program.

Interactive Format Subcommands

Interactive format subcommands consist of a keyword followed by zero to four arguments. You only need to type enough characters of the full keyword to uniquely identify the subcommand. The output of a subcommand goes to standard output, but you can redirect the output of individual subcommands to a file by appending a greater−than sign (>), followed by a file name, to the command line.

? [*SubCommand*]	Displays command usage information. When used without *SubCommand*, displays a list of all the **xntpdc** command keywords. When used with *SubCommand*, displays function and usage information about the command.
help [*SubCommand*]	Same as the **?** [*Subommand*] subcommand.
delay*Milliseconds*	Specifies the time interval to add to timestamps included in requests which require authentication. This subcommand enables unreliable server reconfiguration over long delay network paths or between machines whose clocks are unsynchronized. If you enter this subcommand without an argument, it prints the current setting for this subcommand.
host *HostName*	Specifies the host to send quieries to. *HostName* may be either a host name or a numeric address. If you enter this subcommand without an argument, it prints the current setting for this subcommand.
hostnamesyes | **no**	Specifies whether to display the host name (**yes**) or the numeric address (**no**). The default is **yes** unless the **−n** flag is used. If you enter this subcommand without an argument, it prints the current setting for this subcommand.
keyid*Number*	Specifies the server key number to use to authenticate configuration requests. If you enter this subcommand without an argument, it prints the current setting for this subcommand.
passwd	Prompts you to type in the NTP server authentication password to use to authenticate configuration requests.
quit	Exits the **xntpdc** query program.
timeout*Milliseconds*	Specifies the time−out period for responses to server queries. The default is 8000 milliseconds. If you enter this subcommand without an argument, it prints the current setting for this subcommand.

Query Subcommands

The **xntpdc** query subcommands result in sending NTP mode 7 packets containing requests to the server. These subcommands are read−only (they do not modify the server configuration state).

clkbug*ClockPeerAddress* [*Addr2*] [*Addr3*] [*Addr4*]

Displays debugging information for a reference clock driver. Some clock drivers provide this information which is mostly undecodable without a copy of the driver source in hand.

clockbug*ClockPeerAddress* [*Addr2*] [*Addr3*] [*Addr4*]

Displays information concerning a peer clock. The values obtained provide information on the setting of fudge factors and other clock performance information.

dmpeers

Displays a list of peers for which the server is maintaining state, along with a summary of that state. Identical to the output of the **peers** subcommand except for the character in the leftmost column. Characters only appear beside peers which were included in the final stage of the clock selection algorithm.

The possible character in the leftmost column are:

.
: Indicates that this peer was cast off in the falseticker detection.

+
: Indicates that the peer made it through.

*
: Denotes the peer the server is currently synchronizing with.

iostats
Displays statistics counters maintained in the input−output module.

kerninfo
Displays kernel phase−lock loop operating parameters. This information is available only if the kernel of the hosts being generated has been specially modified for a precision timekeeping function.

listpeers
Displays a brief list of the peers for which the server is maintaining state. These include all configured peer associations as well as those peers whose stratum is such that the server considers them to be possible future synchonization candidates.

loopinfo [**oneline** | **multiline**]
Displays the values of selected loop filter variables. The loop filter is the part of NTP that adjusts the local system clock. The `offset` is the last offset given to the loop filter by the packet processing code. The `frequency` is the frequency error of the local clock in parts−per−million (ppm). The `poll adjust` controls the stiffness (resistance to change) of the phase−lock loop and the speed at which it can adapt to oscillator drift. The `watchdog timer` is the number of elasped seconds since the last sample offset given to the loop filter. The **oneline** and **multiline** options specify the format to display this information. The **multiline** option is the default.

memstats
Displays statistics counters related to memory allocation code.

monlist
Displays traffic counts collected and maintained by the monitor facility.

peers
Displays a list of peers for which the server is maintaining state, along with a summary of that state. Summary information includes:

- address of the remote peer,
- reference ID (0.0.0.0 for an unknown reference ID),
- the stratum of the remote peer (a stratum of 16 indicates the remote peer is unsynchronized),
- the polling interval (seconds),
- the reachability register (octal), and
- the current estimated delay, offset and dispersion of the peer (seconds).

The character in the left margin indicates the mode this peer entry is in:

+
: symmetric active.

−
: symmetric passive.

=
: remote server polled in client mode.

^
: server is broadcasting to this address.

~
: remote peer is sending broadcasts.

*
: marks the peer the server is currently synchronizing to.

The contents of the host field may be a host name, an IP address, a reference clock implementation name with its parameter or REFCLK

	(*ImplementationNumber, Parameter*). Only IP addresses display when using **hostanames no**.
pstats*PeerAddress* [*Addr2*] [*Addr3*] [*Addr4*]	
	Displays per−peer statistic counters associated with the specified peers.
reslist	Displays the server's restriction list which may help to understand how the restrictions are applied.
sysinfo	Displays a variety of system state variables related to the local server. All except the last four lines are described in the NTP Version 3 specification, RFC 1305. The system flags show various system flags, some of which can be set and cleared by the **enable** and **disable** configuration statements. The `stability` is the residual frequency error remaining after applying the system frequency correction. You use it for maintenance and debugging. In most architectures, this value will initially decrease from as high as 500 ppm to a nominal value in the range .01 to 0.1 ppm. If it remains high for some time after starting the daemon, something may be wrong with the local clock, or the value of the kernel variable *Tick* may be incorrect. The `broadcastdelay` shows the default broadcast delay, as set by the **broadcastdelay** configuration statement, while the `authdelay` shows the default authentication delay, as set by the **authdelay** configuration statement.
sysstats	Displays statistics counters maintained in the protocol module.
timerstats	Displays statistics counters maintained in the timer/event queue support code.

Runtime Configuration Requests Subcommands

The server authenticates all requests which cause state changes in the server by using a configured NTP key. The server can also disable this facility by not configuring a key. You must make the key number and the corresponding key known to the **xtnpdc** command. You can do this by using the **keyid** and **passwd** subcommands, which prompts at the terminal for a password to use as the encryption key. The **xtnpdc** command will also prompt you automatically for both the key number and password the first time you give a subcommand which would result in an authenticated request to the server. Authentication not only verifies that the requester has permission to make such changes, but also protects against transmission errors.

Authenticated requests always include a timestamp in the packet data, as does the computation of the authentication code. The server compares this timestamp to the time at which it receives the packet.

The server rejects the request if they differ by more than 10 seconds. This makes simple replay attacks on the server, by someone able to overhear traffic on your LAN, much more difficult. It also makes it more difficult to request configuration changes to your server from topologically remote hosts. While the reconfiguration facility works well with a server on the local host, and may work adequately between time−synchronized hosts on the same LAN, it works very poorly for more distant hosts. So, if you choose reasonable passwords, take care in the distribution and protection of keys and apply appropriate source address restrictions, the run−time reconfiguration facility should provide an adequate level of security.

The following subcommands all make authenticated requests.

addpeer*PeerAddress* [*Keyid*] [*Version*] [**prefer**]	
	Adds a configured peer association operating in symmetric active mode at the specified address. You may delete an existing association with the same peer or simply convert an existing association to conform to the new configuration when using this subcommand. If the *Keyid* is a nonzero integer, all outgoing packets to the remote server

will have an authentication field attached encrypted with this key. To specify no authentication , enter *Keyid* as 0 or leave blank. The values for *Version* can be 1, 2 or 3, with 3 as the default. The **prefer** option indicates a preferred peer used primarily for clock synchronisation if possible. The preferred peer also determines the validity of the PPS signal. If the preferred peer is suitable for synchronization, so is the PPS signal.

addserver*PeerAddress* [*Keyid*] [*Version*] [**prefer**]
: Same as the **addpeer** subcommand, except that the operating mode is client.

addtrap*Address* [*Port*] [*Interface*]
: Sets a trap for asynchronous messages at the specified address and port number for sending messages with the specified local interface address. If you do not specify the port number, the value defaults to 18447. If you do not specify the interface address, the value defaults to the source address of the local interface.

authinfo
: Displays information concerning the authentication module, including known keys and counts of encryptions and decryptions performed.

broadcast*PeerAddress* [*Keyid*] [*Version*]
: Same as the **addpeer** subcommand, except that the operating mode is broadcast. The *PeerAddress* can be the broadcast address of the local network or a multicast group address assigned to NTP (224.0.1.1).

clrtrap*Address* [*Port*] [*Interface*]
: Clears a trap for asynchronous messages at the specified address and port number for sending messages with the specified local interface address. If you do not specify the port number, the value defaults to 18447. If you do not specify the interface address, the value defaults to the source address of the local interface.

delrestrict*AddressMask* [**ntpport**]
: Deletes the matching entry from the restrict list.

disable*Option ...*
: Disables various server options. Does not affect options not mentioned. The **enable** subcommand describes the options.

enable*Option ...*
: Enables various server options. Does not affect options not mentioned. You can specify one or more of the following values for *Option*:

auth
: Causes the server to synchronize with unconfigured peers only if the peer has been correctly authenticated using a trusted key and key identifier. The default for this option is disable (off).

bclient
: Causes the server to listen for a message from a broadcast or multicast server, following which an association is automatically instantiated for that server. The default for this argument is disable (off).

monitor
: Enables the monitoring facility, with default enable (on).

pll
: Enables the server to adjust its local clock, with default enable (on). If not set, the local clock free−runs at its intrinsic time and frequency offset. This option is useful when the local clock is controlled by some other device or protocol and NTP is used only to provide synchronization to other clients.

stats
: Enables statistics facility filegen, with default enable (on).

fudge*PeerAddress* [*Time1*] [*Time2*] [*Stratum*] [*Refid*]
: Provides a way to set certain data for a reference clock.

Time1 and *Time2* are in fixed point seconds and used in some clock drivers as calibration constants.

Stratum is a number in the range zero to 15 and used to assign a nonstandard operating stratum to the clock.

Refid is an ASCII string in the range one to four characters and used to assign a nonstandard reference identifier to the clock.

monitoryes | **no**
: Enables or disables the monitoring facility. A **monitorno** subcommand followed by a **monitoryes** subcommand is a good way of resetting the packet counts.

readkeys
: Purges the current set of authentication keys and obtains a new set by rereading the keys file specified in the **xntpd** configuration file. This allows you to change encryption keys without restarting the server.

reset*Module*
: Clears the statistics counters in various modules of the server. You can specify one or more of the following values for *Module*: **io**, **sys**, **mem**, **timer**, **auth**, **allpeers**.

restrict*AddressMaskOption ...*
: Adds the values of *Option* to an existing restrict list entry, or adds a new entry to the list with the specified *Option*. The **mask** option defaults to 255.255.255.255, meaning that *Address* is treated as the address of an individual host. You can specify one or more of the following values for *Option*:

ignore
: Ignore all packets from hosts which match this entry. Does not respond to queries nor time server polls.

limited
: Specifies that these hosts are subject to client limitation from the same net. Net in this context refers to the IP notion of net (class A, class B, class C, etc.). Only accepts the first **client_limit** hosts that have shown up at the server and that have been active during the last **client_limit_period** seconds. Rejects requests from other clients from the same net. Only takes into account time request packets. Private, control, and broadcast packets are not subject to client limitation and therefore do not contribute to client count. The monitoring capability of the **xntpd** daemon keeps a history of clients. When you use this option, monitoring remains active. The default value for **client_limit** is 3. The default value for **client_limit_period** is 3600 seconds.

lowpriotrap
: Declare traps set by matching hosts to low priority status. The server can maintain a limited number of traps (the current limit is 3), assigned on a first come, first served basis, and denies service to later trap requestors. This parameter modifies the assignment algorithm by allowing later requests for normal priority traps to override low priority traps.

nomodify
: Ignore all NTP mode 6 and 7 packets which attempt to modify the state of the server (run time reconfiguration). Permits queries which return information.

nopeer
: Provide stateless time service to polling hosts, but not to allocate peer memory resources to these hosts.

noquery
: SIgnore all NTP mode 6 and 7 packets (information queries and configuration requests) from the source. Does not affect time service.

noserve
: Ignore NTP packets whose mode is not 6 or 7. This denies time service, but permits queries.

notrap
: Decline to provide mode 6 control message trap service to matching hosts. The trap service is a subsystem of the mode 6 control message protocol intended for use by remote event logging programs.

notrust
: STreat these hosts normally in other respects, but never use them as synchronization sources.

ntpport
: Match the restriction entry only if the source port in the packet is the standard NTP UDP port (123).

setprecision*Precision*	Sets the precision which the server advertises. *Precision* should be a negative integer in the range −4 through −20.
traps	Displays the traps set in the server.
trustkey*Keyid ...*	Adds one or more keys to the trusted key list. When you enable authentication, authenticates peers with trusted time using a trusted key.
unconfig*PeerAddress* [*Addr2*] [*Addr3*] [*Addr4*]	Removes the configured bit from the specified peers. In many cases deletes the peer association. When appropriate, however, the association may persist in an unconfigured mode if the remote peer is willing to continue on in this fashion.
unrestrict*AddressMaskOption ...*	Removes the specified options from the restrict list entry indicated by *Address* and *Mask*. The **restrict** subcommand describes the values for *Option*.
untrustkey*Keyid ...*	Removes one or more keys from the trusted key list.

Files

/usr/sbin/xntpdc Contains the **xntpdc** command.

Related Information

The **ntpq**, **ntpdate**, and **ntptrace** commands.

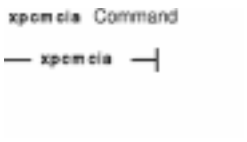
The **xntpd** daemon.

xpcmcia Command

Purpose

Starts PCMCIA GUI (Graphical User Interface) utility.

Syntax



xpcmcia

Description

The **xpcmcia** command starts the PCMCIA GUI utility, a graphical interface that enables you to know the real time state of the PCMCIA cards installed in your machine.

The PCMCIA GUI utility displays icons in the xpcmcia window for each PC card slot to indicate their state. Each icon represents a device in a slot and what state the device is in. When there is no PC card inserted in a slot, the image for "empty" is displayed. The description of the device can be viewed in a popup window by moving the mouse pointer onto the device icon.

Security

Access Control: Any User

Files Accessed: None

Examples

To start PCMCIA GUI utility, enter:

```
xpcmcia
```

Files

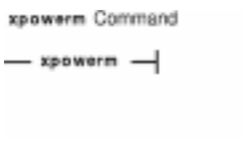
/usr/lpp/X11/bin/xpcmcia Contains the **xpcmcia** command.

xpowerm Command

Purpose

Starts Power Management GUI (Graphical User Interface) utility.

Syntax



xpowerm

Description

The **xpowerm** command starts Power Management GUI utility, a graphical interface that enables you to perform Power Management tasks without entering complex commands.

The Power Management GUI utility displays two function buttons: the system transition button, and the Power Management parameter button.

> **Note:** If the power management controller (pmc) and the power management daemon (pmd) are not available, you can not run the PM GUI utility, XPOWERM. Motif will display an error message. The PM GUI utility, XPOWERM, requires that the power management controller (pmc) be configured, and the power management daemon (pmd) running.

System Transition Button

You can change the destination of system state transition by clicking the right mouse button on the system transition button. A popup menu appears from which you can select a state. The selected state can be viewed in a popup window by moving the mouse pointer onto the button area.

Power Management Parameter Button

You can display the Power Management parameters (all of the items in SMIT) by clicking the Power Management parameter button.

Battery Indicator

If your system has an inner battery, an indicator showing approximate battery time remaining and the current power source (AC or DC) is displayed. You can discharge the inner battery by clicking the right mouse button on the battery indicator area. A popup menu appears from which you can select "discharge".

Security

Access Control: Any User

Files Accessed: None

Examples

To start Power Management GUI utility, enter:

```
xpowerm
```

Files

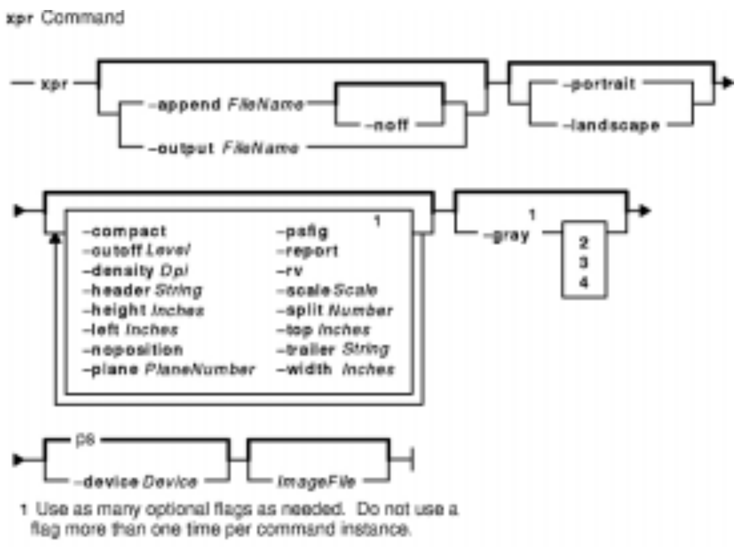
/usr/lpp/X11/bin/xpowerm Contains the **xpowerm** command.

xpr Command

Purpose

Formats a window dump file for output to a printer.

Syntax



xpr [**−append** *FileName* [**−noff**] | **−output** *FileName*] [**−landscape** | **−portrait**]
[**−compact**] [**−cutoff** *Level*] [**−density** *Dpi*] [**−gray** { **2** | **3** | **4** }] [**−header** *String*]
[**−height** *Inches*] [**−left** *Inches*] [**−noposition**] [**−plane** *PlaneNumber*] [**−psfig**] [**−report**]
[**−rv**] [**−scale** *Scale*] [**−split** *Number*] [**−top** *Inches*] [**−trailer** *String*] [**−width** *Inches*]
[**−device** *Device*] [*ImageFile*]

Description

The **xpr** command uses a window dump file produced by the **xwd** utility as input and formats the dump file for output on all printers supported by the hardware. If you do not specify a file argument, the **xpr** command uses standard input. By default, the **xpr** command prints the largest possible representation of the window on the output page.

The **xpr** command options allow you to add headers and trailers, specify margins, adjust the scale and orientation, and append multiple window dumps to a single output file. Output is to standard output unless the **−output** flag is specified.

Flags

−append *FileName*	Specifies a file name previously produced by the **xpr** command to which the window is to append. (This flag is not supported on PostScript printers.)
−compact	Uses simple run−length encoding for compact representation of windows with many white pixels. This flag compresses white space but not black space, so it is not useful for reverse−video windows. (This flag supports PostScript, LIPS II+, and LIPSIII output only.)

−cutoff*Level*	Changes the intensity level where colors are mapped to black or white for monochrome output on a LaserJet printer. The *Level* variable is expressed as a percentage of full brightness. Fractions are acceptable.
−device *Device*	Specifies the device on which the file prints. The **xpr** command supports the following printers: ***3812** or **pp*** IBM PP3812 ***4207*** Proprinter ***5201*** IBM Quietwriter 1 model 2 ***5202*** IBM Quietwriter 2 ***jprinter*** IBM Japanese Printer (Japanese data stream) ***ljet*** HP LaserJet and IBM Laser Printer ***ps*** PostScript printers (this is the default) ***lips2*** Canon LaserShot LIPS II+ mode ***lips3*** Canon LaserShot LIPS III mode
−density *Dpi*	Indicates the dots−per−inch (dpi) density that the HP printer uses. 300 dpi is the default. Allowable densities are 300, 150, 100, and 75 dpi.
−gray *Number*	Specifies gray−scale conversion to a color image, rather than mapping to a black−and−white image. The *Number* variable must be one of the following: ***2*** 2 x 2 conversion ***3*** 3 x 3 conversion ***4*** 4 x 4 conversion This conversion doubles, triples, or quadruples, respectively, the effective width and height of the image. **Note:** This option is valid only for PostScript printers.
−header *String*	Specifies a header string to print above the window.
−height *Inches*	Specifies the maximum height of the page.
ImageFile	Contains the captured bitmap of the image. If you do not specify the *ImageFile* parameter, the **xpr** command uses standard input.
−landscape	Forces the window to print in landscape mode. (The display is laid out with the windows being wider than they are high.) By default, a window prints so that its longest side follows the long side of the paper.
−left *Inches*	Specifies the left margin in inches. Fractions are acceptable. By default, this flag prints the window on the center of the page.
−noff	When specified in conjunction with the **−append** flag, the window is displayed on the same page as the previous window. (This flag is not supported on PostScript printers.)
−noposition	Causes the header, trailer, and image positioning command generation to be bypassed for the LaserJet printer.
−output *FileName*	Specifies an output file name. If you do not specify this option, the **xpr** command uses standard output.

−plane*PlaneNumber*	Specifies which bit plane to use in an image. The default uses the entire image and maps values into black and white based on color intensities. This option is not supported for the LaserJet printer.
−portrait	Forces the window to print in portrait mode. (The display is laid out with the windows being higher than they are wide.) By default, a window prints so that its longest side follows the long side of the paper.
−psfig	Suppresses translation of the PostScript picture to the center of the page.
−report	Prints out statistics to standard error about the window *ImageFile* parameter.
−rv	Forces the window to print in reverse video.
−scale *Scale*	Affects the size of the window on the page. PostScript printers are able to translate each bit in a window pixel map into a grid of a specified size. For example, each bit might translate into a 3 x 3 grid. To specify a 3 x 3 grid, enter **−scale 3**. By default, a window prints with the largest scale that fits on the page for the specified orientation. If you do not specify a device, the aspect ratio can vary.
−split *Number*	Splits a window into several pages. This might be necessary for very large windows that would otherwise cause the printer to overload and print the page in an obscure manner. (This flag is not supported on PostScript or HP Laserjet printers.)
−top *Inches*	Specifies the top margin for the window in inches. Fractions are acceptable. By default, this flag prints the window on the center of the page.
−trailer *String*	Specifies a trailer string to print below the window.
−width *Inches*	Specifies the maximum width of the page.

Note: The 4207, 5201, and 5202 printers' images must be recorded by the **xwd** utility in XYPixmap or XYBitmap format. XYPixmap images are converted into bitmaps using a thresholding algorithm. For the HP Laserjet printer, multiplane images must be recorded in ZPixmap format. Single plane images may be either XYPixmap, XYBitmap, or ZPixmap formats.

Related Information

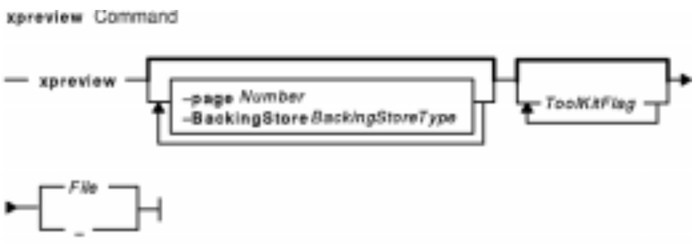
The **X** command, **xwd** command, **xwud** command.

xpreview Command

Purpose

Displays troff files on an X display.

Syntax



xpreview [**−BackingStore** *BackingStoreType*] [**−page** *Number*] [*ToolKitFlag ...*] { *File* | **−** }

Description

The **xpreview** command is an AIXwindows 2.1− and Motif2.1−based application that displays output from the **troff** command on an AIXwindows display. The **troff** command output file must be prepared for the devX100 device.

The user interface contains the standard AIXwindows interface controls for calling the root menu, iconifying the window, and setting the window to full screen size. The interface also includes a main window with a scrollable display area for text. Use the pushbuttons for Next, Previous, Goto Page, Print Page, Print File, and Newfile to manipulate the viewing document.

Mouse button three actuates a popup menu for configuring print capabilities. The menu includes an option to set the command line and another to select a printer queue. The command line dialog box expects command line input through the **troff** command. For example,

```
pic −Tibm3816 troff−input−file |tbl|troff −mm −Tibm3816
```

is an acceptable command line. The printer queue option displays a list of configured printer queues. If this option is not selected, the **xpreview** command uses the system−defined default queue.

When you are previewing an input file, the Print Page and Print File buttons require command line input. Note that once a printer queue is selected, it remains selected for the duration of the viewing session, or until an alternate printer queue is selected.

Fonts supported for the devX100 device in European locales are:

- Times New Roman in normal, italic, and bold
- Courier in normal and bold
- Helvetica in normal and bold
- Symbol

The **xpreview** command supports the following font sizes: 8, 10, 14, 18, 24, 30, and 36.

The **xpreview** command does not display files resulting from the **troff** command constructed for a device other than those described in this document.

To preview a file on a certain device, the **xpreview** command requires the fonts found in the following directories:

- **/usr/lib/X11/fonts** directory for files formatted for font files other than Japanese
- **/usr/lib/X11/fonts/JP** for Japanese font files

Xstation Support

The **xpreview** command can display the devX100 formatted files on an Xstation. The Xstation must be configured to include **/usr/lib/X11/fonts/i18n** in the font path. To preview Japanese character files, the font path should include **/usr/lib/X11/fonts/JP**.

Multibyte Support

The **xpreview** command supports multibye locales. Also, to display Japanese characters, Japanese 16−dot fonts (part of the Japanese BSL package) and 24− and 32−dot fonts (part of the AIXwindows font package) must be installed. To display Korean characters, Korean fonts (part of the Korean BSL package) must be installed.

Japanese support currently includes the following font sets:

- In 16−dot: RomanKn12, Kanji12, and IBM_JPN12
- In 24−dot: RomanKn17, Kanji17, and IBM_JPN17
- In 32−dot: RomanKn23, Kanji23, and IBM_JPN23, or RomanKn23G, Kanji23G, and IBM_JPN23G

Korean support currently includes the following font sets:

- In 16−dot, EnglHg16 and Hangul16
- In 24−dot, EnglHg24 and Hangul24

Flags

The **xpreview** command accepts the standard **X** Toolkit command line flags, as well as the following flags:

−	Requires input to be read from standard input.
−help	Indicates that a brief summary of the allowed command line flags should be printed.
−BackingStore*BackingStoreType*	The **−BackingStore** flag causes the server to save the window contents so that when it is scrolled around the viewport, the window is painted from contents saved in server backing store. Redisplays of the drawing window can take up to a second or so. The *BackingStoreType* parameter can have one of the following values: **Always**, **WhenMapped** or **NotUseful**. **Notes:** 1. Enter a space between the **−BackingStore** flag and its *BackingStoreType* parameter. 2. Use of this flag requires that the server be started with backing store enabled.
−page*Number*	Specifies the page number of the document to be first displayed.
ToolKitFlag	The following standard **X** Toolkit flags are commonly used with the **xpreview** command: ***−bg****Color* Specifies the color to use for the background of the window. The default is white.

	−bg*Color* Specifies the color to use for the background of the window. The default is white. ***−fg****Color* Specifies the color to use for displaying text. The default is black. ***−geometry*** *Geometry* Specifies the preferred size and position of the window. ***−display****Host***:***Display* Specifies the **X** server to contact. ***−xrm****ResourceString* Specifies a resource string to be used.
File	Specifies the file to be printed.

Examples

1. To build files output by the **troff** command into files that are suitable for use with the **xpreview** command, enter the following commands:

   ```
   troff−TX100 troff−input | xpreview
   pic −TX100 pic−troff−input | tbl | troff −man −TX100 | xpreview
   ```

2. To build files output by the **troff** command into files that are suitable for use with the Japanese language version of the **xpreview** command, enter the following commands:

   ```
   LANG=ja_JP
   troff −TX100 troff−input | xpreview −
   pic −TX100 pic−troff−input | tbl | troff −man −TX100 \
           | xpreview −
   ```

Files

/usr/lib/X11/app−defaults/XPreview	Contains user−configurable applications defaults file.
/usr/lib/X11/Ja_JP/app−defaults/XPreview	Contains user−configurable applications default file for the Japanese (IBM−932) locale.
/usr/lib/X11/ja_JP/app−defaults/XPreview	Contains user−configurable applications default file for the Japanese (IBM−eucJP) locale.
/usr/lib/X11/ko_KR/app−defaults/XPreview	Contains user−configurable applications default file for the Korean locale.
/usr/lib/X11/zh_TW/app−defaults/XPreview	Contains user−configurable applications default file for the Traditional Chinese locale.
/usr/lib/font/devX100	Contains troff fonts for devX100 devices.
/usr/lib/X11/fonts	Contains X fonts for 100 dpi devices.
/usr/lib/X11/fonts/JP	Contains X fonts for multi−byte characters.
/usr/lib/X11/fonts/JP	Contains X fonts for Japanese characters.

Related Information

The **cat** command, **csplit** command, **diff** command, **lint** command, **lp** command, **lpr** command, **pg** command, **pr** command, **qprt** command, **sed** command, **sort** command, **tabs** command, **X** command, **xrdb** command.

The **eqn** command, **grap** command, **pic** command, **tbl** command, **troff** command, **X** command, **xrdb** command.

AT&T Bell Laboratories Computing Science Technical Report No. 14, *GRAP − A Language for Typesetting*

Graphs. Tutorial and User Manual by John L Bentley and Brian W. Kernighan.

The **nl_langinfo** subroutine in *Technical Reference: Base Operating System and Extensions*.

Some Applications of Inverted Indexes on the UNIX *System* by M.E. Lesk.

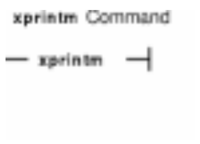
UNIX System V Documentor's Workbench Reference Manual. ISBN 0−13−943580−8. Prentice Hall.

xprintm Command

Purpose

Starts Print Manager, a Visual System Management (VSM) application.

Syntax



xprintm

Description

The **xprintm** command starts Print Manager, one of the Visual System Management (VSM) applications. Print Manager is a graphical interface that enables you to perform printer and queue tasks through direct manipulation of objects (icons), freeing you from entering complex command syntax or from searching through menus.

Print Manager enables you to perform basic tasks on printers and queues and is designed to make creating queues much simpler. In addition, it provides a graphical representation of queue and printer attachments as well as print jobs waiting in the queue. However, you must use SMIT to start or schedule print jobs.

The Print Manager session creates or adds to the **smit.log** and **smit.script** files in your home directory. (These are the same files appended when you run a SMIT session.) The commands built and run by Print Manager are added to the end of the **smit.log** file along with the command output.

The time, name of the task, and the command (flags and parameters included) are added to the end of the **smit.script** file in a format that can easily be used to create executable shell scripts.

Example

To start Print Manager, enter:

```
xprintm
```

To see a list tasks you can perform for an object or area, press the right mouse button to display its pop−up menu. Read the text in the Information Area for help on the objects and areas.

Files

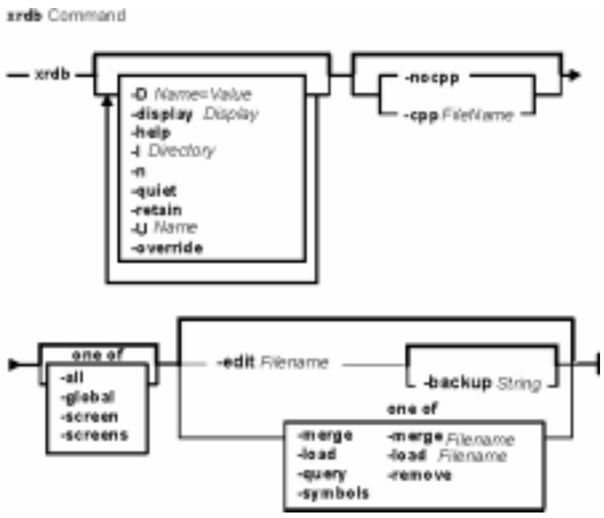
smit.log	Specifies detailed information on your session, with time stamps.
smit.script	Specifies the task commands run during your session, with time stamps.

xrdb Command

Purpose

X Server resource database utilities.

Syntax



xrdb [**−display** *Display*] [**−help**] [**−quiet**] [**−retain**] [**−cpp** *FileName* | **−nocpp**]
[**−D** *Name*=*Value*] [**−I***Directory*] [**−U** *Name*] [**−all** | **−global** | **−screen** | **−screens**] [**−n**]
[**−edit** *FileName* | [**−backup** *String*] | **−merge** [*FileName*] | **−load** [*FileName*]
| **−query** | **−remove** | **symbols**] **−override**]

Description

The **xrdb** command gets or sets the contents of the RESOURCE_MANAGER property on the root window of screen 0 or the SCREEN_RESOURCES property on the root window of any or all screens, or everything combined. You normally run this program from your X startup file.

Most X clients use the RESOURCE_MANAGER and SCREEN_RESOURCES properties to get user preferences about color, fonts, and so on for applications. Having this information in the server (where it is available to all clients) instead of on disk solves the problem in previous versions of X that required you to maintain *defaults* files on every machine that you might use. It also allows for dynamic changing of defaults without editing files.

The RESOURCE_MANAGER property specifies resources that apply to all screens of the display. The SCREEN_RESOURCES property on each screen specifies additional (or overriding) resources to be used for that screen. (When there is only one screen, SCREEN_RESOURCES is normally not used; all resources are placed in the RESOURCE_MANAGER property.)

For compatibility, if there is no RESOURCE_MANAGER property defined (either because the **xrdb** command was not run or if the property was removed), the resource manager looks for a file called **.Xdefaults** in your home directory.

The file name (or the standard input if − or no file name is given) is optionally passed through the C preprocessor with the following symbols defined, based on the capabilities of the server being used:

SERVERHOST=*Hostname*	Specifies the hostname portion of the display to which you are connected.
SRVR_*name*	Turns the **SERVERHOST** hostname string into a legal identifier. For example `my-dpy.lcs.mit.edu` becomes `SRVR_my_dpy_lcs_mit_edu`.
HOST=*Hostname*	Specifies the hostname portion of the display to which you are connected.
DISPLAY_NUM=*num*	Specifies the number of the display on the server host.
CLIENTHOST=*Hostname*	Specifies the name of the host on which xrdb is running.
CLNT_*name*	Turns the **CLIENTHOST** hostname string into a legal identifier. For example `expo.lcs.mit.edu` becomes `CLNT_expo_lcs_mit_edu`.
WIDTH=*Number*	Specifies the width of the default screen in pixels.
HEIGHT=*Number*	Specifies the height of the default screen in pixels.
X_RESOLUTION=*Number*	Specifies the x resolution of the default screen in pixels per meter.
Y_RESOLUTION=*Number*	Specifies the y resolution of the default screen in pixels per meter.
PLANES=*Number*	Specifies the number of bit planes (the depth) of the root window of the default screen.
RELEASE=*Number*	Specifies the vendor release number for the server. The interpretation of this number varies depending on **VENDOR**.
REVISION=*Number*	Specifies the X protocol minor version supported by this server (currently 0).
VERSION=*Number*	Specifies the X protocol major version supported by this server (should always be 11).
VENDOR=*Vendor*	A string specifying the vendor of the server.
VNDR_*name*	Turns the **VENDOR** name string into a legal identifier. For example `MIT X Consortium` becomes `VNDR_MIT_X_Consortium`.
EXT_*name*	Turns each extension string into a legal identifier. A symbol is defined for each protocol extension supported by the server. For example `X3D-PEX` becomes `EXT_X3D_PEX`.
NUM_SCREENS=*num*	Specifies the total number of screens.
SCREEN_NUM=*num*	Specifies the number of current screen. from 0 (zero).
BITS_PER_RGB=*Number*	Specifies the number of significant bits in an RGB color specification. This is the log base 2 of the number of distinct shades of each primary that the hardware can generate. Note that it is not related to **PLANES**.
CLASS=*VisualClass*	Specifies the visual class of the root window of the default screen which is one of the following:
CLASS_*visualclass=visualid*	Specifies the visual class of the root window in a form can *#ifdef* on. The value is the numeric id of the visual.
	DirectColor, **GrayScale**, **PseudoColor**, **StaticColor**, **StaticGray**, **TrueColor**
CLASS_*visualclass_depth=num*	A symbol is defined for each visual supported for the screen. The symbol includes the class of the visual and its depth; the value is the numeric id of the visual. (If more than one visual has the same class and depth, the numeric id of the first one reported by the server is used.)S
COLOR	Defined only if **CLASS** is one of **StaticColor**, **PseudoColor**, **TrueColor**, or **DirectColor**.

Comment lines begin with an ! (exclamation mark) and are ignored.

Since **xrdb** can be read from standard input, use it to change the contents of properties directly from a terminal or from a shell script.

Flags

−all	Indicates that operation is performed on the screen−independent resource property (RESOURCE_MANAGER), as well as the screen−specific property (SCREEN_RESOURCES) on every screen of the display. For example, when used in conjunction with **−query**, the contents of all properties are output. For **−load** and **−merge**, the input file is processed once for each screen. The resources that occur in common in the output for every screen are collected and applied as the screen−independent resources. The remaining resources are applied for each individual per−screen property. This is the default mode of operation. This option is specific to X11R5.
−backup *String*	Specifies a suffix to append to the file name. Use it with **−edit** to generate a backup file. **−edit** is a prerequisite for **−backup** *String.*
−cpp *FileName*	Specifies the pathname of the C preprocessor program to use. Although the **xrdb** command was designed to use CPP, any program that acts as a filter and accepts the **−D**, **−I**, and **−U** flags can be used.
−D*Name*=*Value*	Passes through to the preprocessor and defines symbols to use with conditionals such as `#ifdef.`
−display *Display*	Specifies the X Server to use. It also specifies the screen to use for the **−screen** option, and it specifies the screen from which preprocessor symbols are derived for the **−global** option.
−edit *FileName*	Indicates that the contents of the specified properties should be edited into the given file, replacing any values listed there. This allows you to put changes you made to your defaults back into your resource file, preserving any comments or preprocessor lines.
−global	Indicates that the operation should only be performed on the screen−independent RESOURCE_MANAGER property. This option is specific to X11R5.
−help	Prints a brief description of the allowed flags.
−I*Directory*	(uppercase i) Passes through to the preprocessor and specifies a directory to search for files referenced with `#include.`
−load	Indicates that the input is loaded as the new value of the specified properties, replacing the old contents. This is the default action.
−merge	Indicates that the input merges with, instead of replaces, the current contents of the specified properties. This option performs a lexicographic sorted merge of the two inputs, which is probably not what you want, but remains for backward compatibility.
−n	Indicates that changes to the specified properties (when used with **−load** or **−merge**) or to the resource file (when used with **−edit**) should be shown on the standard output, but should not be performed. This option is specific to X11R5.
−nocpp	Indicates that the **xrdb** command should not run the input file through a preprocessor before loading it into properties.
−override	Indicates that the input should be added to, instead of replacing, the current contents of the specified properties. New entries override previous entries.
−query	Indicates that the current contents of the specified properties should print onto the standard output. Note that since preprocessor commands in the input resource file are part of the input file, not part of the property, they do not appear in the output from this flag.
−quiet	Indicates that a warning about duplicate entries should not display. This option is specific to X11R5.
−remove	Indicates that the specified properties should be removed from the server.
−retain	Indicates that the server should be instructed not to reset if the **xrdb** command is the first client. This should never be necessary under normal conditions, since the **xdm** and **xinit** commands always act as the first client. This option is specific to X11R5.
−screen	Indicates that the operation should only be performed on the SCREEN_RESOURCES property of the default screen of the display. This option is specific to X11R5.
−screens	Indicates that the operation should be performed on the SCREEN_RESOURCES property

	of each screen of the display. For **−load** and **−merge**, the input file is processed once for each screen. This option is specific to X11R5.
−symbols	Indicates that the symbols defined for the preprocessor should be printed onto the standard output.
−U*Name*	Passes through to the preprocessor and removes any definitions of this symbol.

Examples

1. To load a file into the database:

   ```
   xrdb −load myfile
   ```

2. To take the contents of the database just loaded and edit or put it into newfile:

   ```
   xrdb −edit newfile
   ```

Files

The **xrdb** command generalizes the **~/.Xdefaults** files.

Related Information

The **XGetDefault** function.

xrx Command

Purpose

RX helper program.

Syntax

xrx [**−toolkitoption** ...] filename

Description

The helper program may be used with any Web browser to interpret documents in the `RX MIME` type format and start remote applications.

xrx reads in the RX document specified by its filename, from which it gets the list of services the application wants to use. Based on this information, **xrx** sets the various requested services, including creating authorization keys if your X server supports the `SECURITY` extension. It then passes the relevant data, such as the X display name, to the application through an `HTTP GET` request of the associated CGI script. The Web server then executes the CGI script to start the application. The client runs on the web server host connected to your X server.

Installation

You need to configure your web browser to use **xrx** for RX documents. Generally the following line in your **$HOME/.mailcap** is enough:

```
application/x−rx; xrx %s
```

However, you may need to refer to your web browser's documentation for exact instructions on configuring helper applications.

Once correctly configured, your browser will activate the helper program whenever you retrieve any document of the MIME type application/x−rx.

Flags

The **xrx** helper program accepts all of the standard X Toolkit command line options such as:

−xrm resourcestring	This option specifies a resource string to be used. There may be several instances of this option on the command line.

Resources

The application class name of the **xrx** program is **Xrx** and it understands the following application resource names and classes:

xrxHasFirewallProxy *(class **XrxHasFirewallProxy**)*
Specifies whether an X server firewall proxy is running and should be used. Default is "False."
xrxInternalWebServers *(class **XrxInternalWebServers**)*
The web servers for which the X server firewall proxy should not be used (only relevant when

xrxHasFirewallProxy is "True"). Its value is a comma separated list of mask/value pairs to be used to filter internal web servers, based on their address. The mask part specifies which segments of the address are to be considered and the value part specifies what the result should match. For instance the following list:

255.255.255.0/198.112.45.0,

255.255.255.0/198.112.46.0

matches the address sets: 198.112.45.* and 198.112.46.*. More precisely, the test is (address mask) == value.

xrxFastWebServers *(class* ***XrxFastWebServers****)*
: The web servers for which `LBX` should not be used. The resource value is a list of address mask/value pairs, as previously described.

xrxTrustedWebServers *(class* ***XrxTrustedWebServers****)*
: The web servers from which remote applications should be run as trusted clients. The default is to run remote applications as untrusted clients. The resource value is a list of address mask/value pairs, as previously described.

Environment

The xrx helper program uses the standard X environment variables such as `DISPLAY` to get the default X server host and display number. If the RX document requests `X-UI-LBX` service and the default X server does not advertise the `LBX` extension, **xrx** will look for the environment variable `XREALDISPLAY` to get a second address for your X server and look for the `LBX` extension there. When running your browser through **lbxproxy** you will need to set `XREALDISPLAY` to the actual address of your server if you wish remote applications to be able to use `LBX` across the Internet.

If the RX document requests `XPRINT` service, **xrx** will look for the variables `XPRINTER`, `PDPRINTER`, `LPDEST`, `PRINTER`, and `XPSERVERLIST` to get the printer name and X Print server address to use. Note that although this set of variables allows to specify more than one server and printer, only the first pair will be used. Finally, if you are using a firewall proxy, **xrx** will look for `PROXY_MANAGER` to get the address of your proxy manager (see **proxymngr**). When not specified it will use `:6500` as the default.

Related Information

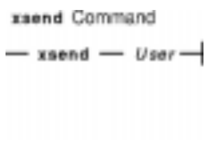
The **libxrx** command, **lbxproxy** command, and the **proxymngr** command.

xsend Command

Purpose

Sends secret mail in a secure communication channel.

Syntax



xsend*User*

Description

The **xsend** command sends messages that can be read only by the intended recipient. This command is similar to the **mail** command, but the mail sent with this command is intended to be secret.

The **xsend** command is used with the **enroll** command and the **xget** command to send secret mail. The **enroll** command sets up the password used to receive secret mail. The **xget** command uses that password to receive the mail.

The **xsend** command reads standard input until an EOF (Ctrl−D) or a . (period) is entered. It then encrypts this text along with some header information and sends it. After sending the encrypted message,the **xsend** command mails a standard mail message to the recipient informing them they have received secret mail.

> **Note:** Secret mail can only be sent to local users.

Examples

1. To send secret mail, enter:

   ```
   xsend ron
   ```

   When you have issued the **xsend** command with the recipient's name, the mail system is used to enter the text of the message. When you finish entering the message to user `ron`, press the Enter key, then Ctrl−D or a . (period) to exit the mail editor and send the message. The **xsend** command encrypts the message before it is sent.

2. To send a file to another user, enter:

   ```
   xsend lance <proposal
   ```

In this example, the file `proposal` is sent to user `lance`.

Files

/var/spool/secretmail/*.keys	Contains the encrypted key for *User*.
/var/spool/secretmail/*.[0−9]	Contains the encrypted mail messages for *User*.

/usr/bin/xsend	Contains the command executable files.

Related Information

The **bellmail** command, **enroll** command, **mail** command, **xget** command.

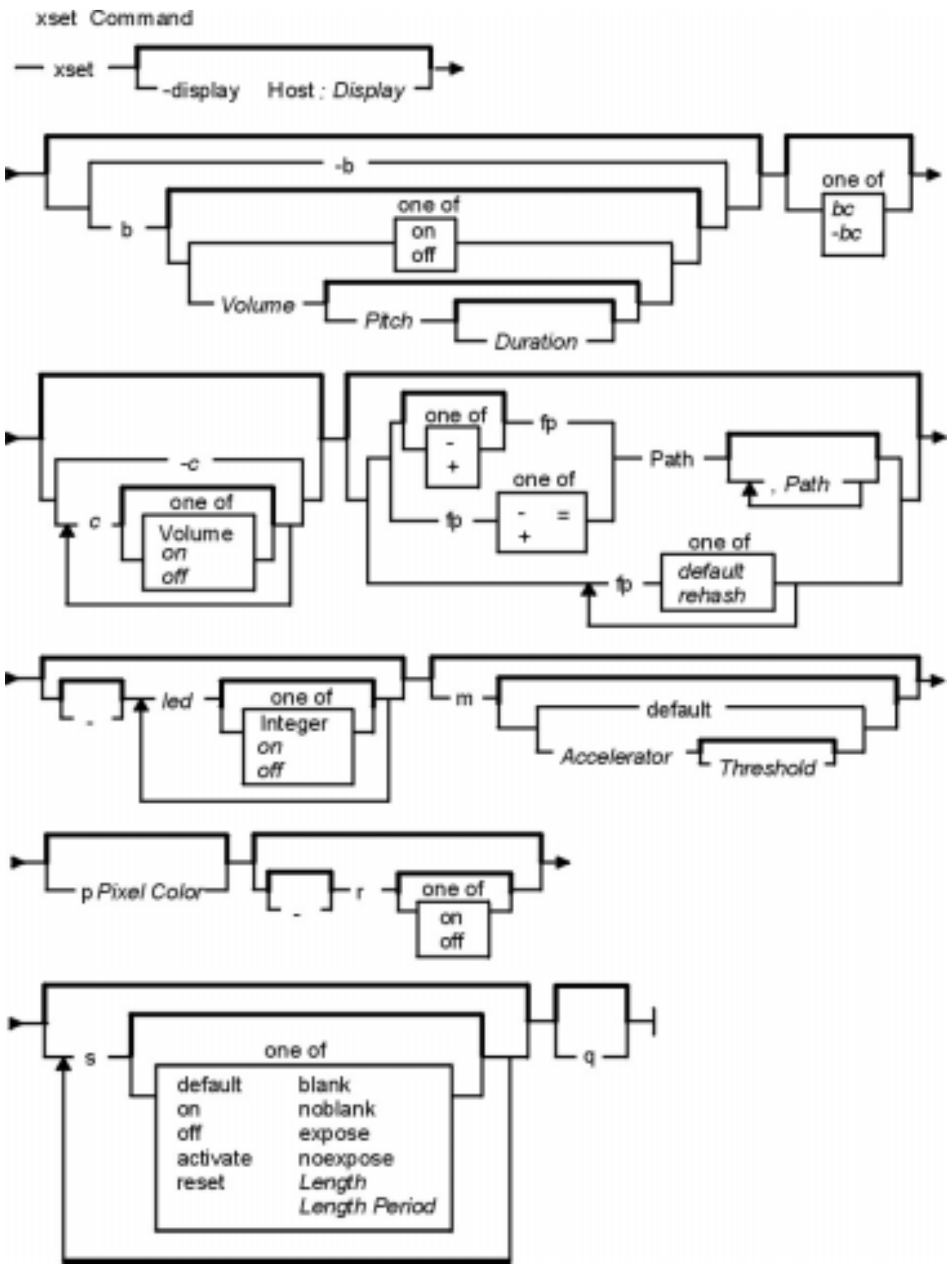
Mail Overview, Sending and Receiving Secret Mail in *AIX Version 4.3 System User's Guide: Communications and Networks*.

xset Command

Purpose

Sets options for your X−Windows environment.

Syntax



xset [**−display***Display*] [**b** [*Volume* [*Pitch* [*Duration*]]] | **−b** | **b on** | **b off**]
[**bc** | **−bc**] **c** [*Volume*] | **−c** | **c on** | **c off**] [[**−** | **+**] **fp** [**−** | **+** | **=**]
Path [**,***Path***,** [...]]] [**fp default**] [**fp rehash**] [[**−**] **led** [*Integer*]]
[**led on** | **led off**] [**m** [*Accelelator*] [*Threshold*]]] [**m** [**ouse**] **default**] [**p** *Pixel Color*] [[**−**] **r**] [**r on** | **r off**] [**s** [*Length* [*Period*]]] [**s blank** | **s noblank**]
[**s expose** | **s noexpose**] [**s on** | **soff**] [**s activate**] [**s reset**] [**s default**] [**q**]

Description

The **xset** command customizes your X−Windows environment.

Flags

−display*Host***:***Display*	Specifies the X server to use. For more information about servers, see the **X** command.
b or **b on**	Turns the bell on. This is the default setting. **Note:** Not all hardware is able to vary the bell characteristics, but for that which can, all of the **b** flag permutations and its variables are available.
b [*Volume* [*Pitch* [*Duration*]]]	Specifies the bell volume, pitch, and duration. This flag accepts up to three numeric values. *Volume*: If only one numeric is given then it is assumed to be *Volume*. The bell volume is set to that numeric as a percentage of the bell's maximum possible volume dependent on current hardware capabilities. *Pitch*: The second numeric in hertz values, is the tonal sound of the bell. *Duration*: The third numeric in milliseconds, is the length of time that the bell rings.
−b or **b off**	Turns the bell off.
bc or **−bc**	Controls bug compatibility mode in the server, if possible. A preceding **−** (dash) disables this mode; otherwise, bug compatibility mode is enabled. The server must support the MIT−SUNDRY−NONSTANDARD protocol extension for the **bc** flag to work. New application development should be performed with bug compatibility mode disabled. The **bc** flag is provided for pre−X11 Release 4 (X11R4) clients. Some pre−X11R4 clients pass illegal values in various protocol requests. Such clients, when run with an X11R4 server, end abnormally or otherwise fail to operate correctly. This flag explicitly reintroduces certain bugs into the X server so that such clients still can be run.
c or **con**	Turns on the click. System default.
c *Volume*	A numeric from 0 to 100 that specifies a percentage of the click's maximum possible volume dependent on current hardware capabilities.
−c or **coff**	Turns off the click.
fp=*Path***,...**	Sets the font path to the directories given in the *Path* parameter. The directories are interpreted by the server, not by the client, and are server−dependent. The server ignores directories that do not contain font databases created by the **mkfontdir** command. All of the options and variables supported by the **fp** flag are available.
fp− or **−fp**	Deletes the font path specified by the *Path* parameter from the end of

	the current font path if the − (dash) precedes **fp** and from the front of the font path if the − (dash) follows **fp.**
fp+ or **+fp**	Adds the font path specified by the *Path* parameter to the bottom of font list if the − (dash) precedes **fp** and from the end of the font path if the − (dash) follows **fp**.
fp default	Resets the font path to the server's default.
fp rehash	Causes the server to reread the font databases in the current font path. Usually used only when adding new fonts to a font directory after running **mkfontdir** to recreate the font database.
led or**led on**	Turns all LEDs on.
−led *Integer*	Turns the LED specfied by *Integer* off. Valid values are between 1 and 32.
led *Integer*	Turns the LED specfied by *Integer* on. Valid values are between 1 and 32.
−led or **led off**	Turns all LEDs off. **Note:** Not all hardware assigns the same *Integer* variables to the same LED functions.
m	Allows you to control the precision of the mouse or other pointing device. If no variable or the **default** argument is specified, the system defaults are used. This flag accepts the following optional arguments and parameters: *Acceleration* Sets the multiplier for the mouse movement. The value can be specified as an integer or a fraction. *Threshold* Sets the minimum number of pixels needed to invoke a movement of the mouse. The value is specified in pixels. If only one parameter is given, it will be interpreted as the *Acceleration* parameter. ***default*** Uses the system defaults.
p	Controls pixel color values. The root background colors may be changed on some servers by altering the entries for BlackPixel and WhitePixel. Although these values are often **0** and **1**, they need not be. Also, a server may choose to allocate those colors privately, in which case the **xset** command generates an error. The **xset** command also generates an error if the map entry is a read−only color. Valid parameters are: *Pixel* Specifies the color map entry number in decimal. *Color* Specifies a color.
r or **r on**	Enables autorepeat.
−r or **r off**	Disables autorepeat.
s or **s default**	Sets screen saver parameters to the default screen−saver characteristics.
s [*Length*[*Period*]]	Specifies the length of time the server must be inactive for the screen saver to activate. *Period s*pecifies the period in which the background

	pattern must be changed to avoid burn in. The values of *Length* and *Period* are specified in seconds. If only one numerical parameter is given, it is read as a *Length* parameter.
s on or **s off**	Turns the screen saver functions on and off, respectively.
s activate	Causes the screen saver to activate, even if it has been turned off.
s reset	Causes the screen saver to deactivate if it was activated.
s blank	Sets the preference to blank the video (if the hardware can do so) rather than display a background pattern.
s noblank	Sets the preference to display a pattern rather than blank the video.
s expose	Sets the preference to allow window exposures (the server can freely discard window contents).
s noexpose	Sets the preference to disable screen saver unless the server can regenerate the screens without causing exposure events.
q	Reports information on the current settings.

These settings will be reset to default values when you log out.

Note: Not all X implementations are guaranteed to honor all of these options.

Examples

1. To set the bell volume to medium, the tone to 50 hertz, and length of time the bell rings to 50 milliseconds:

   ```
   xset b 50,50,50
   ```

2. To set the font path to the **/usr/lib/X11/fonts** directory:

   ```
   xset fp= /usr/lib/x11/fonts
   ```

3. To cause the server to reread the font databases in the current font path:

   ```
   xset fp rehash
   ```

4. To see information on the current settings:

   ```
   xset q
   ```

   which produces output similar to the following:

   ```
   Keyboard Control:
     auto repeat:  on    key click percent:  0    LED mask:  00000000
     auto repeating keys:  0000000000000000
                           0000000000000000
                           0000000000000000
                           0000000000000000
     bell percent:  50    bell pitch:  400    bell duration:  100

   Pointer Control:
     acceleration:  2 = 2 / 1    threshold:  4

   Screen Saver:
     prefer blanking:  no    allow exposures:  no
     timeout:  0    cycle:  0

   Colors:
     default colormap:  0x8006e    BlackPixel:  0    WhitePixel:  1
   ```

```
Font Path:
   /usr/lib/X11/fonts/,/usr/lib/X11/fonts/75dpi/,/usr/lib/X11/fonts/100dpi/,/usr/
lib/X11/fonts/oldx10/,/usr/lib/X11/fonts/oldx11/,/usr/lib/X11/fonts/bmug/,/usr/l
ib/X11/fonts/info−mac/,/usr/lib/X11/fonts/JP/,/usr/lib/X11/fonts/misc/
```

Related Information

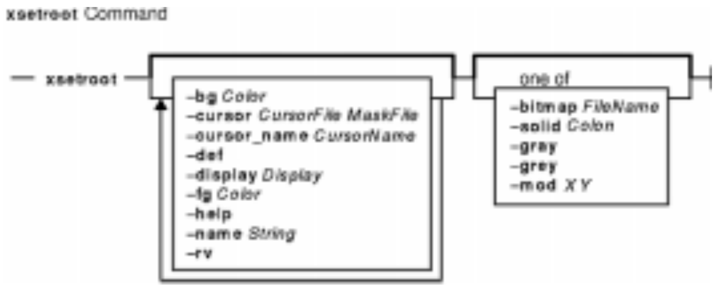
The **X** command, **xmodmap** command, **xrdb** command, **xsetroot** command.

xsetroot Command

Purpose

Sets the root window parameters for the **X** command.

Syntax



xsetroot [**−bg** *Color*] [**−cursor** *CursorFile MaskFile*] [**−cursor_name** *CursorName*] [**−def**]
[**−display** *Display*] [**−fg** *Color*] [**−help**] [**−name** *String*] [**−rv**]
[**−bitmap** *FileName* | **−gray** | **−grey** | **−mod** *X Y* | **−solid** *Color*]

Description

The **xsetroot** command allows you to tailor the appearance of the background (root) window on a workstation display running X. Normally, you experiment with the **xsetroot** command until you find a personalized look that you like, then put the **xsetroot** command that produces it into your X startup file. If no options are specified or if the **−def** flag is specified, the window is reset to its default state. The **−def** flag can be specified with other flags and only the unspecified characteristics are reset to the default state.

Only one of the background color (tiling) changing flags (**−bitmap**, **−solid**, **−gray**, **−grey**, or **−mod**) can be specified at a time.

Flags

−bg*Color*	Uses the *Color* parameter as the background color.
−bitmap*FileName*	Uses the bitmap specified in the file to set the window pattern. You can make your own bitmap files (little pictures) using the **bitmap** program. The entire background is made of repeated tiles of the bitmap.
−cursor*CursorFileMaskFile*	Changes the pointer cursor to what you want when it is outside of any window. Cursor and mask files are bitmaps (little pictures) that can be made with the **bitmap** program. You probably want the mask file to be all black until you get used to the way masks work.
−cursor_name*CursorName*	Changes the pointer cursor to one of the standard cursors from the cursor font.
−def	Resets unspecified attributes to the default values. (Restores the background to the familiar gray mesh and the cursor to the hollow x shape.)
−display*Display*	Specifies the server connection. See the **X** command.
−fg*Color*	Uses the *Color* parameter as the foreground color. Foreground and background colors are meaningful only with the **−cursor**, **−bitmap**, or **−mod** flags.
−gray	Makes the entire background gray.
−grey	Makes the entire background grey.

−help	Prints a usage message and exits.
−mod*XY*	Makes a plaid−like grid pattern on your screen. The *X* and *Y* parameters are integers ranging from 1 to 16. Zero and negative numbers are taken as 1.
−name*String*	Sets the name of the root window to the *String* parameter. There is no default value. Usually a name is assigned to a window so that the window manager can use a text representation when the window is iconified. This flag is not used because you cannot iconify the background.
−rv	Exchanges the foreground and background colors. Normally the foreground color is black and the background color is white.
−solid*Color*	Sets the background of the root window to the specified color. This flag is only used on color servers.

Related Information

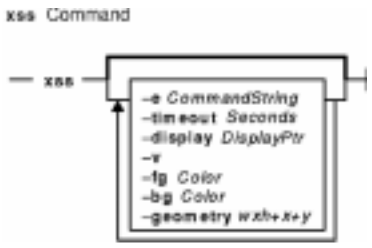
The **X** command, **xset** command, **xrdb** command.

xss Command

Purpose

Improves the security of unattended workstations.

Syntax



xss [**−e** *CommandString*] [**−timeout** *Seconds*] [**−display** *DisplayPtr*] [**−v**] [**−fg** *Color*]
[**−bg** *Color*] [**−geometry** *wxh+x+y*]

Description

The **xss** command works with the newly added Massachusetts Institute of Technology (MIT) Screen Saver Extensions in order to implement a user controllable screen saver/lock. This command is designed to improve the security of unattended workstations.

The **xss** command executes a user−specified command string when it receives a screen saver timeout message, or when the user activates the pushbutton. When no user−specified command is given, the **xss** command defaults to the **xlock** command.

> **Note:** The **xss** command only uses the newly added MIT Screen Saver Extensions. The **xss** command does not work on an older X server, or when using an older X extension library.

Flags

−e*CommandString*	Sets the **xss** command to execute when either the screen saver times out, or the user activates the pushbutton. Note that if the *CommandString* parameter value is longer than one word, it must be surrounded by " " (double quotations).
−timeout*Seconds*	Sets the number of seconds of user inactivity before the screen saver times out, and causes the **xss** command to run the *CommandString* parameter.
−display*DisplayPtr*	Sets the connection to the X11 display.
−v	Turns on verbose mode.
−fg*Color*	Sets the foreground color of the pushbutton.
−bg*Color*	Sets the background color of the pushbutton.
−geometry *wxh+x+y*	Specifies the size and location of the client window.

Examples

When running remotely and using the **−display** flag for the **xss** command, remember that you may also have to use the **−display** flag option for the command that will be executed by the **xss** command. See the following running remote example:

1. Running remote:

   ```
   xss -display myhost:0 -e "xlock -remote -display myhost:0"
   ```
2. Screen saver only:

   ```
   xss -e "xlock -nolock"
   ```
3. Simple example:

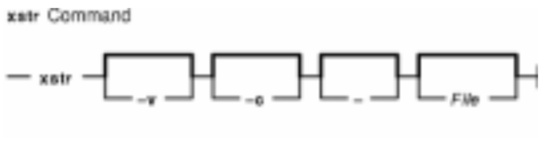
   ```
   xss -e xlock
   ```

xstr Command

Purpose

Extracts strings from C programs to implement shared strings.

Syntax



xstr [**−v**] [**−c**] [**−**] [*File*]

Description

The **xstr** command maintains a file **strings** into which strings in component parts of a large program are hashed. These strings are replaced with references to this array. This serves to implement shared constant strings, most useful if they are also read−only.

The command:

```
xstr −c File
```

extracts the strings from the C source in the *File* parameter, replacing string references by expressions of the form (**&xstr**[*number*]) for some number. An appropriate declaration of the xstr array is prepended to the file. The resulting C text is placed in the file **x.c**, to then be compiled. The strings from this file are appended into the **strings** file if they are not there already. Repeated strings and strings which are suffixes of existing strings do not cause changes to the file **strings**.

If a string is a suffix of another string in the file but the shorter string is seen first by the **xstr** command, both strings are placed in the file **strings**.

After all components of a large program have been compiled, a file **xs.c** declaring the common xstr array space can be created by a command of the form:

```
xstr
```

This **xs.c** file should then be compiled and loaded with the rest of the program. If possible, the array can be made read−only (shared), saving space and swap overhead.

The **xstr** command can also be used on a single file. The command:

```
xstr File
```

creates files **x.c** and **xs.c** as before, without using or affecting any **strings** file in the same directory.

It may be useful to run the **xstr** command after the C preprocessor if any macro definitions yield strings or if there is conditional code which contains strings which may not, in fact, be needed.

The **xstr** command reads from its standard input when the **−** (minus sign) flag is given and does not alter the **strings** file unless the **−c** flag is specified also.

An appropriate command sequence for running the **xstr** command after the C preprocessor is:

```
cc −E name.c | xstr −c −
cc −c x.c
mv x.o name.o
```

The **xstr** command does not touch the file **strings** unless new items are added, thus the **make** command can avoid remaking the **xs.o** file unless truly necessary.

Flags

−c	Extracts strings from the specified file, and places them in the **strings** file.
−v	Verbose mode. Tells when strings are found, or new in the **strings** file.
−	Reads from standard input.

Examples

1. To extract the strings from the C source in the *File.c* parameter, replacing string references by expressions of the form (**&xstr**[*number*]):

   ```
   xstr −c File.c
   ```

   An appropriate declaration of the xstr array is prepended to the file. The resulting C text is placed in the file **x.c**, to then be compiled.

2. To declare the common xstr array space in the **xs.c** file:

   ```
   xstr
   ```

Files

strings	File which contains the extracted strings.
x.c	Massaged C source.
xs.c	C source for definition of array xstr.
/tmp/xs*	Temporary file when **xstr** command does not touch the **strings** file.
/usr/ccs/bin/mkstr	Contains an executable file.
/usr/ccs/bin/mkstr	Contains an executable file for Berkeley environment.

Related Information

The **mkstr** command.

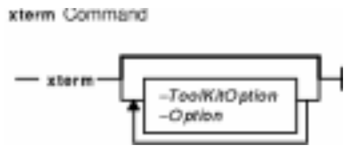
xterm Command

Purpose

Provides a terminal emulator for the X Window System.

> **Note:** The **xterm** command is ported from the Massachusetts Institute of Technology (MIT) X Window System, Version 11, Release 6 with no functional enhancements. The **xterm** command does not have support for localization or internationalization. For the localized and internationalized terminal emulator, the user can use the **aixterm** or **dtterm** commands.

Syntax



xterm [−*ToolkitOption* ...] [−*Option* ...]

Description

The **xterm** program is a terminal emulator for the X Window System. It provides DEC VT102 and Tektronix 4014 compatible terminals for programs that cannot use the window system directly. If the underlying operating system supports terminal resizing capabilities, the **xterm** program uses the facilities to notify programs running in the window whenever it is resized.

The VT102 and Tektronix 4014 terminals each have their own window so that you can edit text in one and look at graphics in the other at the same time. To maintain the correct aspect ratio (height/width), Tektronix graphics are restricted to the largest box with a 4014 aspect ratio that will fit in the window. This box is located in the upper left area of the window.

Although both windows may be displayed at the same time, one of them is considered the *activewindow* for receiving keyboard input and terminal output. This is the window that contains the text cursor. The active window can be chosen through escape sequences, the VT Options menu in the VT102 window, and the Tek Options menu in the 4014 window.

Emulations

The VT102 emulation is fairly complete, but does not support smooth scrolling, VT52 mode, the blinking character attribute, or the double−wide and double−size character sets. The **termcap** file entries that work with the **xterm** command include **xterm**, **vt102**, **vt100** and ``ansi," and the **xterm** command automatically searches the **termcap** file in this order for these entries and then sets the **TERM** and the **TERMCAP** environment variables.

Many of the special **xterm** features may be modified under program control through a set of escape sequences different from the standard VT102 escape sequences.

The Tektronix 4014 emulation is also fairly good. It supports 12−bit graphics addressing, scaled to the window size. Four different font sizes and five different lines types are supported. There is no write−thru or defocused mode support.

The Tektronix text and graphics commands are recorded internally by the **xterm** command and may be written to a file by sending the COPY escape sequence (or through the Tektronix menu, as described in the following sections). The name of the file will be **COPY***yy*−*MM*−*dd***.***hh***:***mm***:***ss*, where *yy*, *MM*, *dd*, *hh*, *mm*, and *ss* are the year, month, day, hour, minute, and second when the copy is performed (the file is created in the directory that the **xterm** command is started in, or the home directory for a login **xterm**).

Other Features

The **xterm** command automatically highlights the text cursor when the pointer enters the window (selected) and unhighlights it when the pointer leaves the window (unselected). If the window is the focus window, the text cursor is highlighted no matter where the pointer is located.

In VT102 mode, there are escape sequences to activate and deactivate an alternate screen buffer, which is the same size as the display area of the window. When activated, the current screen is saved and replaced with the alternate screen. Saving of lines scrolled off the top of the window is disabled until the normal screen is restored.

The **termcap** file entry for the **xterm** command allows the **vi** command editor to switch to the alternate screen for editing and to restore the screen on exit.

In either VT102 or Tektronix mode, there are escape sequences to change the name of the windows.

Options

The **xterm** terminal emulator accepts all of the standard X Toolkit command−line options as well as the following (if the option begins with a + instead of a −, the option is restored to its default value):

−help	Causes the **xterm** command to print out a message describing its options.
−132	Normally, the VT102 DECCOLM escape sequence that switches between 80− and 132−column mode is ignored. This option causes the DECCOLM escape sequence to be recognized, and the xterm window will resize appropriately.
−ah	Indicates that the **xterm** command should always highlight the text cursor. By default, the **xterm** command will display a hollow text cursor whenever the focus is lost or the pointer leaves the window.
+ah	Indicates that the **xterm** command should do text cursor highlighting based on focus.
−b *Number*	Specifies the size of the inner border (the distance between the outer edge of the characters and the window border) in pixels. The default is 2.
−cc*CharacterClassRange*:*Value*[**,**...]	Sets classes indicated by the given ranges for use in selecting by words.
−cn	Indicates that newlines should not be cut in line−mode selections.
+cn	Indicates that newlines should be cut in line−mode selections.
−cr*Color*	Specifies the color to use for the text cursor. The default is to use the same foreground color that is used for text.
−cu	Indicates that the **xterm** command should work around a bug in the **more** program that causes it to incorrectly display lines that are exactly the width of the window and are followed by a line beginning with a tab (the leading tabs are not displayed). This option is so named because it was originally thought to be a bug in the **curses** function

	cursor motion package.
+cu	Indicates that **xterm** should not work around the **more** function bug previously mentioned.
−e*Program* [*Arguments*]	Specifies the program (and its command−line arguments) to be run in the xterm window. It also sets the window title and icon name to be the base name of the program being run if neither the −**T** nor the −**n** option is given on the command line. **Note:** This must be the last option on the command line.
−fb*Font*	Specifies a font to be used when displaying bold text. This font must be the same height and width as the normal font. If only one of the normal or bold fonts is specified, it will be used as the normal font and the bold font will be produced by overstriking this font. The default is to do overstriking of the normal font.
−i	Turns on the **useInsertMode** resource.
+i	Turns off the **useInsertMode** resource.
−j	Indicates that the **xterm** command should do jump scrolling. Normally, text is scrolled one line at a time; this option allows the **xterm** command to move multiple lines at a time so that it does not fall as far behind. Its use is strongly recommended since it makes the **xterm** command much faster when scanning through large amounts of text. The VT100 escape sequences for enabling and disabling smooth scrolling as well as the VT Options menu can be used to turn this feature on or off.
+j	Indicates that the **xterm** command should not do jump scrolling.
−ls	Indicates that the shell that is started in the xterm window is a login shell (in other words, the first character of the *ArgumentVector* parameter is a dash, indicating to the shell that it should read the user's **.login** or **.profile** file).
+ls	Indicates that the shell that is started should not be a login shell (in other words, it will be a normal subshell).
−mb	Indicates that the **xterm** command should ring a margin bell when the user types near the right end of a line. This option can be turned on and off from the VT Options menu.
+mb	Indicates that the margin bell should not be rung.
−mc *Milliseconds*	Specifies the maximum time between multiclick selections.
−ms *Color*	Specifies the color to be used for the pointer cursor. The default is to use the foreground color.
−nb *Number*	Specifies the number of characters from the right end of a line at which the margin bell, if enabled, will ring. The default is 10.
−rw	Indicates that reverse wraparound should be allowed. This allows the cursor to back up from the leftmost column of one line to the rightmost column of the previous line. This is very useful for editing long shell command lines and is encouraged. This option can be turned on and off from the VT Options menu.
+rw	Indicates that reverse wraparound should not be allowed.
−aw	Indicates that auto wraparound should be allowed. This allows the cursor to automatically wrap to the beginning of the next line when it is at the rightmost position of a line and text is output.
+aw	Indicates that auto wraparound should not be allowed.
−s	Indicates that the **xterm** command may scroll asynchronously,

	meaning that the screen does not have to be kept completely up to date while scrolling. This allows the **xterm** command to run faster when network latencies are high and is typically useful when running across a large Internet or many gateways.
+s	Indicates that the **xterm** command should scroll synchronously.
−sb	Indicates that some number of lines that are scrolled off the top of the window should be saved and that a scrollbar should be displayed so that those lines can be viewed. This option may be turned on and off from the VT Options menu.
+sb	Indicates that a scrollbar should not be displayed.
−sf	Indicates that Sun Function Key escape codes should be generated for function keys.
+sf	Indicates that the standard escape codes should be generated for function keys.
−si	Indicates that output to a window should not automatically reposition the screen to the bottom of the scrolling region. This option can be turned on and off from the VT Options menu.
+si	Indicates that output to a window should cause it to scroll to the bottom.
−sk	Indicates that pressing a key while using the scrollbar to review previous lines of text should cause the window to be repositioned automatically in the normal position at the bottom of the scroll region.
+sk	Indicates that pressing a key while using the scrollbar should not cause the window to be repositioned.
−sl *Number*	Specifies the number of lines to save that have been scrolled off the top of the screen. The default is 64.
−t	Indicates that the **xterm** command should start in Tektronix mode, rather than in VT102 mode. Switching between the two windows is done using the Options menus.
+t	Indicates that the **xterm** command should start in VT102 mode.
−tm*String*	Specifies a series of terminal−setting keywords followed by the characters that should be bound to those functions, similar to the **stty** program. Allowable keywords include: **intr**, **quit**, **erase**, **kill**, **eof**, **eol**, **swtch**, **start**, **stop**, **brk**, **susp**, **dsusp**, **rprnt**, **flush**, **weras**, and **lnext**. Control characters may be specified as ^*Character* (for example, ^c or ^u), and ^? may be used to indicate Delete.
−tn*Name*	Specifies the name of the terminal type to be set in the **TERM** environment variable. This terminal type must exist in the **termcap** database and should have **li#** and **co#** entries.
−ut	Indicates that the **xterm** command should not write a record into the **/etc/utmp** system log file.
+ut	Indicates that the **xterm** command should write a record into the **/etc/utmp** system log file.
−vb	Indicates that a visual bell is preferred over an audible one. Instead of ringing the terminal bell whenever the Ctrl−G key sequence signal is received, the window will flash.
+vb	Indicates that a visual bell should not be used.
−wf	Indicates that the **xterm** command should wait for the window to be mapped the first time before starting the subprocess so that the initial terminal size settings and environment variables are correct. It is the application's responsibility to catch subsequent terminal size changes.

+wf	Indicates that the **xterm** command should not wait before starting the subprocess.
−C	Indicates that this window should receive console output. This is not supported on all systems. To obtain console output, you must be the owner of the console device, and you must have read and write permission for it. If you are running X windows under **xdm** on the console screen, you may need to have the session startup and reset programs explicitly change the ownership of the console device in order to get this option to work.
−S*ccn*	Specifies the last two letters of the name of a pseudoterminal to use in slave mode, plus the number of the inherited file descriptor. The option is parsed ``%c%c%d". This allows the **xterm** command to be used as an input and output channel for an existing program and is sometimes used in specialized applications.

The following command−line arguments are provided for compatibility with older versions. They may not be supported in the next release as the X Toolkit provides standard options that accomplish the same task.

%*geom*	Specifies the preferred size and position of the Tektronix window. It is shorthand for specifying the ***tekGeometry** resource.
#geom	Specifies the preferred position of the icon window. It is shorthand for specifying the ***iconGeometry** resource.
−T*String*	Specifies the title for the **xterm** program's windows. It is equivalent to **−title**.
−n*String*	Specifies the icon name for the **xterm** program's windows. It is shorthand for specifying the ***iconName** resource. Note that this is not the same as the Toolkit option **−name** (see the following). The default icon name is the application name.
−r	Indicates that reverse video should be simulated by swapping the foreground and background colors. It is equivalent to **−rv**.
−w*Number*	Specifies the width in pixels of the border surrounding the window. It is equivalent to **−borderwidth** or **−bw**.

The following standard X Toolkit command−line arguments are commonly used with the **xterm** command:

−bg*Color*	Specifies the color to use for the background of the window. The default is white.
−bd*Color*	Specifies the color to use for the border of the window. The default is black.
−bw*Number*	Specifies the width in pixels of the border surrounding the window.
−fg*Color*	Specifies the color to use for displaying text. The default is black.
−fn*Font*	Specifies the font to be used for displaying normal text. The default is fixed.
−name*Name*	Specifies the application name under which resources are to be obtained, rather than the default executable file name. The *Name* parameter should not contain . or * characters.
−title*String*	Specifies the window title string, which may be displayed by window managers if the user so chooses. The default title is the command line specified after the **−e** option, if any; otherwise, the application name.
−rv	Indicates that reverse video should be simulated by swapping the foreground and background colors.
−geometry*Geometry*	Specifies the preferred size and position of the VT102 window; see the **X** command.
−display*Display*	Specifies the X server to contact; see the **X** command.
−xrm*ResourceString*	Specifies a resource string to be used. This is especially useful for setting resources that do not have separate command−line options.
−iconic	Indicates that the **xterm** command should ask the window manager to start it as an

icon rather than as the normal window.

Resources

The program understands all of the core X Toolkit resource names and classes as well as:

iconGeometry (class **IconGeometry**)	Specifies the preferred size and position of the application when iconified. It is not necessarily obeyed by all window managers.
termName (class **TermName**)	Specifies the terminal type name to be set in the **TERM** environment variable.
title (class **Title**)	Specifies a string that may be used by the window manager when displaying this application.
ttyModes (class **TtyModes**)	Specifies a string containing terminal−setting keywords and the characters to which they may be bound. Allowable keywords include: **intr**, **quit**, **erase**, **kill**, **eof**, **eol**, **swtch**, **start**, **stop**, **brk**, **susp**, **dsusp**, **rprnt**, **flush**, **weras**, and **lnext**. Control characters may be specified as ^*Character* (for example, ^c or ^u) and ^? may be used to indicate Delete. This is very useful for overriding the default terminal settings without having run an **stty** program every time an **xterm** window is started.
useInsertMode (class **useInsertMode**)	Forces the use of insert mode by adding appropriate entries to the **TERMCAP** environment variable. This is useful if the system termcap is broken. The default is **false**.
utmpInhibit (class **UtmpInhibit**)	Specifies whether **xterm** should try to record the user's terminal in **/etc/utmp**.
sunFunctionKeys (class **SunFunctionKeys**)	Specifies whether Sun Function Key escape codes should be generated for function keys instead of standard escape sequences.
waitForMap (class **WaitForMap**)	Specifies whether the **xterm** command should wait for the initial window map before starting the subprocess. The default is False.

The following resources are specified as part of the **vt100** widget (class **VT100**):

allowSendEvents (class **AllowSendEvents**)	Specifies whether synthetic key and button events (generated using the X protocol **SendEvent** request) should be interpreted or discarded. The default is False, meaning they are discarded. Note that allowing such events creates a large security hole.
alwaysHighlight (class **AlwaysHighlight**)	Specifies whether **xterm** should always display a highlighted text cursor. By default, a hollow text cursor is displayed whenever the pointer moves out of the window or the window loses the input focus.
appcursorDefault (class **AppcursorDefault**)	If True, the cursor keys are initially in application mode. The default is False.
appkeypadDefault (class **AppkeypadDefault**)	If True, the keypad keys are initially in application mode. The default is False.
autoWrap (class **AutoWrap**)	Specifies whether auto wraparound should be enabled. The default is True.

bellSuppressTime (class **BellSuppressTime**)	Specifies the number of milliseconds after a bell command is sent during which additional bells will be suppressed. The default is 200. If set to nonzero, additional bells will also be suppressed until the server reports that processing of the first bell has been completed; this feature is most useful with the visible bell.
boldFont (class **BoldFont**)	Specifies the name of the bold font to use instead of overstriking.
c132 (class **C132**)	Specifies whether the VT102 DECCOLM escape sequence should be honored. The default is False.
charClass (class **CharClass**)	Specifies comma−separated lists of character class bindings of the form [*low*−]*high*:*value*. These are used in determining which sets of characters should be treated the same when doing cut and paste. See "Character Classes" .
curses (class **Curses**)	Specifies whether the last column bug in the **curses** function should be worked around. The default is False.
cutNewline (class **cutNewline**)	If **false**, triple clicking to select a line does not include the Newline at the end of the line. If **true**, the Newline is selected. The default is **true**.
cutToBeginningofLines (class **CutToBeginningOfLine**)	If **false**, triple clicking to select a line selects only from the current word forward. If **true**, the entire line is selected. The default is **true**.
background (class **Background**)	Specifies the color to use for the background of the window. The default is white.
foreground (class **Foreground**)	Specifies the color to use for displaying text in the window. Setting the class name instead of the instance name is an easy way to have everything that would normally appear in the text color change color. The default is black.
cursorColor (class **Foreground**)	Specifies the color to use for the text cursor. The default is black.
eightBitInput (class **EightBitInput**)	If True, meta characters input from the keyboard are presented as a single character with the eighth bit turned on. If False, meta characters are converted into a 2−character sequence with the character itself preceded by **ESC**. The default is True.
eightBitOutput (class **EightBitOutput**)	Specifies whether 8−bit characters sent from the host should be accepted as is or stripped when printed. The default is True.
font (class **Font**)	Specifies the name of the normal font. The default is fixed.
font1 (class **Font1**)	Specifies the name of the first alternative font.
font2 (class **Font2**)	Specifies the name of the second alternative font.
font3 (class **Font3**)	Specifies the name of the third alternative font.
font4 (class **Font4**)	Specifies the name of the fourth alternative font.
font5 (class **Font5**)	Specifies the name of the fifth alternative font.
font6 (class **Font6**)	Specifies the name of the sixth alternative font.
geometry (class **Geometry**)	Specifies the preferred size and position of the VT102 window.
hpLowerleftBugCompat (class **hpLowerleftBugCompat**)	Specifies whether to work around a bug in **xdb**, which ignores termcap and always sends ESC F to move to the lower left corner. **true** causes **xterm** in interpret ESC F as a request to

	move to the lower left corner of the screen. The default is **false**.
internalBorder (class **BorderWidth**)	Specifies the number of pixels between the characters and the window border. The default is 2.
jumpScroll (class **JumpScroll**)	Specifies whether jump scrolling should be used. The default is True.
loginShell (class **LoginShell**)	Specifies whether the shell to be run in the window should be started as a login shell. The default is False.
marginBell (class **MarginBell**)	Specifies whether the bell should be run when the user types near the right margin. The default is False.
multiClickTime (class **MultiClickTime**)	Specifies the maximum time in milliseconds between multiclick select events. The default is 250 milliseconds.
multiScroll (class **MultiScroll**)	Specifies whether scrolling should be done asynchronously. The default is False.
nMarginBell (class **Column**)	Specifies the number of characters from the right margin at which the margin bell should be rung, when enabled.
pointerColor (class **Foreground**)	Specifies the foreground color of the pointer. The default is **XtDefaultForeground**.
pointerColorBackground (class **Background**)	Specifies the background color of the pointer. The default is **XtDefaultBackground**.
pointerShape (class **Cursor**)	Specifies the name of the shape of the pointer. The default is **xterm**.
resizeGravity (class **ResizeGravity**)	Affects the behavior when the window is resized to be taller or shorter. **NorthWest** specifies that the top line of text on the screen stays fixed. If the window is made shorter, lines are dropped from the bottom; if the window is made taller, blank lines are added at the bottom. This is compatible with the behavior in MIT version X11R4. **SouthWest** (the default) specifies that the bottom line of text on the screen stays fixed. If the window is made taller, additional saved lines will be scrolled down onto the screen; if the window is made shorter, lines will be scrolled off the top of the screen, and the top saved lines will be dropped.
reverseVideo (class **ReverseVideo**)	Specifies whether reverse video should be simulated. The default is False.
reverseWrap (class **ReverseWrap**)	Specifies whether reverse wraparound should be enabled. The default is False.
saveLines (class **SaveLines**)	Specifies the number of lines to save beyond the top of the screen when a scrollbar is turned on. The default is 64.
scrollBar (class **ScrollBar**)	Specifies whether the scrollbar should be displayed. The default is False.
scrollTtyOutput (class **ScrollCond**)	Specifies whether output to the terminal should automatically cause the scrollbar to go to the bottom of the scrolling region. The default is True.
scrollKey (class **ScrollCond**)	Specifies whether pressing a key should automatically cause the scrollbar to go to the bottom of the scrolling region. The default is False.
scrollLines (class **ScrollLines**)	Specifies the number of lines that the **scroll−back** and **scroll−forw** actions should use as a default. The default value is 1.

signalInhibit (class **SignalInhibit**)	Specifies whether the entries in the Main Options menu for sending signals to **xterm** should be disallowed. The default is False.
tekGeometry (class **Geometry**)	Specifies the preferred size and position of the Tektronix window.
tekInhibit (class **TekInhibit**)	Specifies whether the escape sequence to enter Tektronix mode should be ignored. The default is False.
tekSmall (class **TekSmall**)	Specifies whether the Tektronix mode window should start in its smallest size if no explicit geometry is given. This is useful when running the **xterm** command on displays with small screens. The default is False.
tekStartup (class **TekStartup**)	Specifies whether **xterm** should start up in Tektronix mode. The default is False.
titeInhibit (class **TiteInhibit**)	Specifies whether **xterm** should remove **ti** and **tetermcap** file entries (used to switch between alternate screens during startup of many screen−oriented programs) from the **TERMCAP** string. If set, the **xterm** command also ignores the escape sequence to switch to the alternate screen.
translations (class **Translations**)	Specifies the key and button bindings for menus, selections, programmed strings, and so forth. See "Actions" .
visualBell (class **VisualBell**)	Specifies whether a visible bell (flashing) should be used instead of an audible bell when the Ctrl−G key sequence signal is received. The default is False.

The following resources are specified as part of the **tek4014** widget (class **Tek4014**):

width (class **Width**)	Specifies the width of the Tektronix window in pixels.
height (class **Height**)	Specifies the height of the Tektronix window in pixels.
fontLarge (class **Font**)	Specifies the large font to use in the Tektronix window.
font2 (class **Font**)	Specifies font number 2 to use in the Tektronix window.
font3 (class **Font**)	Specifies font number 3 to use in the Tektronix window.
fontSmall (class **Font**)	Specifies the small font to use in the Tektronix window.
initialFont (class **InitialFont**)	Specifies which of the four Tektronix fonts to use initially. Values are the same as for the **set−tek−text** action. The default is large.
ginTerminator (class **GinTerminator**)	Specifies what characters should follow a GIN report or status report. The possibilities are `none,' which sends no terminating characters; CRonly, which sends CR; and CR&EOT, which sends both CR and EOT. The default is none.

The resources that may be specified for the various menus are described in the documentation for the **AthenaSimpleMenu** widget. Following is a list of the names and classes of the entries in each of the menus.

The mainMenu has the following entries:

securekbd (class **SmeBSB**)	Invokes the **secure()** action.
allowsends (class **SmeBSB**)	Invokes the **allow−send−events(toggle)** action.
redraw (class **SmeBSB**)	Invokes the **redraw()** action.
line1 (class **SmeLine**)	This is a separator.
suspend (class **SmeBSB**)	Invokes the **send−signal(tstp)** action on systems that support job control.
continue (class **SmeBSB**)	Invokes the **send−signal(cont)** action on systems that support job control.
interrupt (class **SmeBSB**)	Invokes the **send−signal(int)** action.

hangup (class **SmeBSB**)	Invokes the **send−signal(hup)** action.
terminate (class **SmeBSB**)	Invokes the **send−signal(term)** action.
kill (class **SmeBSB**)	Invokes the **send−signal(kill)** action.
line2 (class **SmeLine**)	This is a separator.
quit (class **SmeBSB**)	Invokes the **quit()** action.

The vtMenu has the following entries:

scrollbar (class **SmeBSB**)	Invokes the **set−scrollbar(toggle)** action.
jumpscroll (class **SmeBSB**)	Invokes the **set−jumpscroll(toggle)** action.
reversevideo (class **SmeBSB**)	Invokes the **set−reverse−video(toggle)** action.
autowrap (class **SmeBSB**)	Invokes the **set−autowrap(toggle)** action.
reversewrap (class **SmeBSB**)	Invokes the **set−reversewrap(toggle)** action.
autolinefeed (class **SmeBSB**)	Invokes the **set−autolinefeed(toggle)** action.
appcursor (class **SmeBSB**)	Invokes the **set−appcursor(toggle)** action.
appkeypad (class **SmeBSB**)	Invokes the **set−appkeypad(toggle)** action.
scrollkey (class **SmeBSB**)	Invokes the **set−scroll−on−key(toggle)** action.
scrollttyoutput (class **SmeBSB**)	Invokes the **set−scroll−on−tty−output(toggle)** action.
allow132 (class **SmeBSB**)	Invokes the **set−allow132(toggle)** action.
cursesemul (class **SmeBSB**)	Invokes the **set−cursesemul(toggle)** action.
visualbell (class **SmeBSB**)	Invokes the **set−visualbell(toggle)** action.
marginbell (class **SmeBSB**)	Invokes the **set−marginbell(toggle)** action.
altscreen (class **SmeBSB**)	This entry is currently disabled.
line1 (class **SmeLine**)	This is a separator.
softreset (class **SmeBSB**)	Invokes the **soft−reset()** action.
hardreset (class **SmeBSB**)	Invokes the **hard−reset()** action.
clearsavedlines (class **SmeBSB**)	Invokes the **clear−saved−lines()** action.
line2 (class **SmeLine**)	This is a separator.
tekshow (class **SmeBSB**)	Invokes the **set−visibility(tek,toggle)** action.
tekmode (class **SmeBSB**)	Invokes the **set−terminal−type(tek)** action.
vthide (class **SmeBSB**)	Invokes the **set−visibility(vt,off)** action.

The fontMenu has the following entries:

fontdefault (class **SmeBSB**)	Invokes the **set−vt−font(d)** action.
font1 (class **SmeBSB**)	Invokes the **set−vt−font(1)** action.
font2 (class **SmeBSB**)	Invokes the **set−vt−font(2)** action.
font3 (class **SmeBSB**)	Invokes the **set−vt−font(3)** action.
font4 (class **SmeBSB**)	Invokes the **set−vt−font(4)** action.
font5 (class **SmeBSB**)	Invokes the **set−vt−font(5)** action.
font6 (class **SmeBSB**)	Invokes the **set−vt−font(6)** action.
fontescape (class **SmeBSB**)	Invokes the **set−vt−font(e)** action.
fontsel (class **SmeBSB**)	Invokes the **set−vt−font(s)** action.

The tekMenu has the following entries:

tektextlarge (class **SmeBSB**)	Invokes the **set−tek−text(l)** action.

tektext2 (class **SmeBSB**)	Invokes the **set−tek−text(2)** action.
tektext3 (class **SmeBSB**)	Invokes the **set−tek−text(3)** action.
tektextsmall (class **SmeBSB**)	Invokes the **set−tek−text(s)** action.
line1 (class **SmeLine**)	This is a separator.
tekpage (class **SmeBSB**)	Invokes the **tek−page()** action.
tekreset (class **SmeBSB**)	Invokes the **tek−reset()** action.
tekcopy (class **SmeBSB**)	Invokes the **tek−copy()** action.
line2 (class **SmeLine**)	This is a separator.
vtshow (class **SmeBSB**)	Invokes the **set−visibility(vt,toggle)** action.
vtmode (class **SmeBSB**)	Invokes the **set−terminal−type(vt)** action.
tekhide (class **SmeBSB**)	Invokes the **set−visibility(tek,toggle)** action.

The following resources are useful when specified for the **AthenaScrollbar** widget:

thickness (class **Thickness**)	Specifies the width in pixels of the scrollbar.
background (class **Background**)	Specifies the color to use for the background of the scrollbar.
foreground (class **Foreground**)	Specifies the color to use for the foreground of the scrollbar. The *thumb* of the scrollbar is a simple checkerboard pattern with alternating pixels for foreground and background colors.

Pointer Usage

Once the VT102 window is created, the **xterm** command allows you to select text and copy it within the same or other windows.

The selection functions are invoked when the pointer buttons are used with no modifiers, and when they are used with the Shift key. The assignment of the functions to keys and buttons may be changed through the resource database.

Pointer button 1 (usually left) is used to save text into the cut buffer. Move the cursor to beginning of the text, and then hold the button down while moving the cursor to the end of the region and releasing the button. The selected text is highlighted and is saved in the global cut buffer and made the PRIMARY selection when the button is released.

Double−clicking selects by words, triple−clicking selects by lines, and quadruple−clicking goes back to characters. Multiple−click is determined by the amount of time from button up to button down, so you can change the selection unit in the middle of a selection. If the key or button bindings specify that an X selection is to be made, the **xterm** command will leave the selected text highlighted for as long as it is the selection owner.

Pointer button 2 (usually middle) "types" (pastes) the text from the PRIMARY selection, if any, otherwise from the cut buffer, inserting it as keyboard input.

Pointer button 3 (usually right) extends the current selection. If pressed while closer to the right edge of the selection than the left, it extends or contracts the right edge of the selection. If you contract the selection past the left edge of the selection, the **xterm** command assumes you really meant the left edge, restores the original selection, and then extends or contracts the left edge of the selection.

And the opposite also applies: if pressed while closer to the left edge of the selection than the right, it extends/contracts the left edge of the selection. If you contract the selection past the right edge of the selection, the **xterm** command assumes you really meant the right edge, restores the original selection, and then extends/contracts the right edge of the selection. Extension starts in the selection unit mode that the last selection or extension was performed in; you can multiple−click to cycle through them.

By cutting and pasting pieces of text without trailing new lines, you can take text from several places in different windows and form a command to the shell, for example, or take output from a program and insert it into your favorite editor. Since the cut buffer is globally shared among different applications, you should regard it as a "file" whose contents you know. The terminal emulator and other text programs should be treating it as if it were a text file; in other words, the text is delimited by new lines.

The scroll region displays the position and amount of text currently showing in the window (highlighted) relative to the amount of text actually saved. As more text is saved (up to the maximum), the size of the highlighted area decreases.

Clicking button 1 with the pointer in the scroll region moves the adjacent line to the top of the display window.

Clicking button 3 moves the top line of the display window down to the pointer position.

Clicking button 2 moves the display to a position in the saved text that corresponds to the pointer's position in the scrollbar.

Unlike the VT102 window, the Tektronix window does not allow the copying of text. It does allow Tektronix GIN mode, and in this mode the cursor will change from an arrow to a cross. Pressing any key will send that key and the current coordinates of the cross cursor. Pressing button one, two, or three will return the letters l, m, and r, respectively.

If the Shift key is pressed when a pointer button is pressed, the corresponding uppercase letter is sent. To distinguish a pointer button from a key, the high bit of the character is set (but this is bit is normally stripped unless the terminal mode is RAW; see the **tty** command for details).

Menus

The **xterm** command has four menus, named mainMenu, vtMenu, fontMenu, and tekMenu. Each menu pops up under the correct combinations of key and button presses. Most menus are divided into two section, separated by a horizontal line. The top portion contains various modes that can be altered. A check mark appears next to a mode that is currently active. Selecting one of these modes toggles its state. The bottom portion of the menu lists command entries; selecting one of these performs the indicated function.

The xterm menu pops up when the control key and pointer button one are pressed in a window. The mainMenu contains items that apply to both the VT102 and Tektronix windows. The **Secure Keyboard** mode is used when typing in passwords or other sensitive data in an unsecure environment.

Notable entries in the command section of the menu are **Continue**, **Suspend**, **Interrupt**, **Hangup**, **Terminate**, and **Kill**, which send the **SIGCONT**, **SIGTSTP**, **SIGINT**, **SIGHUP**, **SIGTERM**, and **SIGKILL** signals, respectively, to the process group of the process running under **xterm** (usually the shell). The **Continue** function is especially useful if the user has accidentally pressed Ctrl−Z, suspending the process.

The vtMenu sets various modes in the VT102 emulation, and is popped up when the control key and pointer button two are pressed in the VT102 window. In the command section of this menu, the soft reset entry will reset scroll regions. This can be convenient when some program has left the scroll regions set incorrectly (often a problem when using VMS or TOPS−20).

The full reset entry will clear the screen, reset tabs to every eight columns, and reset the terminal modes (such as wrap and smooth scroll) to their initial states just after the **xterm** command has finished processing the command−line options.

The fontMenu sets the font used in the VT102 window. In addition to the default font and a number of alternatives that are set with resources, the menu offers the font last specified by the Set Font escape sequence (See " Control Sequences") and the current selection as a font name (if the PRIMARY selection is owned).

The tekMenu sets various modes in the Tektronix emulation, and is popped up when the control key and pointer button two are pressed in the Tektronix window. The current font size is checked in the Modes section of the menu. The **PAGE** entry in the command section clears the Tektronix window.

Security

X windows environments differ in their security consciousness. MIT servers, run under **xdm**, are capable of using a *magic cookie* authorization scheme that can provide a reasonable level of security for many people. If your server is only using a host−based mechanism to control access to the server (see the **xhost** command), and if you enable access for a host and other users are also permitted to run clients on that same host, there is every possibility that someone can run an application that will use the basic services of the X protocol to snoop on your activities, potentially capturing a transcript of everything you type at the keyboard.

This is of particular concern when you want to type in a password or other sensitive data. The best solution to this problem is to use a better authorization mechanism than host−based control, but a simple mechanism exists for protecting keyboard input in the **xterm** command.

The xterm menu contains a **Secure Keyboard** entry that, when enabled, ensures that all keyboard input is directed *only* to the **xterm** command (using the **GrabKeyboard** protocol request). When an application prompts you for a password (or other sensitive data), you can enable **Secure Keyboard** using the menu, type in the data, and then disable **Secure Keyboard** using the menu again.

Only one X client at a time can secure the keyboard, so when you attempt to enable **Secure Keyboard** it may fail. In this case, the bell will sound. If the **Secure Keyboard** succeeds, the foreground and background colors will be exchanged (as if you selected the **Reverse Video** entry in the Modes menu); they will be exchanged again when you exit secure mode. If the colors do *not* switch, you should be *very* suspicious that you are being spoofed.

If the application you are running displays a prompt before asking for the password, it is safest to enter secure mode *before* the prompt gets displayed, and to make sure that the prompt gets displayed correctly (in the new colors), to minimize the probability of spoofing. You can also bring up the menu again and make sure that a check mark appears next to the entry.

Secure Keyboard mode will be disabled automatically if your xterm window becomes iconified (or otherwise unmapped), or if you start up a reparenting window manager (that places a title bar or other decoration around the window) while in **Secure Keyboard** mode. (This is a feature of the X protocol not easily overcome.) When this happens, the foreground and background colors will be switched back and the bell will sound in warning.

Character Classes

Clicking the middle mouse button twice in rapid succession will cause all characters of the same class (such as letters, white space, punctuation) to be selected. Since different people have different preferences for what should be selected (for example, should file names be selected as a whole or only the separate subnames), the default mapping can be overridden through the use of the **charClass** (class **CharClass**) resource.

This resource is a series of comma−separated *range*:*value* pairs. The *range* is either a single number or *low−high* in the range of 0 to 127, corresponding to the ASCII code for the character or characters to be set. The *value* is arbitrary, although the default table uses the character number of the first character occurring in the set.

The default table is:

```
static int charClass[128] = {
/* NUL  SOH  STX  ETX  EOT  ENQ  ACK  BEL */
    32,   1,   1,   1,   1,   1,   1,   1,
/*  BS   HT   NL   VT   NP   CR   SO   SI */
     1,  32,   1,   1,   1,   1,   1,   1,
/* DLE  DC1  DC2  DC3  DC4  NAK  SYN  ETB */
     1,   1,   1,   1,   1,   1,   1,   1,
/* CAN   EM  SUB  ESC   FS   GS   RS   US */
     1,   1,   1,   1,   1,   1,   1,   1,
/*  SP    !    "    #    $    %    &    ' */
    32,  33,  34,  35,  36,  37,  38,  39,
/*   (    )    *    +    ,    −    .    / */
    40,  41,  42,  43,  44,  45,  46,  47,
/*   0    1    2    3    4    5    6    7 */
    48,  48,  48,  48,  48,  48,  48,  48,
/*   8    9    :    ;    <    =    >    ? */
    48,  48,  58,  59,  60,  61,  62,  63,
/*   @    A    B    C    D    E    F    G */
    64,  48,  48,  48,  48,  48,  48,  48,
/*   H    I    J    K    L    M    N    O */
    48,  48,  48,  48,  48,  48,  48,  48,
/*   P    Q    R    S    T    U    V    W */
    48,  48,  48,  48,  48,  48,  48,  48,
/*   X    Y    Z    [    \    ]    ^    _ */
    48,  48,  48,  91,  92,  93,  94,  48,
/*   `    a    b    c    d    e    f    g */
    96,  48,  48,  48,  48,  48,  48,  48,
/*   h    i    j    k    l    m    n    o */
    48,  48,  48,  48,  48,  48,  48,  48,
/*   p    q    r    s    t    u    v    w */
    48,  48,  48,  48,  48,  48,  48,  48,
/*   x    y    z    {    |    }    ~  DEL */
    48,  48,  48, 123, 124, 125, 126,   1};
```

For example, the string `33:48,37:48,45−47:48,64:48` indicates that the exclamation mark, percent sign, dash, period, slash, and ampersand characters should be treated the same way as characters and numbers. This is useful for cutting and pasting electronic mailing addresses and file names.

Actions

It is possible to rebind keys (or sequences of keys) to arbitrary strings for input by changing the translations for the **vt100** or **tek4014** widgets. Changing the translations for events other than key and button events is not expected, and will cause unpredictable behavior. The following actions are provided for using within the vt100 or tek4014 translations resources:

bell([*Percent*]**)**	This action rings the keyboard bell at the specified percentage above or below the base volume.
ignore()	This action ignores the event but checks for special pointer position escape sequences.
insert()	This action inserts the character or string associated with the key that was pressed.
insert−seven−bit()	This action is a synonym for **insert()**.
insert−eight−bit()	This action inserts an 8−bit (meta) version of the character or string associated with the key that was pressed. The exact action depends on the value of the **eightBitInput** resource.
insert−selection(*SourceName* [**,** ...]**)**	This action inserts the string found in the selection or cutbuffer

indicated by the *SourceName* parameter. Sources are checked in the order given (case is significant) until one is found. Commonly used selections include PRIMARY, SECONDARY, and CLIPBOARD. Cut buffers are typically named CUT_BUFFER0 through CUT_BUFFER7.

keymap(*Name***)**
: This action dynamically defines a new translation table whose resource name is *Name* with the suffix *Keymap* (case is significant). The name None restores the original translation table.

popup−menu(*MenuName***)**
: This action displays the specified popup menu. Valid names (case is significant) include mainMenu, vtMenu, fontMenu, and tekMenu.

secure()
: This action toggles the **Secure Keyboard** mode described in the section named " Security" , and is invoked from the **securekbd** entry in mainMenu.

select−start()
: This action begins text selection at the current pointer location. See the section entitled " Pointer Usage " for information on making selections.

select−extend()
: This action tracks the pointer and extends the selection. It should only be bound to Motion events.

select−end(*DestName* [**,** ...]**)**
: This action puts the currently selected text into all of the selections or cutbuffers specified by *DestName*.

select−cursor−start()
: This action is similar to **select−start** except that it begins the selection at the current text cursor position.

select−cursor−end(*DestName* [**,** ...]**)**
: This action is similar to **select−end** except that it should be used with **select−cursor−start**.

set−vt−font(*d/1/2/3/4/5/6/e/s* [**,***NormalFont* [**,** *BoldFont*]]**)**
: This action sets the font or fonts currently being used in the VT102 window. The first argument is a single character that specifies the font to be used:

d or *D* indicates the default font (the font initially used when the **xterm** command was started),

1 through *6* indicate the fonts specified by the *font1* through *font6* resources,

e or *E* indicates the normal and bold fonts that have been set through escape codes (or specified as the second and third action arguments, respectively), and

s or *S* indicates the font selection (as made by programs such as the **xfontsel** program) specified by the second action argument.

start−extend()
: This action is similar to **select−start** except that the selection is extended to the current pointer location.

start−cursor−extend()
: This action is similar to **select−extend** except that the selection is extended to the current text cursor position.

string(*String***)**
: This action inserts the specified text string as if it had been typed. Quotation is necessary if the string contains white space or nonalphanumeric characters. If the string argument begins with the characters ``0x," it is interpreted as a hex character constant.

scroll−back(*Count* [**,***Units*]**)**
: This action scrolls the text window backward so that text that had previously scrolled off the top of the screen is now visible. The

	Count argument indicates the number of *Units* (which may be *page*, *halfpage*, *pixel*, or *line*) by which to scroll.
scroll−forw(*Count* [**,***Units*]**)**	
	This action scrolls is similar to **scroll−back** except that it scrolls the other direction.
allow−send−events(*On/Off/Toggle***)**	This action set or toggles the **allowSendEvents** resource and is also invoked by the **allowsends** entry in mainMenu.
redraw()	This action redraws the window and is also invoked by the **redraw** entry in mainMenu.
send−signal(*SigName***)**	This action sends the signal named by *SigName* to the **xterm** subprocess (the shell or program specified with the **−e** command−line option) and is also invoked by the **suspend**, **continue**, **interrupt**, **hangup**, **terminate**, and **kill** entries in mainMenu. Allowable signal names are (case is not significant): ***tstp*** *(if supported by the operating system),* ***suspend*** *(same as* ***tstp****),* ***cont*** *(if supported by the operating system),* ***int****,* ***hup****,* ***term****,* ***quit****,* ***alrm****,* ***alarm*** *(same as* ***alrm****), and* ***kill****.*
quit()	This action sends a **SIGHUP** to the subprogram and exits. It is also invoked by the **quit** entry in mainMenu.
set−scrollbar(*On/Off/Toggle***)**	This action toggles the **scrollbar** resource and is also invoked by the **scrollbar** entry in vtMenu.
set−jumpscroll(*On/Off/Toggle***)**	This action toggles the **jumpscroll** resource and is also invoked by the **jumpscroll** entry in vtMenu.
set−reverse−video(*On/Off/Toggle***)**	This action toggles the **reverseVideo** resource and is also invoked by the **reversevideo** entry in vtMenu.
set−autowrap(*On/Off/Toggle***)**	This action toggles automatic wrapping of long lines and is also invoked by the **autowrap** entry in vtMenu.
set−reversewrap(*On/Off/Toggle***)**	This action toggles the **reverseWrap** resource and is also invoked by the **reversewrap** entry in vtMenu.
set−autolinefeed(*On/Off/Toggle***)**	This action toggles automatic insertion of linefeeds and is also invoked by the **autolinefeed** entry in vtMenu.
set−appcursor(*On/Off/Toggle***)**	This action toggles the handling Application Cursor Key mode and is also invoked by the **appcursor** entry in vtMenu.
set−appkeypad(*On/Off/Toggle***)**	This action toggles the handling of Application Keypad mode and is also invoked by the **appkeypad** entry in vtMenu.
set−scroll−on−key(*On/Off/Toggle***)**	This action toggles the **scrollKey** resource and is also invoked from the **scrollkey** entry in vtMenu.
set−scroll−on−tty−output(*On/Off/Toggle***)**	
	This action toggles the **scrollTtyOutput** resource and is also invoked from the **scrollttyoutput** entry in vtMenu.
set−allow132(*On/Off/Toggle***)**	This action toggles the **c132** resource and is also invoked from the **allow132** entry in vtMenu.
set−cursesemul(*On/Off/Toggle***)**	This action toggles the **curses** resource and is also invoked from the **cursesemul** entry in vtMenu.

set−visual−bell(*On/Off/Toggle***)**	This action toggles the **visualBell** resource and is also invoked by the **visualbell** entry in vtMenu.
set−marginbell(*On/Off/Toggle***)**	This action toggles the **marginBell** resource and is also invoked from the **marginbel**l entry in vtMenu.
set−altscreen(*On/Off/Toggle***)**	This action toggles between the alternate and current screens.
soft−reset()	This action resets the scrolling region and is also invoked from the **softreset** entry in vtMenu.
hard−reset()	This action resets the scrolling region, tabs, window size, and cursor keys and clears the screen. It is also invoked from the **hardreset** entry in vtMenu.
clear−saved−lines()	This action does **hard−reset** (see previous entry) and also clears the history of lines saved off the top of the screen. It is also invoked from the **clearsavedlines** entry in vtMenu.
set−terminal−type(*Type***)**	This action directs output to either the vt or tek windows, according to the *Type* string. It is also invoked by the **tekmode** entry in vtMenu and the **vtmode** entry in tekMenu.
set−visibility(*vt/tek*, *On/Off/Toggle***)**	This action controls whether or not the vt or tek windows are visible. It is also invoked from the **tekshow** and **vthide** entries in vtMenu and the **vtshow** and **tekhide** entries in tekMenu.
set−tek−text(*large/2/3/small***)**	This action sets font used in the Tektronix window to the value of the resources **tektextlarge**, **tektext2**, **tektext3**, and **tektextsmall** according to the argument. It is also by the entries of the same names as the resources in tekMenu.
tek−page()	This action clears the Tektronix window and is also invoked by the **tekpage** entry in tekMenu.
tek−reset()	This action resets the Tektronix window and is also invoked by the **tekreset** entry in tekMenu.
tek−copy()	This action copies the escape codes used to generate the current window contents to a file in the current directory beginning with the name **COPY**. It is also invoked from the **tekcopy** entry in tekMenu.
visual−bell()	This action flashes the window quickly.

The Tektronix window also has the following action:

gin−press(*l/L/m/M/r/R***)** This action sends the indicated graphics input code.

The default bindings in the VT102 window are:

```
Shift <KeyPress> Prior:     scroll−back(1,halfpage) \n\
Shift <KeyPress> Next:      scroll−forw(1,halfpage) \n\
Shift <KeyPress> Select:    select−cursor−start \
                            select−cursor−end(PRIMARY,
                            CUT_BUFFER0) \n\
Shift <KeyPress> Insert:    insert−selection(PRIMARY,
                            CUT_BUFFER0) \n\
~Meta<KeyPress>:            insert−seven−bit \n\
Meta<KeyPress>:             insert−eight−bit \n\
!Ctrl <Btn1Down>:           popup−menu(mainMenu) \n\
!Lock Ctrl <Btn1Down>:      popup−menu(mainMenu) \n\
~Meta <Btn1Down>:           select−start \n\
~Meta <Btn1Motion>:         select−extend \n\
!Ctrl <Btn2Down>:           popup−menu(vtMenu) \n\
!Lock Ctrl <Btn2Down>:      popup−menu(vtMenu) \n\
~Ctrl ~Meta <Btn2Down>:     ignore \n\
~Ctrl ~Meta <Btn2Up>:       insert-selection(PRIMARY,
                            CUT_BUFFER0) \n\
!Ctrl <Btn3Down>:           popup-menu(fontMenu) \n\
!Lock Ctrl <Btn3Down>:      popup-menu(fontMenu) \n\
~Ctrl ~Meta <Btn3Down>:     start-extend \n\
~Meta <Btn3Motion>:         select-extend \n\
<BtnUp>:                    select-end(PRIMARY, CUT_BUFFER0) \n\
<BtnDown>:                  bell(0)
```

The default bindings in the Tektronix window are:

```
~Meta<KeyPress>:            insert-seven-bit \n\
Meta<KeyPress>:             insert-eight-bit \n\
!Ctrl <Btn1Down>:           popup-menu(mainMenu) \n\
!Lock Ctrl <Btn1Down>:      popup-menu(mainMenu) \n\
!Ctrl <Btn2Down>:           popup-menu(tekMenu) \n\
!Lock Ctrl <Btn2Down>:      popup-menu(tekMenu) \n\
Shift ~Meta<Btn1Down>:      gin-press(L) \n\
~Meta<Btn1Down>:            gin-press(l) \n\
Shift ~Meta<Btn2Down>:      gin-press(M) \n\
~Meta<Btn2Down>:            gin-press(m) \n\
Shift ~Meta<Btn3Down>:      gin-press(R) \n\
~Meta<Btn3Down>:            gin-press(r)
```

The following is an example of how the **keymap** action is used to add special keys for entering commonly typed works:

```
*VT100.Translations:          #override <Key>F13: keymap(dbx)
*VT100.dbxKeymap.translations:
 \

    <Key>F14:    keymap(None) \n\
    <Key>F17:    string("next") string(0x0d) \n\
    <Key>F18:    string("step") string(0x0d) \n\
    <Key>F19:    string("continue") string(0x0d) \n\
    <Key>F20:    string("print ")
                 insert-selection(PRIMARY,CUT_BUFFER0)
```

Environment

The **xterm** command sets the environment variables **TERM** and **TERMCAP** properly for the size window you have created. It also uses and sets the **DISPLAY** environment variable to specify which bitmap display terminal to use. The **WINDOWID** environment variable is set to the X window ID number of the xterm window.

Bugs

Large pastes do not work on some systems. This is not a bug in the **xterm** command; it is a bug in the pseudo terminal driver of those systems. The **xterm** command feeds large pastes to the pty only as fast as the pty will accept data, but some pty drivers do not return enough information to know if the write operation has succeeded.

Many of the options are not resettable after the **xterm** command starts.

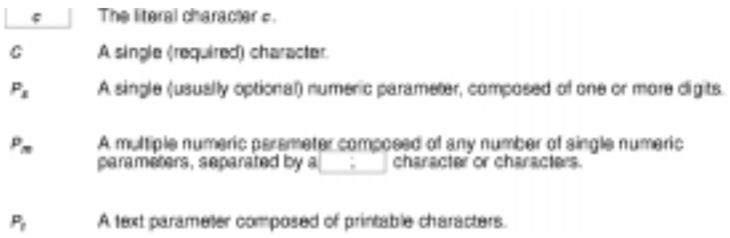
Only fixed−width, character−cell fonts are supported.

Control Sequences

This section lists control sequences available for the **xterm** command.

Definitions

The following figure shows how to interpret key sequences in this section.

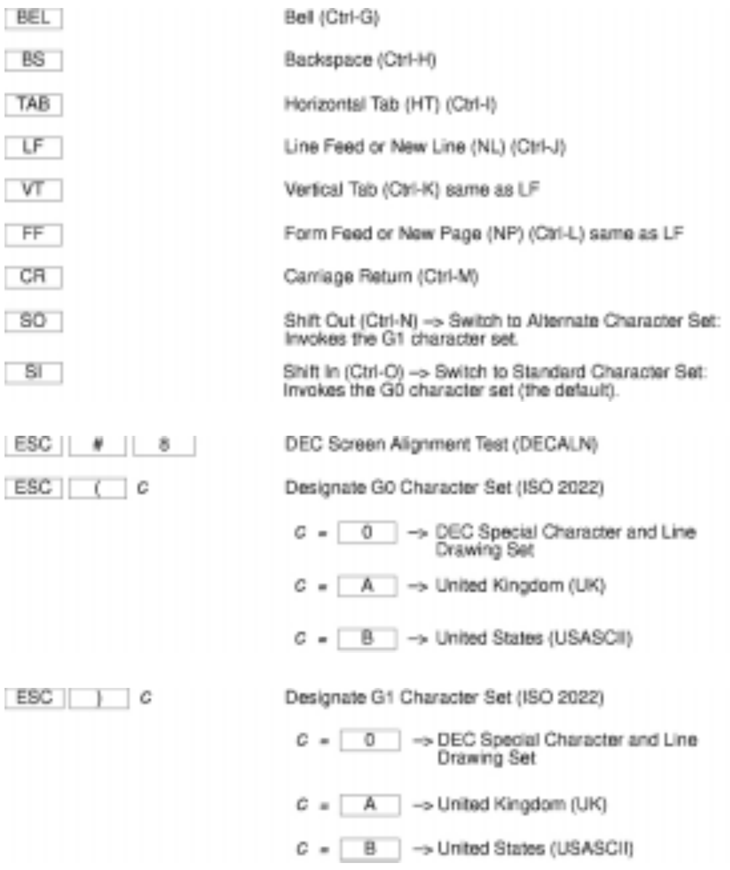


$\boxed{c}$	The literal character *c*.
C	A single (required) character.
P_s	A single (usually optional) numeric parameter, composed of one or more digits.
P_m	A multiple numeric parameter composed of any number of single numeric parameters, separated by a $\boxed{;}$ character or characters.
P_t	A text parameter composed of printable characters.

VT100 Mode

Most of these control sequences are standard VT102 control sequences, but there are some sequences here from later DEC VT terminals, too. Major VT102 features not supported are smooth scrolling, double−size characters, blinking characters, and VT52 mode.

There are additional control sequences to provide xterm−dependent functions, like the scrollbar or window size. Where the function is specified by DEC or ISO 6429, the code assigned to it is given in parentheses. The escape codes to designate character sets are specified by ISO 2022; see that document for a discussion of character sets.



$\boxed{\text{BEL}}$	Bell (Ctrl-G)
$\boxed{\text{BS}}$	Backspace (Ctrl-H)
$\boxed{\text{TAB}}$	Horizontal Tab (HT) (Ctrl-I)
$\boxed{\text{LF}}$	Line Feed or New Line (NL) (Ctrl-J)
$\boxed{\text{VT}}$	Vertical Tab (Ctrl-K) same as LF
$\boxed{\text{FF}}$	Form Feed or New Page (NP) (Ctrl-L) same as LF
$\boxed{\text{CR}}$	Carriage Return (Ctrl-M)
$\boxed{\text{SO}}$	Shift Out (Ctrl-N) -> Switch to Alternate Character Set: Invokes the G1 character set.
$\boxed{\text{SI}}$	Shift In (Ctrl-O) -> Switch to Standard Character Set: Invokes the G0 character set (the default).
$\boxed{\text{ESC}}\boxed{\#}\boxed{8}$	DEC Screen Alignment Test (DECALN)
$\boxed{\text{ESC}}\boxed{(}$ *C*	Designate G0 Character Set (ISO 2022)
	C = $\boxed{0}$ -> DEC Special Character and Line Drawing Set
	C = $\boxed{A}$ -> United Kingdom (UK)
	C = $\boxed{B}$ -> United States (USASCII)
$\boxed{\text{ESC}}\boxed{)}$ *C*	Designate G1 Character Set (ISO 2022)
	C = $\boxed{0}$ -> DEC Special Character and Line Drawing Set
	C = $\boxed{A}$ -> United Kingdom (UK)
	C = $\boxed{B}$ -> United States (USASCII)

ESC * C	Designate G2 Character Set (ISO 2022) C = 0 –> DEC Special Character and Line Drawing Set C = A –> United Kingdom (UK) C = B –> United States (USASCII)
ESC + C	Designate G3 Character Set (ISO 2022) C = 0 –> DEC Special Character and Line Drawing Set C = A –> United Kingdom (UK) C = B –> United States (USASCII)
ESC 7	Save Cursor (DECSC)
ESC 8	Restore Cursor (DECRC)
ESC =	Application Keypad (DECPAM)
ESC >	Normal Keypad (DECPNM)
ESC D	Index (IND)
ESC E	Next Line (NEL)
ESC H	Tab Set (HTS)
ESC M	Reverse Index (RI)
ESC N	Single Shift Select of G2 Character Set (SS2): Affects next character only.
ESC O	Single Shift Select of G3 Character Set (SS3): Affects next character only.
ESC P P_t ESC \	Device Control String (DCS). **xterm** implements no DCS functions; P_t is ignored. P_t need not be printable characters.
ESC Z	Return Terminal ID (DECID). Obsolete form of ESC [c (DA).
ESC [P_s @	Insert P_s (Blank) Character or Characters (default = 1) (ICH)
ESC [P_s A	Cursor Up P_s Times (default = 1) (CUU)
ESC [P_s B	Cursor Down P_s Times (default = 1) (CUD)
ESC [P_s C	Cursor Forward P_s Times (default = 1) (CUF)
ESC [P_s D	Cursor Backward P_s Times (default = 1) (CUB)
ESC [P_s ; P_s H	Cursor Position [row,column] (default = [1,1]) (CUP)
ESC [P_s J	Erase in Display (ED) P_s = 0 –> Clear Below (default) P_s = 1 –> Clear Above P_s = 2 –> Clear All
ESC [P_s K	Erase in Line (EL) P_s = 0 –> Clear to Right (default) P_s = 1 –> Clear to Left P_s = 2 –> Clear All
ESC [P_s L	Insert P_s Lines (default = 1) (IL)
ESC [P_s M	Delete P_s Lines (default = 1) (DL)
ESC [P_s P	Delete P_s Characters (default = 1) (DCH)

ESC [P_s ; P_s ; P_s ; P_s ; P_s T
Initiate hilite mouse tracking. Parameters are [*Func*;*Startx*;*Starty*;*FirstRow*;*LastRow*]. See "Mouse Tracking".

ESC [P_s c
Send Device Attributes (DA)
P_s = 0 or omitted –> Request attributes from terminal
–> ESC [? 1 ; 2 c
("I am a VT100 with Advanced Video Option.")

ESC [P_s ; P_s f
Horizontal and Vertical Position [row;column] (default = [1,1]) (HVP)

ESC [P_s g
Tab Clear (TBC)
P_s = 0 –> Clear Current Column (default)
P_s = 3 –> Clear All

ESC [P_m h
Set Mode (SM)
P_s = 4 –> Insert Mode (IRM)
P_s = 2 0 –> Automatic Newline (LNM)

ESC [P_m l
Reset Mode (RM)
P_s = 4 –> Replace Mode (IRM)
P_s = 2 0 –> Normal Linefeed (LNM)

ESC [P_m m
Character Attributes (SGR)
P_s = 0 –> Normal (default)
P_s = 1 –> Bold
P_s = 4 –> Underscore
P_s = 5 –> Blink (appears as Bold)
P_s = 7 –> Inverse

ESC [P_s n
Device Status Report (DSR)
P_s = 5 –> Status Report
ESC [0 n ("OK")
P_s = 6 –> Report Cursor Position (CPR) [row;column] as
ESC [*r* ; *c* R

ESC [P_s ; P_s r
Set Scrolling Region [top;bottom] (default = full size of window) (DECSTBM)

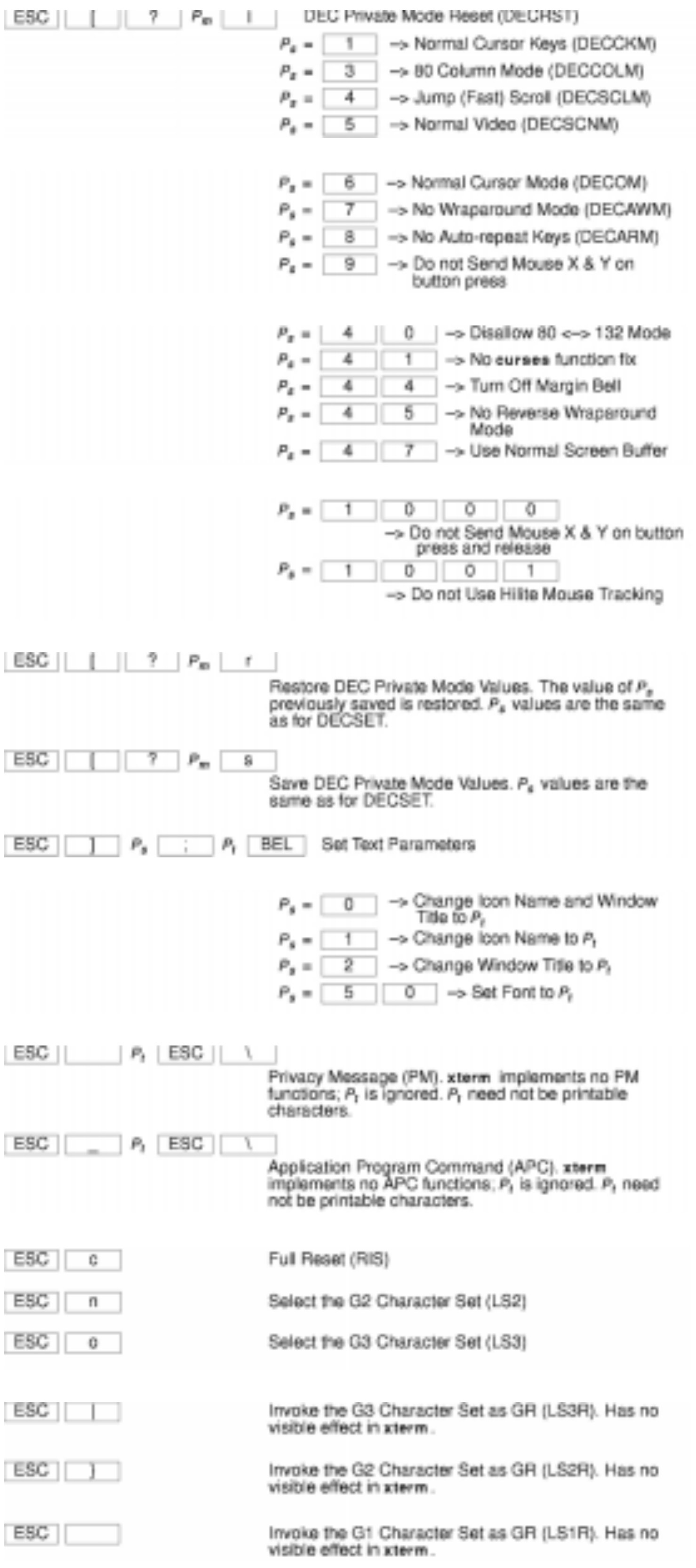
ESC [P_s x
Request Terminal Parameters (DECREQTPARM)

ESC [? P_m h
DEC Private Mode Set (DECSET)
P_s = 1 –> Application Cursor Keys (DECCKM)
P_s = 2 –> Designate USASCII for character sets G0–G3. (In the VT102, this selects VT52 mode (DECANM), which **xterm** does not support.)

P_s = 3 –> 132 Column Mode (DECCOLM)
P_s = 4 –> Smooth (Slow) Scroll (DECSCLM)
P_s = 5 –> Reverse Video (DECSCNM)
P_s = 6 –> Origin Mode (DECOM)
P_s = 7 –> Wraparound Mode (DECAWM)
P_s = 8 –> Auto-repeat Keys (DECARM)
P_s = 9 –> Send Mouse X & Y on button press. See "Mouse Tracking".

P_s = 3 8 –> Enter Tektronix Mode (DECTEK)
P_s = 4 0 –> Allow 80 <–> 132 Mode
P_s = 4 1 –> **curses** function fix
P_s = 4 4 –> Turn On Margin Bell
P_s = 4 5 –> Reverse Wraparound Mode

P_s = 4 7 –> Use Alternate Screen Buffer (unless disabled by the **titeInhibit** resource)
P_s = 1 0 0 0
–> Send Mouse X & Y on button press and release. See "Mouse Tracking".
P_s = 1 0 0 1
–> Use Hilite Mouse Tracking. See "Mouse Tracking".



ESC [? P_m l DEC Private Mode Reset (DECRST)

P_s = 1 -> Normal Cursor Keys (DECCKM)
P_s = 3 -> 80 Column Mode (DECCOLM)
P_s = 4 -> Jump (Fast) Scroll (DECSCLM)
P_s = 5 -> Normal Video (DECSCNM)

P_s = 6 -> Normal Cursor Mode (DECOM)
P_s = 7 -> No Wraparound Mode (DECAWM)
P_s = 8 -> No Auto-repeat Keys (DECARM)
P_s = 9 -> Do not Send Mouse X & Y on button press

P_s = 4 0 -> Disallow 80 <-> 132 Mode
P_s = 4 1 -> No **curses** function fix
P_s = 4 4 -> Turn Off Margin Bell
P_s = 4 5 -> No Reverse Wraparound Mode
P_s = 4 7 -> Use Normal Screen Buffer

P_s = 1 0 0 0 -> Do not Send Mouse X & Y on button press and release
P_s = 1 0 0 1 -> Do not Use Hilite Mouse Tracking

ESC [? P_m r
Restore DEC Private Mode Values. The value of P_s previously saved is restored. P_s values are the same as for DECSET.

ESC [? P_m s
Save DEC Private Mode Values. P_s values are the same as for DECSET.

ESC] P_s ; P_t BEL Set Text Parameters

P_s = 0 -> Change Icon Name and Window Title to P_t
P_s = 1 -> Change Icon Name to P_t
P_s = 2 -> Change Window Title to P_t
P_s = 5 0 -> Set Font to P_t

ESC P_t ESC \
Privacy Message (PM). **xterm** implements no PM functions; P_t is ignored. P_t need not be printable characters.

ESC _ P_t ESC \
Application Program Command (APC). **xterm** implements no APC functions; P_t is ignored. P_t need not be printable characters.

ESC c Full Reset (RIS)

ESC n Select the G2 Character Set (LS2)

ESC o Select the G3 Character Set (LS3)

ESC | Invoke the G3 Character Set as GR (LS3R). Has no visible effect in **xterm**.

ESC } Invoke the G2 Character Set as GR (LS2R). Has no visible effect in **xterm**.

ESC Invoke the G1 Character Set as GR (LS1R). Has no visible effect in **xterm**.

XTERM Description Limitation

The xterm terminal description in the DEC.TI file on AIX Version 4 provides underline mode by using the SGR attribute. The SMUL and RMUL attributes are not currently defined in the XTERM terminal description on AIX Version 4. Use the more generic capability named SGR.

```
tput sgr x y
```

Where *x* is either a 1 or a 0 to turn standout mode on or off respectively, and *y* is either a 1 or a 0 to turn underline mode on or off respectively. See the article "**terminfo** file format" for more details on the SGR capability.

```
tput sgr 0 1    turn off standout; turn on underline
tput sgr 0 0    turn off standout; turn off underline
tput sgr 1 1    turn on standout; turn on underline
tput sgr 1 0    turn on standout; turn off underline
```

Mouse Tracking

The **VT** widget can be set to send the mouse position and other information on button presses. These modes are typically used by editors and other full−screen applications that want to make use of the mouse.

There are three mutually exclusive modes, each enabled (or disabled) by a different parameter in the DECSET (or DECRST) escape sequence. Parameters for all mouse tracking escape sequences generated by the **xterm** command encode numeric parameters in a single character as *value*+040. The screen coordinate system is 1−based.

For example, ! is 1. The screen coordinate system is 1-based.

X10 compatibility mode sends an escape sequence on button press encoding the location and the mouse button pressed. It is enabled by specifying parameter 9 to DECSET. On button press, the **xterm** command sends the following 6 characters. *C*b is button−1. *C*x and *C*y are the *x* and *y* coordinates of the mouse when the button was pressed.

ESC [M $C_bC_xC_y$

ESC [M $C_bC_xC_y$

Normal tracking mode sends an escape sequence on both button press and release. Modifier information is also sent. It is enabled by specifying parameter 1000 to DECSET. On button press or release, the **xterm** command sends the following key sequence:

ESC [M $C_bC_xC_y$

ESC [M $C_bC_xC_y$

The low two bits of *C*b encode button information: 0=MB1 pressed, 1=MB2 pressed, 2=MB3 pressed, 3=release. The upper bits encode what modifiers were down when the button was pressed and are added together. 4=Shift, 8=Meta, 16=Control. *C*x and *C*y are the *x* and *y* coordinates of the mouse event. The upper left corner is (1,1).

Mouse hilite tracking notifies a program of a button press, receives a range of lines from the program, highlights the region covered by the mouse within that range until button release, and then sends the program the release coordinates. It is enabled by specifying parameter 1001 to DECSET.

> **Attention:** Use of this mode requires a cooperating program or it will hang the **xterm** command. On button press, the same information as for normal tracking is generated; the **xterm** command then waits for the program to send mouse tracking information. *All X events are ignored until the following proper escape sequence is received from the pty*:

ESC [P_s ; P_s ; P_s ; P_s ; P_s T

ESC [P_s ; P_s ; P_s ; P_s ; P_s T

The parameters are *Func*, *Startx*, *Starty*, *FirstRow*, and *LastRow*. The *Func* parameter is nonzero to initiate hilite tracking and 0 (zero) to abort. The *Startx* and *Starty* parameters give the starting x and y location for the highlighted region. The ending location tracks the mouse, but is never above row *FirstRow* and is always above row *LastRow*. (The top of the screen is row 1.) When the button is released, the **xterm** command reports the ending position one of two ways: if the start and end coordinates are valid text locations, the **xterm** command reports the ending position as follows:

ESC [t $C_x C_y$

ESC [t $C_x C_y$

If either coordinate is past the end of the line, the **xterm** command reports the ending position as follows:

ESC [T $C_x C_y C_x C_y C_x C_y$

ESC [T $C_x C_y C_x C_y C_x C_y$

The parameters are *Startx*, *Starty*, *Endx*, *Endy*, *Mousex*, and *Mousey*. The *Startx*, *Starty*, *Endx*, and *Endy* parameters give the starting and ending character positions of the region. The *Mousex* and *Mousey* parameters give the location of the mouse at button up, which may not be over a character.

Tektronix 4014 Mode

Most of these sequences are standard Tektronix 4014 control sequences. The major features missing are the write−thru and defocused modes. This document does not describe the commands used in the various Tektronix plotting modes but does describe the commands to switch modes.

Related Information

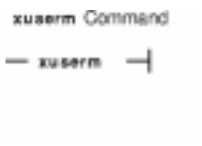
The **aixterm** command, **resize** command, **tset** command, **vi** or **vedit** command.

xuserm Command

Purpose

Starts Users & Groups Manager, a Visual System Management (VSM) application.

Syntax



xuserm

Description

The **xuserm** command starts Users & Groups Manager, one of the Visual System Management (VSM) applications. Users & Groups Manager is a graphical interface that enables you to perform security tasks through direct manipulation of objects (icons), freeing you from entering complex command syntax or from searching through menus.

Users & Groups Manager makes adding users simple by providing system−defined and user−customized templates. Simple drag−and−drop actions enable you to set user passwords, change a user's language, and allow or disallow a user to log in to a system (enable or disable).

The Users & Groups Manager session creates or adds to the **smit.log** and **smit.script** files in your home directory. (These are the same files appended when you run a SMIT session.) The commands built and run by Users & Groups Manager are added to the end of the **smit.log** file along with the command output. The time, name of the task, and the command (flags and parameters included) are added to the end of the **smit.script** file in a format that can easily be used to create executable shell scripts.

Example

To start Users & Groups Manager, enter:

```
xuserm
```

To see a list tasks you can perform for an object or area, press the right mouse button to display its pop−up menu. Read the text in the Information Area for help on the objects and areas.

Files

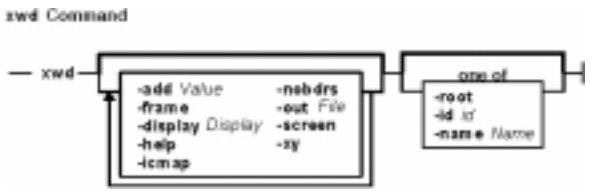
smit.log	Specifies detailed information on your session, with time stamps.
smit.script	Specifies the task commands run during your session, with time stamps.

xwd Command

Purpose

Dumps the image of an Enhanced X−Windows window.

Syntax



xwd [**−add** *Value*] [**−frame**] [**−display** *Display*] [**−help**] [**−nobdrs**] [**−xy**] [**−out** *File*]
[**−root** | **−id** *id* | **−name** *Name*] [**−icmap**] [**−screen**]

Description

The **xwd** command is an Enhanced X−Windows window dumping utility. The **xwd** command allows you to store window images in a specially formatted dump file. This file can then be read by various other X utilities that perform functions such as redisplaying, printing, editing, formatting, archiving, and image processing. Select the target window by clicking the mouse in the desired window. The keyboard bell rings once at the beginning of the dump and twice when the dump is completed.

Flags

−add *Value*	Specifies a signed value to add to every pixel. This option is specific to X11R5.
−frame	This option indicates that the window manager frame should be included when manually selecting a window.
−display *Display*	Specifies the server connection.
−help	Prints the usage command syntax summary.
−nobdrs	Specifies that the window dump does not include the pixels that compose the X window border. This is useful if you want to include the window contents in a document as an illustration. The result of the **−nobdrs** flag depends on which window manager is running. Many window managers remove all borders from the client. For example, the **XGetWindowAttributes** function returns the value of 0 for the `border_width` field regardless of the border width when the client was started. Therefore, any border that is visible on the screen belongs to the window manager; the client has no knowledge of it. In this case, the **−nobdrs** flag has no effect.
−out*File*	Specifies the output file on the command line. The default is to output to standard out.
−root	Indicates that the root window should be selected for the window dump, without requiring the user to select a window with the pointer. This option is specific to X11R5.
−id*id*	Indicates that the window with the specified resource id should be selected for the window dump, without requiring the user to select a window with the pointer. This option is specific to X11R5.
−name*Name*	Indicates that the window with the specified WM_NAME property should be selected for the window dump, without requiring the user to select a window with the pointer. This option is specific to X11R5.

−icmap	Forces the first installed colormap of the screen to be used to obtain RGB values. By default, the colormap of the chosen window is used. This option is specific to X11R5.
−screen	Indicates that the GetImage request used to obtain the image should be done on the root window, rather than directly on the specified window. In this way, you can obtain pieces of the other windows that overlap the specified window and, more importantly, capture menus or other popups that are independent windows but appear over the specified window. This option is specific to X11R5.
−xy	Selects xy format dumping instead of the default z format. This option applies to color displays only.

File

XWDFile.h X Window dump file format definition file.

Related Information

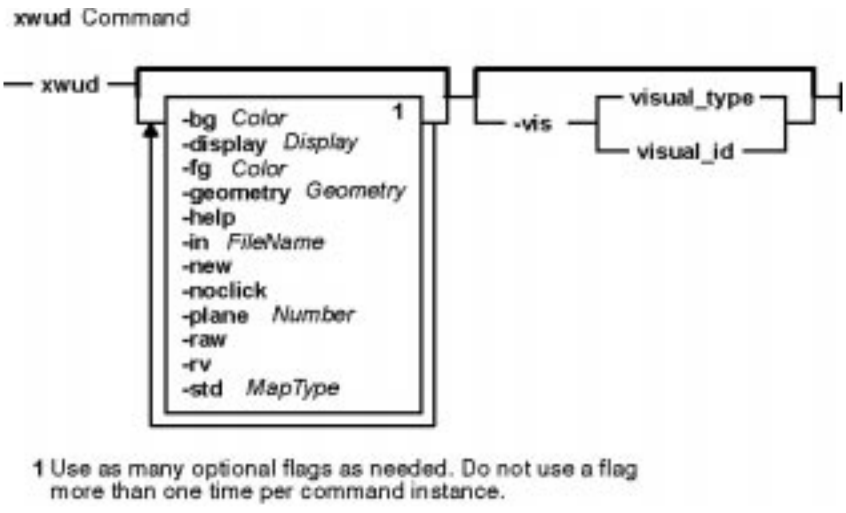
The **xwud** command.

xwud Command

Purpose

Retrieves and displays the dumped image of an Enhanced X−Windows window.

Syntax



xwud [**−in** *FileName*] [**−noclick**] [**−geometry** *Geometry*] [**−display** *Display*] [**−new**]
[**−std** *MapType*] [**−raw**] [**−vis visual_type** | **visual_id**] [**−help**] [**−rv**] [**−plane** *Number*] [
−fg *Color*] [**−bg** *Color*]

Description

The **xwud** command retrieves the dumped image of an Enhanced X−Windows window. It does so by displaying in a window an image saved in a specially formatted dump file previously produced by the **xwd** command. The dump file format is determined by the **XWDFile.h** file.

You can use flags to specify color display, window size and position, input field, and visual class or identification. You can also select a single bit plane of the image to display.

Flags

−bg*Color*	Specifies the color to display for the **0** (zero) bits in the image if a bitmap image (or a single plane of an image) is displayed.
−display*Display*	Specifies the server to connect to; see the **X** command.
−fg*Color*	Specifies the color to display for the **1** bits in the image if a bitmap image (or a single plane of an image) is displayed.
−geometry*Geometry*	Specifies the size and position of the window. Typically, you will only specify the position and let the size default to the actual size of the image.
−help	Prints a short description of the allowable options.
−in*FileName*	Specifies the input file on the command line. If the input file is not specified, the standard input is assumed.
−new	Creates a new color map for displaying the image. If the image characteristics match those of the display, this flag can display the image on the screen faster,

	but at the cost of using a new color map (which on most terminals causes other windows to go technicolor).
−noclick	Prevents the application from ending when a button in the window is clicked. You can end the application by typing a q or Q character, or the Ctrl−C key sequence.
−plane*Number*	Selects a single bit plane of the image to display. Planes are numbered, with 0 (zero) being the least significant bit. Use this flag to determine which plane to pass to the **xpr** command for printing.
−raw	Displays the dumped image in whatever color values currently exist on the screen. This flag is useful when undumping an image back onto the same screen that the image originally came from, while the original windows are still on the screen. This results in getting the image on the screen faster.
−rv	Swaps the foreground and background colors if a bitmap image (or a single plane of an image) displays. This flag is useful when displaying a bitmap image that has the color sense of pixel values 0 and 1 reversed from what they are on the display.
−std *MapType*	Uses the specified Standard Colormap to display the image. You can obtain the map type by converting the type to uppercase letters, prepending **RGB_** and appending **_MAP**. Typical map types are **best**, **default**, and **gray**. See the **/usr/lpp/X11/Xamples/clients/xstdcmap** for information about creating Standard Colormaps.
−visvisual_type | **visual_id**	Specifies a particular visual type or visual id. The default picks the **best** one or you can specify **default**, which is the same class as the colormap of the root window. You can specify a particular class: **StaticGray**, **GrayScale**, **StaticColor**, **PseudoColor**, **DirectColor**, **TrueColor**. Specify **Match** to use the same class as the source image. Specify an exact visual id (specific to the server) as a hexadecimal number (prefixed with 0x) or as a decimal number. This string is not case sensitive.

Environment Variables

DISPLAY Gets the default display.

Example

To retrieve a specific file from the dump window, enter:

```
xwud −in FileName
```

Related Information

The **X** command, **xpr** command, **xwd** command.

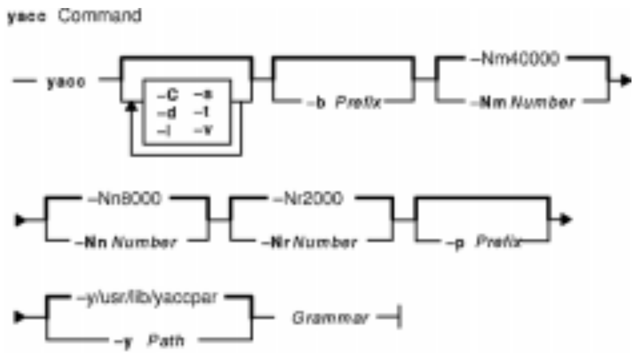
See **/usr/lpp/X11/Xamples/clients/xstdcmap**.

yacc Command

Purpose

Generates an LALR(1) parsing program from input consisting of a context−free grammar specification.

Syntax



yacc [**−b** *Prefix*] [**−C**] [**−d**] [**−l**] [**−Nn***Number*] [**−Nm***Number*] [**−Nr***Number*] [**−p** *Prefix*]
[**−s**] [**−t**] [**−v**] [**−y** *Path*] *Grammar*

Description

The **yacc** command converts a context−free grammar specification into a set of tables for a simple automaton that executes an LALR(1) parsing algorithm. The grammar can be ambiguous; specified precedence rules are used to break ambiguities.

You must compile the output file, **y.tab.c**, with a C language compiler to produce a **yyparse** function. This function must be loaded with the **yylex** lexical analyzer, as well as with the **main** subroutine and the **yyerror** error−handling subroutine (you must provide these subroutines). The **lex** command is useful for creating lexical analyzers usable by the **yyparse** subroutine. Simple versions of **main** and **yyerror** subroutines are available through the **yacc** library, **liby.a**. Also, **yacc** can be used to generate C++ output.

You can compile the **yacc**−generated C file **(y.tab.c)** with the **−DYACC_MSG** option to include code necessary to use the Message Facility. When you use this option during compilation, error messages generated by the **yyparse** subroutine and the **YYBACKUP** macro are extracted from the **yacc_user.cat** catalog.

This allows you to receive error messages in languages other than English in non−English locales. If the catalog cannot be found or opened, the **yyparse** and **YYBACKUP** subroutines display the default English messages.

The **yacc** command is affected by the **LANG**, **LC_ALL**, **LC_CTYPE**, and **LC_MESSAGES** environment variables.

Flags

−b *Prefix*	Use *Prefix* instead of **y** as the prefix for all output file names. The code file **y.tab.c**, the header file **y.tab.h** (created when **−d** is specified), and the description file **y.output** (created when **−v** is specified) are changed to *Prefix*.**tab.c**, *Prefix*.**tab.h**, and *Prefix*.**output**, respectively.

−C	Produces the **y.tab.C** file instead of the **y.tab.c** file for use with a C++ compiler. To use the I/O Stream Library for input and output, define the macro, **_CPP_IOSTREAMS**.
−d	Produces the file **y.tab.h**. This contains the **#define** statements that associate the **yacc**−assigned token codes with your token names. This allows source files other than **y.tab.c** to access the token codes by including this header file.
−l	Does not include any **#line** constructs in **y.tab.c**. Use this only after the grammar and associated actions are fully debugged.
−Nn*Number*	Changes the size of the token and nonterminal names array to *Number*. The default value is 8000. Valid values are only those greater than 8000.
−Nm*Number*	Changes the size of the memory states array to *Number*. Default value is 40000. Valid values are only those greater than 40000.
−Nr*Number*	Changes the internal buffer sizes to handle large grammars. The default value is 2000. Valid values are only those greater than 2000.
−p *Prefix*	Use *Prefix* instead of **yy** as the prefix for all external names created by the **yacc** command. External names affected include: **yychar**, **yylval**, **yydebug**, **yyparse( )**, **yylex( )**, and **yyerror( )**. (Previously, **−p** was used to specify an alternate parser; now, **−y***Path* can be used to specify an alternate parser.)
−s	Breaks the **yyparse** function into several smaller functions. Since its size is somewhat proportional to that of the grammar, it is possible for the **yyparse** function to become too large to compile, optimize, or execute efficiently.
−t	Compiles run−time debugging code. By default, this code is not included when **y.tab.c** is compiled. However, the run−time debugging code is under the control of the preprocessor macro, **YYDEBUG**. If **YYDEBUG** has a nonzero value, the C compiler (**cc**) includes the debugging code, regardless of whether the **−t** flag is used. **YYDEBUG** should have a value of 0 if you don't want the debugging code included by the compiler. Without compiling this code, the **yyparse** subroutine will have a faster operating speed. The **−t** flag causes compilation of the debugging code, but it does not actually turn on the debug mode. To get debug output, the **yydebug** variable must be set either by adding the C language declaration, `int yydebug=1` to the declaration section of the **yacc** grammar file or by setting **yydebug** through **dbx**.
−v	Prepares the file **y.output**. It contains a readable description of the parsing tables and a report on conflicts generated by grammar ambiguities.
−y *Path*	Uses the parser prototype specified by *Path* instead of the default **/usr/lib/yaccpar** file. (Previously, **−p** was used to specify an alternate parser.)

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

1. The following command:

   ```
   yacc grammar.y
   ```

   draws **yacc** rules from the **grammar.y** file, and places the output in **y.tab.c**.

2. The following command:

```
yacc −d grammar.y
```

functions the same as example 1, but it also produces the **y.tab.h** file which would contain C−style **#define** statements for each of the tokens defined in the **grammar.y** file.

Files

y.output	Contains a readable description of the parsing tables and a report on conflicts generated by grammar ambiguities.
y.tab.c	Contains an output file.
y.tab.h	Contains definitions for token names.
yacc.tmp	Temporary file.
yacc.debug	Temporary file.
yacc.acts	Temporary file.
/usr/ccs/lib/yaccpar	Contains parser prototype for C programs.
/usr/ccs/lib/liby.a	Contains a run−time library.

Related Information

The **lex** command.

Creating an Input Language with the lex and yacc Commands in *AIX General Programming Concepts: Writing and Debugging Programs*.

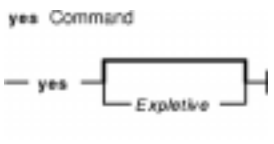
The Example program for the lex and yacc programs in *AIX General Programming Concepts: Writing and Debugging Programs*.

yes Command

Purpose

Outputs an affirmative response repetitively.

Syntax



yes [*Expletive*]

Description

The **yes** command outputs an affirmative response repetitively. Use the **yes** command as piped input to another command that requires an affirmative response before it completes the specified action. For example, the **yes** command is useful when deleting multiple files from a directory. The Ctl−C key sequence terminates the continuous affirmative responses.

> **Note:** The current locale is determined by the **LC_MESSAGES** environment variable or the *Expletive* parameter, if specified. The *Expletive* parameter can be any single character or character stream. If you enter an *Expletive* parameter after issuing the **yes** command, the *Expletive* parameter displays to the screen until you type the Ctl−C key sequence.

Examples

1. To delete all files in a directory and automatically send an affirmative response to the question `Remove these files?`, enter:

   ```
   yes | del *
   ```

   This statement displays the names of the files deleted by the **delete** command.
2. To display the word `first` to the screen, enter:

   ```
   yes first
   ```

This statement displays the word until you enter the Ctl−C key sequence.

File

/usr/bin/yes
Contains the **yes** command.

Related Information

The **environment** file.

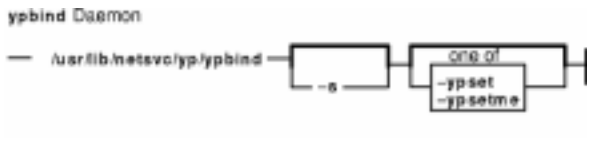
Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

ypbind Daemon

Purpose

Enables client processes to bind, or connect, to an NIS server.

Syntax



/usr/lib/netsvc/yp/ypbind [**−s −ypset −ypsetme**]

Description

The **ypbind** daemon binds, or connects, processes on a Network Information Services (NIS) client to services on an NIS server. This daemon, which runs on every NIS client, is started and stopped by the following System Resource Controller (SRC) commands:

```
startsrc −s ypbind
```

```
stopsrc −s ypbind
```

When a client requests information from a Network Information Services (NIS) map, the **ypbind** daemon broadcasts on the network for a server. When the server responds, it gives the daemon the Internet address and port number of a host. This is the host that provides the information the client is seeking. The **ypbind** daemon stores this address information in the **/var/yp/binding** directory using a file name of **domainname.version**. Then, the next time the client wants to access an NIS map, the client's **ypbind** daemon refers to the addresses in the **domainname.version** file.

The **ypbind** daemon can maintain bindings to several domains and their servers **−ypsetme** simultaneously. The default domain is the one specified by the **domainname** command at startup time.

Notes:

1. If a domain becomes unbound (usually when the server crashes or is overloaded), the **ypbind** daemon broadcasts again to find another server.
2. To force a client to bind to a specific server, use the **ypset** command.
3. To find out which server a client is bound to, use the **ypwhich** command.

Flags

−s	Runs the **ypbind** daemon in a secure mode on privileged communications ports.
−ypset	Indicates the local host accepts **ypset** commands from local or remote hosts.
−ypsetme	Indicates that the local host accepts **ypset** commands only from the local host. This flag overrides the **−ypset** flag if both are specified.

Note: If neither the **−ypset** or **−ypsetme** flags are specified, the local host rejects all

ypset commands from all hosts. This is the most secure mode since the NIS server cannot change.

Note: If neither the **−ypset** or **−ypsetme** flags are specified, the local host rejects all **ypset** commands from all hosts. This is the most secure mode since the NIS server cannot change. However, if no NIS servers exist on the networks directly connected to the client machine, then the **−ypsetme** flag must be used and the NIS server should be specified with the **ypset** command.

Files

/var/yp/binding directory	Contains Internet addresses and port numbers for NIS servers.
domainname.version	Binary file that contains the address and port number of the current NIS server.

Related Information

The **domainname** command, **makedbm** command, **mkclient** command, **mkmaster** command, **mkslave** command, **ypcat** command, **ypinit** command, **ypmatch** command, **yppoll** command,**yppush** command, **ypset** command, **ypwhich** command, **ypxfr** command.

System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

NIS Reference.

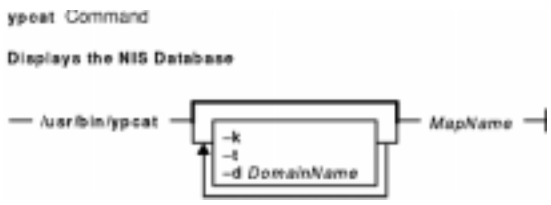
ypcat Command

Purpose

Prints out a Network Information Services (NIS) map.

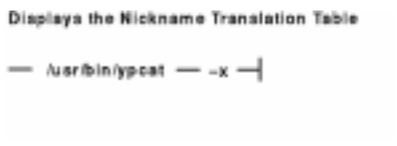
Syntax

To Display the Network Information Services Database



/usr/bin/ypcat [**−k**] [**−t**] [**−d***DomainName*] *MapName*

To Display the Nickname Translation Table



/usr/bin/ypcat−x

Description

The **ypcat** command prints out the Network Information Services (NIS) map you specify with the *MapName* parameter. You can specify either a map name or a map nickname. Since the **ypcat** command uses the NIS service, you do not need to specify a server.

Flags

−k	Displays the keys for those maps in which the values are null or for which the key is not part of the value. (None of the maps derived from files that have an ASCII version in the **/etc** directory fall into this class.)
−t	Indicates that the name specified by the *MapName* parameter is *not* a nickname. This flag causes the **ypcat** command to bypass the nickname translation table and search only for the map specified by the *MapName* parameter.
−d *DomainName*	Searches the specified domain for the specified map.
−x	Displays the nickname translation table. This table lists the map nicknames the command knows of and indicates the map name (as specified by the *MapName* parameter) associated with each nickname.

Examples

1. To look at the networkwide password map, **passwd.byname**, enter:

```
ypcat passwd
```

In this example, `passwd` is the nickname for the **passwd.byname** map.

2. To locate a map, enter:

   ```
   ypcat -t passwd
   ```

   In this example, the **ypcat** command bypasses any maps with the nickname of `passwd` and searches for a map with the full name of `passwd`.

3. To display a map in another domain, enter:

   ```
   ypcat -d polaris passwd
   ```

   In this example, the **ypcat** command locates the map named `passwd` in the domain named `polaris`.

4. To display the map nickname translation table, enter:

   ```
   ypcat -x
   ```

In this example, the **ypcat** command displays a list of map nicknames and their associated map names.

Related Information

The **domainname** command, **ypmatch** command.

The **ypserv** daemon.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

NIS Reference.

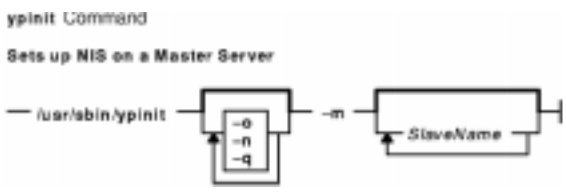
ypinit Command

Purpose

Sets up NIS maps on a Network Information Services (NIS) server.

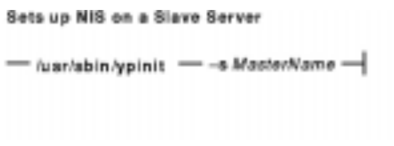
Syntax

To Set up NIS on an NIS Master Server



/usr/sbin/ypinit [**−o**] [**−n**] [**−q**] **−m** [*SlaveName* ...]

To Set up NIS on an NIS Slave Server



/usr/sbin/ypinit −s*MasterName*

Description

The **ypinit** command sets up NIS maps on a Network Information Services (NIS) master server or NIS slave server. Only users with root user authority can use the **ypinit** command.

By default, the **ypinit** command uses the ASCII system files as input files for the map being created.

Flags

−m [*SlaveName...*]	Indicates that the local host is to be the NIS master. If the **−q** flag is used the **−m** flag can be followed by the names of the machines that will be the NIS slave servers.
−n	Indicates that the **ypinit** command is not to stop if it finds errors.
−o	Allows any existing maps for the current NIS domain to be overwritten.
−q	Indicates that the **ypinit** command is to get arguments from the command line instead of prompting for input.
−s *MasterName*	Copies NIS maps from the server workstation you specify in the *MasterName* parameter.

Examples

1. To set up an NIS master server that functions as the master for all NIS maps, enter the following command on the command line:

   ```
   ypinit −m
   ```

This command invokes the **make** procedure, which follows the instructions in the **/var/yp/Makefile** file.

2. To set up an NIS slave server, enter:

   ```
   ypinit −s zorro
   ```

   In this example, the **ypinit** command copies the NIS maps onto your workstation from the NIS server named `zorro`, making your workstation an NIS slave server.

3. To set up an NIS master server without being prompted for input, enter:

   ```
   ypinit −o −n −q −m slave
   ```

   Note: If the system has previously been configured as an NIS master server, You should ensure that the directory, **/var/yp/binding**, is removed before executing **ypinit**. If old information is stored in **/var/yp/binding**, it may cause errors to occur during configuration of the NIS master server.

Files

/etc/bootparams	Lists clients that diskless clients can use for booting.
/etc/passwd	Contains an entry for each user that has permission to log on to the machine.
/etc/group	Contains an entry for each user group allowed to log on to the machine.
/etc/hosts	Contains an entry for each host on the network.
/var/yp/Makefile	Contains rules for making NIS maps.
/etc/networks	Contains the name of each network in the DARPA Internet.
/etc/netmasks	Lists network masks used to implement IP standard subnetting.
/etc/netid	Contains identification information for machines, hosts, and groups.
/etc/rpc	Contains map information for RPC programs.
/etc/services	Contains an entry for each server available through the Internet.
/etc/protocols	Defines Internet protocols used on the local host.
/etc/netgroup	Contains information about each user group on the network.
/etc/ethers	Contains the Ethernet addresses of hosts on the Internet network.
/etc/publickey	Contains public or secret keys for NIS maps.

Related Information

The **chmaster** command, **chslave** command, **lsmaster** command, **makedbm** command, **mkmaster** command, **mkslave** command, **yppush** command, **ypxfr** command.

The **ypserv** daemon.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

NIS Reference.

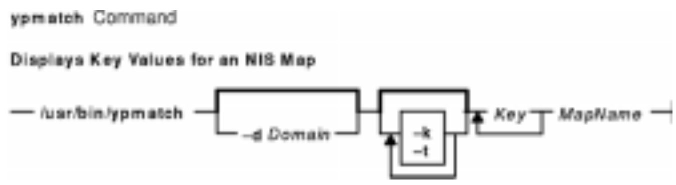
ypmatch Command

Purpose

Displays the values of given keys within a Network Information Services (NIS) map.

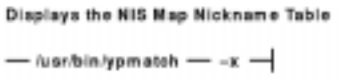
Syntax

To Display Key Values for an NIS Map



/usr/bin/ypmatch [**−d** *Domain*] [**−k**] [**−t**] *Key... MapName*

To Display the NIS Map Nickname Table



/usr/bin/ypmatch −x

Description

The **ypmatch** command displays the values associated with one or more keys within a Network Information Services (NIS) map. Use the *MapName* parameter to specify either the name or nickname of the map you want to search.

When you specify multiple keys in the *Key* parameter, the system searches the same map for all of the keys. Since pattern matching is not available, match the capitalization and length of each key exactly. If the system does not find a match for the key or keys you specify, a diagnostic message is displayed.

Flags

−d *Domain*	Specifies a domain other than the default domain.
−k	Prints a key followed by a colon before printing the value of the key. This is useful only if the keys are not duplicated in the values or if you have specified so many keys that the output could be confusing.
−t	Inhibits translation of nickname to map name.
−x	Displays the map nickname table. This lists the nicknames (as specified by the *MapName* parameter) the command knows of and indicates the map name associated with each nickname.

Examples

To display the value associated with a particular key, enter:

```
ypmatch −d ibm −k host1 hosts
```

In this example, the **ypmatch** command displays the value of the `host1` key from the `hosts` map in the `ibm` domain.

Related Information

The **ypcat** command.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

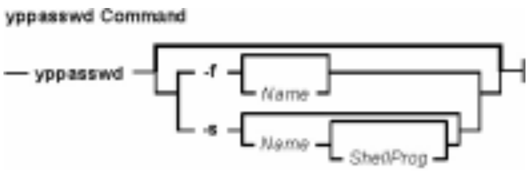
NIS Reference.

yppasswd Command

Purpose

Changes your network password in Network Information Services (NIS).

Syntax



yppasswd [**−f** [*Name*] | **−s** [*Name* [*ShellProg*]]]

Description

The **yppasswd** command changes (or installs) a network password and associates it with the name you specify in the *UserName* parameter. To create or change a password, you must be the owner of the password you want to change. The Network Information Services (NIS) password can be different from the one on your own machine. Root users on an NIS server can change the password of another user without knowing the user's original password. Root users on an NIS client, however, do not have this privilege.

When you enter the **yppasswd** command on the command line, the system prompts you to enter the old password. Once you do this, the system prompts you to enter the new password. The password you enter can be as small as four characters long if you use a mixture of uppercase and lowercase characters. Otherwise, the password has to be six characters long or longer. These rules are relaxed if you are insistent enough.

If you should enter the old password incorrectly, you have to enter the new password before the system will give you an error message. The system requires both passwords because the **update** protocol sends them to the server at the same time. The server catches the error and notifies you that you entered the old password incorrectly.

To verify the new password, the system prompts you to enter it again. For this new password to take effect, the **yppasswdd** daemon must be running on your NIS server.

> **Note:** The **yppasswd** command cannot establish rules for passwords as does the **passwd** command.

Flags

−f [*Name*]	Changes user *Name*'s gecos information in the NIS maps. Gecos information is general information stored in the **/etc/passwd** file.
−s [*Name* [*ShellProg*]]	Changes user *Name*'s login shell in the NIS maps.

Example

1. To change a user's NIS password, enter:

```
yppasswd Joe
```

This example demonstrates how to change the NIS password for the user named `Joe`. The system prompts you to enter Joe's old password and then his new password.

2. To change the login shell to **/bin/ksh** for the user named `Joe`, if the **yppasswdd** daemon has not been started with the **−noshell** flag, enter:

   ```
   yppasswd −s Joe /bin/ksh
   ```

3. To change the gecos information in the **passwd** file for the user named `Joe`, if the **yppasswdd** daemon has not been started with the **−nogecos** flag, enter:

   ```
   yppasswd −f Joe
   Old NIS password:
   Joe's current gecos:
   John Doe Test User Id
   Change (yes) or (no)? >y
   To?>Joe User Test User Id
   ```

Related Information

The **yppasswdd** daemon.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

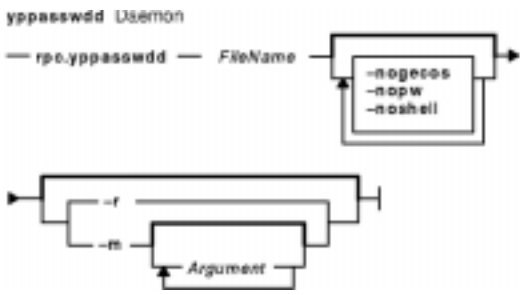
NIS Reference.

yppasswdd Daemon

Purpose

Receives and executes requests from the **yppasswd** command.

Syntax



rpc.yppasswdd*FileName* [**−nogecos**] [**−nopw**] [**−noshell**] [**−r** | **−m** [*Argument...*]]

Description

The **yppasswdd** daemon is a server that receives and executes requests for new passwords from the **yppasswd** command **.** These requests require the daemon to verify the user's old password and change it. The daemon changes the password in the file you specify in the *FileName* parameter, which has the same format as the **/etc/passwd** file.

To make it possible to update the Network Information Services (NIS) password map from remote machines, the **yppasswdd** daemon must be running on the master server that contains the NIS password map.

> **Note:** The **yppasswdd** daemon is not run by default, nor can it be started up from the **inetd** daemon like other Remote Procedure Call (RPC) daemons.

The **yppasswdd** daemon can be started and stopped with the following System Resource Controller (SRC) commands:

```
startsrc −s yppasswdd
```

```
stopsrc −s yppasswdd
```

Flags

−m	Runs the **make** command using the makefile in the **/var/yp** directory. This adds the new or changed password to the NIS password map. Any arguments that follow the **−m** flag are passed to the **make** command.
−nogecos	Indicates the server will not accept changes for gecos information from the **yppasswd** command.
−nopw	Indicates that the server will not accept password changes from the **yppasswdd** command.
−noshell	Indicates the server will not accept changes for user shells from the **yppasswd** command.
−r	Directly updates the **/var/yp/***domainname***/passwd.byname** and **/var/yp/***domainname***/passwd.byuid** database files with new or changed passwords. This option is faster than the **−m** flag because the **make** command is not run. The **−r** flag is useful when the

database files are large (several thousand entries or more).

Note: The System Resource Controller (SRC) starts the **yppasswdd** daemon with the **−m** flag specified by default. Use the **chssys** command to change the default to the **−r** flag.

Example

To propagate updated passwords immediately, invoke the **yppasswdd** daemon as follows:

```
startsrc −s yppasswdd
```

Files

/etc/inetd.conf	Defines how the **inetd** daemon handles Internet service requests.
/var/yp/Makefile	Contains rules for making NIS maps.
/etc/rc.nfs	Contains the startup script for the NFS and NIS daemons.
/etc/security/passwd	Stores password information.

Related Information

The **chssys** command, **domainname** command, **make** command, **passwd** command, **startsrc** command, **yppasswd** command.

The **inetd** daemon.

The **/etc/security/passwd** file.

System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Remote Procedure Call (RPC) Overview for Programming in *AIX Version 4.3 Communications Programming Concepts*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

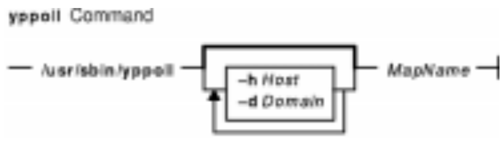
NIS Reference.

yppoll Command

Purpose

Displays the order number (ID number) of the Network Information Services (NIS) map currently in use on the server.

Syntax



/usr/sbin/yppoll [**−h***Host*] [**−d***Domain*] *MapName*

Description

The **yppoll** command uses the **ypserv** daemon to display the order number of the map you specify in the *MapName* parameter. An order number is a map's ID number and is assigned by the system. This number changes whenever a map is updated. Use the **yppoll** command whenever you want to make sure your servers are using the most current version of a particular map.

The **yppoll** command can run on systems that have either version 1 or version 2 of the Network Information Services (NIS) protocol installed. Be aware, however, that each version of the protocol has its own set of diagnostic messages.

> **Note:** When specifying a map name, be sure to enter the map's full name. The **yppoll** command does not recognize map nicknames.

Flags

−h *Host*	Enables you to specify a server other than the default server. To find out which server the command defaults to, use the **ypwhich** command.
−d *Domain*	Enables you to specify a domain other than the default domain. To find out which domain the command defaults to, use the **domainname** command.

Examples

1. To look at a map located on a particular host, enter:

   ```
   /usr/sbin/yppoll −h thor netgroups.byuser
   ```

   In this example, the **yppoll** command displays the order number for the `netgroups.byuser` map located on the host named `thor`.

2. To look at a map on a domain, enter:

   ```
   /usr/sbin/yppoll −d atlantis hosts.byname
   ```

In this example, the **ypoll** command displays the order number for the `hosts.byname` map located in the domain `atlantis`.

Related Information

The **domainname** command, **ypwhich** command.

The **ypserv** daemon.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

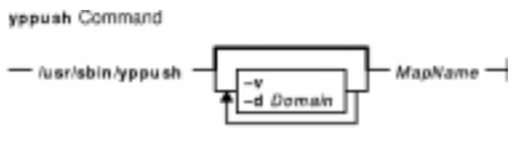
NIS Reference.

yppush Command

Purpose

Prompts the Network Information Services (NIS) slave servers to copy updated NIS maps.

Syntax



/usr/sbin/yppush [**−v**] [**−d***Domain*] *MapName*

Description

The **yppush** command, which is issued from the **/usr/etc/yp** directory, prompts the Network Information Services (NIS) slave servers to make copies of updated NIS maps. The *MapName* variable specifies that map to be transferred to the slave servers of the master servers. To get a list of the servers it needs to prompt, the **yppush** command reads the **ypservers** map, specified by the *Domain* parameter or the current default domain. Once prompted, each slave server uses the **ypxfr** command to copy and transfer the map back to its own database.

You can use the System Management Interface Tool (SMIT) to run this command. To use SMIT, enter:

```
smit yppush
```

> **Note:** If your system uses version 1 of the NIS protocol, the **ypxfr** command is not the transfer agent.

Flags

−d*Domain*	Specifies a domain other than the default domain. The maps for the specified domain must exist.
−v	Displays messages as each server is called and then displays one message for each server's response, if you are using the version 2 protocol. If this flag is omitted, the command displays error messages only. **Note:** Version 1 of the NIS protocol does not display messages. If your system uses version 1, use the **yppoll** command to verify that the transfer took place.

Examples

1. To copy a map from another domain to the slave servers, enter:

   ```
   /usr/sbin/yppush −d atlantis netgroup
   ```

   In this example, the **yppush** command copies the `netgroup` map from the `atlantis` domain.

2. To display the in−progress status of the **yppush** command as it calls each slave server, enter:

   ```
   /usr/sbin/yppush −v −d atlantis netgroup
   ```

In this example, the **yppush** command displays in−progress messages as it copies the `netgroup` map from the `atlantis` domain onto each of the network's slave servers.

File

/var/yp/*DomainName***/ypservers.{dir, pag}**	Lists servers that the **yppush** command prompts to make copies of updated NIS maps.

Related Information

The **yppoll** command, **ypxfr** command.

The **ypserv** daemon.

System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks* and NIS Maps in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

NIS Reference.

ypserv Daemon

Purpose

Looks up information in local Network Information Services (NIS) maps.

Syntax

/usr/lib/netsvc/yp/ypserv

Description

The **ypserv** daemon looks up information in its local Network Information Services (NIS) maps. The operations performed by the **ypserv** daemon are defined for the implementor by the NIS Protocol Specification and for the programmer by the **/usr/include/rpcsvc/yp_prot.h** header file. Communication with the **ypserv** daemon is by means of Remote Procedure Calls (RPC).

The **ypserv** daemon runs only on server machines. The **ypserv** daemon is started and stopped by the following System Resource Controller (SRC) commands:

```
startsrc −s ypserv
```

```
stopsrc −s ypserv
```

The **ypserv** daemon performs the following operations on a specified map within an NIS domain:

Match	Takes a key and returns the associated value.
Get_first	Returns the first key−value pair from the map.
Get_next	Enumerates the next key−value pair in the map.
Get_all	Ships the entire NIS map to a requestor in response to a single RPC request.
Get_order_number	Supplies information about a map instead of map entries. The order number actually exists in the map as a key−value pair, but the server does not return it through the normal lookup functions. However, the pair will be visible if you examine the map with the **makedbm** command.
Get_master_name	Supplies information about a map instead of map entries. The master name actually exists in the map as a key−value pair, but the server does not return it through the normal lookup functions. However, the pair will be visible if you examine the map with the **makedbm** command.

Log information is written to the **/var/yp/ypserv.log** file if it exists when the **ypserv** daemon starts running.

If the **/var/yp/securenets** file exists, the **ypservr** command only responds to hosts within the ip range specified in this file.

Files

/etc/rc.nfs	Contains the startup script for the NFS and NIS daemons.
/var/yp/ypserv.log	Contains the log for the **ypserv** daemon.

Related Information

The **chmaster** command, **chslave** command, **domainname** command, **makedbm** command, **mkmaster** command, **mkslave** command, **ypcat** command, **ypinit** command, **ypmatch** command, **yppoll** command, **yppush** command, **ypset** command, **ypwhich** command, **ypxfr** command.

System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks,* NIS Maps in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

Remote Procedure Call Overview for Programming in *AIX Version 4.3 Communications Programming Concepts*.

How to Configure NIS in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

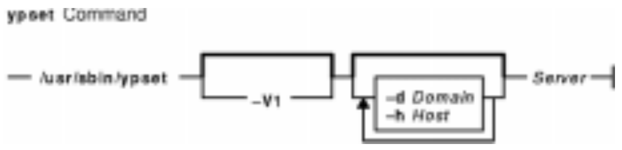
NIS Reference.

ypset Command

Purpose

Directs a client machine to a specific server.

Syntax



/usr/sbin/ypset [**−V1**] [**−d***Domain*] [**−h***Host*] *Server*

Description

The **ypset** command directs the **ypbind** daemon on the client to the **ypserv** daemon on the server. The **ypbind** daemon goes to the server you specify in the *Server* parameter to get Network Information Services (NIS) services for the domain you specify in the *Domain* parameter. The **ypbind** daemon gets the NIS services from the **ypserv** daemon on the server.

Once the binding is set, it is not tested until a client process (such as the **ypcat** command or the **ypwhich** command) tries to get a binding for the domain. If the attempt to bind fails, (the specified server is down or is not running the **ypserv** daemon), the **ypbind** daemon makes another attempt to bind for the same domain.

Specify either a name or an Internet Protocol (IP) address in the *Server* parameter. If you specify a name, the **ypset** command attempts to resolve the name to an IP address through the use of the NIS service. This works only if your machine has a current valid binding for the domain in question. In most cases, you should specify the server as an IP address.

In cases where several hosts on the local network are supplying NIS services, the **ypbind** daemon can rebind to another host. For instance, if a server is down or is not running the **ypserv** daemon, the **ypbind** daemon rebinds the client to another server. In this way, the network information service balances the load among the available NIS servers.

Use the **ypset** command if the network:

- Does not support broadcasting.
- Supports broadcasting but does not have an NIS server.
- Accesses a map that exists only on a particular NIS server.

Flags

−d*Domain*	Specifies a domain other than the default domain.
−h *Host*	Sets the binding for the **ypbind** daemon on the specified host instead of on the local host. The host can be specified as a name or as an IP address.
−V1	Binds the specified server for the (old) version 1 NIS protocol.

Example

To set a server to bind on a host in a particular domain, enter:

```
ypset −d ibm −h venus mars
```

In this example, the **ypset** command causes the host named `venus` to bind to the server named `mars`.

Related Information

The **domainname** command, **ypcat** command, **ypwhich** command,

The **ypbind** daemon, **ypserv** daemon.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks*.

How to Configure NIS in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

NIS Reference.

ypupdated Daemon

Purpose

Updates information in Network Information Services (NIS) maps.

Syntax

/usr/lib/netsvc/yp/rpc.ypupdated [**−i**] [**−s**]

Description

The **ypupdated** daemon updates information in Network Information Services (NIS) maps. Before it can update information, however, the daemon consults the **updaters** file in the **/var/yp** directory to determine which NIS maps should be updated and how they should be changed.

By default, the **ypupdated** daemon requires the most secure method of authentication available to it, either DES (secure) or UNIX (insecure).

The **ypupdated** daemon is started and stopped by the following System Resource Controller (SRC) commands:

```
startsrc −s ypupdated
```

```
stopsrc −s ypupdated
```

Flags

−s Accepts only calls authenticated using the secure Remote Procedure Call (RPC) mechanism (AUTH_DES authentication). This disables programmatic updating of NIS maps unless the network supports these calls.

−i Accepts RPC calls with the insecure AUTH_UNIX credentials. This allows programmatic updating of NIS maps in all networks.

Examples

To start the **ypupdated** daemon from the command line, enter:

```
startsrc −s ypupdated
```

File

/var/yp/updaters A makefile for updating NIS maps.

Related Information

The **startsrc** command.

The **keyserv** daemon.

System Resource Controller Overview in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

Remote Procedure Call Overview for Programming in *AIX Version 4.3 Communications Programming Concepts*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

NIS Reference.

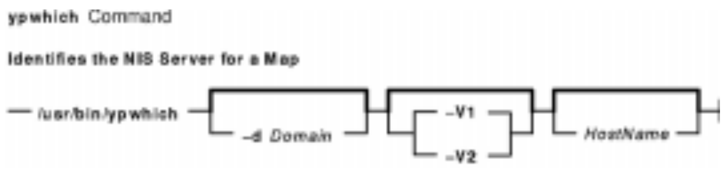
ypwhich Command

Purpose

Identifies either the Network Information Services (NIS) server or the server that is the master for a given map.

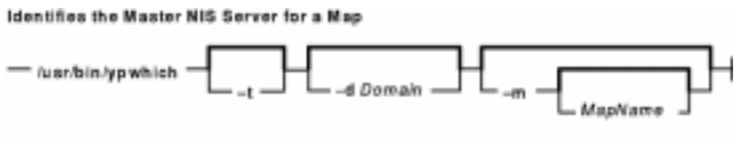
Syntax

To Identify the NIS Server



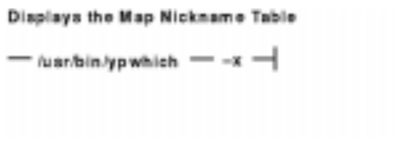
/usr/bin/ypwhich [**−d***Domain*] [**−V1** | **−V2**] [*HostName*]

To Identify the Master NIS Server for a Map



/usr/bin/ypwhich [**−t**] [**−d***Domain*] [**−m** [*MapName*]]

To Display the Map Nickname Table



/usr/bin/ypwhich−x

Description

The **ypwhich** command identifies which server supplies Network Information Services (NIS) services or which server is the master for a map, depending on how the **ypwhich** command is invoked. If invoked without arguments, this command displays the name of the NIS server for the local machine. If you specify a host name, the system queries that host to find out which master it is using.

Flags

−d *Domain*	Uses the specified domain instead of the default domain.
−V1	Indicates which server is serving the old version 1 NIS protocol client processes.
−V2	Indicates which server is serving the current version 2 NIS protocol client processes. If neither version is specified, the **ypwhich** command attempts to locate the server that supplies the version 2 services. If there is no version 2 server currently bound, the **ypwhich** command then attempts to locate the server supplying version 1 services. Since servers and clients are

	both backward−compatible, the user need seldom be concerned about which version is currently in use.
−t	Inhibits nickname translation, which is useful if there is a map name identical to a nickname.
−m *MapName*	Finds the master NIS server for a map. No host can be specified with the **−m** flag. The *MapName* variable can be a map name or a nickname for a map. When the map name is omitted, the **−m** flag produces a list of available maps.
−x	Displays the map nickname table. This lists the nicknames (*MapName*) the command knows of and indicates the map name associated with each nickname.

Examples

1. To find the master server for a map, enter:

   ```
   ypwhich −m passwd
   ```

   In this example, the **ypwhich** command displays the name of the server for the passwd map.

2. To find the map named `passwd`, rather than the map nicknamed `passwd`, enter:

   ```
   ypwhich −t −m passwd
   ```

   In this example, the **ypwhich** command displays the name of the server for the map whose full name is passwd.

3. To find out which server serves clients that run the old version 1 of the NIS protocol, enter:

   ```
   ypwhich −V1
   ```

4. To display a table of map nicknames, enter:

   ```
   ypwhich −x
   ```

Related Information

The **ypset** command.

The **ypserv** daemon.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks.*

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

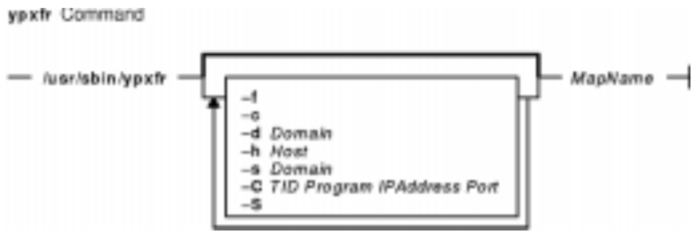
NIS Reference.

ypxfr Command

Purpose

Transfers a Network Information Services (NIS) map from an NIS server to a local host.

Syntax



/usr/sbin/ypxfr [**−f**] [**−c**] [**−d***Domain*] [**−h***Host*] [**−s***Domain*] [**−C** *TID Program IPAddress Port*] [**−S**] *MapName*

Description

The **ypxfr** command transfers a Network Information Services (NIS) map from an NIS server to the local host as follows:

1. Creates a temporary map in the **/var/yp/***Domain* directory (which must already exist) on the client.
2. Fetches the map entries from the server and fills in the map on the client, one at a time.
3. Gets and loads the map parameters (order number and server).
4. Deletes any old versions of the map.
5. Moves the temporary map to the real map name.

If the **/var/yp/securenets** file exists, the **ypxfr** command only responds to hosts that are listed in this file.

The *MapName* variable specifies the name of a map that will be transferred from an NIS server.

If run interactively, the **ypxfr** command sends output to the user's terminal. If invoked without a controlling terminal, the **ypxfr** command appends its output to the **/var/yp/ypxfr.log** file (if the file already exists). This file records each transfer attempt and its results. The **ypxfr** command is most often invoked from the root user's **crontab** file or by the **ypserv** daemon.

To maintain consistent information between servers, use the **ypxfr** command to update every map in the NIS database periodically. Be aware though that some maps change more frequently than others and therefore need to be updated more frequently. For instance, maps that change infrequently, such as every few months, should be updated at least once a month. Maps that change frequently, such as several times a day, should be checked hourly for updates. The **services.byname** map, for example, may not change for months at a time, while the **hosts.byname** map may change several times a day.

To perform periodic updates automatically, use a **crontab** entry. To update several maps at once, group commands together in a shell script. Examples of a shell script can be found in the **/usr/etc/yp** directory in the following files: **ypxfr_1perday**, **ypxfr_2perday**, **ypxfr_1perhour**.

You can use the System Management Interface Tool (SMIT) to run this command. To use SMIT, enter:

```
smit ypxfr
```

Flags

−C *TID Program IPAddress Port*	Tells the **ypxfr** command where to find the **yppush** command. The **ypserv** daemon invokes the **ypxfr** command to call back a **yppush** command to the host. Use the parameters to indicate the following: *TID* Specifies the transaction ID of the **yppush** command. *Program* Specifies the program number associated with the **yppush** command. *IPAddress* Specifies the Internet Protocol address of the port where the **yppush** command resides. *Port* Specifies the port that the **yppush** command is listening on. **Note:** This option is only for use by the **ypserv** daemon.
−c	Prevents sending of a request to `ClearCurrentMap` to the local **ypserv** daemon. Use this flag if the **ypserv** daemon is not running locally at the time you are running the **ypxfr** command. Otherwise, the **ypxfr** command displays an error message and the transfer fails.
−d*Domain*	Specifies a domain other than the default domain. The maps for the specified domain must exist.
−f	Forces the transfer to occur even if the version at the master is not more recent than the local version.
−h*Host*	Gets the map from host specified, regardless of what the map says the master is. If a host is not specified, the **ypxfr** command asks the NIS service for the name of the master and tries to get the map from there. The *Host* variable can contain a name or an Internet address in the form `a.b.c.d.`
−S	Requires the **ypserv** server, from which it obtains the maps to be transferred, use *privileged* IP ports. Since only root user processes are typically allowed to use privileged ports, this feature adds an extra measure of security to the transfer. If the map being transferred is a secure map, the **ypxfr** command sets the permissions on the map to `0600.`
−s*Domain*	Specifies a source domain from which to transfer a map that should be the same across domains (such as the **services.byname** map).

Examples

To get a map from a host in another domain, enter:

```
/usr/sbin/ypxfr −d ibm −h venus passwd.byname
```

In this example, the **ypxfr** command gets the `passwd.byname` map from the host name `venus` in the `ibm` domain.

Files

/var/yp/ypxfr.log	Contains the log file.

/usr/sbin/ypxfr_1perday	Contains the script to run one transfer each day, for use with the **cron** daemons.
/usr/sbin/ypxfr_2perday	Contains the script to run two transfers each day.
/usr/sbin/ypxfr_1perhour	Contains the script for hourly transfers of volatile maps.

Related Information

The **crontab** command, **yppush** command.

The **cron** daemon, **ypserv** daemon.

System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks,* NIS Maps in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

Network Information Services (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

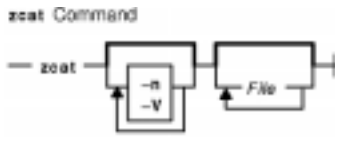
NIS Reference.

zcat Command

Purpose

Expands a compressed file to standard output.

Syntax



zcat [**−n**] [**−V**] [*File* ...]

Description

The **zcat** command allows the user to expand and view a compressed file without uncompressing that file. The **zcat** command does not rename the expanded file or remove the **.Z** extension. The **zcat** command writes the expanded output to standard output.

Flags

−n	Omits the compressed file header from the compressed file.
−V	Writes the current version and compile options to standard error.

Parameters

File ...	Specifies the compressed files to expand.

Return Values

If the **zcat** command exits with a status of 1 if any of the following events occur:

- The input file was not produced by the **compress** command.
- An input file cannot be read or an output file cannot be written.

If no error occurs, the exit status is 0.

Exit Status

0	Successful completion.
>**0**	An error occurred.

Examples

To view the `foo.Z` file without uncompressing it, enter:

```
zcat foo.Z
```

The uncompressed contents of the `foo.Z` file are written to standard output. The file is not renamed.

Related Information

The **compress** command, **pack** command, **uncompress** command, **unpack** command.

Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

The **compress** command uses the modified Lempel−Zev algorithm described in "A Technique for High Performance Data Compression," Welch, Terry A. *IEEE Computer*, vol. 17, no. 6 (June 1984), pp. 8−19.

Appendix A. Command Support for Files Larger than 2 Gigabytes

AIX 4.2 or later provides support for files greater than 2 gigabytes so that users can store large quantities of data in a single file. Many, but not all, AIX commands support the use of files larger than 2 gigabytes. Additionally, some commands have large file support with limitations.

Commands That Do Not Support Files Larger Than 2 Gigabytes

In many cases, commands that do not support large files do not utilize files of any size to begin with, such as the **date**, **echo**, **nice**, **kill** commands and others.

This support also does not extend to specific system−controlled files, such as **/etc/passwd**, **/etc/inittab**, files in **/etc/security**, system accounting files, etc. Consequently, commands that only utilize these system files, such as commands to administer users and system security (**mkuser**, **su**), system accounting commands (**acctcom**, **prdaily**), and general system controlling commands (**init**, **penable**) do not have large file support.

Other commands do not support large files because they work with files of a specific format defined to have a maximum of less than or equal to 2 gigabytes. These include the XCOFF file format, defining the format of object files and executable files. The file headers that define XCOFF do not have fields defined to support files this large, and the system would not be able to load an executable file of this size. Commands that utilize these files, such as **ld**, **as**, **m4**, **strip** and so on, do not have large file support.

The header format of the **pack**, **unpack**, and **pcat** commands does not have enough characters to store a file size over 2 gigabytes.

Additional file formats also prevent files of their type from being larger than 2 gigabytes. These include some archiving utilities restricted in format by industry standards, such as the **cpio**, **pax**, and **tar** (you can archive large files with **backup**) commands, and the object file archive format, restricting the **ar** command.

The AIX print spooling subsystem has been enabled on the frontend to support the submission, manipulation, and cancelation of files larger than 2 gigabytes. However, the default AIX printer backend, the **piobe** command, does not support files of this size. This means print jobs larger than 2 gigabytes can either be sent to a remote printer or print server that can handle these large files, or an alternate user or vendor−supplied backend that comprehends large files could be used.

Note: A print job larger than 2 gigabytes would likely take several days to complete.

Finally, there are commands for which the user files used are not reasonably expected to ever be larger than 2 gigabytes. For example, although a directory may contain large files, the directory file itself may not exceed 2 gigabytes. Hence, commands such as **mkdir** and **rmdir** do not support large directories. Other examples in which support is unnecessary would be using the **wall** command to broadcast the contents of extremely large files to all terminals, or using the **nroff** command to process over 2 gigabytes of written text in a single file.

Commands That Support Files Larger Than 2 Gigabytes

The following commands all support files larger than 2 gigabytes. Commands which do not appear on the list do not support large files. Commands with limited large file support are marked with an asterisk (*) and an explanation of their limitations follow the list.

aclget	**auditcat ***	**auditconv ***	**auditselect ***

awk *	**backup**	**bdiff**	**bsh ***
cancel *	**cat**	**chgrp**	**chmod**
chown	**cksum**	**cmp**	**comm**
compress	**cp**	**csh ***	**csplit**
ctags	**cut**	**dd**	**del**
devnm	**di**	**du**	**egrep**
enq *	**expand**	**fgrep**	**file**
find *	**fold**	**grep**	**head**
iconv	**install**	**join**	**ksh ***
li	**link**	**ln**	**lp ***
lpd *	**lpq ***	**lpr ***	**lprm ***
lpstat *	**ls**	**make ***	**move**
mv	**nawk ***	**newform**	**nl**
nohup	**od**	**paste**	**patch**
pr	**proto**	**qcan ***	**qchk ***
qdaemon *	**qpri ***	**qprt ***	**qstatus ***
rdist *	**rdump**	**rembak ***	**restore**
rev	**rm**	**rrestore**	**Rsh ***
sed	**sort**	**split**	**strings**
sum	**tab**	**tail**	**tee**
test	**touch**	**tr**	**trbsd**
tsh *	**uncompress**	**unexpand**	**uniq**
unlink	**untab**	**update**	**virscan**
wc	**whereis**	**which**	**zcat**

Limitations

The printer commands support files larger than 2 gigabytes on the printer frontend only. The default AIX printer backend, the **piobe** command, does not support files of this size. This applies to the following commands:

cancel	**lpq**	**qcan**	**qprt**
enq	**lpr**	**qchk**	**qstatus**
lp	**lprm**	**qdaemon**	**rembak**
lpd	**lpstat**	**qpri**	

The shells support I/O redirection of files that are larger than 2 GB. No other support for files larger than 2 gigabytes is offered in the shells. This applies to the commands **bsh**, **csh**, **ksh**, **Rsh**, and **tsh**.

> **Note:** The **sh** command is a link to the **ksh** command.

The **awk** and **nawk** commands are able to handle data files larger than 2 gigabytes. However, **awk** and **nawk** scripts themselves may not be this large.

The **find** command will process files larger than 2 gigabytes, but it will not allow the use of the **−size***Number* flag where *Number* is larger than 2 gigabytes.

The **make** command will operate with targets and dependencies that are larger than 2 gigabytes, but a makefile itself may not be this large.

The audit commands **auditcat**, **auditconv**, and **auditselect** support **trail** files that are larger than 2 gigabytes, but they do not support **bin** files larger than 2 gigabytes.

> **Attention:** DO NOT attempt to send a large file to a pre−AIX 4.2 or non−AIX machine with the **rdist** command. Doing so will result in undefined behaviors and in rare cases, loss of data.

Appendix B. Functional List of Commands

This appendix lists commands by function.

- Assemblers and Compilers
- Object Data Manager (ODM)

Communications

Commands List: Asynchronous Terminal Emulation

ate	Starts the Asynchronous Terminal Emulation (ATE) Program.
xmodem	Transfers files with the **xmodem** protocol, which detects data transmission errors during asynchronous transmission.

Commands List: Basic Networking Utilities

ct	Dials an attached terminal and issues a login process.
cu	Connects directly or indirectly to another system.
cut	Writes out selected bytes, characters, or fields from each line of a file.
rmail	Handles remote mail received through Basic Networking Utilities (BNU).
tip	Connects to a remote system.
uucheck	Checks for files and directories required by the BNU.
uucico	Transfers Basic Networking Utilities (BNU) command, data, and execute files to remote systems.
uuclean	Removes files from the BNU spool directory.
uucleanup	Deletes selected files from the Basic Networking Utilities (BNU) spooling directory.
uucp	Copies files from one operating system to another.
uucpadm	Enters basic BNU configuration information.
uucpd	Handles communications between BNU and TCP/IP.
uudecode	Encodes or decodes a binary file for transmission using electronic mail.
uudemon.admin	Provides periodic information on the status of BNU file transfers.
uudemon.cleanu	

	Cleans up BNU spooling directories and log files.
uudemon.hour	Initiates file transport calls to remote systems using the BNU program.
uudemon.poll	Polls the systems listed in the BNU **Poll** file.
uuid_gen	Generates Universal Unique Identifiers (UUIDs) for objects, types, and interfaces.
uuencode	Encodes or decodes a binary file for transmission using electronic mail.
uukick	Uses debugging mode to contact a specified remote system.
uulog	Provides information about BNU file−transfer activities on a system.
uuname	Provides information about other systems accessible to the local system.
uupick	Completes the transfer and handles files sent by the **uuto** command.
uupoll	Forces a poll of a remote BNU system.
uuq	Displays the BNU job queue and deletes specified jobs from the queue.
uusched	Schedules work for the Basic Networking Utilities (BNU) file transport program.
uusend	Sends a file to a remote host.
uusnap	Displays the status of BNU contacts with remote systems.
uustat	Reports the status of and provides limited control over BNU operations.
uuto	Copies files from one system to another.
uutry	Contacts a specified remote system with debugging turned on and allows the user to override the default retry time.
Uutry	Contacts a specified remote system with debugging turned on and saves the debugging output in a temporary file.
uux	Runs a command on another UNIX−based system.
uuxqt	Executes Basic Networking Utilities (BNU) remote command requests.

Commands List: General AIX Communications Facilities

confer	Provides an online conferencing system.
connect	Connects to a remote computer.
enroll	Sets up a password used to implement a secure communication channel.
getty	Sets the characteristics of ports.
joinconf	Provides an online conferencing system.
mesg	Permits or refuses write messages.
no	Configures network options.
pdelay	Enables or reports the availability of delayed login ports.
pdisable	Disables login ports.
penable	Enables or reports the availability of login ports.
phold	Disables or reports the availability of login ports on hold.
pshare	Enables or reports the availability of shared login ports.
rdist	Maintains identical copies of files on multiple hosts.
rdump	Backs up files onto a remote machine's device.
wall	Writes a message to all users that are logged in.
write	Sends messages to other users on the system.
writesrv	Allows users to send messages to and receive messages from a remote system.

Commands List: Mail Facilities

bellmail	Sends messages to system users and displays messages from system users.
bffcreate	Creates installation image files in backup format.
biff	

	Enables or disables mail notification during the current session.
comsat	Notifies users of incoming mail.
from	Determines who mail is from.
imapd	Starts the Internet Message Access Protocol (IMAP) server process.
Mail or mail	Sends and receives mail.
mailq	Prints the contents of the mail queue.
mailstats	Displays statistics about mail traffic.
mailx	Sends and receives mail.
msgs	Reads system messages.
newaliases	Builds a new copy of the alias database from the **/etc/aliases** file.
pop3d	Starts the Post Office Protocol Version 3 (POP3) server process.
rmail	Handles remote mail received through Basic Networking Utilities (BNU).
sendmail	Routes mail for local or network delivery.
smdemon.cleanu	Cleans up the **sendmail** queue for periodic housekeeping.
xget	Receives secret mail in a secure communication channel.
xsend	Sends secret mail in a secure communication channel.

Commands List: Message Handler

ali	Lists mail aliases and their addresses.
anno	Annotates messages.
ap	Parses and reformats addresses.
bugfiler	Automatically stores bug reports in specified mail directories.
burst	Explodes digests into messages.
comp	Composes a message.
conflict	Searches for alias and password conflicts.
dist	Redistributes a message to additional addresses.
dp	Parses and reformats dates.
folder	Selects and lists folders and messages.
folders	Lists all folders and messages in mail directory.
forw	Forwards messages.
inc	Incorporates new mail into a folder.
install_mh	Sets up mailbox directories.
mark	Creates, modifies, and displays message sequences.
mhl	Produces formatted listings of messages.
mhmail	Sends or receives mail.
mhpath	Prints full path names of messages and folders.
msgchk	Checks for messages.
msh	Creates an MH shell.
next	

	Shows the next message.
packf	Compresses the contents of a folder into a file.
pick	Selects messages by content, and creates and modifies sequences.
post	Routes a message.
prev	Shows the previous message.
prompter	Invokes a prompting editor.
rcvdist	Sends a copy of incoming messages to additional recipients.
rcvpack	Saves incoming messages in a packed file.
rcvstore	Incorporates new mail from standard input into a folder.
rcvtty	Notifies the user of incoming messages.
refile	Moves files between folders.
repl	Replies to a message.
rmf	Removes folders and the messages they contain.
rmm	Removes messages from active status.
scan	Produces a one line per message scan listing.
send	Sends a message.
sendbug	Mails a system bug report to a specified address.
show	Shows messages.
slocal	Processes incoming mail.
sortm	Sorts messages.
spost	Routes a message.
vmh	Invokes a visual interface for use with MH commands.
whatnow	Invokes a prompting interface for draft disposition.

whom	Manipulates Message Handler (MH) addresses.

Commands List: Network File System

automount	Mounts NFS file systems automatically.
biod	Handles client requests for files.
bootparamd	Provides information for booting to diskless clients.
chnfs	Changes the configuration of the system to invoke a specified number of **biod** and **nfsd** daemons.
chnfsexp	Changes the options used to export a directory to NFS clients.
chnfsmnt	Changes the options used to mount a directory from an NFS server.
exportfs	Exports and unexports directories to NFS clients.
lockd	Processes lock requests.
mknfs	Configures the system to run NFS.
mknfsexp	Exports a directory to NFS clients.
mknfsmnt	Mounts a directory from an NFS server.
mountd	Answers requests from clients for file system mounts.
nfsd	Starts client requests for file system operations.
nfso	Configures Network File System (NFS) network options.
nfsstat	Displays statistical information about the Network File System (NFS) and Remote Procedure Call (RPC) calls.
on	Executes commands on remote systems.
portmap	Converts RPC program numbers into Internet port numbers.
rexd	Executes programs for remote machines.
rmnfs	Changes the configuration of the system to stop invoking the NFS daemons.

rmnfsexp	Unexports a directory from NFS clients.
rmnfsmnt	Removes an NFS mount.
rpcgen	Generates C code to implement an RPC protocol.
rpcinfo	Reports the status of Remote Procedure Call (RPC) servers.
rpc.pcnfsd	Handles service requests from PC−NFS (Personal Computers Network File System) clients.
rstatd	Returns performance statistics obtained from the kernel.
rup	Shows the status of a remote host on the local network.
rusers	Reports a list of users logged in remote machines.
rusersd	Responds to queries from the **rusers** command.
rwall	Sends messages to all users on the network.
rwalld	Handles requests from the **rwall** command.
showmount	Displays a list of all clients that have remotely mounted file systems.
spray	Sends a specified number of packets to a host and reports performance statistics.
sprayd	Receives packets sent by the **spray** command.
statd	Provides crash and recovery functions for the locking services on NFS.

Commands List: Network Information Service

chkey	Changes your encryption key.
chmaster	Executes the **ypinit** command and restarts the NIS daemons to change a master server.
chslave	Re−executes the **ypinit** command to retrieve maps from a master server and restarts the **ypserv** daemon to change the slave server.
chypdom	Changes the current domainname of the system.
domainname	

Displays or sets the name of the current NIS domain.

keyenvoy

Acts as an intermediary between user processes and the **keyserv** daemon.

keylogin

Decrypts and stores the user's secret key.

keyserv

Stores public and private keys.

lsmaster

Displays the characteristics for the configuration of an NIS master server.

lsnfsexp

Displays the characteristics of directories that are exported with the Network File System (NFS).

lsnfsmnt

Displays the characteristics of NFS mountable file systems.

makedbm

Makes a Network Information Service (NIS) map.

mkclient

Uncomments the entry in the **/etc/rc.nfs** file for the **ypbind** daemon and starts the **ypbind** daemon to configure a client.

mkkeyserv

Uncomments the entry in the **/etc/rc.nfs** file for the **keyserv** daemon and invokes the daemon by using the startsrc command.

mkmaster

Invokes the **ypinit** command and starts the NIS daemons to configure a master server.

mkslave

Executes the **ypinit** command to retrieve maps from an NIS master server and starts the **ypserv** daemon to configure a slave server.

newkey

Creates a new key in the **/etc/publickey** file.

revnetgroup

Reverses the listing of users and hosts in network group files in NIS maps.

rmkeyserv

Stops the **keyserv** daemon and comments the entries for the **keyserv** daemon in the **/etc/rc.nfs** file.

rmyp

Removes the configuration for NIS.

ypbind

Enables client processes to bind, or connect, to an NIS server.

ypcat

Prints out an NIS map.

ypinit

Sets up NIS maps on an NIS server.

ypmatch

	Displays the values of given keys within an NIS map.
yppasswd	Changes your network password in NIS.
yppasswdd	Receives and executes requests from the **yppasswd** command.
yppoll	Displays the order number (ID number) of the NIS map currently in use on the server.
yppush	Prompts the NIS slave servers to copy updated NIS maps.
ypserv	Looks up information in local NIS maps.
ypset	Directs a client machine to a specific server.
ypupdated	Updates information in NIS maps.
ypwhich	Identifies either the NIS server or the server that is the master for a given map.
ypxfr	Transfers an NIS map from an NIS server to a local host.

Commands List: Network Management

mosy	Converts the ASN.1 definitions of Structure and Identification of Management Information (SMI) and Management Information Base (MIB) modules into objects definition files for the **snmpinfo** command.
snmpd	Starts the Simple Network Management Protocol (SNMP) agent daemon as a background process.
snmpinfo	Requests or modifies values of Management Information Base (MIB) variables managed by a Simple Network Management Protocol (SNMP) agent.

Commands List: STREAMS

autopush	Configures lists of automatically pushed STREAMS modules.
scls	Produces a list of module and driver names.
strace	Prints STREAMS trace messages.
strchg	Changes stream configuration.
strload	

	Loads and configures Portable Streams Environment (PSE).
strconf	Queries stream configuration.
strclean	Cleans up the STREAMS error logger.
strerr (Daemon)	Receives error log messages from the STREAMS log driver.

Commands List: Transmission Control Protocol/Internet Protocol

arp	Displays and modifies address resolution.
chnamsv	Changes TCP/IP−based name service configuration on a host.
chprtsv	Changes a print service configuration on a client or server machine.
f	Shows user information.
finger	Shows user information.
fingerd	Provides server function for **finger** command.
ftp	Transfers files between a local and a remote host.
ftpd	Provides the server function for the Internet FTP protocol.
gated	Provides gateway routing functions for the RIP, EGP, HELLO, and SNMP protocols.
gettable	Gets NIC format host tables from a host.
host	Resolves a host name into an Internet address or an Internet address into a host name.
hostent	Directly manipulates address−mapping entries in the system configuration database.
hostid	Sets or displays the identifier of the current local host.
hostname	Sets or displays the name of the current host system.
htable	Converts host files to the format used by network library routines.
ifconfig	Configures or displays network interface parameters for a network that is using TCP/IP.

inetd	Provides Internet service management for a network.
ipreport	Generates a packet trace report from the specified packet trace file.
iptrace	Provides interface−level packet tracing for Internet protocols.
lpd	Provides the remote print server on a network.
lsnamsv	Shows name service information stored in the database.
lsprtsv	Shows print service information stored in the database.
mkhosts	Generates the host table file.
mknamsv	Configures TCP/IP−based name service on a host for a client.
mkprtsv	Configures TCP/IP−based print service on a host.
mktcpip	Sets the required values for starting TCP/IP on a host.
named	Provides the server function for the Domain Name Protocol.
namerslv	Directly manipulates domain name server entries for local resolver routines in the system configuration database.
netstat	Shows network status.
nslookup	Queries Internet domain name servers.
ping	Sends an echo request to a network host.
rcp	Transfers files between a local and a remote host or between two remote hosts.
remsh	Executes the specified command at the remote host or logs into the remote host.
rexec	Executes commands one at a time on a remote host.
rexecd	Provides the server function for the **rexec** command.
rlogin	Connects the local host with a remote host.
rlogind	Provides the server function for the **rlogin** command.
rmnamsv	

	Unconfigures TCP/IP−based name service on a host.
rmprtsv	Unconfigures a print service on a client or server machine.
route	Manually manipulates the routing tables.
routed	Manages network routing tables.
rsh	Executes the specified command at the remote host or logs into the remote host.
rshd	Provides the server function for remote command execution.
ruptime	Shows the status of each host on a network.
ruser	Directly manipulates entries in three separate system databases that control foreign host access to programs
rwho	Shows which users are logged in to hosts on the local network.
rwhod	Provides the server function for the **rwho** and **ruptime** commands.
securetcpip	Enables the operating system network security feature.
setclock	Sets the time and date for a host on a network.
slattach	Attaches serial lines as network interfaces.
sliplogin	Configures a standard−input terminal line as a Serial Line Internet Protocol (SLIP) link to a remote host.
talk	Converse with another user.
talkd	Provides the server function for the **talk** command.
tcpdump	Prints out packet headers.
telinit	Initializes and controls processes.
telnet	Connects the local host with a remote host using the TELNET interface.
telnetd	Provides the server function for the TELNET protocol.
tftp	Transfers files between hosts using the Trivial File Transfer Protocol (TFTP).

tftpd	Provides the server function for the Trivial File Transfer Protocol.
timed	Invokes the time server daemon at system startup time.
timedc	Returns information about the **timed** daemon.
tn	Connects the local host with a remote host using the TELNET interface.
tn3270	Connects the local host with a remote host using the TELNET interface.
traceroute	Prints the route that IP packets take to a network host.
trpt	Performs protocol tracing on TCP sockets.
utftp	Transfers files between hosts using the Trivial File Transfer Protocol (TFTP).

Commands List: X.25 WAN Support

Commands List: 3270 Host Connection Program

chhcons	Changes an HCON session profile.
clhcons	Classifies an HCON session profile.
e789	Initiates one or more HCON emulation sessions.
e789cln	Stops an HCON session and its associated resources.
e789pr	Initiates an HCON printer session.
fxfer	Transfers files between a local system and a host computer connected by HCON.
genprof	Generates an automatic logon/logoff profile for an AUTOLOG procedure.
hconutil	Starts the HCON Utility Program.
lshconp	Lists all defined HCON session profiles for an HCON user.
lshcons	Lists the characteristics of a HCON session profile.
lshconu	

	Lists all HCON users.
mkhcons	Creates an HCON session profile.
mkhconu	Registers an HCON user.
rmhcons	Removes an HCON session profile.
rmhconu	Removes an HCON user.
stathcon	Lists the status of HCON session profiles and SNA Logical Unit (LU) pools.
sthcondmn	Starts the **hcondmn** subsystem.
tlog	Tests an AUTOLOG script.
xhcon	Invokes an HCON session using the Motif interface.

Commands List: Network Computing System (NCS)

lb_admin	Monitors and administers Location Broker registrations.
llbd	Manages the information in the Local Location Broker database.
nrglbd	Manages the Global Location Broker database.

Files and Directories

Commands List: Directories

cd	Changes the current directory.
chgrp	Changes the group ownership of a file or directory.
chmod	Changes permission modes.
chroot	Changes the root directory of a command.
delete	Removes (unlinks) files or directories.
di	Lists the contents of a directory.
dircmp	Compares two directories and the contents of their common files.
dirname	Writes to standard output all but the last part of a specified path.
dosdir	Lists the directory for DOS files.
fdformat	Formats diskettes.
li	Lists the contents of a directory.
ls	Displays the contents of a directory.
mkdir	Creates one or more new directories.
mvdir	Moves (renames) a directory.
pathchk	Checks pathnames.
pwd	Displays the pathname of the working directory.
rm	Removes (unlinks) files or directories.
rmdir	Removes a directory.
which_fileset	Searches the **/usr/lpp/bos/AIX_file_list** file for a specified file name or command.

Commands List: Editors

ctags	Makes a file of tags to help locate objects in source files.
e	Starts the INed editor.
ed	Edits text by line.
edit	Provides a simple line editor for the new user.
ex	Edits lines interactively, with a screen display.
ffill	Fills arbitrarily broken lines of text.
fformat	Formats a text paragraph.
fill	Fills arbitrarily broken lines of text.
fjust	Fills and justifies unevenly indented paragraphs of text.
ghost	Reconstructs previous versions of an INed structured file.
history	Displays the history of an INed structured file.
just	Fills and justifies unevenly indented paragraphs of text.
keymaps	Displays INed command key layout for all keyboards.
newfile	Converts a text file into an INed structured file.
prtty	Prints to the printer port of the terminal.
readfile	Displays the text of INed structured files.
red	Edits text by line.
rmhist	Removes the history information from INed structured files.
rpl	Replaces all occurrences of a string in a file.
sed	Provides a stream editor.
tdigest	Converts the **terms** files.
tvi	Provides a trusted editor with a full−screen display.

vedit	Edits files with a full−screen display.
versions	Prints the modification dates of an INed structured file.
vi	Edits files with a full−screen display.
view	Starts the vi editor in read−only mode.

Commands List: Files

ar	Maintains the indexed libraries used by the linkage editor.
backup	Backs up files and filesystems.
cat	Concatenates or displays files.
chgrp	Changes the group ownership of a file or directory.
chlang	Changes the language (LANG) environment variable in the **/etc/environment** file.
chmod	Changes permission modes.
chtz	Changes the language (TZ) environment variable in the **/etc/profile** file.
cksum	Changes the checksum and byte count of a file.
copy	Copies files.
cp	Copies files.
cpio	Copies files into and out of archive storage and directories.
dd	Converts and copies a file.
defragfs	Increases a file system's contiguous free space.
del	Deletes files if the request is confirmed.
delete	Removes (unlinks) files or directories.
dosdel	Deletes DOS Files.
dosread	

	Copies DOS files to AIX files.
doswrite	Copies AIX files to DOS files.
file	Determines the file type.
find	Finds files with a matching expression.
link	Performs a **link** subroutine.
ln	Links files.
mv	Moves files.
nulladm	Creates the file specified with read and write permissions to the file owner and group and read permissions to other users.
pax	Extracts, writes, and lists members of archive files; copies files and directory hierarchies.
pg	Formats files to the display.
restore	Copies previously backed−up file systems or files, created by the **backup** command, from a local device.
rm	Removes (unlinks) files or directories.
rmvfs	Removes entries in the **/etc/vfs** file.
split	Splits a file into pieces.
sum	Displays the checksum and block count of a file.
tar	Manipulates archives.
tee	Displays the output of a program and copies it into a file.
touch	Updates the access and modification times of a file.
umask	Displays or sets the file mode creation
mask.**unlink**	Performs an **unlink** subroutine.

Commands List: File Contents

awk	Finds lines in files matching patterns and then performs specified actions on them.

bdiff	Uses the **diff** command to find differences in very large files.
bfs	Scans files.
cmp	Compares two files.
colrm	Extracts columns from a file.
comm	Selects or rejects lines common to two sorted files.
comp	Composes a message.
compress	Compresses and expands data.
csplit	Splits files by context.
cut	Writes out selected bytes, characters, or fields from each line of a file.
diff	Compares text files.
diff3	Compares three files.
dircmp	Compares two directories and the contents of their common files.
egrep	Searches a file for a pattern.
expand	Writes to standard output with tabs changed to spaces.
fformat	Formats a text paragraph.
fgrep	Searches a file for a literal string.
fold	Folds long lines for finite−width output device.
genxlt	Generates a code set conversion table for use by the **lconv** library.
grep	Searches a file for a pattern.
head	Display the first few lines or bytes of a file or files.
iconv	Converts the encoding of characters from one code page encoding scheme to another.
join	Joins the data fields of two files.
localedef	

	Processes locales and character map files to produce a locale database.
look	Finds lines in a sorted file.
more	Displays continuous text one screen at a time on a display screen.
paste	Merges the lines of several files or subsequent lines in one file.
pcat	Unpacks files and writes them to standard output.
pack	Compresses files.
page	Displays continuous text one screen at a time on a display screen.
rev	Reverse characters in each line of a file.
rpl	Replaces all occurrences of a string in a file.
sdiff	Compares two files and displays the differences in a side−by−side format.
sort	Sorts files, merges files that are already sorted, and checks files to determine if they have been sorted.
spell	Finds English−language spelling errors.
spellin	Creates a spelling list.
spellout	Verifies that a word is not in the spelling list.
tab	Changes spaces into tabs.
tail	Writes a file to standard output, beginning at a specified point.
tr	Translates characters.
trbsd	Translates characters (BSD version).
tsort	Sorts an unordered list of ordered pairs (a topological sort).
uncompress	Compresses and expands data.
unexpand	Writes to standard output with tabs restored.
uniq	Deletes repeated lines in a file.
unpack	

	Expands files.
untab	Changes tabs into spaces.
wc	Counts the number of lines, words, and bytes in a file.
what	Displays identifying information in files.
zcat	Compresses and expands data.

Commands List: Text Formatting

addbib	Creates or extends a bibliographic database.
apropos	Locates commands by keyword lookup.
canonls	Processes **troff** command output for the Canon LASER SHOT in LIPS III mode.
catman	Creates the cat files for the manual.
checkcw	Prepares constant−width text for the **troff** command.
checkeq	Checks documents formatted with memorandum macros.
checkmm	Checks documents formatted with memorandum macros.
checknr	Checks **nroff** and **troff** files.
col	Filters for standard output text having reverse linefeeds and forward/reverse half−linefeeds.
colcrt	Filters **nroff** command output for CRT previewing.
cw	Prepares constant−width text for the **troff** command.
deroff	Removes **nroff**, **troff**, **tbl**, and **eqn** command constructs from files.
diction	Highlights unclear or wordy sentences.
diffmk	Marks differences between files.
enscript	Converts text files to PostScript format for printing.
eqn	Formats mathematical text for the **troff** command.

expand	Writes to standard output with tabs changed to spaces.
explain	Provides an interactive thesaurus.
fmt	Formats mail messages prior to sending.
grap	Typesets graphs to be processed by the **pic** command.
greek	Converts English−language output from a Teletype 37 workstation to output for other workstations.
hp	Handles special functions for the HP2640− and HP2621−series terminals.
hplj	Post−processes the **troff** command output for the HP LaserJet Series printers.
hyphen	Finds hyphenated words.
ibm3812	Post−processes the **troff** command output for the 3818 Pageprinter and the 3812 Model 2 Pageprinter.
ibm3816	Post−processes the **troff** command output for the 3816 Pageprinter and the 3812 Model 2 Pageprinter.
ibm5587G	Post−processes **troff** command output for the 5587G printer with the (32x32/24x24) cartridge installed.
indxbib	Builds an inverted index for a bibliography.
lookbib	Finds references in a bibliography.
macref	Produces cross−reference listing of macro files.
makedev	Creates binary description files suitable for reading by the **troff** command and its preprocessors.
managefonts	Provides the user with a simple menu−based interface to update or change the set of installed font families on the system.
mant	Typesets manual pages.
mm	Prints documents formatted with memorandum macros.
mmt	Typesets documents.
mvt	

Typesets English−language view graphs and slides.

ndx	Creates a subject−page index for a document.
neqn	Formats mathematical text for the **nroff** command.
newform	Changes the format of a text file.
nl	Numbers lines in a file.
nroff	Formats text for printing on typewriter−like devices and line printers.
pic	Preprocesses **troff** command input for the purpose of drawing pictures.
proff	Formats text for printers with personal printer data streams.
ps630	Converts Diablo 630 print files to PostScript format.
ps4014	Converts a Tektronix 4014 files to PostScript format.
psc	Converts **troff** intermediate format to PostScript format.
psdit	Converts **troff** intermediate format to PostScript format.
psplot	Converts files in plot format to PostScript format.
psrev	Reverses the page order of a PostScript file and selects a page range for printing.
psroff	Converts files from **troff** format to PostScript format.
ptx	Generates a permuted index.
refer	Finds and inserts literature references in documents.
roffbib	Prints a bibliographic database.
soelim	Processes **.so** requests in **nroff** command files.
sortbib	Sorts a bibliographic database.
spell	Finds English−language spelling errors.
spellin	Creates a spelling list.
spellout	Verifies that a word is not in the spelling list.

style	Analyzes surface characteristics of a document.
subj	Generates a list of subjects from a document.
tbl	Formats tables for the **nroff** and **troff** commands.
tc	Interprets text in the **troff** command output for the Tektronix 4015 system.
troff	Formats text for printing on typesetting devices.
ul	Performs underlining.
vgrind	Formats listings of programs that are easy to read.
xpreview	Displays **troff** files on an X display.

Text Formatting Macro Packages

man	Provides a formatting facility for manual pages.
me	Provides a formatting facility for creating technical papers in various styles.
mm	Provides a formatting facility for business documents such as memos, letters, and reports.
mptx	Formats a permuted index produced by the **ptx** command.
ms	Provides a formatting facility for various styles of articles, theses, and books.
mv	Simplifies typesetting of view graphs and projection slides.

General Operations

Commands List: Devices and Terminals

adfutil	Provides the capability to merge Micro Channel information for PS/2 adapters with the AIX Version 3 Configuration Database.
bterm	Emulates terminals in bidirectional bus (BIDI) mode.
cancel	Cancels requests to a line printer.
captoinfo	Converts a termcap file to a terminfo descriptor file.
cfgmgr	Configures devices by running the programs specified in the Configuration Rules object class.
chcons	Redirects the system console to a specified device or file to be effective on the next start of the system.
chdev	Changes the characteristics of a device.
chdisp	Changes the display used by the low function terminal (LFT) subsystem .
chfont	Changes the default font for a display.
chkbd	Changes the default keyboard map used by the high function terminal Subsystem at system startup.
clear	Clears the terminal screen.
devnm	Names a device.
diag	Performs hardware problem determination.
digest	Converts the ASCII form of the **/etc/qconfig** file into the **/etc/qconfig.bin** file, a binary version of the queue configuration used by the **qdaemon** command.
dscreen	Starts the Dynamic Screen utility.
enable	Enables a printer queue
fdformat	

	Formats diskettes.
flcopy	Copies to and from diskettes.
fold	Folds long lines for finite−width output device.
format	Formats diskettes.
getty	Sets the characteristics of ports.
hplj	Post−processes the **troff** command output for the HP LaserJet Series printers.
ibm3812	Post−processes the **troff** command output for the 3816 Pageprinter and the 3812 Model 2 Pageprinter.
ibm3816	Post−processes the **troff** command output for the 3816 Pageprinter and the 3812 Model 2 Pageprinter.
ibm5587G	Post−processes **troff** command output for the 5587G printer with the (32x32/24x24) cartridge installed.
iconv	Converts the encoding of characters from one code page encoding scheme to another.
infocmp	Manages **terminfo** descriptions.
iostat	Reports Central Processing Unit (CPU) statistics and input/output statistics for tty, disks, and CD−ROMs.
keycomp	Compiles a keyboard mapping file into an input method keymap file.
keymaps	Displays INed command key layout for all keyboards.
lp	Sends requests to a line printer.
lpr	Enqueues print jobs.
lpstat	Displays line printer status information.
lptest	Generates the line printer ripple pattern.
lsattr	Displays attribute characteristics and possible values of attributes for devices in the system.
lscfg	Displays diagnostic information about a device.
lsconn	

	Displays the connections a given device, or kind of device, can accept.
lscons	Writes the name of the console device to standard output.
lsdev	Displays devices in the system and their characteristics.
lsdisp	Lists the displays currently available on the system.
lsdsmitd	Displays an alpha−ordered list of the domains for DSMIT.
lsdsmitm	Displays an alphabetically ordered list of machines in DSMIT.
lsfont	Lists the fonts available for use by the display.
lskbd	Lists the keyboard maps currently available to the Low Function Terminal (LFT) subsystem.
lsparent	Displays the possible parent devices that accept a specified connection type or device.
mkdev	Adds a device to the system.
mkfont	Adds the font code associated with a display to the system.
mknod	Creates a special file.
mt (BSD)	Gives subcommands to streaming tape device.
panel20	Diagnoses activity between an HIA and the 5080 Control Unit.
pdelay	Enables or reports the availability of delayed login ports.
pdisable	Disables login ports.
penable	Enables or reports the availability of login ports.
phold	Disables or reports the availability of login ports on hold.
pioattred	Provides a way to format and edit attributes in a virtual printer.
piobe	Print job manager for the printer backend.
pioburst	Generates burst pages (header and trailer pages) for printer output.
piocnvt	Expands or contracts a predefined definition or virtual printer definition.

piodigest	Digests attribute values for a virtual printer definition into memory image and stores the memory image in a file.
piofontin	Copies fonts from a multilingual font diskette.
pioformat	Drives a printer formatter.
piofquote	Converts certain control characters destined for PostScript printers.
pioout	Printer backend's device driver interface program.
piopredef	Creates a predefined printer data stream definition.
portmir	Allows one TTY stream (monitor) to attach to another TTY stream (target) and monitor the user session that is taking place on that stream.
pr	Writes a file to standard output.
pshare	Enables or reports the availability of shared login ports.
pstart	Enables or reports the availability of login ports (normal, shared, and delayed).
pstat	Interprets the contents of the various system tables and writes it to standard output.
reset	Initializes terminals.
rmdev	Removes a device from the system.
rmt	Allows remote access to magnetic tape devices.
script	Makes a typescript of a terminal session.
setmaps	Sets terminal maps or code setmaps.
splp	Changes or displays printer driver settings.
stty	Sets, resets, and reports workstation operating parameters.
stty−cxma	Sends and reports the terminal options for 128−port asynchronous controllers.
swapon	Specifies additional devices for paging and swapping.
swcons	

	Redirects, temporarily, the system console output to a specified device or file.
sysdumpdev	Changes the primary or secondary dump device designation in a running system.
tabs	Sets tab stops on terminals.
tapechk	Performs consistency checking of the streaming tape device.
tcopy	Copies a magnetic tape.
tctl	Gives commands to a streaming tape device.
termdef	Queries terminal characteristics.
tput	Queries the terminal discriptor files in the **terminfo** database.
tset	Initializes terminals.
tsm	Provides terminal state management.
tty	Writes to standard output the full pathname of your terminal.

Commands List: Documentation and Education

apropos	Locates commands by keyword lookup.
catman	Creates the cat files for the manual.
explain	Provides an interactive thesaurus.
help	Provides information for new users.
learn	Provides computer−aided instruction courses and practice for using files, editors, macros, and other features.
man	Displays manual entries online.
mergenote	Combines multiple InfoExplorer note files into a single notes file.

Commands List: File Systems

automount	Mounts NFS file systems automatically.
chfs	

	Changes attributes of a file system.
chps	Changes attributes of a paging space.
chvfs	Changes entries in the **/etc/vfs** file.
crfs	Adds a file system.
crvfs	Creates entries in the **/etc/vfs** file.
defragfs	Increases a file system's contiguous free space.
df	Reports information about space on file systems.
dfsck	Checks file system consistency and interactively repairs the file system.
dosformat	Formats a DOS diskette.
dumpfs	Dumps file system information.
ff	Lists the file names and statistics for a file system.
fsck	Checks file system consistency and interactively repairs the file system.
fsdb	Debugs file systems.
istat	Examines i−node numbers.
lsfs	Displays the characteristics of file systems.
mkfs	Makes a file system.
mklost+found	Creates a lost and found directory for the **fsck** command.
mkproto	Constructs a prototype file system.
mount	Makes a file system available for use.
ncheck	Generates path names from i−node numbers.
proto	Constructs a prototype file for a file system.
rmfs	Removes a file system, any logical volume on which it resides, and the associated stanza in the **/etc/filesystems** file.
rrestore	Copies previously backed up file systems from a remote machine's

	device to the local machine.
skulker	Cleans up file systems by removing unwanted files.
umount	Unmounts a previously mounted file system, directory, or file.
unmount	Unmounts a previously mounted file system, directory, or file.
update	Periodically updates the super block.

Commands List: Games

arithmetic	Tests arithmetic skills.
bj	Starts the blackjack game.
craps	Starts the craps game.
fish	Plays the go fish card game.
fortune	Displays a random fortune from a database of fortunes.
hangman	Starts the hangman word−guessing game.
moo	Starts the number−guessing game.
number	Displays the written form of a number.
quiz	Tests your knowledge.
ttt	Starts the tic−tac−toe game.
turnoff	Sets the permission codes off for files in the **/usr/games** directory.
turnon	Sets the permission codes on for the files in the **/usr/games** directory.
wump	Starts the hunt the wumpus game.

Commands List: License Use Management

drm_admin	Administers servers based on the Data Replication Manager (DRM), such as **glbd**, the replicated version of the global location broker (GLB).
glbd	Manages the global location broker database.
lb_admin	

	Monitors and administers Location Broker registrations.
lb_find	Gets a list of global location broker (GLB) server daemons and their attributes.
llbd	Manages the information in the Local Location Broker database.
ls_admin	Displays and edits the license server database.
ls_dpass	Create passwords for License Use Management−licensed software from compound licenses.
ls_rpt	Reports on network license server events
ls_stat	Displays the status of the license server system.
ls_tv	Verifies that license servers are working.
monitord	Communicates with the License Use Management server and requests an AIX Version 4 concurrent−use license for each countable login.
netlsd	Starts the license server.
nrglbd	Manages the Global Location Broker database.

Commands List: Logical Volumes

chlv	Changes only the characteristics of a logical volume.
chpv	Changes the characteristics of a physical volume in a volume group.
chvg	Sets the characteristics of a volume group.
cplv	Copies the contents of a logical volume to a new logical volume.
exportvg	Exports the definition of a volume group from a set of physical volumes.
extendlv	Increases the size of a logical volume by adding unallocated physical partitions from within the volume group.
extendvg	Adds physical volumes to a volume group.
importvg	Imports a new volume group definition from a set of physical volumes.
lslv	Displays information about a logical volume.

lspv	Displays information about a physical volume within a volume group.
lsvg	Displays information about volume groups.
migratepv	Moves allocated physical partitions from one physical volume to one or more other physical volumes.
mirrorvg	Mirrors all the logical volumes that exist on a given volume group.
mklv	Creates a logical volume.
mklvcopy	Provides copies of data within the logical volume.
mkvg	Creates a volume group.
mkvgdata	Creates a file containing information about a volume group for use by the **savevg** and **restvg** commands.
redefinevg	Redefines the set of physical volumes of the given volume group in the device configuration database.
reducevg	Removes physical volumes from a volume group.
reorgvg	Reorganizes the physical partition allocation for a volume group.
restvg	Restores the user volume group and all it containers and files, as specified in the **/tmp/vgdata/vgname/vgname.data** file contained within the backup image created by the **savevg** command.
rmlv	Removes logical volumes from a volume group.
rmlvcopy	Removes copies from a logical volume.
savevg	Finds and backs up all file belonging to a specified volume group.
synclvodm	Synchronizes or rebuilds the logical volume control block, the device configuration database, and the volume group descriptor areas on the physical volumes.
syncvg	Synchronizes logical volume copies that are not current.
unmirrorvg	Removes the mirrors that exist on volume groups or specified disks.
varyoffvg	Deactivates a volume group.
varyonvg	Activates a volume group.

Commands List: Network Installation Management (NIM)

lsnim	Displays information about the Network Installation Management (NIM) environment.
nim	Performs operations on Network Installation Management (NIM) objects.
nimclient	Allows Network Installation Management (NIM) operations to be performed from a NIM client.
nimconfig	Initializes the Network Installation Management (NIM) client package.
niminit	Displays information about the Network Installation Management (NIM) environment.
xinstallm	Starts Install and Update Software Manager or Easy Install, two of the Visual System Management (VSM) applications.
xnim	Starts the Network Installation Management (NIM) graphical user interface.

Commands List: Numerical Data

bc	Provides an interpreter for arbitrary−precision arithmetic language.
dc	Provides an interactive desk calculator for doing arbitrary−precision integer arithmetic.
factor	Factors a number.
number	Displays the written form of a number.
units	Converts units in one measure to equivalent units in another measure.

Commands List: Performance Tuning

acctcms	Produces command usage summaries from accounting records.
acctcom	Displays selected process accounting record summaries.
accton	Performs process−accounting procedures.
bf	Analyzes the memory requirements of applications.
bfrpt	Analyzes the memory requirements of applications.
filemon	Monitors and reports performance of file system.
fileplace	Displays the placement of file's blocks within logical or physical volumes.
gprof	Displays call graph profile data.
iostat	Reports Central Processing Unit (CPU) statistics and input/output statistics for tty, disks, and CD−ROMs.
lsattr	Displays attribute characteristics and possible values of attributes for devices in the system.
lslv	Displays information about a logical volume.
mmtu	Displaying, adding, and deleting maximum transfer unit (MTU) values used for path MTU discovery.
netpmon	Monitors activity and reports statistics on network usage.
netstat	Shows network status.
nfsstat	Displays statistical information about the Network File System (NFS) and Remote Procedure Call (RPC) calls.
nice	Runs a command at a specified priority.
no	Configures network options.
nulladm	Creates the file specified with read and write permissions to the file owner and group and read permissions to other users.
ps	Shows current status of processes.
renice	Alters priority of running processes.
reorgvg	Reorganizes the physical partition allocation for a volume group.
rmss	Simulates system with various sizes of real memory.
sar	Collects, reports, or saves system activity information.
stem	Allows insertion of user−supplied instrumentation code at the entry and exit points of existing program and library subroutines.
stripnm	Displays the symbol information of a specified object file.
svmon	Captures and analyzes a snapshot of virtual memory.
time	Prints the time of the execution of a command.
timex	Reports, in seconds, the elapsed time, user time, and system execution time for a command.
tprof	Specifies the user program to be profiled, executes it, and produces reports.
trcnm	Generates a kernel name list.
trcrpt	Formats a report from the trace log.
trcstop	Stops the trace function.
vmstat	Reports virtual memory statistics.

Commands List: Processes and Commands

apply	Applies a command to a set of parameters.

cron	Runs commands automatically.
cronadm	Lists or removes **crontab** or **at** jobs.
crontab	Submits, lists, or removes **cron** job files.
env	Displays the current environment or sets the environment for the execution of a command.
fuser	Identifies processes using a file or file structure.
install	Installs a command.
installbsd	Installs a command (BSD version of the **install** command).
ipcs	Reports interprocess communication facility status.
kill	Sends a signal to running processes.
killall	Cancels all processes except the calling process.
lastcomm	Displays information about the last commands executed.
nice	Runs a command at a specified priority.
nohup	Runs a command without hangups.
ps	Shows current status of processes.
renice	Alters priority of running processes.
sleep	Suspends execution for an interval.
time	Prints the time of the execution of a command.
timex	Reports, in seconds, the elapsed time, user time, and system execution time for a command.
wait	Waits until the termination of a process ID.
whatis	Describes what function a command performs.
xargs	Constructs parameter lists and runs commands.

Commands List: Queues

at	Runs commands at a later time.
atq	Displays the queue of jobs waiting to be run.
atrm	Removes jobs spooled by the **at** command.
batch	Runs jobs when the system load level permits.
chprtsv	Changes a print service configuration on a client or server machine.
chque	Changes the queue name.
chquedev	Changes the printer or plotter queue device names.
chvirprt	Changes the attribute values of a virtual printer.
digest	Converts the ASCII form of the **/etc/qconfig** file into the **/etc/qconfig.bin** file, a binary version of the queue configuration used by the **qdaemon** command.
disable	Disables a printer queue.
enq	Enqueues a file.
lpq	Examines the spool queue.
lpr	Enqueues print jobs.
lprm	Removes jobs from the line printer spooling queue.
lsallq	Lists the names of all configured queues.
lsallqdev	Lists all configured printer and plotter queue device names within a specified queue.
lsprtsv	Shows print service information stored in the database.
lsque	Displays the queue stanza name.
lsquedev	Displays the device stanza name.
lsvirprt	Displays the attribute values of a virtual printer.
mkprtsv	Configures TCP/IP−based print service on a host.

mkque	Adds a printer queue to the system.
mkquedev	Adds a printer queue device to the system.
mkvirprt	Makes a virtual printer.
piodmgr	Compacts the Object Data Manager (ODM) database in the **/var/spool/lpd/pio/@local/smit** directory.
piolpx	Provides printer backend support for Xstation attached printers.
piolsvp	Lists virtual printers on a system.
piomgpdev	Manages printer pseudo−devices.
piomkapqd	Builds a SMIT dialog to create print queues and printers.
piomkpq	Creates a printer queue.
piomsg	Sends a printer backend message to the user.
qadm	Performs system administration functions for the print spooling system.
qcan	Cancels a print job.
qchk	Displays the status of a print queue.
qdaemon	Schedules jobs enqueued by the **enq** command.
qhld	Holds a spooled print job.
qmov	Moves spooled print jobs to another queue.
qpri	Prioritizes a job in the print queue.
qprt	Starts a print job.
qstatus	Provides printer status for the printer spooling system.
rembak	Sends a print job to a queue on a remote server.
rmprtsv	Unconfigures a print service on a client or server machine.
rmque	Removes a printer queue from the system.
rmquedev	Removes a printer or plotter queue device from the system.
rmvirprt	Removes a virtual printer.

Commands List: Screen Output

banner	Writes ASCII character strings in large letters to standard output.
cal	Displays a calendar.
calendar	Writes reminder messages to standard output.
echo	Writes character strings to standard output.
leave	Reminds you when you have to leave.
more	Displays continuous text one screen at a time on a display screen.
news	Writes system news items to standard output.
page	Displays continuous text one screen at a time on a display screen.
tail	Writes a file to standard output, beginning at a specified point.
vacation	Returns a message to the sender that the mail recipient is on vacation.

Commands List: Security and System Access

acledit	Edits the access control information of a file.
aclget	Displays the access control information of a file.
aclput	Sets the access control information of a file.
audit	Controls system auditing.
auditbin	Manages bins of audit information.

auditcat	Writes bins of audit records.
auditpr	Formats bin or stream audit records to a display device or printer.
auditselect	Selects audit records for analysis according to defined criteria.
auditstream	Creates a channel for reading audit records.
chfn	Changes a user's gecos information.
chgroup	Changes attributes for groups.
chgrp	Changes the group ownership of a file or directory.
chgrpmem	Changes the administrators or members of a group.
chmod	Changes permission modes.
chown	Changes the user associated with a file.
chrole	Changes role attributes.
chsec	Changes attributes in the security stanza files.
chsh	Changes a user's login shell.
chtcb	Changes or queries the **trusted computing base** attribute of a file.
chuser	Changes attributes for the specified user.
groups	Displays group membership.
grpck	Verifies the correctness of a group definition.
last	Displays information about previous logins.
lastlogin	Updates the **/var/adm/acct/sum/loginlog** file to show the last date each user logged in.
lssec	Lists the attributes in the security stanza files.
lock	Reserves a terminal.
login	Initiates a user session.
logname	Displays login name.
logout	Stops all processes on a port.
lsgroup	Displays the attributes of groups.
lslicense	Displays the maximum number of users that can be logged in concurrently.
lsrole	Displays role attributes.
lsuser	Displays attributes of user accounts.
makekey	Generates an encryption key.
mkgroup	Creates a new group.
mkpasswd	Creates a hashed look−aside version of the user database.
mkrole	Creates new roles.
mkuser	Creates a new user account.
mkuser.sys	Customizes a new user account.
newgrp	Changes your primary group identification.
nulladm	Creates active accounting data files.
passwd	Changes a user's password.
pwdadm	Administers users' passwords.
pwdck	Verifies the correctness of local authentication information.
rmgroup	Removes a group.
rmrole	Removes a role.
rmuser	Removes a user account.
Rsh	Invokes the restricted version of the Bourne shell.
setgroups	Resets the supplementary group ID for the session.
setsenv	Resets the protected state environment of a user.

shell	Executes a shell with the user's default credentials and environment.
su	Changes the user ID associated with a session.
sysck	Checks the inventory information during installation and update procedures.
tcbck	Audits the security state of the system.
usrck	Verifies the correctness of a user definition.
xss	Improves the security of unattended workstations.

Commands List: Shells

alias	Defines or displays aliases.
basename	Returns the base file name of a string parameter.
bg	Runs jobs in the background.
bsh	Invokes the Bourne shell.
chsh	Changes a user's login shell.
command	Executes a simple command.
csh	Invokes the C shell.
expr	Evaluates arguments as expressions.
false	Returns an exit value of zero **(true)** or a nonzero exit value (**false**).
fc	Processes the command history list.
fg	Runs jobs in the foreground.
getopt	Parses command line flags and parameters.
hash	Remembers or reports command path names.
jobs	Displays status of jobs in the current session.
ksh	Invokes the Korn shell.
line	Reads one line from the standard input.
patch	Applies changes to files.
read	Reads one line from standard input.
rsh	Executes the specified command at the remote host or logs into the remote host.
Rsh	Invokes the restricted version of the Bourne shell.
sh	Invokes the default shell.
shell	Executes a shell with the user's default credentials and environment.
tee	Displays the output of a program and copies it into a file.
test	Evaluates conditional expressions.
true	Returns an exit value of zero (**true**) or a nonzero exit value (**false**).
tsh	Interprets commands in a trusted shell.
type	Writes a description of the command type.
ulimit	Sets or reports user resource limits.
unalias	Removes alias definitions.
xargs	Constructs argument lists and runs commands.
yes	Outputs an affirmative response repetitively.

Commands List: System Accounting and Statistics

accton	Performs process−accounting procedures.
crash	Displays system images for examining a dump.
date	Displays or sets the date or time.

diag	Performs hardware problem determination.
dp	Parses and reformats dates.
du	Summarizes disk usage.
dump	Dumps selected parts of an object file.
errclear	Deletes entries from the error log.
errdead	Extracts error records from a system dump.
errdemon	Starts the error−logging daemon and writes entries to the error log.
errinstall	Installs messages in the error logging message sets.
errlogger	Logs an operator message.
errmsg	Adds a message to the error logging message catalog.
errpt	Processes a report of logged errors.
errstop	Terminates the error−logging daemon.
errupdate	Updates the Error Record Template Repository.
getconf	Writes system configuration variable values to standard output.
id	Displays the system identifications of a specified user.
iostat	Reports Central Processing Unit (CPU) statistics and input/output statistics for tty, disks, and CD−ROMs.
ipcs	Reports interprocess communication facility status.
ipreport	Generates a packet trace report from the specified packet trace file.
iptrace	Provides interface−level packet tracing for Internet protocols.
last	Displays information about previous logins.
locale	Writes information about current locale or all public locales.
logger	Makes entries in the system log.
pac	Prepares printer/plotter accounting records.
pstat	Interprets the contents of the various system tables and writes it to standard output.
sa	Summarizes accounting records.
sa1	Collects and stores binary data in the **/var/adm/sa/sa***dd* file.
sa2	Writes a daily report in the **/var/adm/sa/sar***dd* file.
sadc	Provides a system activity report package.
sar	Collects, reports, or saves system activity information.
snap	Gathers system configuration information.
stathcon	Lists the status of HCON session profiles and SNA logical unit (LU) pools.
sysdumpstart	Provides a command line interface to start a kernel dump to the primary or secondary dump device.
sysline	Displays system status on the status line of a terminal.
syslogd	Logs system messages.
tput	Queries the terminal descriptor files in the **terminfo** database,
uname	Displays the name of the current operating system.
uptime	Shows how long the system has been up.
users (BSD)	Displays a compact list of users currently on the system.
vmstat	Reports virtual memory statistics.
w	Prints a summary of current system activity.
watch	Observes a program that may be untrustworthy.
who	Identifies the users currently logged in.
whoami	Displays your login name.
whois	Identifies a user by user ID or alias.

acct/* Commands

ac	Prints connect−time records.
acctcms	Produces command usage summaries from accounting records.
acctcom	Displays selected process accounting record summaries.
acctcon1	Performs connect−time accounting.
acctcon2	Performs connect−time accounting.
acctdisk	Performs disk−usage accounting.
acctdusg	Performs disk−usage accounting.
acctmerg	Merges total accounting files into an intermediary file or a daily report.
acctprc1	Performs process−accounting procedures.
acctprc2	Performs process−accounting procedures.
accton	Performs process−accounting procedures.
acctwtmp	Manipulates connect−time accounting records to change formats and to make corrections in the records.
chargefee	Charges users for the computer resources they use.
ckpacct	Checks data file size for process accounting.
diskusg	Generates disk accounting data by user ID.
dodisk	Initiates disk−usage accounting.
fwtmp	Manipulates connect−time accounting records to change formats and to make corrections in the records.
lastlogin	Reports the last login date for each user on the system.
monacct	Performs monthly or periodic accounting.
nulladm	Creates active accounting data files.
prctmp	Displays session record files.
prdaily	Creates an ASCII report of the previous day's accounting data.
prtacct	Formats and displays files in **tacct** format.
remove	Deletes files from **var/adm/acct** subdirectories.
runacct	Runs daily accounting.
shutacct	Turns off processing accounting.
startup	Turns on accounting functions at system startup.
turnacct	Provides an interface to the **accton** command to turn process accounting on or off.
wtmpfix	Manipulates connect−time accounting records to change formats and to make corrections in the records.

Commands List: System Resources

chps	Changes attributes of a paging space.
chserver	Changes a subserver definition in the subserver object class.
chssys	Changes a subsystem definition in the subsystem object class.
compress	Compresses and expands data.
lslicense	Displays the range of users that can be logged in concurrently.
lsps	Displays the characteristics of paging spaces.
lssrc	Gets status of a subsystem, a group of subsystems, or a subserver.
mknotify	Adds a notify method definition to the Notify object class.
mkps	Add an additional paging space to the system.
mkserver	Adds a subserver definition to the subserver object class.

mkssys	Adds a subsystem definition to the subsystem object class.
pack	Compresses files.
pagesize	Displays the system page size.
pcat	Unpacks files and writes them to standard output.
rmnotify	Removes a notify method definition from the Notify object class.
rmps	Removes a paging space from the system along with any logical volume on which it resides.
rmserver	Removes a subserver definition from the Subserver Type object class.
rmssys	Removes a subsystem definition from the subsystem object class.
srcmstr	Starts the System Resource Controller.
startsrc	Starts a subsystem, a group of subsystems, or a subserver.
stopsrc	Stops a subsystem, a group of subsystems, or a subserver.
swapon	Specifies additional devices for paging and swapping.
tracesoff	Turns off tracing of a subsystem, a group of subsystems, or a subserver.
traceson	Turns on tracing of a subsystem, a group of subsystems, or subserver.
uncompress	Compresses and expands data.
zcat	Compresses and expands data.

Commands List: Software Installation

bootinfo	Determines current boot device, default install, and paging disks. Determines and displays various boot information.
bootlist	Alters the list of IPL devices or the ordering of devices on the list) available to the system.
bootparamd	Provides information for booting to diskless clients.
bosboot	Creates boot device.
chitab	Changes records in the **/etc/inittab** file.
ckprereq	Verifies that all prerequisite software is available and at appropriate revision levels.
fastboot	Restarts the system.
fasthalt	Stops the processor.
halt	Stops the processor.
init	Initializes and controls processes.
installp	Installs available software products in a compatible installation package.
inudocm	Displays contents of files containing supplemental information.
inurecv	Recovers all files saved by the **inusave** command.
inurest	Performs simple archive and restore operations for the **installp** command and shell scripts.
inusave	Saves files that are installed or updated during an installation procedure.
inuumsg	Displays specific error or diagnostic messages provided by a software products installation procedures.
logger	Make entries in the system log.
lppchk	Verifies files of an installable software product.
lsitab	Lists records in the **/etc/inittab** file.
lslpp	Lists software products.
mkboot	Creates the boot image, the boot record and the service record.
mkitab	Makes records in the **/etc/inittab** file.
rc	Performs normal startup initialization.
reboot	Restarts the system.
refresh	Requests a refresh of a subsystem or group of subsystems.

rmitab	Removes records in the **/etc/inittab** file.
shutdown	Ends system operation.
smit	Performs system management.
sync	Updates the i−node table and writes buffered files to the hard disk.
sysck	Checks the inventory information during installation and update procedures.

Commands List: User Interface

AIXwindows:

custom	Allows users to customize X applications.
dtscript	Builds simple dialogs used in the X Window System environment.
mwm	Runs the AIXwindows Window Manager.
uil	The command that starts the User Interface Language Compiler for the AIXwindow system.
xmbind	Configures virtual key bindings.

Enhanced X−Windows:

addX11input	Adds an X11 input extension record into the ODM database.
aixterm	Initializes an Enhanced X−Windows terminal emulator.
bdftopcf	A font compiler that converts fonts from Bitmap Distribution format to Portable Compiled format.
deleteX11input	Deletes an X11 input extension record from the ODM database.
listX11input	Lists X11 input extension records entered into the ODM database.
mkfontdir	Creates a **fonts.dir** file from a directory of font files.
resize	Sets the **TERMCAP** environment variable and terminal settings to the current window size.
rgb	Reads lines from standard input and inserts them into a database to associate color names with specific rgb values.
startx	Initializes an X session.
uil	Starts the User Interface Language Compiler for the AIXwindows system.
X	Starts the X Server.
xauth	Edits and displays the authorization information used in connecting to the X server.
xclock	Continuously displays the current time of day.
xcmsdb	Loads, queries, or removes Screen Color Characterization Data stored in properties on the root window of the screen.
xdm	X Display Manager with support for XDMCP.
xfs	Supplies fonts to X Window System display servers.
xhost	Controls who can have access to Enhanced X−Windows on the current host machine.
xinit (Enhanced X−Windows)	
xinit (X11R5)	Initializes the X Window System.
xlock	Locks the local X display until a password is entered.
xlsfonts	Displays the font list for X.
xmodmap	Modifies keymaps in the X server.
xpr	Formats a window dump file for output to a printer.
xrdb	Performs X server resource database utilities.

xset (X−Windows)	Sets options for your X−Windows environment.
xsetroot	The root window parameter setting utility for the **x** command.
xterm	Provides a terminal emulator for the X Window System.
xwd	Dumps the image of an Enhanced X−Window.
xwud	Retrieves the dumped image of an Exhanced X−Windows window.

Commands List: Macros

add_netopt	Adds a network option structure to the list of network options.
AllPlanes	Returns a plane mask with all bits set.
assert	Verifies a program assertion.
auth_destroy	Destroys authentication information.
BitmapBitOrder	Returns the ordering of bits in a bit map.
BitmapPad	Returns the scan line pad unit of the server.
BitmapUnit	Returns the size of a bitmap unit.
BlackPixel	Returns the black pixel value.
BlackPixelOfScreen	Returns the black pixel value.
CellsOfScreen	Returns the number of color−map cells in the default color map of the specified screen.
clnt_call	Calls the remote procedure associated with the *clnt* parameter.
clnt_control	Changes or retrieves various information about a client object.
clnt_destroy	Destroys the client's RPC handle.
clnt_freeres	Frees data that was allocated by the RPC/XDR system.
clnt_geterr	Copies error information from a client handle.
ConnectionNumber	Returns the file descriptor of the connection.
DTOM	Converts an address anywhere within an **mbuf** structure to the head of that **mbuf** structure.
DefaultColormap	Returns the default color−map ID.
DefaultColormapOfScreen	Returns the default color map.
DefaultDepth	Returns the depth (number of planes) of the root window.
DefaultDepthOfScreen	Returns the default depth (number of planes).
DefaultGC	Returns the default graphics context (GC) of the default root window.
DefaultGCofScreen	Returns the default graphic context (GC).
DefaultRootWindow	Returns the root window.
DefaultScreen	Returns the default screen.
DefaultScreenOfDisplay	Returns the default screen.
DefaultVisual	Returns the default visual type.
DefaultVisualOfScreen	Returns the default visual.
DisplayCells	Returns the number of entries in the default color map.
DisplayHeight	Returns an integer that describes the height of the screen in pixels.
DisplayOfScreen	Returns the display of the specified screen.
DisplayPlanes	Returns the depth (number of planes) of the root window of the specified screen.
DisplayString	Obtains the string passed to the **XOpenDisplay** function.
DisplayWidth	Returns an integer that describes the width of the screen in pixels.
DisplayWidthMM	Returns an integer that describes the width of the screen in millimeters.

DoesBackingStore	Indicates if the screen supports backing store attributes.
DoesSaveUnders	Indicates if the specified screen supports the save under flag.
del_netopt	Deletes a network option structure from the list of network options.
EventMaskOfScreen	Returns the initial event mask of the root window.
feof, **ferror**, **clearerr**, or **fileno**	Checks the status of a stream.
HeightMMOfScreen	Returns an integer that describes the height of the screen in millimeters.
ImageByteOrder	Specifies the required byte order.
LastKnownRequestProcessed	Extracts the full serial number of the last request known by **Xlib** to have been processed by the X Server.
IsCursorKey	Determines if the key symbol is a cursor key.
IsFunctionKey	Determines if the key symbol is a function key.
IsKeypadKey	Determines if a key symbol is a keypad key.
IsMiscFunctionKey	Determines if the key symbol is a miscellaneous function key.
IsModifierKey	Determines if the key symbol is a modifier key.
IsPFKey	Determines if the key symbol is a programmed function (PF) key.
M_HASCL	Determines if an **mbuf** structure has an attached cluster.
MTOCL	Converts a pointer to an **mbuf** structure to a pointer to the head of an attached cluster.
MTOD	Converts a pointer to an **mbuf** structure to a pointer to the data stored in the **mbuf** structure.
M_XMEMD	Returns the address of an **mbuf** cross−memory descriptor.
man	Provides a formatting facility for manual pages.
MaxCmapsOfScreen	Returns the maximum number of color maps supported by the specified screen.
m_copy	Creates a copy of all or part of a list of **mbuf** structures.
m_clget	Allocates a page−sized **mbuf** structure cluster.
me	Provides a formatting facility for creating technical papers in various styles.
m_getclust	Allocates an **mbuf** structure from the **mbuf** buffer pool and attaches a page−sized cluster.
MinCmapsOfScreen	Returns the minimum number of color maps supported by the specified screen.
mm	Provides a formatting facility for business documents such as memos, letters, and reports.
mptx	Formats a permuted index produced by the **ptx** command.
ms	Provides a formatting facility for various styles of articles, theses, and books.
mv	Simplifies typesetting of view graphs and projection slides.
NextRequest	Extracts the full serial number to be used for the next request.
PlanesOfScreen	Returns the number of planes (depth) in the specified screen.
ProtocolRevision	Returns the minor protocol revision number.
ProtocolVersion	Returns the major version number.
QLength	Returns the length of the event queue for the display.
RootWindow	Returns the root window.
RootWindowOfScreen	Returns the root window of the specified screen.
ScreenCount	Returns the number of available screens.
ScreenOfDisplay	Returns a pointer to the screen of the specified display.
ServerVendor	Returns a pointer to a null−terminated string.

svc_destroy	Destroys a Remote Procedure Call (RPC) service transport handle.
svc_freeargs	Frees data allocated by the RPC/XDR system.
svc_getargs	Decodes the arguments of an RPC request.
svc_getcaller	Gets the network address of the caller of a procedure.
varargs	Handles a variable−length parameter list.
VendorRelease	Returns a number related to a vendor's release of the X server.
WhitePixel	Returns the white pixel value for the specified screen.
WhitePixelOfScreen	Returns the white pixel value.
WidthMMOfScreen	Returns an integer that describes the width of the screen in millimeters.
WidthOfScreen	Returns an integer that describes the width of the screen in pixels.
xdr_destroy	Destroys the XDR stream pointed to by the *xdrs* parameter.
xdr_getpos	Returns an unsigned integer that describes the current position in the data stream.
xdr_inline	Returns a pointer to the buffer of a stream pointed to by the *xdrs* parameter
xdr_setpos	Changes the current position in the XDR stream.
XtCheckSubclass	Checks the subclass of a widget and generates a debugging error message.
XtClass	Obtains the class of a widget.
XtDisplay	Returns the display pointer for the specified widget.
XtIsManaged	Determines the managed state of a specified child widget.
XtIsRealized	Determines is a widget has been realized.
XtIsSensitive	Determines the current sensitivity state of a widget.
XtNewString	Copies an instance of a string.
XtOffset	Determines the byte offset of a resource field within a structure.
XtParent	Returns the parent widget for the specified widget.
XtScreen	Returns a pointer to the screen.
XtSuperclass	Obtains the superclass of the widget.
XtWindow	Returns the window of the specified widget.

Programming Tools

Commands List: Debuggers

adb	Provides a general purpose debug program.
dbx	Provides an environment to debug and run programs under the AIX system.
od	Displays files in a specified format.
prof	Displays object file profile data.
savecore	Saves a core dump of the operating system.
syscall	Performs a specified subroutine call.
trace	Records selected system events.
trcdead	Extracts the trace buffer from a system dump image.
trcnm	Generates a kernel name list.
trcrpt	Formats a report from the trace log.
trcstop	Stops the trace function.
trcupdate	Adds, replaces, or deletes trace report format templates.

Commands List: Messages

dspcat	Displays all or part of a message catalog.
dspmsg	Displays a selected message from a message catalog.
gencat	Creates and modifies a message catalog.
mkcatdefs	Preprocesses a message source file.
mkstr	Creates an error message file.
runcat	Pipes the output data from the **mkcatdefs** command to the **gencat**

	command.
xstr	Extracts strings from C programs to implement shared strings.

Commands List: Source Programs

admin	Creates and controls SCCS files.
asa	Prints FORTRAN files.
cdc	Changes the comments in a SCCS delta.
comb	Combines SCCS deltas.
ctags	Makes a file of tags to help locate objects in source files.
delta	Creates a delta in a SCCS file.
get	Creates a specified version of a SCCS file.
prs	Displays a Source Code Control System (SCCS) file.
rmdel	Removes a delta from a SCCS file.
sact	Displays current SCCS file−editing status.
sccs	Administration program for SCCS commands.
sccsdiff	Compares two versions of a SCCS file.
sccshelp	Provides information about a SCCS message or command.
unget	Cancels a previous **get** command.
unifdef	Removes ifdef'ed lines from a file.
val	Validates SCCS files.
vc	Substitutes assigned values for identification keywords.
vgrind	Formats listings of programs that are easy to read.
whereis	Locates source, binary, or manual for program.
which	Locates a program file, including aliases and paths (the **csh** (C shell) command only).

Commands List: Object Files

ld	Links object files.
lorder	Finds the best order for member files in an object library.
make	Maintains up−to−date versions of programs.
nm	Displays the symbol table of an object file.
prof	Displays object file profile data.
size	Displays the section sizes of the Extended Common Object File Format (XCOFF) object files.
slibclean	Removes any currently unused modules in kernel and library memory.
strings	Finds the printable strings in an object or binary file.
strip	Reduces the size of an Extended Common Object File Format (XCOFF) object file by removing information used by the binder and symbolic debug program.

Commands List: Miscellaneous Languages

bc	Provides an interpreter for arbitrary−precision arithmetic language.
bs	Compiles and interprets modest−sized programs.
m4	Preprocesses files, expanding macro definitions.
sno	Provides a SNOBOL interpreter.

Commands List: C Tools

cb	Puts C source code into a form that is easily read.
cflow	Generates a C flow graph of external references.
cpp	Performs file inclusion and macro substitution on C Language source files.
cxref	Creates a C program cross−reference listing.
execerror	

	Writes error messages to standard error.
indent	Reformats a C Language program.
ipcrm	Removes message queue, semaphore set, or shared memory identifiers.
lex	Generates a C Language program that matches patterns for simple lexical analysis of an input stream.
lint	Checks the C Language programs for potential problems.
m4	Preprocesses files, expanding macro definitions.
mkstr	Creates an error message file.
regcmp	Compiles patterns into C Language **char** declarations.
tic	Translates the **terminfo** descriptor files from source to compiled format.
xstr	Extracts strings from C programs to implement shared strings.
yacc	Generates a LR(1) parsing program from input consisting of a context−free grammar specification.

Commands List: Assemblers and Compilers

Assembler:

as	Assembles a source file.

FORTRAN:

asa	Prints FORTRAN files.
fpr	Prints FORTRAN files.
fsplit	Splits FORTRAN source code into separate routine files.
struct	Translates a FORTRAN program into a RATFOR program.

Commands List: Object Data Manager (ODM)

odmadd	Adds objects to created object classes.
odmchange	Changes the contents of a selected object in the specified object class.
odmcreate	

	Produces the **.c** (source) and **.h** (include) files necessary for ODM application development and creates empty object classes.
odmdelete	Deletes selected objects from specified object classes.
odmdrop	Removes an object class.
odmget	Retrieves objects from the specified object classes into an **odmadd** format.
odmshow	Displays an object class definition on the screen.
restbase	Reads the base customized information from the boot image and restores it into the Device Configuration database used during system boot phase 1.
savebase	Saves information about base−customized devices in the Device Configuration database onto the boot device.

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