AIX System Recovery Guide

Version 6.2

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1. Introduction

The ***SBAdmin AIX System Installation Guide*** is a supplement to the ***SBAdmin User Guide***, providing details on reinstalling an ***AIX*** system from an **SBAdmin System Backup**. Note that a System Backup is not limited to reinstalling the same system from which it was made, but it may also be used to "clone" the original system onto different systems containing the same or different hardware.

When to Use this Guide

This guide provides instructions for booting and reinstalling a system from an SBAdmin System Backup. This document should be reviewed after first installing the software to become familiar with this process and its requirements BEFORE a system installation is required.

Installation from a System Backup is fairly intuitive, but there is information and steps that must be taken to be prepared in the event that a system re-installation is required. The System Backup contains all of the backup data and the information needed to recreate the system and restore the data. If the System Backup is on a tape, then you can boot the system from the tape, so no other media is required. If your System Backup was written to a disk image file on a server, then you must either create a network boot image for booting the client, or a separate Boot-only tape for booting the client to the installation menus.

This guide will refer to information found in the ***SBAdmin User Guide***. When doing so, the reference term or section will be shown in Blue Text. If you need to refer to that information in the Administrator User Guide, highlighted sections (**in bold**) can be found in the **Table of Contents**, and other terms can be found in the Index.

Note that some of the screens in this guide are not seen when you are using the ***TSM Edition***.

2. Create Boot Media for System Installation

The SBAdmin Backup Administrator User Interface provides a very simple procedure for creating boot media, which is described in this section. This interface may be used to create bootable **tapes,** boot **CDROM** images, **network boot** images, or can configure a local **hard disk** to boot t the system recovery process. This interface may create any of the boot media types. Also refer to the **stmakeboot** command in the ***Commands Reference***, which may be run on any client to make bootable media directly from that system.

If using a *Network Administrator*, you should have boot media available for every client. If different clients are of the same **platform type**, **AIX release level**, and have the same **adapter support** installed, then they may typically use the same boot media. If you have one system with all device support installed, that system may be used to create boot media that will boot any system regardless of its own platform type or attached hardware. Keep in mind, however that you must create boot media using the same AIX release level you will be installing from the backup.

You must create boot media using the same *AIX* release level you will be installing from the backup!

When to Create Boot Media

It is generally a good idea to create bootable media for each individual system that is backed up using SBAdmin. This is because most systems do not run under the same AIX release level, have the same device support installed and configured, and have the same software level of various device support and other applications installed.

If you attempt to boot from media created using one AIX release level (i.e. “5.2”), then attempt to install the system from a backup that was running under release 5.3, you may run into problems during or after the installation completes. This is because the devices and filesystems created during the system recovery will be later accessed by a different *AIX kernel* that may not be compatible or provide the proper support. For this reason, the SBAdmin Installation process provides strong warnings if you boot from a different release level than was running at the time the backup was created. The installation process also verifies that your boot media contains the device support that is required to install the system, based on those devices that were in use at the time of the backup. If the support is not provided by the bootable media, devices may not appear which are needed for the install process.

If you have multiple systems, all running the same AIX release (but not necessary the exact same modification or fix level), it is generally safe to use the same boot media to boot and install different systems. Because the boot media is *probably the most important boot media you will ever need*, it is probably a good idea to keep at least one spare or create boot media of different types.

When you Should Always Create New Boot Media

1. Any time you apply operating system updates to AIX. Even if the release level has not changed, some new device support may have been added, shared libraries may have changed, or even the kernel may have been updated.

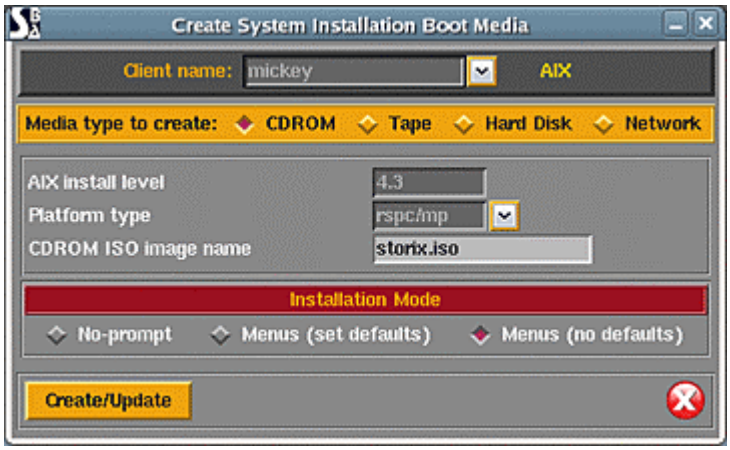
2. Any time you install a new *release level* of SBAdmin System Backup Administrator. Although we try to maintain compatibility between current and past versions, there may be times when a new feature supported by the backup software also adds new support to the system recovery process. Since the

system recovery programs are written to your boot media, you will need to remake the boot media to make sure you are using the latest installation programs.

Creating System Installation Boot Media

To create the boot media, select **Utilities->Create System Installation Media** from the menu bar in the administrator main menu. If using a ***Network Administrator***, you will be prompted to select the client on which the boot media will be created. Note that the boot media is created on the selected **client**, but may be used to boot other clients of similar system type and operating system release levels.

When selecting an ***AIX* Client name**, a screen similar to the following will appear:



The selected client (or the local system if not a *Network Administrator*) will be queried, and the ***AIX install level*** and ***Platform type*** will be displayed in the appropriate fields. You may change the ***Platform type*** if you want to create the image so it will boot on a different platform than the client. The ***AIX install*** level is for information only and cannot be changed.

You must select at the top of the screen the Media type to create. Note that the above example is for creating **CDROM** boot media. The options which appear in the center portion of this screen will differ slightly, depending on the media type selected.

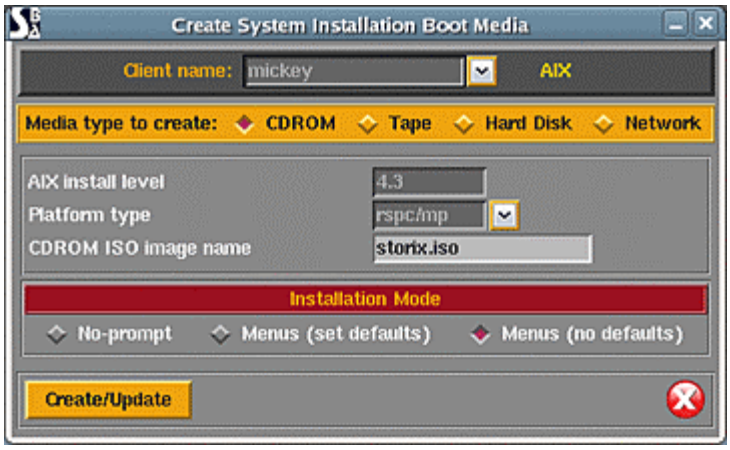
Remember to use the **QuickHelp** (right mouse button) on any button or entry field for details on the use and options for each.

Creation of each media type is described separately:

CDROM image

This process will make a CDROM ISO image, but will not actually burn the image to the CDROM. This image may be copied to any system where your CD/RW device resides where you can use any software or program you choose to copy the image to the CDROM. When making a CDROM, network support (described below) is always included. If using the *Network Administrator* you can make the CDROM image for the local system or for any other client or server system you have configured.

To create a bootable CDROM, select Utilities→Create System Installation Boot Media, then press the **CDROM** button at the top of the screen.



The only entry required is the CDROM ISO image name. You must specify the name of the file to create, but you may not specify the full directory path. All other options will contain a default value, based on the configuration of the system. The CDROM image will be saved on the client or server on which it was created in the ***/storix/temp*** directory (where */storix* is your SBAdmin data directory).

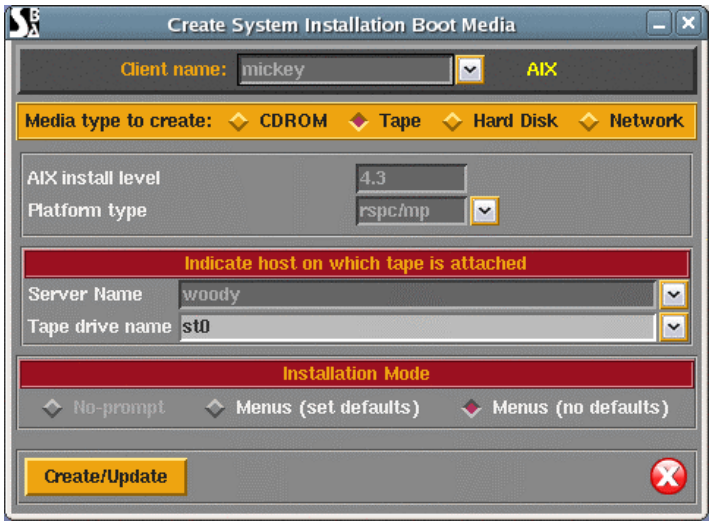
When this process is complete, you may copy this image to the system containing the CD writer device, if different, and use your CD writer program to copy it to a CDROM drive. Recommendations on how this may be done from your ***AIX*** system will be provided upon completion.

Tape

> **Tape option does not appear when you are using *TSM Edition*.**

Tapes will automatically be made bootable when you create an ***AIX*** System Backup to the start of the tape. You can stack additional System Backups to the tape, but no further boot images will be written since they must be at the start of the tape. If you have system backups on a tape (or disk) that are not themselves bootable, you can create a separate bootable tape to boot the system, then select a different installation media.

To create a bootable tape, select Utilities→Create System Installation Boot Media, then press the **Tape** button at the top of the screen.



This option allows you to create the tape from any client, but write to a tape drive on a different server. The selected client (or the local system if not a *Network Administrator*) will be queried, and the ***AIX install level*** and ***Platform type*** will be displayed in the appropriate fields. You may change the ***Platform type*** if you want to create the image so it will boot on a different platform than the client. The ***AIX install*** level is for information only and cannot be changed.

If using a ***Network Administrator***, select the **Server name**. Then select the **Tape Drive Name**.

To boot from the tape, you must have the tape in the drive, and select to boot from the tape device within the system firmware (***OpenFirmware*** on ***IBM System p and System i*** hardware). After booting from a bootable system backup, the tape will be the default install device, and you can continue the system installation from the same tape without a need to select any other options.

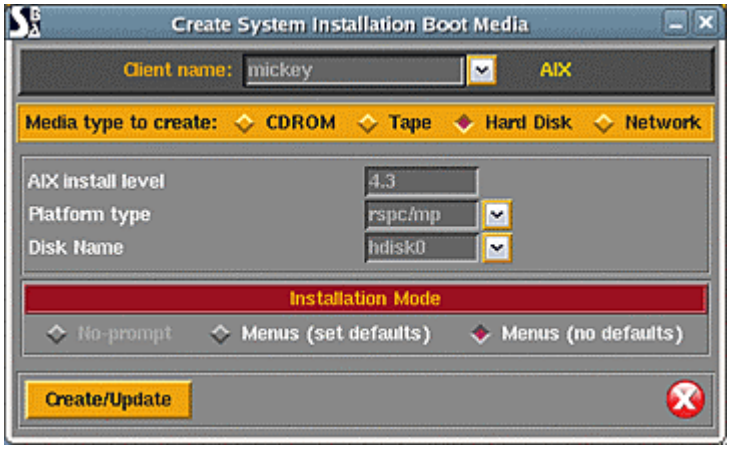
Hard Disk

> **Hard Disk option does not appear when you are using *TSM Edition*.**

If you configured a disk for **System Backups** (see ***SBAdmin User Guide***), then this disk (or disks) can also be made bootable to boot directly to the system recovery process. This allows you to perform your system backups to a local (or SAN-attached/portable) disk, then boot and reinstall the system from that same disk with no need for other backup media.

> **Using this option will not change how the system boots by default. After configuring a disk to boot to the SBAdmin System Install process, you must select to boot from that disk from within your system firmware boot menus.**

To create a bootable disk, select Utilities→Create System Installation Boot Media, then press the **Hard Disk** button at the top of the screen.



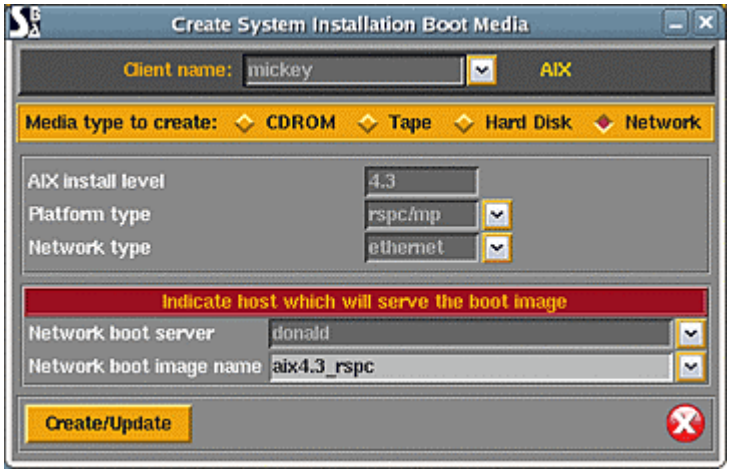
Select the disk to configure in the **Disk Name** field by using the arrow to the right of the entry field. When pressing the arrow, the system will be queried to find one or more disks that were configured using the option ***Configure a Disk for System Backup/Recovery*** in the ***SBAdmin User Guide***. If no disks are listed, then none were configured for system backup/recovery.

Network

Use this option to create a ***network boot image*** to be used to boot a client system over the network from a *network boot server*.

To create a network boot image on any configured client or server and save the image on the boot server, select either:

Configure→Network Boot/Install→Create/Update a Network Boot Image or
Utilities→Create System Installation Boot Media



If creating a network boot image from one system which will be used to boot other systems, the original system must be running the same level of AIX as the backup that will be installed onto the client, and must also have the device support installed to support the client system.

The AIX level, platform type and primary network type of the selected host will be automatically displayed. The ***AIX install level*** shown confirms the AIX level of the boot image that will be created and may not be changed. If the ***Platform Type*** shown is not the same as that of the client to be installed, you must change this field to the platform type of the client. The ***Network Adapter Type*** field will show the first network type detected on the system. If this not the same as the network from which the ***client*** will be booted, change this field accordingly.

> **If device support for the selected *platform type* or *network adapter type* selected was not installed on the system the boot image is created on, an error message will be displayed. If so, you must either select a different system on which to create the boot image or install the required device support from the AIX installation media.**

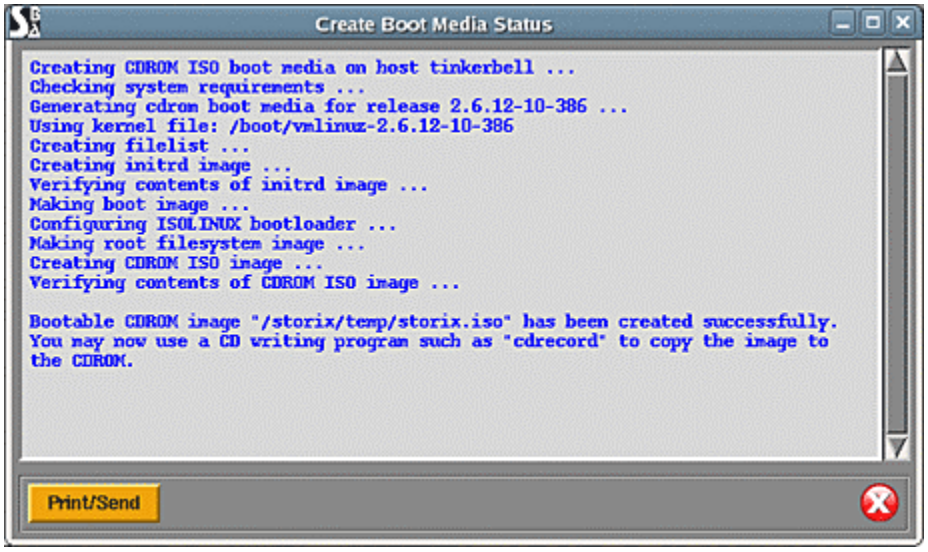
Select the name of the **Network boot server**. This is the server on which the network boot image will stored after it is created. The network boot server may be the same system from which the network boot image is created.

Lastly, type the name of the boot image in the **Network boot image name** field or select the name of an existing image to overwrite by pressing the arrow button to the right of the entry field. If you enter a unique name, a new image will be created using that name. If you select an existing name, the named image will be overwritten.

Note that the network boot "*image*" actually consists of several files on disk, but will always be referred to within the application as a single image by a unique ***boot image name***. The files are copied into the directory specified as the **Directory for Network Boot Images** when the server was configured. If you specify the name of an image which already exists, that image will be overwritten.

Upon successful completion, the network boot image will be created and transferred, if necessary, to the boot server. It will now be possible to configure any client to boot from this image using the option "Enable/Disable Network Installation of a Client" below.

When all selections are complete, press the **Create/Update** button. A new window will appear with the output of the command to create the media and any error message if they should occur, such as in the following example:



No-prompt Installation

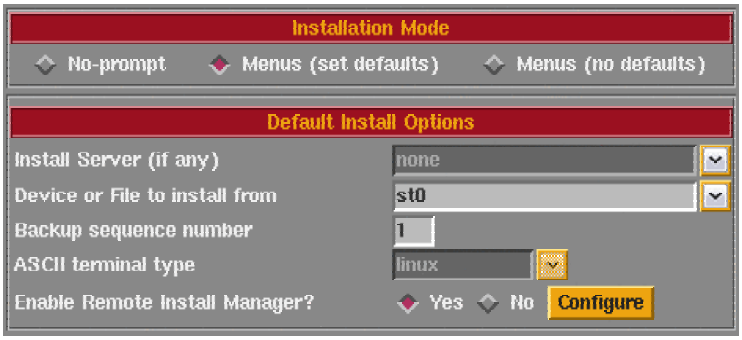
CDROM and **Network** boot media may be created with the default installation options set, also allowing the system to be installed as soon as a system is booted from this media. This allows an installation to take place simply by booting from a network boot image, for instance, with no operator intervention required.

> **To prevent a system from being inadvertently reinstalled by simply booting from the wrong device, this option is not available when booting from a hard disk. Be very careful, however, not to leave the CDROM in the drive and the system firmware set to boot from CDROM first, as a no-prompt installation could occur without any user intervention.**

Be very careful when using this option, as the user will not have the option of intervening in the system recovery process if the boot media was created for no-prompt installation. The exception, however, is if the defaults are not valid (such as an installation device not being available), or if the backup data will not fit onto the new system's hardware without some re-configuration.

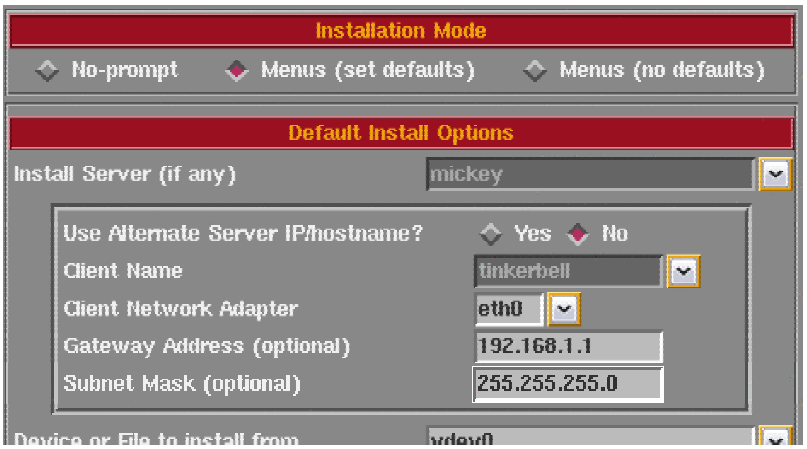
When creating **CDROM** boot media, the following options are available when using the option to Create System Installation Media. For **Network** boot media, the options are available when selecting to Enable Network Installation of a Client. The reason is that, when creating network boot media, a single network boot image may be used for different client systems, and each client system can be configured with different defaults. Refer to each corresponding section for additional details.

If you select either "**No-prompt**" or "**Menus (set defaults)**" for the **Installation Mode**, additional information will appear within the window, such as in the following example:



The Install Server is available only if using a *Network Administrator* license. If the client will install from a locally-attached tape drive, leave this field set to "**none**". If the system will be installed from a remote server, use the arrow button to the right of this field to select a server name.

When selecting a server name, and (when Enabling a Client for Network Boot/Install) the install server differs from the boot server, more information will appear on the screen below this field:



For the client to be installed from a remote server, you must select the name of the client to be installed (which must have been configured from the *Network Administrator* interface). Also, the network adapter name (of the client) will be required. Other fields are optional, but may be required for the client to contact the server.

Select ***Yes*** to the Use Alternate Server IP/Hostname field if the server was configured with an alternate server adapter. In this case, the client will retrieve the backup data from the server using this alternate adapter. Be sure to select the correct adapter name the client will use to contact the server via its alternate adapter.

Enabling Remote Installation Manager

This feature will allow connection to the SBAdmin *System Installation Process* from any remote system. With proper authority, a remote user can connect to, diagnose and perform system installation of a system after that system has been booted from the SBAdmin boot media. This process may be started from the SBAdmin interface on a Network Administrator system, or from any SSH client application. Therefore, installation of even a *Workstation Edition* system may be managed remotely.

The remote user will be required to enter a password to access the system installation process. This password may have been defined when the boot media was created or may be defined in the system installation menus after booting from the media.

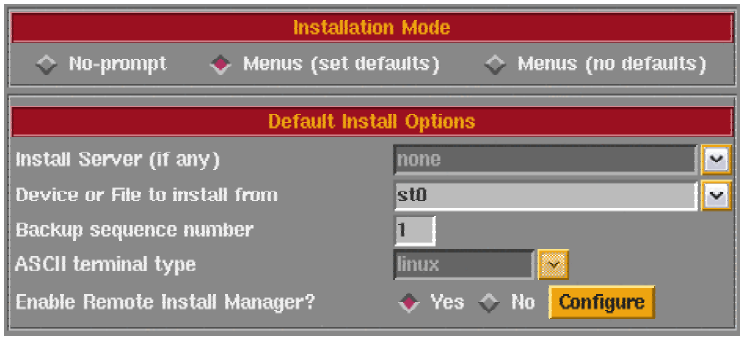
The Remote Install Manager (RIM) may be configured and started in one of two ways:

Configuring RIM when Creating Boot Media

To start RIM automatically when booting a system from SBAdmin boot media:

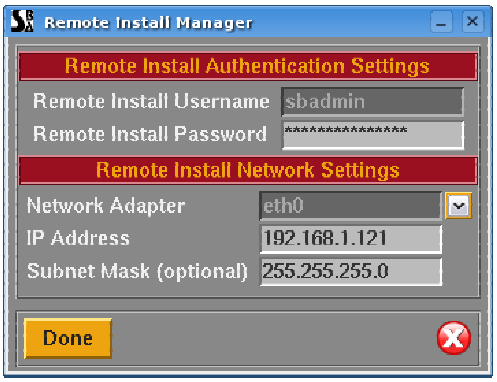
Utilities→Create System Installation Media

Select either **Menus (set defaults)** or **No prompt** for the installation mode. The screen will expand to include the following options:



Select "Yes" for **Enable Remote Install Manager**

Select the **Configure** button to the right to configure the settings. You will be presented with the following window:



The **Remote Install Username** is set to "sbadmin" and may not be changed. Enter a password in the **Remote Install Password** field. The password will be necessary to login to the remote install client.

Select the **Network Adapter** that should be configured to connect to the remote install client. If performing a network boot, then you may select **UseBootAdapter** to use the adapter that was used to perform the network boot. If you configured the **Client Network Adapter** on the previous screen, you can select **UseInstallAdapter** to use the same adapter configured for network installation.

Enter the **IP Address** used to configure the network adapter. This field will be disabled if you selected to use either the boot or install adapter, which will already be enabled.

Enter the **Subnet Mask** (if necessary) used when configuring the network adapter. This field will be disabled if you select to use either the boot or install adapter.

After pressing **Done**, the settings will be saved in the boot configuration. The adapter will be enabled, and a remote connection (with appropriate password) will be accepted when booting from this media.

Configuring RIM after Booting from the Boot Media

To enable RIM from within the *system Installation menus* after booting from the SBAdmin boot media.

From within the system installation menus select System Recovery Utilities. Then select Configure Remote Install Manager, and follow the instructions for Configuring Remote Install Manager in the Utilities section.

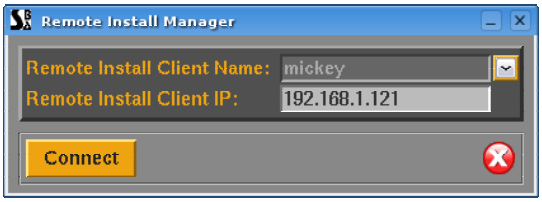
Connecting to the Remote Install Process

To connect to the remote install client use one of the following:

a. **SSH** client program (i.e. "**ssh sbadmin@*192.168.1.121***"): Note that you will always use the user id "sbadmin" and the password you selected in the previous step. If you do not have an ssh client program, you can use the one installed on the Network or Workstation Admin System. This program is called strimsh (i.e. "**/opt/storix/bin/stremsh sbadmin@*192.168.1.121*"**).

or

Select Actions→Remote Install Manager from the **Network Administrator**. A window will appear where you must enter the remote install password:



Select the **Remote Install Client Name** from the drop-down list. The primary IP address of the client will be shown in the **Remote Install Client IP** field. You may change this IP address if you are connecting using a different adapter.

When you press the **Connect** button, a new terminal window will display, and the System Installation Menus will appear. You can, from this window, perform all system installation and maintenance tasks for the remote client.

3. Network Boot/Install Configuration

The information provided in this section will prepare a client system for network boot and installation from a backup server.

Understanding Network Boot and Network Installation

Any client system defined to the admin system may be installed or reinstalled from a **System Backup**. That System Backup will typically reside on the disk or on a tape device attached to a backup server. In order for the client to restore from this backup data, it must first be *booted* over the network from a boot server, then installed from an install server.

- The **boot server** is used solely to provide a basic operating system with which the client will run the remainder of the installation process. If the boot server is not running the same level of AIX as the client to be installed or does not have the device support installed for the client, then a network boot image must be created on another system that meets this requirement, then placed on the boot server.

- The **install server** is used only to provide access to the data to be restored and its operating system level is not relevant. If the backup is on tape, the install server will be the system on which the tape drive is attached. Likewise, if the backup is a disk image file, the disk will be attached to the install server.

Although the boot server and install server are typically the same system, this is not a requirement. If, for instance, there are several systems on which tape drives are attached, the client may be installed from any tape on any system, even though the client is always booted from the same boot server.

If the client to be booted is running the same level of AIX as the boot server and all device support for the client's platform type and base system devices is already installed on the boot server, then you may skip directly to the option "Enable/Disable Network Installation of a Client".

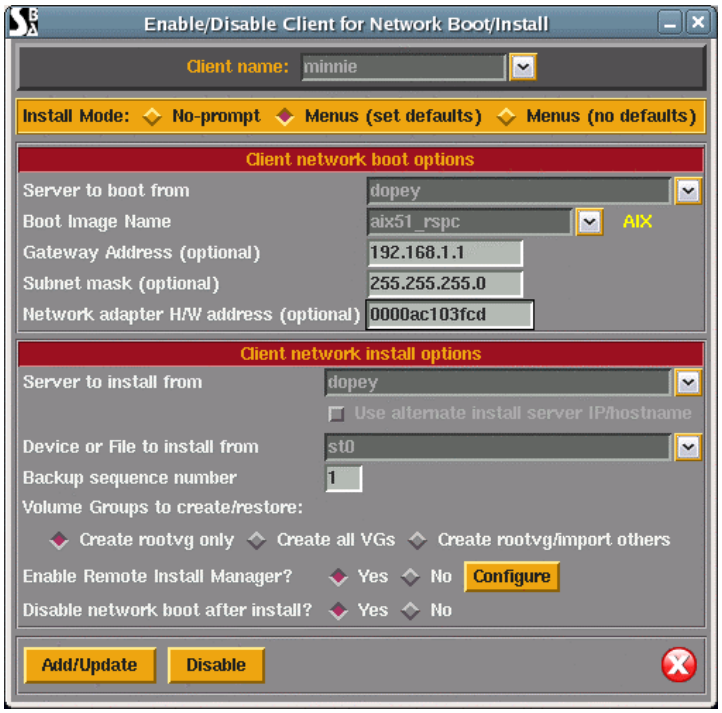
If the client and boot server are to run a different level of AIX or if the device support for the client is not already installed on the boot server, then you will need to create a network boot image from the client or any other system running the same level of AIX that you will be installing. The system from which the network boot image is created must also have installed the device support for the client. To create a network boot image on any system and copy the boot image to the boot server, refer to "Create Bootable Installation Media - Network".

Enable/Disable Network Installation of a Client

This section provides details on configuring a client to be booted and installed from a network **boot server** and/or network **install server**. Although the basic settings are simple, there are optional settings which may be used for more flexibility, such as configuring a no-prompt installation of the client, or installing (reading the backup data) from a different network adapter than the one the client was booted from.

For *AIX* clients which are SP Nodes, most of the information on this screen will be filled in automatically if the admin server is also the control workstation for the node. This includes the *Network Adapter Hardware Address*, which is required for SP Nodes to boot using the Network Boot option of the PSSP software.

To setup the client, select the option Configure→Network Boot/Install→Enable/Disable Network Installation of a Client from the menu bar. You will be prompted for the client to configure. Select the client and press the Continue button. A screen similar to the following will appear:



Options may appear or disappear from this screen depending on your selections. The screen is broken into two main sections, one for configuring the Client network boot options and one for configuring the Client network install options. The setting for the ***Install Mode*** at the top of the screen determines whether or not the ***Client network install options*** section will appear.

The following fields are used to configure the client to boot from a boot server:

1. **Install mode**: You must select here whether you want to perform a no-prompt or menu-driven installation:

    a. By selecting ***No-prompt,*** the client will be installed without entering any information on the client. This is referred to as a no-prompt install. If selected, all of the remaining prompts must be filled in.

    b. If ***Menus (set defaults)*** is selected, you will be provided the additional prompts now, all of which are optional. The information you provide will appear as defaults on the client after it is booted, but those options may also be changed on the client.

    c. If ***Menus (no-defaults)*** is selected, it is assumed that and all install options will be selected from the client install menus once it is booted. When selected, all remaining options will disappear from the screen as they no longer apply.

2. **Server to boot from:** If the server in this field is incorrect, use the arrow button to list and select a different server from which to boot from. By default, the boot server is assumed to be the install server as well. However, the install server may be changed as described later.

3. **Boot Image Name**: Use the arrow button to the right of the entry field to select from a list of boot images previously created using the Create Bootable Installation Media (Network) option. The boot image name selected will determine the AIX level, platform, and network type that will be used to install the client.

When both *Linux* and *AIX* clients are supported, the Boot Image Name selected will determine the additional options which appear, specific to the operating system type of the boot image.

4. **Gateway Address**: If the client must go through a gateway to reach the boot server, enter the IP address of the gateway machine.

5. **Subnet Mask**: If the client is on a subnet, enter the subnet mask.

6. **Network Adapter Hardware Address**: If the client and server are on the same network (no gateway between them) and you want to be able to boot the client without entering the server IP address onto the client, you can enter the client's network adapter hardware address (12-digits) here. Refer to the section ***Boot a Client for Installation from a System Backup*** for details on determining the client hardware adapter address.

7. **Server to install from**: This field will, by default, contain the name of the boot server. If the backup data will be restored from a different server than you booted from, select a different install server in this field. If the install server differs from the boot server, additional fields will appear on the screen which are described in the section Using a Different Install Server than the Boot Server below.

   If you wish to install the client using the server's alternate network adapter, select the button next to "***Use Alternate Server IP/Hostname***". If selected, additional fields will appear as described in the section Using a Different Install Server than the Boot Server below, since the client may need to use a different adapter to reach this alternate adapter on the install server.

8. **Device or File to install from**: Use the arrow button to list and select the device or directory from which the backup data will be restored. If a directory is selected, you will be prompted for the specific System Backup from which to install. After selecting the backup, the filename of the backup image will be placed in this field, and the ***Backup Sequence Number*** field will be automatically filled in with the sequence number of the client backup selected. If you select a tape device for this field, the device name will be placed in the field, but the backup will not be read at this time, since the backup may not be in the drive at the moment.

9. **Backup Sequence Number**: If the client will be installed from a tape device, you must manually select the backup sequence number on the tape media to install from. If there is only one System Backup on the tape, the backup sequence number will be 1 (default). If there are more than one, you must enter the appropriate backup sequence number. If you are unsure as to the correct sequence number to use, view the backup label and use the backup sequence number that corresponds to the desired backup.

10. **Console Device Name**: Select the name of the console device that will be used on the client. If the client is using a graphical display, this is likely "**lft0**". If the client is an SP node, the device is likely "**tty0**". The device selected will be used to display progress messages and, if an error occurs or prompts are enabled on the client, they will appear on this device.

11. **Console terminal type**: If the console device selected was a graphical device, the terminal type will be set to **LFT**. Otherwise, an ASCII terminal is assumed and you must list and select the specific terminal type. Using the arrow key, you can list the terminal types that are available during the installation process and select one from the list.

12. **Volume Groups to create/restore**: This option is used to select the volume groups from the backup that will be created and restored, or imported, during the installation process. It is not possible to select specific volume groups at this time, so you may select one of the following:

    a. ***Create rootvg only***: Select this option if you want only the *rootvg* volume group to be created and restored from the backup. If there are other volume groups on the backup, they will be ignored and will not be defined on the system when the installation completes.

    b. ***Create all VGs***: Select this option if all volume groups for which data was included on the backup should be created and restored. If only the *rootvg* exists on the backup, this option will be identical to the ***Create rootvg only*** option.

    c. ***Create rootvg/import others***: Select this option if the volume groups defined on the backup already exist on the client's disks and need not be restored. In this case, the *rootvg* volume

group will be created and restored, and all other volume groups, if they exist, will be imported from the existing disks.

If it is necessary to select or deselect individual volume groups to create, import or ignore, then you should select the ***Both*** option in the ***Prompt for remaining options field***. Then, you will be presented with the Installation and Maintenance Menu on the client, where you can more specifically tailor the installation options.

When all selections have been made, select the **Add/Update** button at the bottom of the screen. If a boot image for the specified platform and network type does not already exist on the boot server, one will be created which will take a minute or two. The client boot information will be saved and the client will be ready to boot and install. Refer to the section Boot a Client for Installation from a System Backup to initiate the installation process.

Disable a Network Install Client

It may be desirable to disable the network install for a client once the installation of the client is complete. If the client should inadvertently boot over the network and the client is configured for a no-prompt install, the client may end up being reinstalled automatically.

To un-configure the client, simply select the option Configure→Network Boot/Install→Enable/Disable Network Installation of a Client from the menu bar. Select the client to disable. The client network install configuration will appear. Simply press the **Disable** button at the bottom of the screen to un-configure the network install.

Un-configuring the network install client will prevent the client from booting over the network. Although the network install will be disabled, the information for the network install will be retained and will be automatically used as defaults should the same client be configured for network install again in the future.

Using an Alternate Network to Restore the Data

This option is not applicable to *TSM Edition*.

Even though the boot and install server may be the same, it may be desirable to perform the network install (actual restoration of the data) using a different network than was used to perform the network boot. For instance, the client may boot from the server using the *ent0* (ethernet) network, but may want to restore the data from the same server using the *tok0* (token-ring) network instead. This is commonly done in order to redirect the restore data traffic onto a different network than that which is in use by other applications.

To install using an alternate server network, a button is provided on the Network Boot/Install Configuration Screen labeled "***Use Alternate Install Server IP/Hostname***". If you want the alternate server network connection to be used for network install, press the button associated with each option. If the button is not selected, the default network connection used by the client to reach the server (as defined by the server hostname and network routing information on the client) will be used.

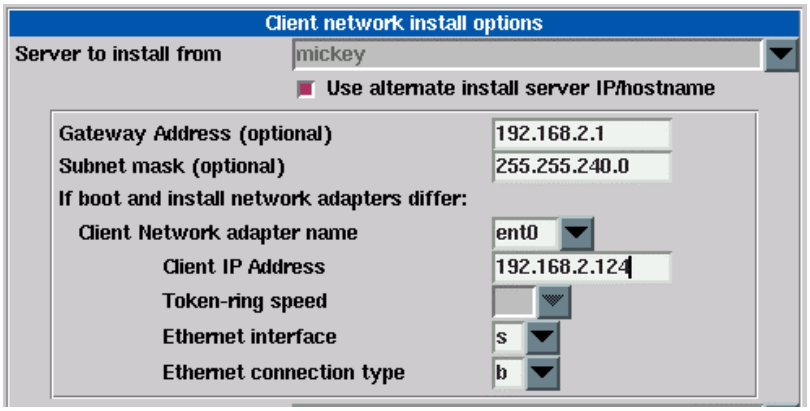
Note that this button will not be available if there was no alternate IP address or hostname setup for network installs from the server. To set the alternate IP address or hostname for a server, refer to the **server configuration** options.

If you select this button, additional options will appear which will be required only if you are using a different network adapter on the client system to contact the install server than was used to boot the client. Refer to the section Using a Different Install Server Than the Boot Server below for additional instructions.

Using a Different Install Server than the Boot Server

This option is not applicable to *TSM Edition*.

If the ***Server to install from*** (install server) is not the same as the ***Server to boot from*** (boot server), or if you selected to ***Use an Alternate Server IP/Hostname*** to reach the install server, additional fields will appear on the screen allowing you to configure the network differently for contacting the install server:



1. **Gateway Address**: If the client must go through a gateway to reach the install server, enter the gateway IP address in this field.

2. **Subnet Mask**: If the network the client uses to reach the install server uses a subnet mask, enter the subnet mask here.

3. **Client Network adapter name**: If the client will use a different network adapter to reach the install server than was used to reach the boot server, use the arrow button to select an adapter name from the list. If you select a different adapter, you must also fill in each of the following fields if they apply:

    a. **Client IP Address**: Enter the IP address associated with the adapter selected. If you are using a different install server than the boot server, the install server must recognize the client by this IP address and the hostname associated with this IP address must have been used to configure the client in the administrator application. If you are using the same server but an alternate server IP/hostname, you must enter the client IP address that will be used to contact the server using the server's alternate address. Refer to the **Configure Servers** option for information on using an Alternate Server Hostname/IP address.

    b. **Token-ring speed**: If the network adapter used to reach the install server differs from that used to reach the boot server, and a token-ring adapter is used, select the correct token-ring speed in this field. Note that an incorrect token-ring speed can cause an interruption in the entire network.

    c. **Ethernet interface**: If the network adapter used to reach the install server differs from that used to reach the boot server, and an ethernet adapter is used, select the correct interface to use, either ***en*** *(standard* ethernet) or ***et*** (IEEE 803.1 ethernet).

    d. **Ethernet connection type**: If the network adapter used to reach the install server differs from that used to reach the boot server, and an ethernet adapter is used, select the correct ethernet connection type, either ***BNC*** (coax) or ***DIX*** (15-pin D-shell).

Using the Same Boot Server to Install Different AIX Levels

The same boot server may be used to boot clients of any platform, network type and AIX install level. The boot server does not need to have any device support installed to support the client's hardware and does not need to run the same level of AIX as the client. The SBAdmin System Recovery process uses a unique network boot process that does not require identical AIX levels on the client and server and does not use NFS mounted /usr filesystems as do other AIX network boot applications.

Instead, you use a separate option to create a network boot image on any system running the AIX level you will be installing, and copy that boot image to the boot server. Each boot image is saved under a different name and may be separately selected when you configure a client to network boot. This 2-step process is described above in this section. First, Create a Network Boot Image (which also copies the boot image to the boot server), then Enable the Network Install of a Client by selecting the boot image on the server you previously created.

Updating Network Boot Images

If you have installed new *base system hardware support* (network devices, disk drives, platform types or display adapters) onto a system that you previously created a network boot image from, you will need to recreate that network boot image before the new device support will be accessible to the clients booting from that image.

After installing the new device support, simply follow the instructions for Create/Update a Network Boot Image to recreate the boot image and copy to the boot server. If you recreate the boot image for the same platform, network and AIX level, it will not be necessary to reconfigure the clients for network boot/install since the clients using the previous boot image will automatically begin using the newly created boot image.

4. Booting to the System Installation Process

Booting the Various Platform Types

This section will provide the specific step-by-step instructions for booting a system to the Installation and Maintenance Menu, used to install a system from a System Backup. Note that the steps differ widely between systems and new systems are being introduced frequently. If you are not familiar with the process of booting your system from different media, you should refer to your system documentation for detailed instructions.

To begin the system installation process, the client system must be booted from SBAdmin Boot Media. This may be a local bootable tape, or a network boot image storied on a boot server. In either case, the remainder of the installation process will be the same.

The instructions for booting the system vary for each boot type and also differ greatly depending on the type of the machine to be booted. Since SBAdmin supports all AIX systems from the earliest micro-channel-based RISC System/6000 (RS/6000) to the most recent (at the time of this chapter) PCI-based Common hardware Reference Platforms (CHRP systems), details on the boot process vary, and change often with new models.

Although specific instructions on booting the systems from the installation media are not described here, here are some hints to help get you started:

Accessing SMS Menus

System Management Services is used to specify the boot device and options. Initiate SMS by pressing F1 (graphical display) or the “1” key (ASCII terminal) when the system configuration icons or messages begin to appear on the screen. After the system configuration completes, the SMS menu will appear (which differs on various models).

CDROM

If your SMS is not setup to allow booting from CDROM, you will need to change it. Also, if your SMS attempts to boot from a hard disk before booting from CDROM, you will need to change this in case there is already a bootable hard disk in the system. Initiate SMS using the instructions above. Assuming your SMS is setup to boot from the correct media, just insert the CDROM and turn on or reset the system.

Tape

Initiate SMS using the instructions above. Assuming your SMS is setup to boot from the correct media, just insert the tape in the drive and exit the SMS menus to complete the boot process. No additional user interaction will be required.

Hard Disk

To install from a hard disk configured as a system recovery boot disk, you must select to boot from the disk within the ***SMS*** menus. Initiate SMS by pressing F1 (graphical display) or the “1” key (ASCII terminal) when the system configuration icons or messages begin to appear on the screen. After the system configuration completes, the SMS menu will appear (which differs on various models).

Assuming your SMS is setup to boot from the correct media, just turn on or reset the system. The remainder of the boot process will complete without further interaction.

Network

To network boot using System Management Services (SMS):

1. Initiate SMS using the instructions provided above.

2. Enter the **client**, **server** and **gateway IP addresses**. This is normally found under *Remote IPL*, *Network Boot*, or *BOOTP* settings. Note that the gateway address is usually left blank if none is used, but on some systems it should be set the same as the server address (indicating no gateway required). Be sure to enter the gateway address the *client* uses to reach the *server*, not the gateway address found on the server.

1. Return to the main SMS menu, then select to change the boot device. Select the network adapter to boot from.

2. Exit SMS to begin the network boot process.

To network boot a Scalable POWERparallel (SP) Node

It is assumed that SP nodes will be booted and installed from a network boot server, usually the control workstation.

An SP node does not have a key switch or console attached to the node system itself. Instead, the network boot is performed from the control workstation through one of several sources. The **Node Front Panel** option in the administrator application, is recommended, as it monitors and performs all of the steps automatically. Should the network boot option on the **Node Front Panel** (see ***SBAdmin User Guide***) fail to complete the boot process, there may be a problem communicating the hardware controls to the node through the ***Node Supervisor Card*** or ***serial port***. Should there be a problem, you may perform ***manual node conditioning*** using the hardware administration tools provided with the SP system.

Should an error occur during a network or tape boot, a value may appear in the system LED panel. The micro-channel-based and SP systems will display an LED value, indicating either a configuration process being executed or an error if the boot process fails. On earlier PCI-based systems, the LED panel is optional, but makes troubleshooting the boot process much easier. Refer to LED codes below for a detailed explanation of the common LED codes used in during the boot and installation process. For LED values which do not appear in that section, refer to the AIX or hardware documentation.

Completing the Boot Process

If booting from a network boot server and the client is configured for no-prompt install, the installation will proceed without any user prompts. This assumes that a console and restore device was pre-determined and the LVM information on the backup media is compatible with the system being installed. Refer to the section Setup Client for Network Installation for details on the configuration of a no-prompt install.

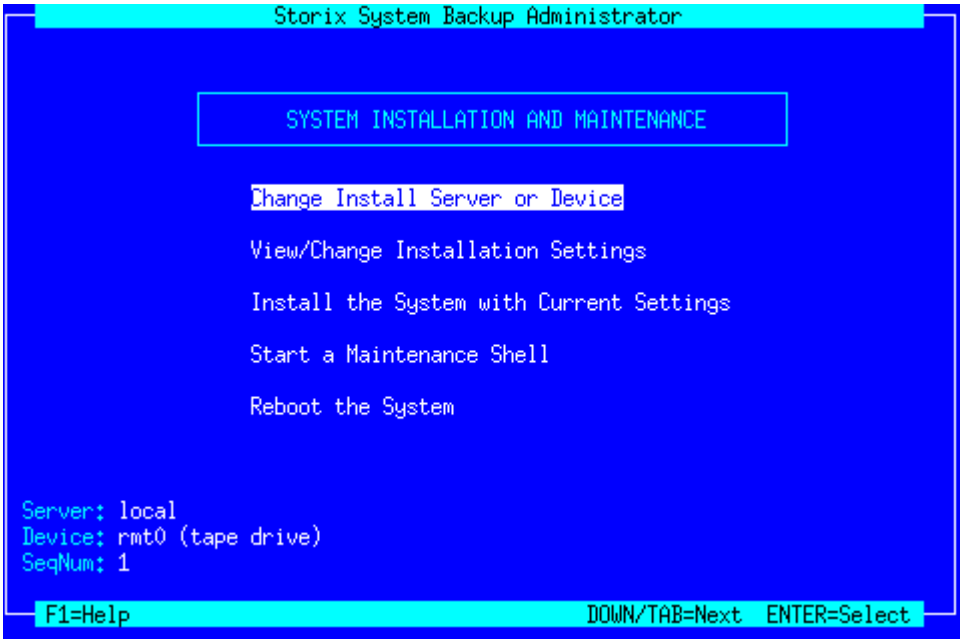
Unless this is a no-prompt install, the following prompt will appear on the screen:

```
****** Please Define the System Console ******

Type 1 at this terminal and press (Enter)
if you want this display to be the System Console.
```

The above example is for an ASCII terminal. Note that the prompt "***Type 1***" will be shown as "***Press F1***" for graphical displays. If the console is an ASCII terminal, press "**1**" and Enter. If the console is a graphic display, press the "***F1***" key and press **Enter**.

After a short time, the following **Installation and Maintenance** screen will appear:



The detailed instructions for using the options on this menu are provided in the sections Reinstall a System from a Backup and Change the Volume Group, Logical Volume and Filesystem Information.

Troubleshooting a Network Boot

To boot from the network, a server must have first been configured to provide a network boot image to this client. Those steps are outlined in the section Network Boot/Install Configuration.

To perform a network boot, The SBAdmin System Recovery boot process uses a standard network process called "***BOOTP***". BOOTP is initiated from the client and communicates with a BOOTP daemon on the boot server, who in turn provides the client with information needed to obtain and execute a network boot image.

You must refer to each of the sections above, depending on your platform type, for instructions on initiating the BOOTP process. If you are unable to boot the system to either the BOOTP Menu or System Management Services Menu, you should refer to your hardware documentation for instructions.

If you are able to initiate the BOOTP process, but the client still fails to display the SBAdmin System Recovery menus, there may have been an error in network communication between the client and server or an error in the network boot configuration. Be sure to check the following:

1. If there is an value in the LED of the client, refer to the LED Codes for specific information and instructions.

2. Check that the settings in the Enable Network Installation of a Client process are configured properly. Specifically be sure that the client gateway, subnet mask, platform and adapter type are correct.

3. Some older RSPC models require the ***Network Adapter Hardware Address*** be entered in the Network Boot Settings. Refer to Determining the Network Adapter Hardware Address instructions below.

4. On a PCI-based system, you cannot use the leading zeros for any of the IP addresses in the SMS Menu.

5. If you are trying to perform a ***broadcast BOOTP*** (by leaving the client and server IP address fields blank), try filling out the client and server addresses instead. Note that a broadcast BOOTP cannot be performed if a gateway is used between the client and server.

6. Be sure that the ***bootpd*** and ***tftpd*** daemons are enabled on the boot server. Check the **/etc/inetd.conf** file on the boot server to ensure that these daemons are not commented out (not preceded with a #). If so, uncomment these lines by removing the "#", then type "`refresh -s inetd`".

7. After initiating the network boot from the client, check to see if the ***bootpd*** daemon was started on the boot server. This daemon will usually remain running for several minutes after it is started, even if the boot fails. Use the command "`ps -ef | grep bootpd`" on the server to check for the existence of this process. If the process does not exist, the boot server did not receive a bootp request from the client. Check the server's IP address you entered in the BOOTP information, and try performing a "`ping`" from the client to check network communication to the boot server. There is an option to "ping" the server from both the BOOTP menu and the SMS menus.

Determining the Network Adapter Hardware Address

Some systems require that the adapter hardware address be used to network boot a client. In other cases, you can prevent the need to enter the client and server IP addresses into the BOOTP screen if the hardware address of the client is known to the boot server. This requires that the network adapter hardware address be entered when setting up the client for network installation. The steps to obtain the network adapter hardware address of the client differ widely depending on the platform and system model. If you do not know how to determine the adapter hardware address, you can find this information on the screen by initiating a network boot operation (even if the boot is unsuccessful).

LED Codes

This chapter contains a list of the system LED codes that may appear when booting or installing from a System Backup. Many of the LED codes are for information only, usually when there is no system console available, and many indicate an error in the boot or install process.

Many of the LED codes will only appear during a no-prompt installation. This is because there may not be a system console attached, and the LED is used to provide information to the user on the progress of the installation, or if an error has occurred requiring user intervention.

The LED codes below are those that are provided by this application. Any other codes that appear are not part of this product, but normally represent a system software or hardware problem. If the LED code is not listed here, you should refer to your system software diagnostics documentation for details.

c06 **Failed to identify the system type during a tape boot**

The ***bootinfo -B*** command failed due to device support missing from the boot image which is required to support the system's hardware. The problem usually is caused from missing SCSI or BUS device support. You will need to remake the boot tape from a system containing all device support required for the system to be installed.

c21 **Could not bring up boot network**

The *ifconfig* command failed to bring up the boot network. Check that the subnet mask is correct or remove the subnet mask from the network boot configuration.

c31 **Prompting user to select a system console**

A prompt should appear on each graphical device and ASCII terminal asking the user to press a key to select that device as the system console. If there is a graphical device and the prompt does not appear, then the boot image does not contain the device support required to activate that device. You must install the graphics adapter device support for the device on the server and remake the network boot image, or recreate a bootable tape on another system containing the required device support.

c32 **User selected a graphical display as a console device**

c33 **User selected an ASCII display as a console device**

c40 **AIX installation programs are being restored from the boot tape**

c43 **Error restoring the AIX install programs during a tape boot**

Either the tape media is defective, the tape drive is defective, or the boot tape is incomplete. Create another boot tape and try booting from tape again.

c45 **Failed to configure a system console or find a console device**

The ***cfgcon*** command failed because of missing device support for either the graphic adapter or standard I/O slot for ascii monitors. You must install the appropriate device support on the system from which the backup tape was made, then recreate the system backup.

c46 **Normal installation is in process**

This LED will appear throughout most of the installation to indicate normal processing.

c47 **Unable to create a PVID on a disk**

This normally indicates a hard disk failure. If installing on the disk for the first time, try checking and/or reformatting the disk in diagnostics and retry the install.

c48 **User is being prompted for input at the console**

This is the normal LED to be displayed during a prompted installation when the installation menus appear. If this is a no-prompt installation, this LED will appear to indicate that a configuration or installation error has occurred and the user is now being prompted for input at the system console. Check the console for errors and proceed accordingly.

c49 **Could not format a JFS log logical volume**

The *logform* command failed to format the JFS log logical volume (typically hd8) during a recovery installation. You will be placed in a maintenance shell. Format the log logical volume manually and continue the installation.

c50 **Creating the rootvg volume group on disk**

c52 **Initializing base operating system after restoration of base operating system files**

c54 **Restoring the base operating system files from the backup media**

c55 **Could not remove the root (hd4) or /usr (hd2) logical volumes**

The *rmlv* command failed to remove a logical volume during a recovery installation process. You will be placed at a maintenance shell. Manually remove the logical volumes, then continue the installation.

c57 **Error restoring filesystem or logical volume data**

If this error occurs, there was a problem restoring either the filesystem data or raw logical volume data from the backup, and typically indicates an error reading the backup media. If this occurs in the / or /usr filesystem, the problem must be corrected and the data must be restored from the media for the installation to continue. If this occurs for any other filesystem or logical volume, you may continue the installation without restoring the data. In this case, the installation will complete successfully, but you must restore the missing data after the system reboots in normal mode.

c59 **An error occurred initializing the base operating system**

If this error occurs, the system was unable to switch to the restored operating system after restoration of the base operating system files. This will typically only occur if there was an error reading the operating system files, or if the operating system on the backup was missing files necessary for normal system operation. Refer to the error messages provided and correct the problem before continuing the installation.

c58 **The user is being prompted to change the key switch to allow for normal system boot**

The key switch is set to the SERVICE position and must be changed to the NORMAL position in order to reboot the system from disk after completion of the installation.

200 **The system key is in secure mode when booting**

Power off, turn the key to SERVICE and power on again.

510 **Configuring base system devices during a tape boot**

511 then blank screen

Console configured but messages cannot be displayed

The *cfgcon* command successfully configured a system console device, however the console messages fail to appear because of missing or incorrect device support for the graphic adapter. You must install the appropriate device support on the system from which the backup tape was made before creating the System Backup.

512 **Configuring additional system devices during a tape boot**

513 **Restoring installation files from tape during a tape boot**

600 **Network boot has started**

602 **Configuring base system devices during a network boot**

603 **Configuration of base system devices failed during a network boot**

If this error occurs, base system device support is probably missing from the network boot image. Ensure that all required device support for the client is installed on the boot server and remake the network boot image.

604 **Configuring network boot device**

605 **Boot device is invalid during a network boot**

The *bootinfo -B* command failed due to device support missing from the boot image which is required to support the system's hardware. The problem usually is caused from missing SCSI or BUS device support. You will need to remake the network boot image on the server after installing all device support required for the system to be installed.

606 **Bringing up network boot device**

608 **Copying client installation settings from boot server to client**

609 **Failed to copy client installation settings from boot server to client**

This error may occur if the client installation settings are missing from the boot server. Check the file ***/storix/*netboot/*client*.bootinfo** (where '***/storix***' is the SBAdmin data directory and '***client***' indicates the name of the client to boot). This error may occur if:

1. The file does not have read permissions for all users.

2. The file does not exist.

3. An **/etc/tftpaccess.ctl** file exists on the boot server but does not provide access to the ***/storix*/netboot** directory (where '***/storix***' is the SBAdmin data directory).

4. On a PCI-based system, you cannot use the leading zeros for any of the IP address in the SMS Menu. Even though the first tftp command works the second one will fail.

Recreate the network boot image on the server and re-enable the network boot client, making sure all values are correct.

613 Could not configure route to boot server

The *route* command failed to establish a route to the boot server. Check that the gateway address is correct, or remove the gateway address from the network boot configuration if no gateway is required for the client to reach the boot server.

614 Could not contact the install server

The client could not contact the install server because there was a network communication error. SBAdmin commands are used to communicate between client and server at this time. You must check that the server is running the same level of SBAdmin that the client was booted under, and that the server has been properly configured for network communications. You must also be sure that the server has enabled the client permission to read from a remote backup on the server.

615 Could not read the second part of the boot image from the boot server.

The boot images on the server are incomplete. Rebuild the boot images on the server and try to boot the client again.

5. Reinstall from a System Backup

A System Backup may be used to reinstall either the original system or a different system with either the same or different hardware configuration. To initiate the installation, you must first boot the client from either a network boot server or from the local tape using the instructions found in the section Booting to the System Installation Process.

To setup a client system to be installed from a System Backup on a network install server, you must first configure it using the process described in the section Enable/Disable Network Installation of a Client.

If the System backup was written to tape, you may also boot and install from the tape if the tape drive is directly attached to the client.

If booting from a tape directly attached to the client, some configuration steps, such as automatic reconfiguration of the client network parameters and SP node customization will not occur. It is normally recommended that a client be installed from an install server whenever possible. In that case, the network will be reconfigured according to the network settings used for the installation.

Cloning Systems

"Cloning" a system means to install a system from a backup originating on another system. The system from which the backup was made may be identical or completely different than the system you are installing.

If the system to be installed is identical in hardware type and configuration to the one the backup was made from, the installation may be performed with no customization required. However, if the systems differ, there may be changes required. For instance, if the disk configuration on which the volume groups were placed is not available on the new system, messages will be displayed that the original disks are not available and you must select new physical volumes into which the volume groups will be placed. See Change Volume Group and Logical Volume Information below.

Automatic Installation of Device Support Software

If the backup does not contain the system device software required to support the devices on the new system, the device support for the new system must be made available or the devices will not be configured on the new system. This may be done automatically by simply inserting an AIX Installation CD-ROM into the CD-ROM drive at any time prior to or during the installation. Upon restoration of the base operating system from the backup, the system will be checked to see if all required device support is installed and, if not, the device support will be automatically installed from the AIX CD-ROM!

No-prompt Installation

If the system is set to no-prompt installation, the Installation and Maintenance Menu will not appear (as described in the following section), but the installation will proceed without any input from the user.

The exception is when the backup is **encrypted**. In this case, you will be required to enter the *encryption key* in order to decrypt the data during the restore. There is no way to automate the process to prevent entering the encryption keys. Refer to Installing from an Encrypted Backup for details on installing from an encrypted backup.

If your boot media was created for a no-prompt installation, a banner will display as follows:

```
=====================================================================
                    !!!!  NO-PROMPT INSTALLATION  !!!!
=====================================================================
The installation process was set to no-prompt mode. The installation
will continue with no prompts unless a problem occurs requiring user-
interaction.
        IF YOU DO NOT WANT THIS MACHINE TO INSTALL AT THIS TIME,
          YOU HAVE 60 SECONDS TO TURN OFF THE SYSTEM POWER!
=====================================================================
```

As indicated, you will have 60 seconds to turn off the system to prevent the system installation process from continuing (and possibly overwriting all data on the system). There is no way to manually interrupt an install process created for no-prompt installation and cause it to display the installation menus.

Refer to Enable/Disable Network Installation of a Client for information how to pre-answer any questions normally asked during the install process which are required for a no-prompt installation. If configured for no-prompt installation, the installation process will proceed automatically as follows:

1. The defined install server and device will be checked to ensure they are available and readable

2. The selected backup will be read and the installation information will be extracted

3. The configuration information from the backup will be compared against the current system configuration to ensure the volume groups and logical volumes may be created according to the backup data. If there are non-fatal problems which can be corrected, they will be corrected automatically. For instance, if a prior physical volume is not available on the new system, leaving only one physical volume in a volume group, mirroring and/or striping of all logical volumes in that volume group will need to be turned off to allow the installation to continue.

   If there are any fatal problems, such as no physical volumes on the new system that match the original system, or if the disks on the new system are not large enough to contain the original data, the system will enter prompted mode and the installation menus will appear in order for the user to make changes to correct the problems before continuing.

Installing from an Encrypted Backup

If the backup to be restored from was encrypted during the backup process, it will be necessary to decrypt the data during the restore. Unlike restoring data on a live system, where the *encryption keys* are available on the backup system, the encryption key must be entered manually during the system installation. The encryption keys are not stored in the boot media or the backup information as this might be penetrable to hackers.

As warned during the backup process, an encrypted backup cannot be restored without the proper *encryption key*. This key may not be retrieved from the backup, nor can Storix assist in providing the correct key. If you do not have the proper encryption key needed to decrypt this backup, you will not restore this data!

The encryption key is a value that the user defined prior to performing the backup. If the encryption key is not known, you will not be able to restore the system from this backup. However, to make encryption keys easier to remember and/or enter, it may be entered either as a *hexadecimal number*, or an *ASCII text* equivalent (if this was the form used to create the original key).

When selecting to install from an encrypted backup, the following message will appear:

```
================================================================================
                        BACKUP DATA IS ENCRYPTED
================================================================================
To read the backup data, an encryption key is required. You may supply
a 32-byte HEX key to decrypt the data. If you used a 16-byte
ASCII (text) key to generate the HEX key, you may also enter it here.

Select one of the following:
        1) Enter a HEX key
        2) Enter an ASCII (text) key
        3) Start a shell
==>
```

Select the appropriate option for entering either a HEX or ASCII encryption key. The third option may be used to start a shell to type commands at the command line should you need to perform system recovery without reading the backup data.

Enter a HEX Key

The length of the key will depend on the number of *bits* of encryption. For 128-bit encryption, a 32-byte hexadecimal number is required. For 192-bit encryption, a 48-byte number is needed, and for 256-bit encryption, a 64-byte hex number is needed. Select option 1 from the list above, then when prompted to "`Enter your 32-byte HEX key (or press Enter to reselect key type)`", enter they key, or press Enter to return to the options above.

Enter an ASCII (text) Key

The length of the key will depend on the number of *bits* of encryption. For 128-bit encryption, a 16-byte ASCII string is required. For 192-bit encryption, a 24-byte string is needed, and for 256-bit encryption, a 32-byte string is needed. Select option 1 from the list above, then when prompted to "`Enter your 16-byte ASCII (text) key (or press Enter to reselect key type)`", enter they key, or press Enter to return to the options above.

The key you enter will be converted to an appropriate hexadecimal number and used to decrypt the data, just as if you entered the hex key yourself.

Upon entry of a valid key, the restoration of the data will continue. If an invalid key is entered, you will be informed so, and returned to the above menu of options.

System Installation Process

After booting from a network boot server

When the system is booted from the network, the client network installation options will also be copied from the boot server to the client. Any installation options setup when the client was configured for network boot (see Enable/Disable Network Installation of a Client) will be used by default for the installation. These pre-set defaults may include the install server and device, the console device and terminal type, the backup sequence number, or anything else required for the installation to proceed with no required input from the user. If the user selected a no-prompt installation (see No-Prompt Installation above) will the installation continue automatically. Otherwise, the installation menus will appear and the user may manually change any prior defaults, add any settings that were not pre-configured, or continue the installation process with the current settings.

After booting from a local tape

When booting from tape, there are no pre-configured system installation settings. However, it will be assumed that the tape from which the system was booted contains the system backup that is to be installed. If not, you may select either another local tape device, or a device or file on a network install server, from which to install the system.

Verifying the hardware configuration

Once the backup media is selected, and you chose to either continue the installation with the current settings or to change the volume group, logical volume or filesystem information, the following will occur:

The physical volumes (disks), volume groups, logical volumes and filesystems defined on the backup are compared against the current system's hardware configuration. If there are problems that would prevent the backup from being installed onto the system, such as missing disks or disks that are too small to contain the backup data, a list of messages indicating the problems will be displayed and the user will be required to either make changes manually or may select to ***automatically fix*** any problems that are non-fatal.

Non-fatal errors are those that require changes to the logical volume configuration in order to allow the data to be restored, although all of the logical volume features may not be the same as on the original system. For instance, if there is only one remaining physical volume that matches the original system configuration for a particular volume group, any mirroring and/or striping will need to be disabled for the logical volumes in that volume group since these features require at least two physical volumes. If such non-fatal errors occur when checking the system information, you will be provided the option of automatically fixing the errors. You may also change the volume group or logical volume information manually to either add more disk space or change other logical volume attributes manually that would allow the logical volume to be created as desired.

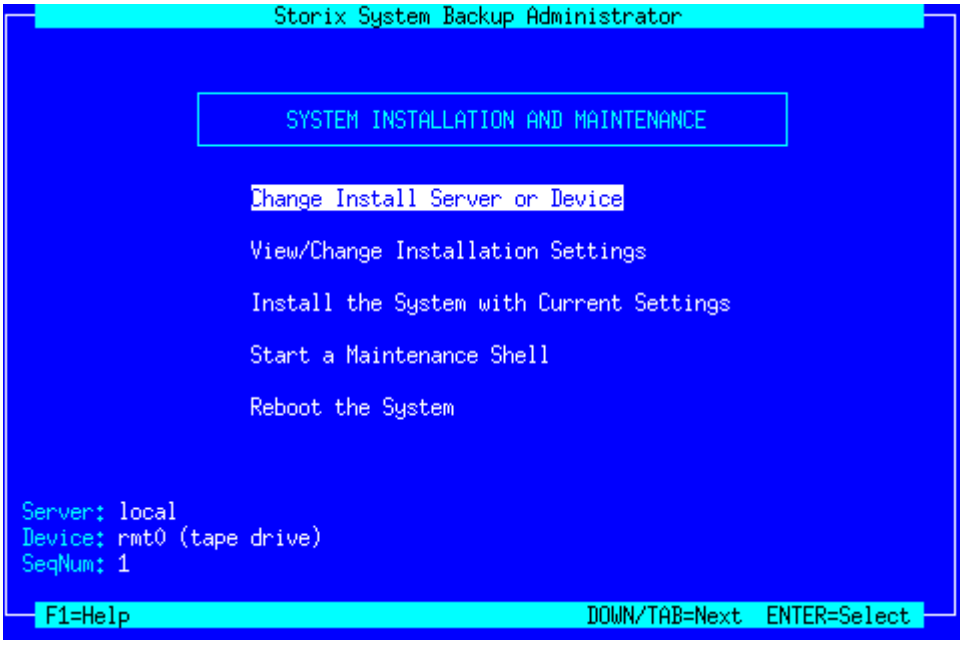
The System Installation and Maintenance Menu

The Installation and Maintenance Menu will provide all options for customizing the installation of the client. To display the Installation and Maintenance Menu, the system to be installed must first be booted from either a System Backup Tape or a Network Boot Server. Refer to Boot a Client for Installation from a System Backup for details.

The Installation and Maintenance Menu will not appear when performing a no-prompt install (after booting from a network boot server), unless an error occurred while verifying the backup data.

Unless performing a no-prompt installation, the following Installation and Maintenance Menu will be displayed after booting from a backup tape or network boot server:

If you are using a color ASCII display as your console, the following menus will appear in color as shown. If you are using a color graphic display, the installation menus will not be in color since the AIX "lft" driver does not support terminal color options.

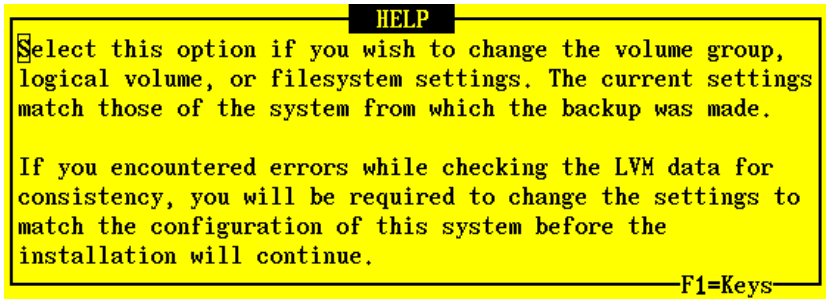


Using Keys and Getting Help

Because these menus appear on the client and not on the admin system, the menus are provided in a form viewable on ASCII terminals. The use of the mouse is not available. Most keyboards will support arrow keys while others do not. Also, some keyboards have page up and page down keys, help keys, etc, that others do not. For this reason, there is a variety of methods which may be used to traverse the menus and options in the installation screens:

- To move between fields, use the **Up-arrow** and **Down-arrow** keys on the keyboard.
- To make a selection, press the **Enter** key, and
- To return to a previous screen, use the **F3** or **ESC** (escape) key
- For pop-up lists, help screens and other messages, you may use the arrow keys to move up and down the list or to scroll the text. You may also use the **Page-up** and **Page-down** keys, if available, or use **CTRL-N** for 'next page' and **CTRL-P** for 'previous page' if not.

Help Windows: The **F1** or **"!"** key (shift/1) may be pressed at any field or menu item to obtain help instructions, detailing the use and options for the corresponding item. A help window will appear in the center of the screen, as shown in the following example:



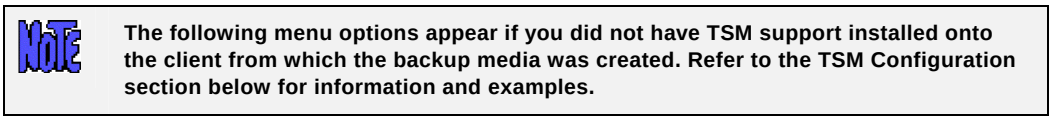
If the help information is lengthy for a particular option, it may be necessary to page the message using the page or control keys described above. To remove the help window and return to the previous entry, press the **F3** or **ESC** key.

Pop-up List Options: Pop-up lists are available for many entry options. When supported, “List=F4/$” will appear at the bottom of the screen. At that field, you may press the **F4** or “**$**” key (shift/4) to list the available options for the corresponding field and select an option from the list. To select an option, use the arrow keys to highlight the desired option and press **Enter**. The selected option will be placed in the entry field and the pop-up window will disappear.

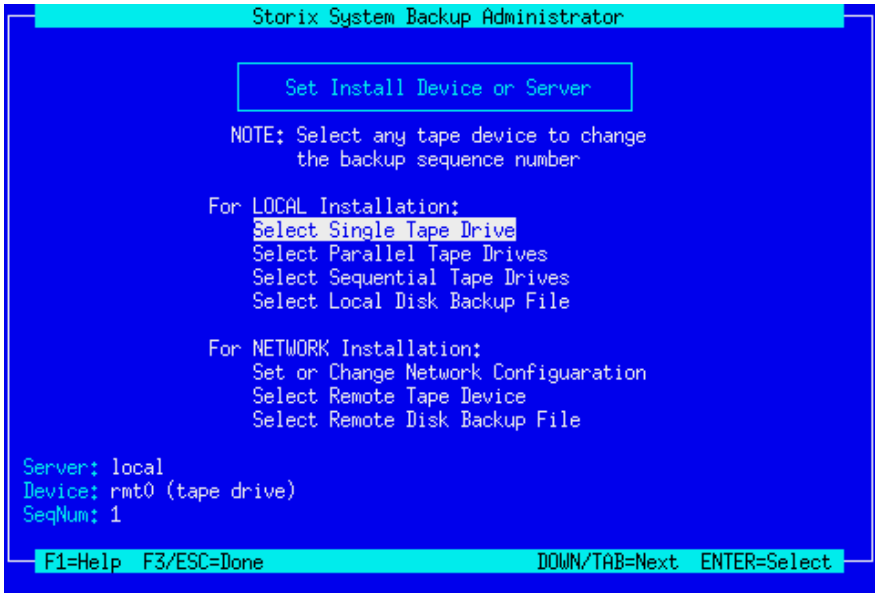
Change Installation Server or Device

The default installation server and device, if any, will be displayed at the bottom of the screen. If the system was booted from the network, the install server will default to the boot server unless a different install server was defined when the client was configured for network boot. If the system was booted from a local tape, the server is assumed to be “local” (or none) and the installation device is assumed to be the tape drive the system was booted from.

Select the Change Installation Server or Device option if you wish to change the server on which the backup media is attached, or the remote or local installation device. You will only be able to select a remote server when using the ***Network Administrator*** license. After selecting option this option, you are presented with one of the following additional option screens:



The following menu options appear if you did not have TSM support installed onto the client from which the backup media was created. Refer to the TSM Configuration section below for information and examples.

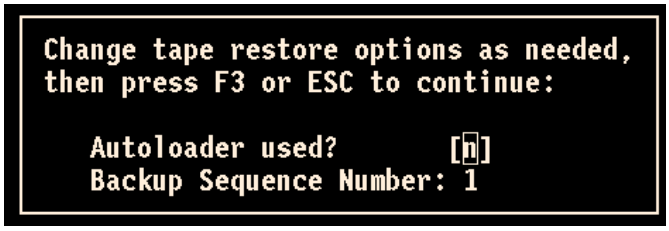


Highlight the option you wish to select using the up and down arrow keys on the keyboard. Each option is described in detail below:

Select Local Tape Drive

Whether you booted from a network boot server or from a local tape device, you may change the installation settings to allow installation from a local tape drive, even a different drive than was booted from. When selecting this option, a list of local tape devices will be displayed and you may select one tape drive from the list. If the backup was created using a *parallel virtual device*, you must instead use the option below.

After selecting a tape device, the following window will pop up on the screen:



If an Autoloader is used with the device, select 'y' in the **Autoloader used?** field. If the backup you wish to install from is not the first backup on the media, type the backup sequence number in the **Backup Sequence Number** field. Refer to the backup sequence number in the backup label if you do not know the correct backup sequence number to use. Also refer to the **Virtual Devices** section for more information on the use of sequential autoloaders. Once you have selected the desired options, press **F3** or **ESC** to return to the Change Installation Server or Device menu.

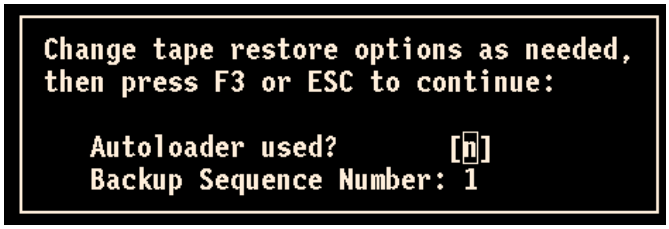
Select Local Parallel Tape Drives

If the backup was created using a parallel virtual device, you must use a parallel virtual device to restore from the backup as well. The virtual devices previously configured on the system are not known when booting in installation mode, so this option provides you a method of defining a parallel virtual device on the local system.

After selecting this option, you are provided a list of local tape drives. You must select at least two drives from the list. To do so, highlight the desired entry and press Enter. An arrow (**==>**) will appear next to each option selected.

Important: You must select the same number of devices used to create the backup and you must select them in the same order as they were previously configured. The device names may differ in installation mode than they were in normal mode, so pay close attention to the device "Address" column to be sure you are selecting the desired tape drive.

When you have selected the desired devices, press **F3** or **ESC**. The following window will pop up on the screen:



If an Autoloader is used with the device, select 'y' in the **Autoloader used?** field. If the backup you wish to install from is not the first backup on the media, type the backup sequence number in the **Backup Sequence Number** field. Refer to the backup sequence number in the backup label if you do not know the correct backup sequence number to use. Also refer to the **Virtual Devices** section for more information on the use of sequential autoloaders. Once you have selected the desired options, press **F3** or **ESC** to return to the Change Installation Server or Device menu.

Select Local Sequential Tape Drives

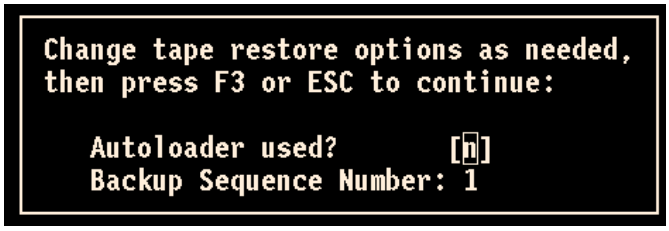
You may also use a sequential tape devices to restore from the backup if the backup spans multiple tapes and you want the installation to automatically span the tapes inserted in different devices. This option is identical to the use of a Sequential Virtual Device. The virtual devices previously configured on the system

are not known when booting in installation mode, so this option provides you a method of defining sequential devices on the local system.

After selecting this option, you are provided a list of local tape drives. You must select at least two drives from the list. To do so, highlight the desired entry and press Enter. An arrow (==>) will appear next to each option selected.

Important: You must select the devices in the same order in which they will be read. The device names may differ in installation mode than they were in normal mode, so pay close attention to the device "Address" column to be sure you are selecting the desired tape drive.

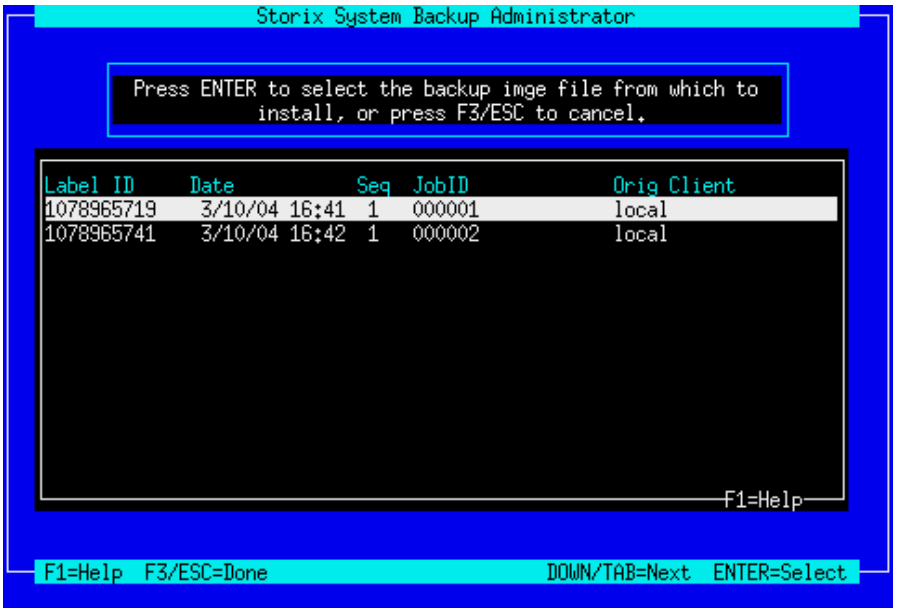
When you have selected the desired devices, press **F3** or **ESC**. The following window will pop up on the screen:



If an Autoloader is used with the devices, select 'y' in the **Autoloader used?** field. If the backup you wish to install from is not the first backup on the media, type the backup sequence number in the **Backup Sequence Number** field. Refer to the backup sequence number in the backup label if you do not know the correct backup sequence number to use. Also refer to **the Virtual Devices** section for more information on the use of sequential autoloaders. Once you have selected the desired options, press **F3** or **ESC** to return to the Change Installation Server or Device menu.

Select Local Disk Backup File

If you configured a locally-attached (or *SAN*-attached) disk for system backup/recovery (refer to ***SBAdmin User Guide***), and you performed the System Backup to a configured ***system backup disk***, you may reinstall the system using that backup. If you select this option, the system will be scanned for one or more system backup disks, and then the disks will be queried for available system backups. If any are found, a screen similar to the following will appear, from which you may select the backup to restore:

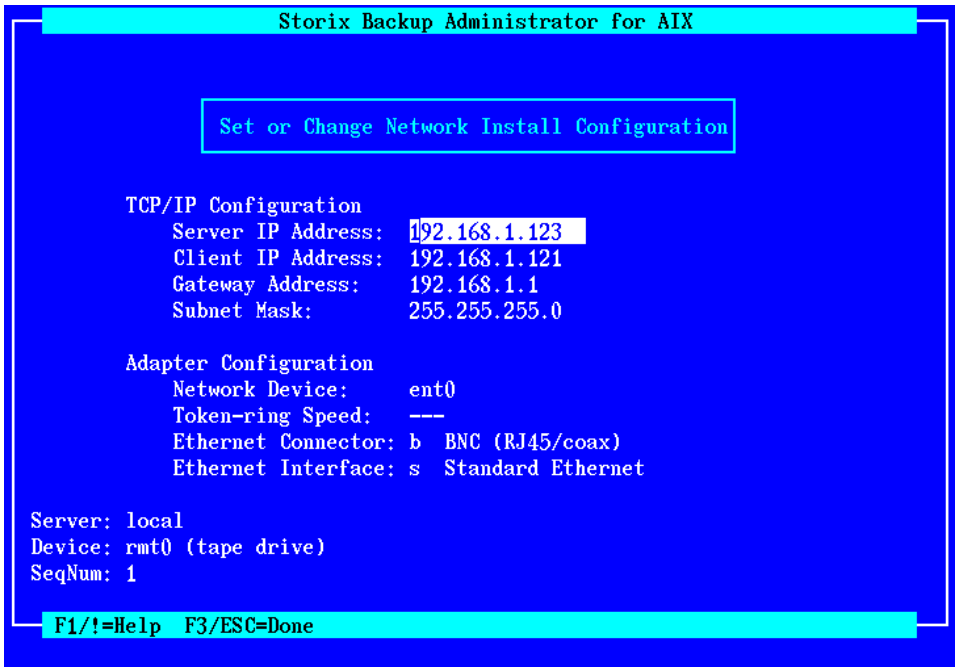


Select a backup by highlighting the desired line and pressing **ENTER**, or press **F3** or **ESC** key to cancel the selection. After making your selection, you are returned to the Change Installation Server or Device menu.

Set or Change Network Configuration

Whether you booted from a Network Boot Server or from a local tape, you may set or change the Install Server from which to obtain the backup. The backup itself may be on a tape attached to the server or on the server's disk drive. Also, if you booted from a server and with to install from the same server using a different network adapter, you may use this option to do so as well.

Upon selecting this option, a screen similar to the following will be displayed:



To use a network install server, the **Server IP Address**, **Client IP Address** and **Network Device** fields must be filled in. If a gateway is required for the client to reach the install server, enter the gateway the client must use in the **Gateway Address** field.

Press the **F3** or **ESC** key to end and return to the Change Installation Server or Device menu once you have finished your selection. When you do so, the network will be configured according to the settings you chose, and the new server will be displayed at the bottom of the screen. If the server has changed, any previous device selection, if any, will be removed and you will be required to select a new installation device.

IMPORTANT: If a token-ring network is selected, you must be sure to select the correct *token-ring speed*. If the token-ring speed is not consistent with the server's token-ring adapter, the network could be disrupted when the adapter is configured.

Select Remote Tape Device

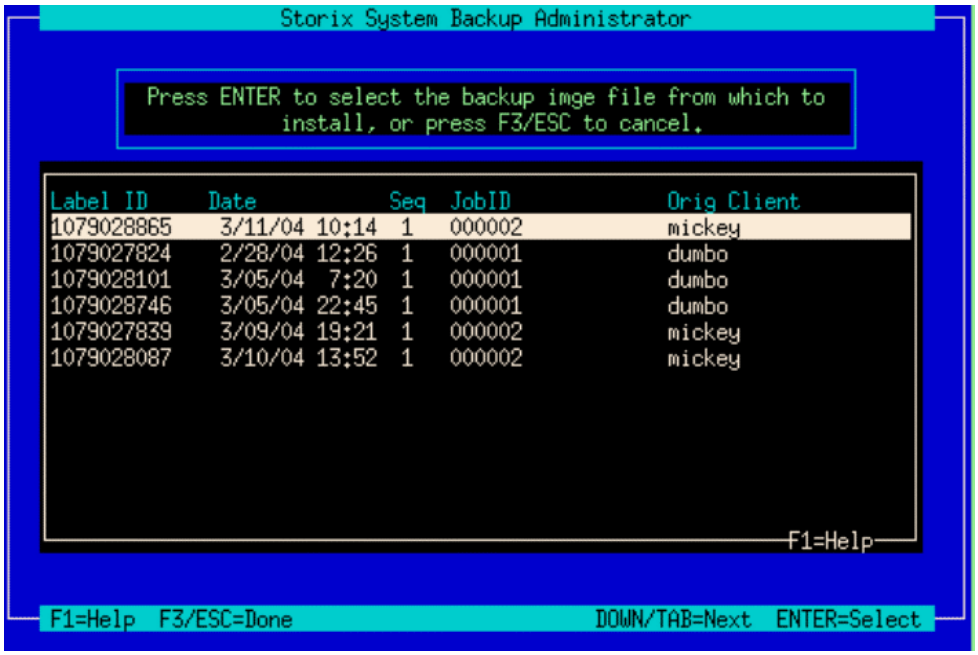
If a network install server is selected and available (indicated by the Server at the bottom of the screen), you may select to install from a backup in a tape drive attached to the remote server. Note that you may select a remote server and device even if you booted from a local tape, provided that you chose to include the network support on the tape when configuring the System Backup profile. When selecting this option, a list of tape drives on the server will be displayed and you may select a tape drive from the list.

Also, if there is a *parallel or sequential virtual device* configured on the server, the virtual devices will be displayed, and you may select one as well. Only select a parallel virtual device if the backup was made using the same parallel device. Refer to **Virtual Devices** chapter for details.

Once you have made your selection, the drive will be checked to ensure that it is available and the name of the device will be displayed at the bottom of the screen, and you will be returned to the Change Installation Server or Device menu.

Select Remote Disk Backup File

If a network install server is selected and available (indicated by the ***Server*** field at the bottom of the screen), you may select to install from a disk file backup available on the server. Note that you may select to install from a remote server and device even if you booted from a local tape, provided that you chose to include the network support on the tape when configuring the System Backup profile. When selecting this option, a list of backup images on the server will be displayed, and you may select a backup from the list. The list will also display the client from which the backup was originally made, the date and backup job information.



The list will contain any backups that were written to the network install images directory (or directories) defined for the install server. Refer to **Configuring Backup Servers, Devices and Directories** for more information on setting the network install images directory.

If you expect a backup image to appear in the list that does not, it may be that the backup was written with permission for only the original client to read it. If the client to install is not the same as the original client (or the client is installing from a different network adapter and therefore has a different hostname), you must change the backup image to allow clients other than the originating client to read it. Refer to **Change Access Permission of a Disk Backup** for details.

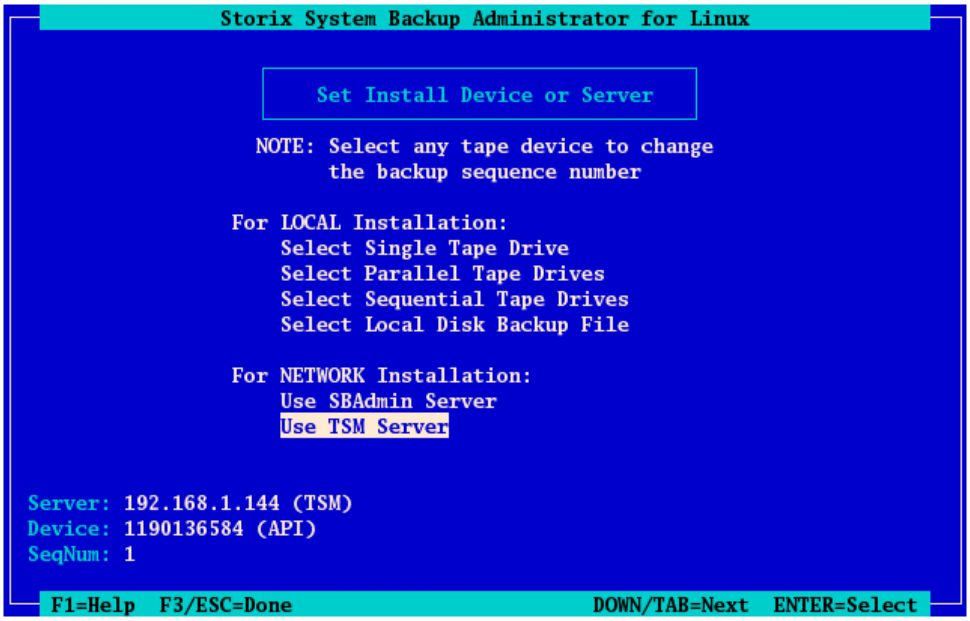
Once you have made your selection, the Backup ID of the backup file will be displayed in the ***Device*** field at the bottom of the screen, and you will be returned to the Change Installation Server or Device menu.

Once the installation server and/or device have been selected, press the **F3** or **ESC** key to return to the Installation and Maintenance Menu.

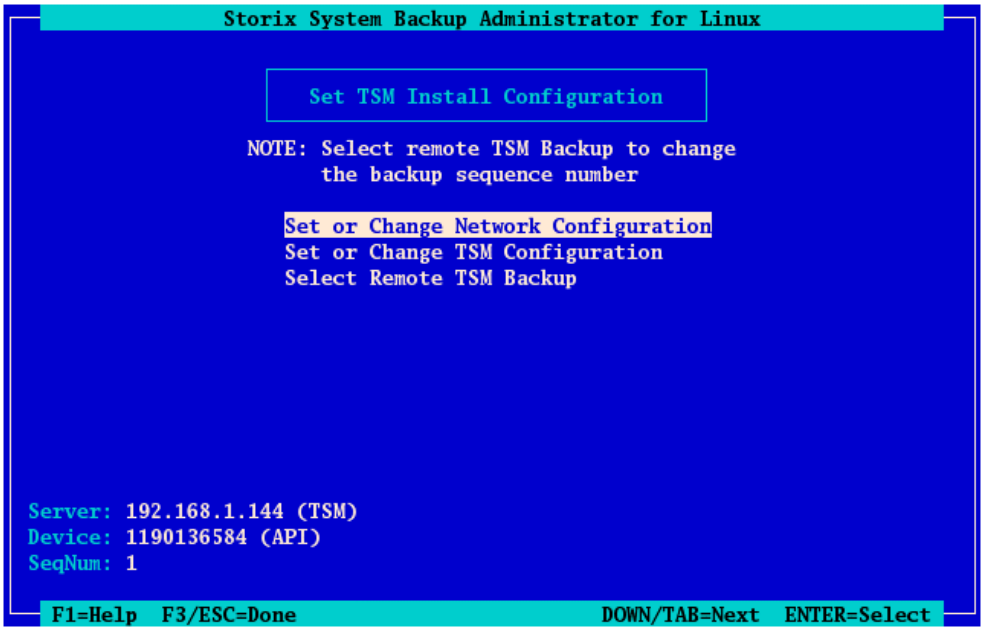
TSM Configuration

When selecting the Change Installation Server or Device option form the main menu and TSM support was enabled on the client from which you created the boot media, the Set Install Device or Server menu will look a bit different as shown below:

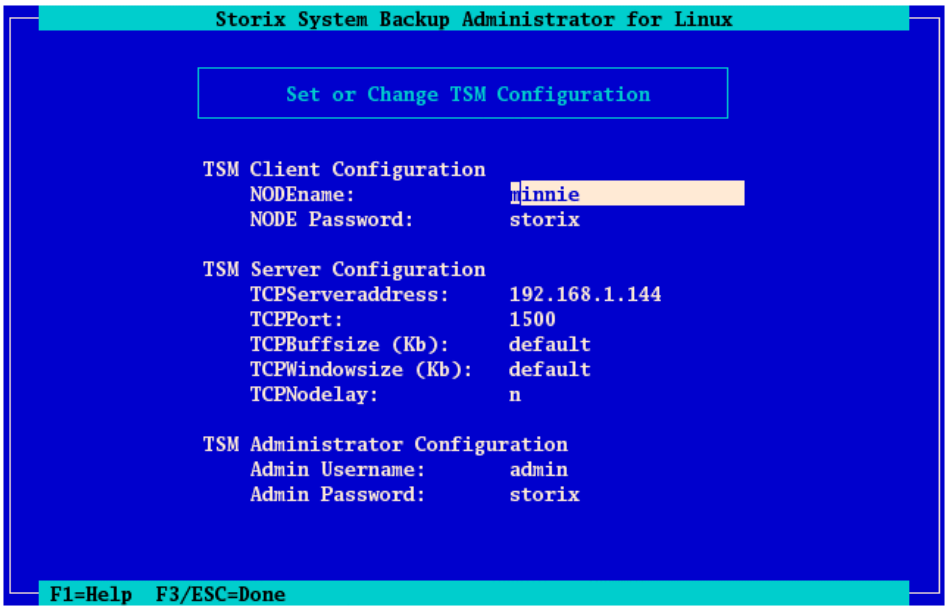
The following menu assumes you have a *Network Edition* installed with the *TSM Backup Support* feature enabled. If you are using *TSM Edition*, there will be no options available for LOCAL Installation or Use SBAdmin Server, but you will be taken directly to the Set or Change TSM Configuration screen which follows.



If you wish to install from a TSM server, select **Use TSM Server** from the list above. The following screen will appear:



You will need to enter additional information used to contact the TSM server on the screen below:



TSM Client Configuration

You are required to enter the **NODEname** of the TSM client you are installing. Note that this is not necessarily the same node from which the backup was originally created. If you know the node's password, enter it in the **NODE Password** field. if you do not know the node password, then you will be required to supply the TSM Administrator username and password in the fields below.

Note that, when logging onto the server using the nodename and password, you will have access to backups created by this node, as well as any backups of other nodes for which the backup read permission was set to allow access to any client. If you need access to all client backups on the server, you will need to log on using the administrative username and password as described below.

TSM Server Configuration

The required field in this section is the **TCPServeraddress**. You must use the TCP address, not the hostname, since host name services are not available when booting from the installation media. The remainder of the fields may typically use the defaults shown. Use the **F1** key to display detailed help information for any screens.

TSM Administrator Configuration

The TSM administrative user information need only be entered if you do not know the **NODE Password**. Also, by logging onto the server as the administrative user, instead of using the node password, you will have access to all backups on the server, even those for which the permission was set to only allow owner access in the backup profile.

Once you have entered all of the required TSM information, press the **F3** or **ESC** key to return to the previous menu.

Change the Installation Settings

The sizes, locations and all other attributes for volume groups, logical volumes and filesystems as defined on the backup may be changed using this option. If the backup settings had not been previously read from the backup, the backup will be read and the settings, according to the original system, will be extracted from the backup. The settings will then be verified to ensure they are compatible with the current system's hardware configuration. If the verification fails, you will be required to fix the information to accommodate installation of the backup onto the current system. This may be done either automatically or by changing the setting manually as described in the section Verify the hardware configuration above.

Upon selection of this option, a set of menus will appear that allow you to customize virtually any attribute of a volume group, logical volume or filesystem defined on the backup. You may also choose to exclude certain volume groups, logical volumes or filesystems, or may to select to create them without actually restoring the data. This process is identical to that which is used when **Recreating Volume Groups** and **Recreating Logical Volumes and Filesystems** on a running system, and is therefore described in details in the section Change the Volume Group, Logical Volume and Filesystem Settings.

Once you have completed all changes, press the **F3** or **ESC** key to return to the Installation and Maintenance Menu.

Install the System with Current Settings

When you have completed all steps necessary prior to installing the system, such as changing the installation server, device or volume group information, you may select this option to begin the installation of the system using the current settings.

The backup settings will again be verified to ensure consistency with the current hardware configuration as described in Verifying the hardware configuration above. If any problems are found, you will be returned to the Installation and Maintenance Menu.

If no problems were found in the system configuration preventing the installation from proceeding, a confirmation screen will appear, showing you the volume groups and disks that will be created or overwritten by the installation. You will be required to press Enter to continue. A final warning will appear and you must then press "y" to continue the installation or "n" to return to the Installation and Maintenance Menu.

If the backup originated on another machine that did not have all device support installed that is used on the new system, you may insert an *AIX Installation CDROM* in the CDROM drive in order to automatically extract and install any required device support during the installation process.

Once you have selected to continue, the installation will proceed with no further user input. All volume groups, logical volumes and filesystems will be created and restored from the backup as defined in the backup information, and as previously customized. The system will reboot at the end of the installation and upon rebooting, will migrate any device configuration from the previous backup onto the new system.

Upon completion of the installation, with the exception of any changes made to the LVM information, the new system will look identical to that of the original system from which the backup was made.

Network Re-configuration (avoiding conflicts)

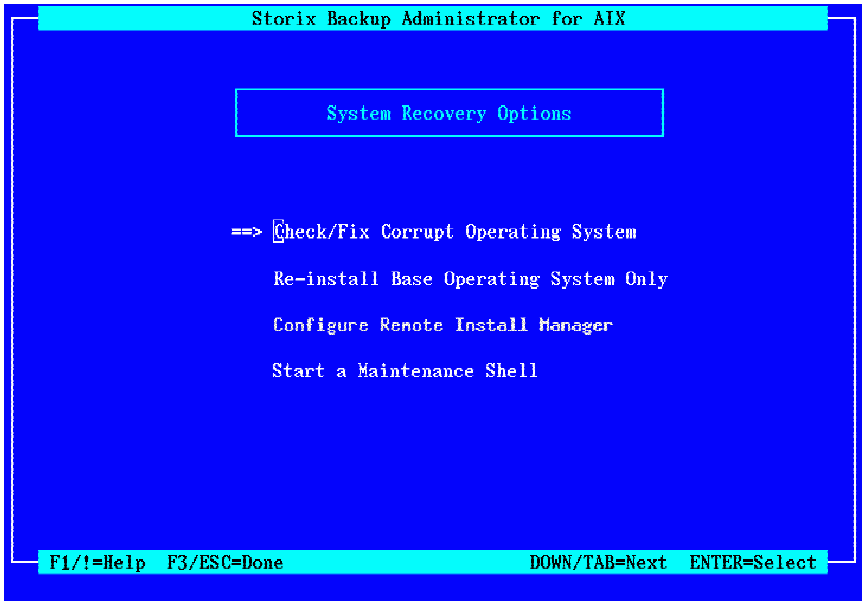
If the system installed from the backup is NOT the same system from which the backup was taken, it may be necessary to either reconfigure or disable any network adapters that might cause a network conflict with the original system (which may still be operational). If the system was installed from local tape, all network devices will be disabled, although they will retain their original settings. If the system was installed from a

network install server, the primary network will be reconfigured using the client network settings used to contact the install server, and any additional network devices, if any, will be disabled.

Should any network device be disabled, you will be informed so, and you may enable them again using the AIX System Management Interface Tool (**SMIT**) for configuring TCP/IP ("`smit tcpip`").

System Recovery Options

By selecting the **System Recovery Options** on the Installation and Maintenance Menu, the following list of options will appear:



Each of the options are described in detail below:

Check/Fix Corrupt Operating System

This option may be used to repair an operating system that has become corrupt due to a corrupt boot logical volume or a corrupt root (/) or /usr filesystem.

When selecting this option, you are provided a list of physical volumes which contain a boot logical volume. The *rootvg* volume will be imported from the physical volume you select from the list. Some systems may have more than one *rootvg* volume group or more than one boot logical volume, and therefore may have multiple disks to select from.

After you have selected a physical volume, you will receive a final confirmation. After selecting "y" to continue, the following will be performed:

1. The rootvg volume group will be imported from the selected physical volume.
2. The rootvg volume group is varied on.
3. The root (/) and /usr filesystems are checked and repaired if necessary.
4. The /etc/filesystems file in the root filesystem is checked to ensure it contains the necessary entries for the base operating system filesystems. If not, the file is moved and replaced with a file containing the necessary entries required for the system to boot properly

5. The root (/) and /usr filesystems are mounted over the RAM filesystem (temporary operating system used for booting the system into installation mode)

6. The boot logical volume is rebuilt using the *bosboot* command.

7. The device list is set to the specified disk for booting in normal mode.

These steps will repair most problems that prevent a system from booting properly. In case there is more repairs that an experienced user may want to make, you will be prompted if you want to reboot the system now or enter a maintenance shell. If you select to enter the maintenance shell, you may type any commands to query or further repair the system. Note that only the base operating system filesystems, including /, /usr, /tmp and /var will be mounted a this time, and only the *rootvg* volume group will be varied on.

If you select to reboot the system, the system will shutdown and reboot in normal mode. Make sure the key switch, if there is one, is in the NORMAL position.

Reinstall Base Operating System Only

Referred to as a "**Recovery Install**", this option will restore only the base operating system files from the backup. It may also be used to automatically reduce the amount of space used by the root (/) and /usr filesystem by recreating those filesystems at the minimum size required to hold the backup data. This is very handy if, for instance, the root filesystem is inadvertently increased in size unnecessarily, or if the program products are removed, thus providing free space in /usr that is needed elsewhere.

This process is not intended for updating the operating system on the client. It is possible to restore the operating system data from a backup originating on another machine, but the restored operating system data (only root and /usr filesystems) may not be compatible with other data on the system. For instance, the /usr filesystem may indicate that a certain product is installed. But, since the product was installed in a different filesystem and does not actually exist on the new system, the product database is now inconsistent. Also, if the operating system was at a different software level than the system it is being restored to, some configuration contained in the /var filesystem, such as printer definitions, may not be compatible with the restored operating system.

Before selecting this option, you must have first selected the network install server, if any, and the installation device or file from which to restore the operating system data. If you have not, you will be returned to the Installation and Maintenance Menu.

When selecting this option, you are provided a list of physical volumes which contain a root (/) filesystem. The *rootvg* volume will be imported from the physical volume you select from the list. Some systems may have more than one *rootvg* volume group, and therefore more than one root filesystem, and therefore may have multiple disks to select from.

After you have selected a physical volume, you will receive a final confirmation that you wish to proceed with the recovery. After selecting "y" to continue, the following will be performed:

a. The rootvg volume group will be imported from the selected physical volume.

b. The rootvg volume group is varied on.

c. The rootvg volume group is checked to ensure that enough space is available to recreate the root (/) and /usr filesystems at the size necessary to restore the data from the backup. If not, you will be informed so and the installation will terminate, providing only an option to reboot the system. It is not possible to varyoff the rootvg volume group once it is varied on, therefore the installation may not be continued.

d. The current root and /usr filesystems and their corresponding logical volumes are removed and recreated at the minimum size required to restore the data. Note that this often provides more free space on the system after the recovery is complete.

e. The root and /usr filesystems are restored from the backup.

f. The system and devices are reconfigured as needed from the backup information.

g. Additional device support is automatically installed to support the system if an AIX Installation CDROM is in the CDROM drive.

h. The boot logical volume and boot list is updated.

i. The system is rebooted in normal mode.

Start a Maintenance Shell

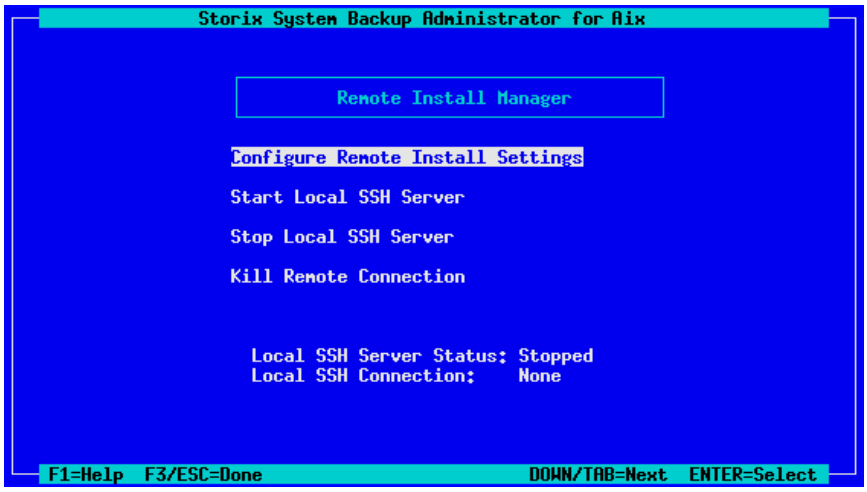
When selecting this option, you will be placed at a shell prompt (preceded by "`maint>`"), where you may perform certain maintenance tasks. Note, however, at this time, the only operating system available is running in installation mode and is therefore limited to a subset of commands. The user would typically only select this option when instructed to do so by a Storix support representative.

To return to the Installation and Maintenance Menu, type "**exit**" at the maintenance shell prompt.

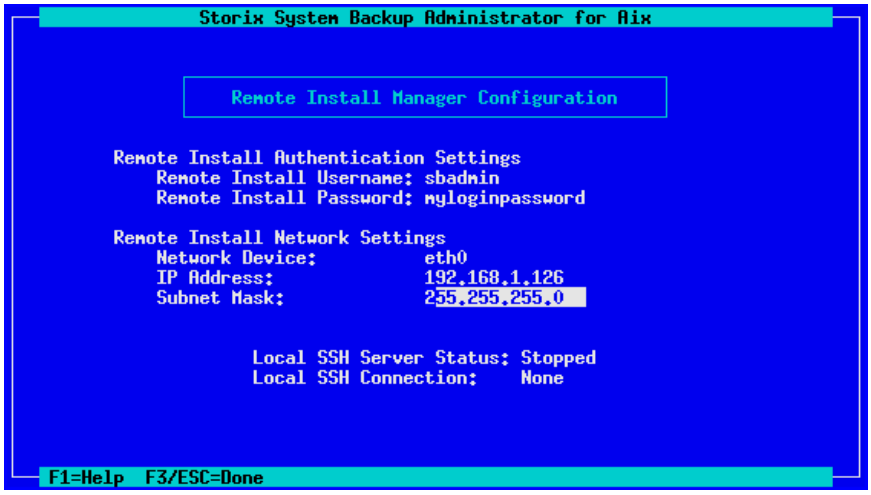
Configure Remote Install Manager

If you configured RIM at the time you created the boot media, it will be automatically enabled and it will not be necessary to configure in this option. If, however you did not pre-configure RIM, or if you need to change the RIM configuration (network adapter, IP address or subnet, or if you forgot the password you previously assigned), you can configure and enable RIM from within the *system Installation menus* after booting from the SBAdmin boot media.

To do so, select the **System Recovery Utilities** option from the main menu to display the following:



Select **Configure Remote Install Manager**. The following screen will display:



2. The **Remote Install Username** is set to “sbadmin” and may not be changed. Enter a password in the **Remote Install Password** field. The password will be necessary to login to the remote install client.

3. Select the **Network Device** (adapter) that should be configured to connect to the remote install client.

4. Enter the **IP Address** used to configure the network adapter. Note that, if the selected adapter is already configured (as a boot or install device) and you enter a different IP address than the adapter is currently using, you will be provided a warning and allowed to continue. If you do so, however, the previous settings will no longer apply, and the adapter will be reconfigured under the new IP address.

5. Enter the **Subnet Mask** (if necessary) used when configuring the network adapter. As with the IP Address, if the adapter is currently configured under a different subnet mask, you will be warned and allowed to reconfigure the adapter under the new subnet mask.

When you have finished your selections, press **ESC** or **F3** to return to the RIM Menu. Then select **Start Local SSH Server**. The network adapter will be configured with these settings and the RIM server will be started. You can see the current status of the RIM server by looking at the **Local SSH** settings which appear on the screen.

Reboot the System

Should you choose not to perform a system installation, choose this option to simply reboot the system. If the system is currently installed, you may reboot in normal mode (be sure the key switch, if any, is set to “normal”). You may also reboot in service mode if you wish to restart this installation process. Refer to the instructions provided in the section Boot a Client for Installation from a System Backup if you want to restart the installation process.

Upon selecting this option, you will be asked to confirm the action. Upon doing so, a quick shutdown of the system will be performed, and the system will be rebooted.

6. Change the Volume Group, Logical Volume and Filesystem Settings

The options described in this chapter are only for *AIX* clients. Support for rebuilding LVM information on *Linux* will be added in a future release.

This section describes the process of changing the volume group, logical volume, and/or filesystem information retrieved from a backup before using the option to **Recreate Volume Groups**, **Recreate Logical Volumes or Filesystems**, or Reinstall from a System Backup.

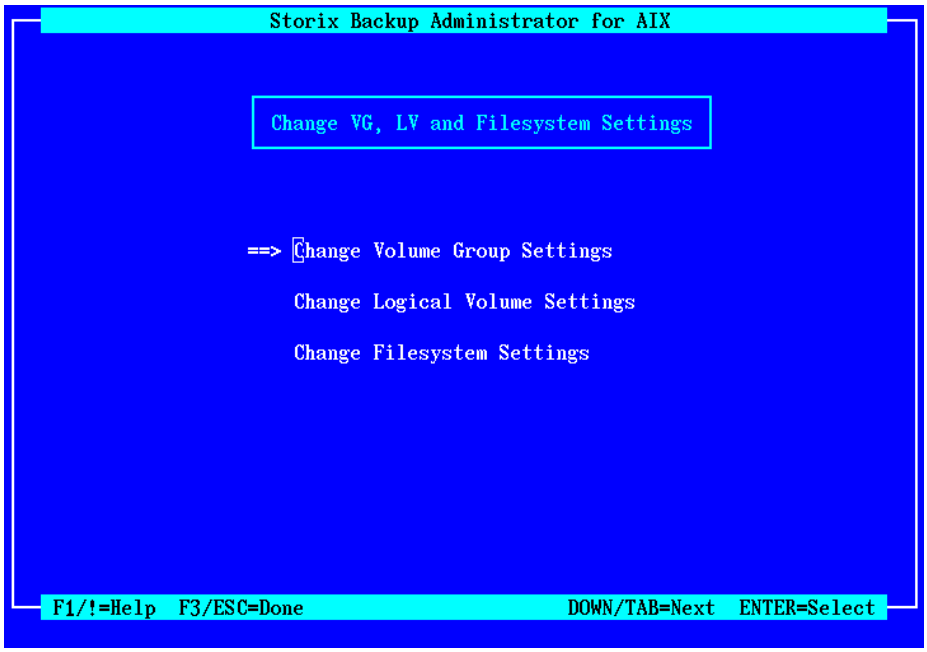
The physical volumes (disks), volume groups, logical volumes and filesystems defined on the backup are compared against the current system's hardware configuration. If there are problems that would prevent the backup from being installed onto the system, such as missing disks or disks that are too small to contain the backup data, a list of messages indicating the problems will be displayed and the user will be required to either make changes manually or must select to automatically fix any problems that are non-fatal.

Non-fatal errors are those that require changes to the logical volume configuration that will allow the data to be restored, although all of the logical volume features may not be the same as on the original system. For instance, if there is only one remaining physical volume that matches the original system configuration for a particular volume group, any mirroring and/or striping will need to be disabled for the logical volumes in that volume group since these features require at least two physical volumes. If such non-fatal errors occur when checking the system information, you will be provided the option of automatically fixing the errors. You may also change the volume group or logical volume information manually to either add more disk space or change other logical volume attributes manually that would allow the logical volume to be created as desired.

The Change Volume Groups & Logical Volume Settings Menu

When selecting to **Recreate Logical Volumes or Filesystems** or **Recreate Volume Groups** from the SBAdmin Inerface, or when selecting to Change Volume Group, Logical Volume or Filesystem Settings when installing from a System Backup, a screen similar to the following will appear:

The screens shown below are the color versions that will appear when you are using either a color ASCII terminal or when displaying the options from the administrator application. If you are using an "lft" console, the options will appear in black and white as the LFT driver does not support color terminal applications.



The option **Change Filesystem Settings** will not appear if you are installing a system from a Power System Backup.

The option **Change Volume Group Settings** will not appear if you have chosen only to **Recreate Logical Volumes or Filesystems** from a backup.

When all changes are complete using these options, press the **F3** or **ESC** key to exit this process and return to the Installation and Maintenance Menu (if installing the system) or to continue to **Recreate Logical Volumes or Filesystems** or **Recreate Volume Groups** from the SBAdmin user interface.

Using Keys and Getting Help

Because these menus appear on the client and not on the admin system, the menus are provided in a form viewable on **ASCII terminals**. The use of the mouse is not available. Most keyboards will support arrow keys while others do not. Also, some keyboards have page up and page down keys, help keys, etc, that others do not. For this reason, there is a variety of methods which may be used to traverse the menus and options in the installation screens:

- To move between fields, use the **Up-arrow** and **Down-arrow** keys on the keyboard.
- To make a selection, press the **Enter** key, and
- To return to a previous screen, use the **F3** or **ESC** (escape) key
- For pop-up lists, help screens and other messages, you may use the arrow keys to move up and down the list or to scroll the text. You may also use the **Page-up** and **Page-down** keys, if available, or use **CTRL-N** for 'next page' and **CTRL-P** for 'previous page' if not.

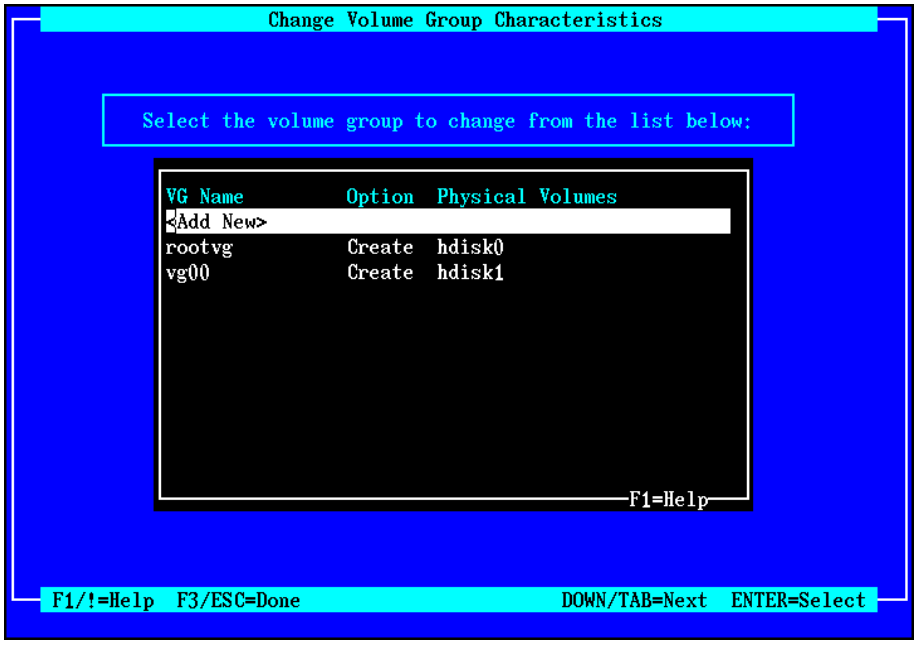
Help Windows: The **F1** or **"!"** key (shift/1) may be pressed at any field or menu item to obtain help instructions, detailing the use and options for the corresponding item. A help window will appear in the center of the screen. If the help information is lengthy for a particular option, it may be necessary to page the message using the page or control keys described above. To remove the help window and return to the previous entry, press the **F3** or **ESC** key.

Pop-up List Options: Pop-up lists are available for many entry options. When supported, “List=F4/$” will appear at the bottom of the screen. At that field, you may press the **F4** or “**$**” key (shift/4) to list the available options for the corresponding field and select an option from the list. To select an option, use the arrow keys to highlight the desired option and press **Enter**. The selected option will be placed in the entry field and the pop-up window will disappear.

Press the **ESC** or **F3** key from this menu to either return to the Installation and Maintenance Menu if you are installing a system, or to continue with the options **Recreate Volume Groups** or **Recreate Logical Volumes or Filesystems** on an active system.

Change Volume Group Settings

When selecting this option, you will be presented a list of volume groups as in this example:



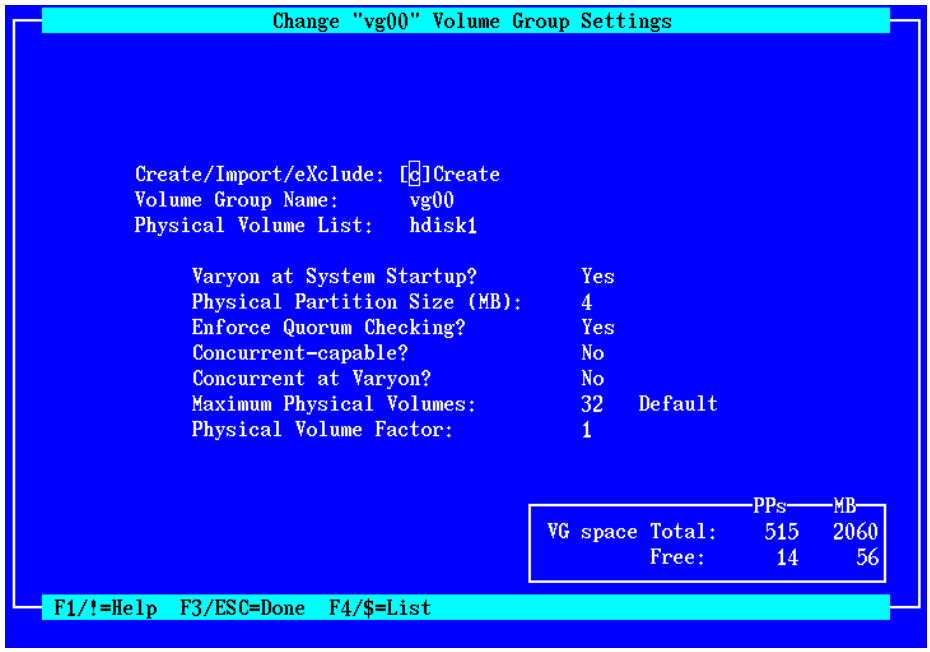
The physical volumes on which the volume group is to be defined is also shown. If, however, the original physical volumes are not available on this system or they are currently assigned to other volume groups, the physical volume will have been automatically removed from the volume group and you will be required to reselect physical volumes on which to create the volume group. If there is only one volume group defined, it will be automatically selected and no list will be shown.

Creating New Volume Groups

The **<Add New>** option may be selected to define a new volume group. When doing so, a new volume group name will be assigned for you. You will have the ability to change the volume group name to any one you choose on the next screen.

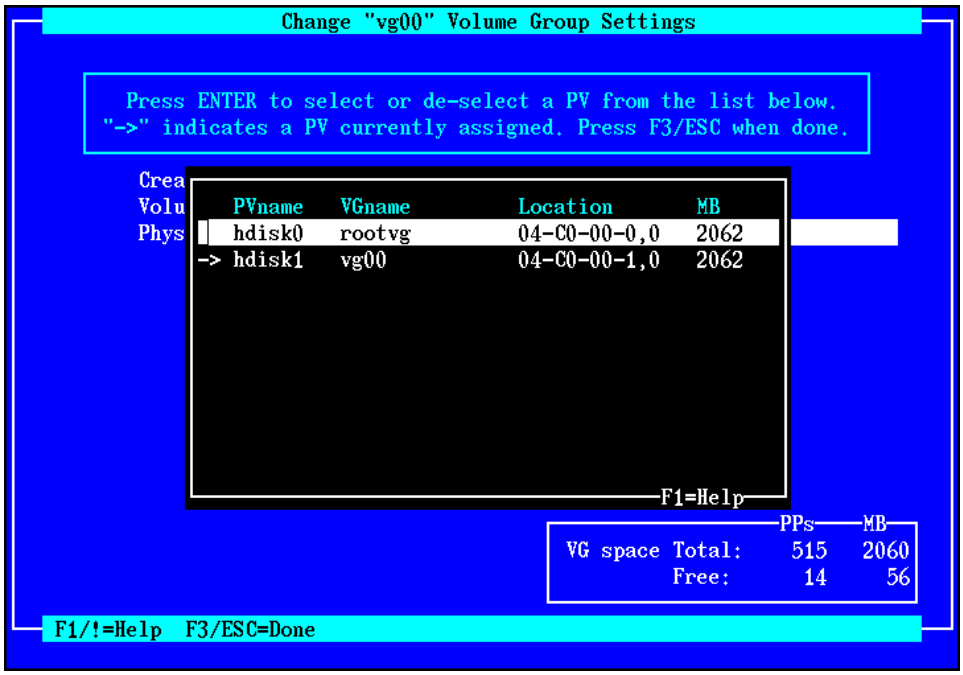
You must have at least one free physical volume in order to add a new volume group to the system. After adding a new volume group, you will then be able to add new logical volumes to it, or move logical volumes or filesystems from another volume group to your new volume group. This is particularly useful, for instance, if the system you backed up had only the *rootvg* volume group, and you want to create multiple volume groups instead, then migrate some of the filesystems and logical volumes to a different VG.

After selecting a volume group from the list (or selecting to add a new VG), a screen similar to the following example will be shown:



Detailed help on each option may be obtained by pressing the **F1** or "**!**" keys.

You will not be able to create the volume group until you have selected at least one physical volume on which to create. You must also have selected enough physical volumes to contain all of the logical volumes and filesystems which will be created. To select or change the list of physical volumes on which to create the volume group, move the cursor to the Physical Volume List field and press either the **F4** or "**$**" keys. The following pop-up window will appear with a list of physical volumes on the system:

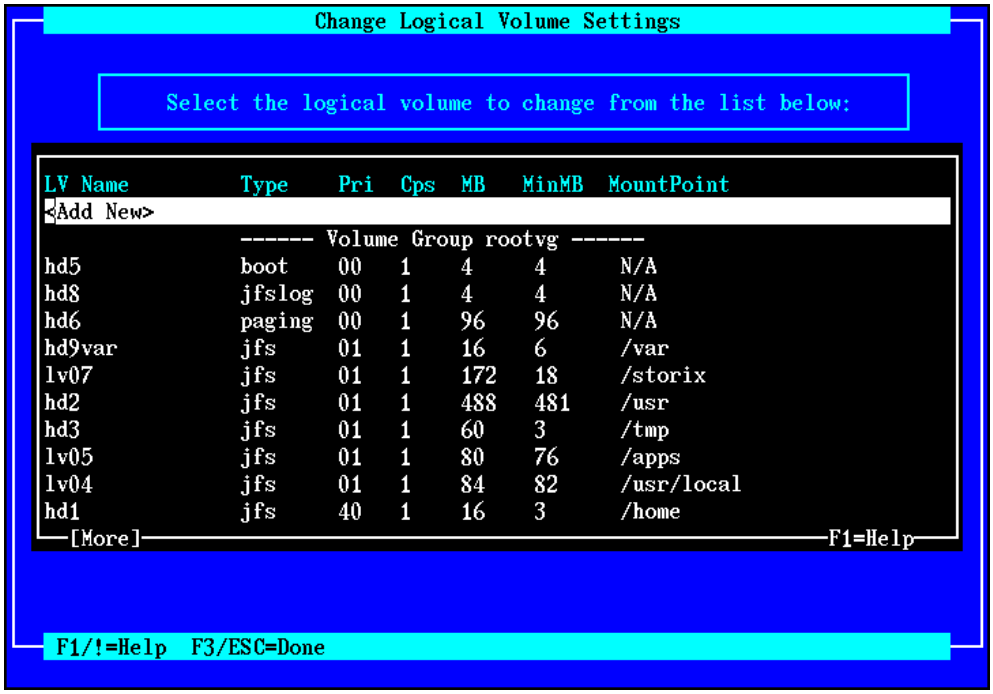


The current volume group in which the physical volume is assigned will be shown, if any, and the physical volumes assigned to the selected volume group are also indicated by an arrow (=>). To select or de-select a physical volume, highlight the selection and press **Enter**. To return to the volume group settings, press **F3** or **ESC**.

When all selections are complete, press **F3** or **ESC** key to select a different volume group from the list (if multiple volume groups are defined) and **F3** or **ESC** again to return to the Change Volume Group & Logical Volume Settings Menu.

Change Logical Volume Settings

This option may be used to change any logical volume attribute, including the name, size, disk location and other attributes. When selecting this option, a list of all logical volumes defined on the backup is displayed, as in the following example:

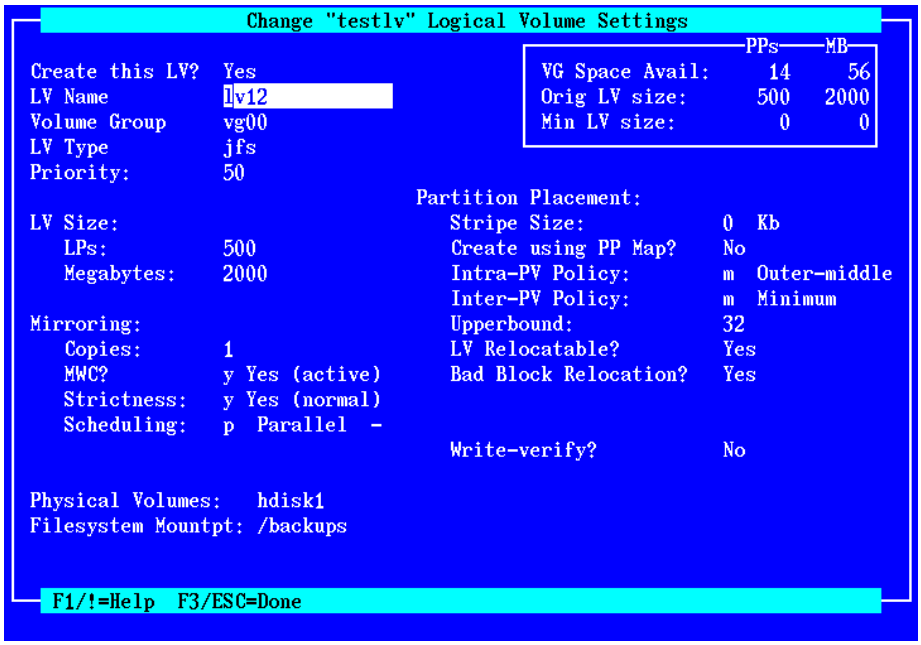


To select a logical volume to change, highlight the desired option and press **Enter**.

Creating New Logical Volumes

The **<Add New>** option may be selected to define a new logical volume. When doing so, you will be asked for the volume group in which to place the new logical volume, and a new logical volume name will be assigned for you. You will have the ability to change the logical volume name to any one you choose on the next screen.

After selecting to add or change a logical volumes, a screen similar to the following will be shown, containing all of the current (or default) logical volume attributes:



Detailed help on each option may be obtained by pressing the **F1** or "**!**" keys.

At the upper-right-hand corner of the screen is a box containing information regarding the current size and free space within the volume group this logical volume is assigned to, and information on the original and minimum size of the logical volume. This information is helpful to determine how much free space is available in the volume group for enlarging this logical volume (and its corresponding filesystem, if any) or how much space is freed by reducing it to the minimum size required to restore the data.

The "**Create this LV?**" field will be "**Create Option**" if installing the system. The options for this field vary depending on whether you are installing the system or recreating the logical volume on an active system:

1. Press "**y**" to create and restore (if installing the system) this logical volume.

2. Press "**n**" if you do not want to create or restore the logical volume.

3. Press "**c**" (only available if installing the system) if you want to create the logical volume but do not want to restore the data.

Changes to the following fields will change the amount of space used in the volume group for this logical volume and will change the volume group space reflected in the upper-right box on the screen:

1. **Volume group**: if you move the LV to a different volume group, the information in the VG Space Avail field will reflect the new volume group.

2. **LPs**: This changes the number of logical partitions used by the logical volume. This number times the number of copies equals the number of PPs (physical partitions) used in the volume group. Changing this value will also change the value of the **Megabytes** field below.

3. **Megabytes**: Likewise, when changing this field, the **LPs** field will be changed accordingly, and will also change the number of PPs used in the volume group. If the number of megabytes selected is not evenly divisible by the partitions size of the volume group, it will be rounded up to the next partition size.

4. **Copies**: Increasing the number of copies by 1 effectively doubles the number of PPs used by this logical volume, and will be reflected in an increase to the number of PPs used in the volume group.

By default, the logical volume may be placed on any physical volume available in the volume group. You may also select the physical volumes on which to place the logical volume by moving to the **Physical Volumes** field

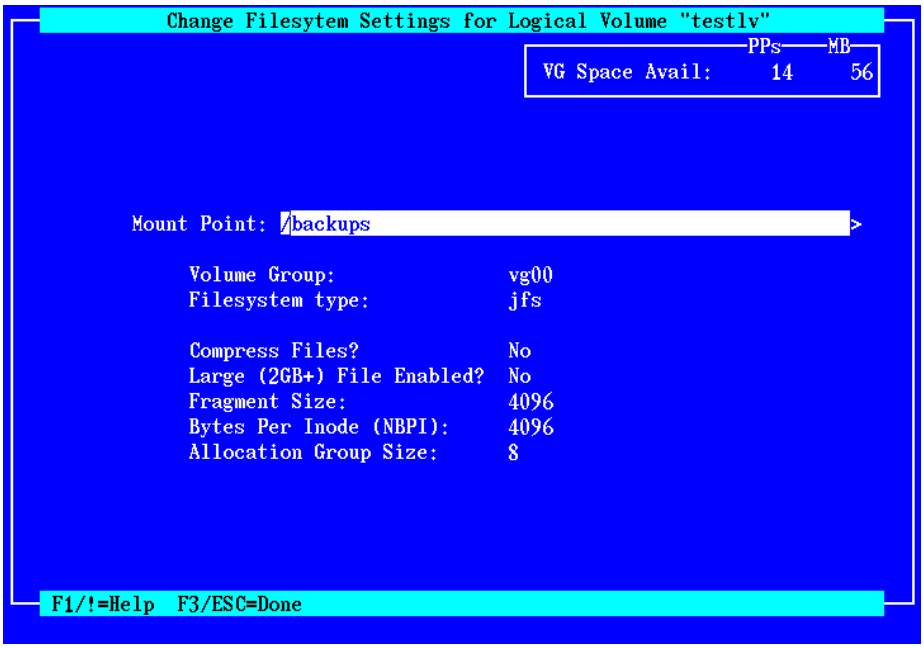
and pressing the **F4** or "**$**" key. When doing so, a list of physical volumes within the selected volume group will be displayed, and you may select one or more from the list. When striping is turned on (by entering a number other than 0 in the **Stripe Size** field), at least two specific physical volumes must be selected.

When all selections are complete, press **F3** or **ESC** key to select a different logical volume from the list (if multiple logical volumes are defined) and **F3** or **ESC** again to return to the Change Volume Group & Logical Volume Settings Menu.

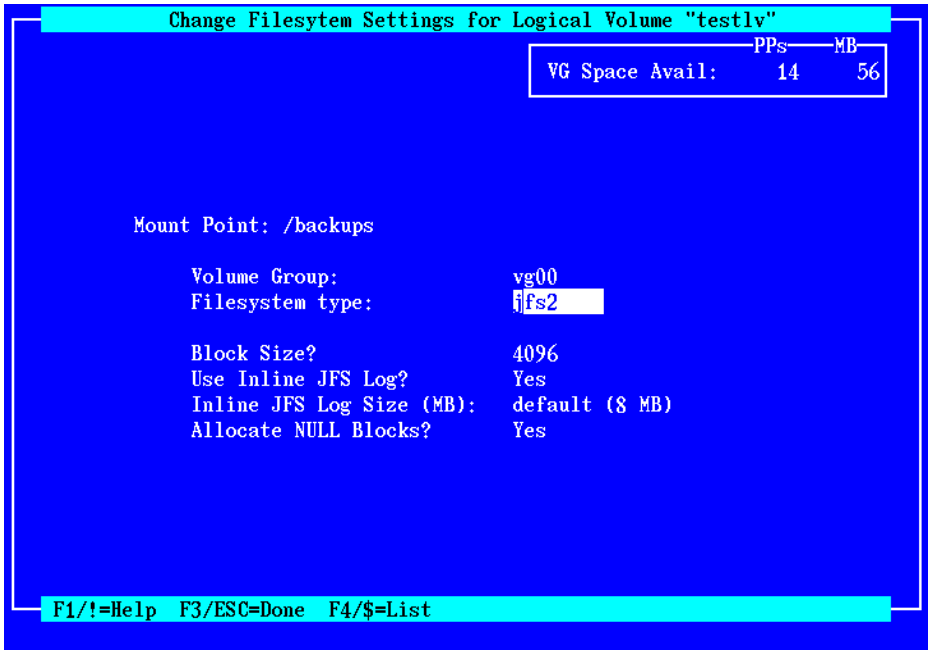
Change Filesystem Attributes

Selecting this option to change attributes for any filesystems defined on the backup. This option will not be available if installing the system from a Power Backup since all data was backed up as raw logical volumes, and the filesystem attributes will be restored from the backup along with the files themselves.

When selecting this option, you are provided a list of filesystems. The list will contain only filesystems in volume groups that will be created from the backup (unless creating specific filesystems on an active system). Select a logical volume from the list to go to the following screen for changing the filesystem settings:



Note that the above options appear when a **Standard JFS Filesystem** is selected. If an **Enhanced JFS (jfs2) Filesystem** is selected, or if the ***Filesystem Type*** field is changed to *jfs2*, the remaining options on the screen will change to those that apply to JFS2 filesystems as in the following example:



Note that the Enhanced JFS Filesystem type may only be selected when booting from AIX Version 5 or later systems.

Detailed help on each option may be obtained by pressing the **F1** or "**!**" keys. If you change information in any fields that may change the amount of space in the filesystem required to restore the data, appropriate messages will appear providing additional information.

At the upper-right-hand corner of the screen is a box containing information regarding the current size and free space within the volume group this filesystem is assigned to. If the volume group this filesystem is placed in is changed (along with its corresponding logical volume), the information at the top of the screen will reflect the space available in the newly selected volume group.

When all selections are complete, press **F3** or **ESC** key to select a different filesystem from the list (if multiple filesystems are defined) and **F3** or **ESC** again to return to the Change Volume Group & Logical Volume Settings Menu.

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