

AIXlink/X.25 Version 2.0.2



Release Notes

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Note

Before using this information and the product it supports, read the information in “Notices”, on page 11.

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AIXlink/X.25 Version 2.0.2

The following information applies to AIXlink/X.25 Version 2.0.2 or later. A readme file for AIXlink/X.25 is written to the **/usr/lpp/sx25** directory during the AIXlink/X.25 installation. Some of the Release Notes information related to runtime is contained in the readme. Any readme information not part of the body of the Release Notes will be found at the end of these Release Notes.

Prerequisites

The AIXlink/X.25 LPP Version 2.0.2 requires a minimum base release of one of the following versions of AIX 5L:

- Version 5.1 with the 5100-04 Recommended Maintenance package (APAR IY39794) or later, which is included on the May 2003, or later, AIX Update CD
- Version 5.2 with the 5200-01 Recommended Maintenance package (APAR IY29795) or later, which is included on the May 2003, or later, AIX Update CD

If the following filesets are installed on a system running AIX Version 5.1, they must be at the following levels or higher before the AIXlink/X.25 LPP will install:

- **bos.rte** must be at level 5.1.0.50 or higher
- **bos.rte.tty** must be at level 5.1.0.50 or higher
- **devices.sys.pci.rte** must be at level 5.1.0.50 or higher

If the following filesets are installed on a system running AIX Version 5.2, they must be at the following levels or higher before the AIXlink/X.25 LPP will install:

- **bos.rte** must be at level 5.2.0.10 or higher
- **bos.rte.tty** must be at level 5.2.0.10 or higher
- **devices.sys.pci.rte** must be at level 5.2.0.10 or higher

If you are using the IBM ARTIC960 MCA Adapter on AIX 5L for POWER Version 5.1, the **devices.artic960** fileset must be at level 1.3.#, where # is equal to or greater than 3.

If you are using the IBM ARTIC960Hx 4-Port PCI Adapter, the **devices.artic960** fileset must be at level 5.1.0.0 or higher for AIX Version 5.1, and at level 5.2.0.0 or higher for AIX Version 5.2.

The **devices.artic960** fileset is available on the AIXlink/X.25 V2.0.2. media for customers using the IBM ARTIC960Hx 4-Port Selectable PCI adapter. The fileset needed for executing in an AIX 5.1 environment is in the **/aix51** directory. The fileset needed for executing in an AIX 5.2 environment is in the **/aix52** directory.

To install the **devices.artic960** fileset, do the following:

1. Mount the AIXlink/X.25 V2.0.2 CD by typing the following:

```
mount -r -v cdrfs /dev/cd0 /mnt
```

Where /mnt is a previously created directory.

2. Install the **devices.artic960** fileset using the **smitty install_selectable_all** command.
3. When prompted for the location of the code to install, enter the following:

```
/mnt/aix#
```

Where # is 51 or 52 depending on your AIX operating environment.

4. Select **devices.artic960.rte** to install, and press Enter.
5. Exit SMIT after the code is installed.

6. Change the directory out of the `/mnt` directory.
7. Type the following:

```
umount /mnt
```

Where `/mnt` is the directory the CD is mounted over.

Note that the **devices.artic960add.rte** fileset is not compatible with running the AIXlink/X.25 LPP over the IBM ARTIC960Hx 4-Port Selectable PCI Adapter or the IBM ARTIC960 MCA Adapter. If this fileset is installed on the system, it automatically configures a **ric960add** device driver over each **ddrnciop** device driver in the system when the **cfgmgr** command is run. Adding AIXlink/X.25 LPP ports to adapters with this device driver configured will fail. Therefore, the **devices.artic960add.rte** fileset may not be installed on a system if use of the AIXlink/X.25 LPP over the IBM ARTIC960Hx 4-Port Selectable PCI Adapter or the IBM ARTIC960 MCA Adapter is desired.

The **devices.artic960** fileset, to support PCI adapters, ships with AIX 5L for POWER Version 5.1 with the 5100-04 Recommended Maintenance package (APAR IY39794) or later and with AIX 5L Version 5.2 with the 5200-01 Recommended Maintenance package (APAR IY29795) or later.

For the IBM ARTIC960 MCA Adapter, the **devices.artic960** fileset is shipped with the adapter. The fileset may also be downloaded from the RadiSys Web site. As of April 2003, the procedure is as follows:

1. Access the RadiSys download site at:
http://www.radisys.com/service_support/artic/ibm
2. Under the IBM RS/6000 ARTIC Features heading, select **IBM ARTIC960 4-Port MultiInterface Adapter**.
3. Under the **Development Software & Manuals** heading locate **ARTIC960 Support for AIX V1.3.x** to access the Installation and file creation instructions, and the Program file. The Program file is the download you need.

Notes:

1. Install only the **devices.artic960** fileset. Do not install the **devices.artic960add.rte** fileset.
2. If **devices.artic960add.rte** was inadvertently installed, run **rmdev -1 ric960add** and remove fileset **devices.artic960add.rte** by using **smitty/install/maint/remove/name=devices.artic960add.rte**.

Packaging Information

The following packages are available on this media:

- **sx25**
- **sx25.adt**
- **sx25.html.locale**
- **sx25.license**

Base X.25 Functionality (sx25)

The **sx25** package provides the base X.25 function, including the protocol stack, device drivers, and adapter microcode. It also includes support for TCP/IP, NPI, DLPI, SNMP, PAD and COMIO. COMIO is provided only in a compatibility mode for customers migrating from earlier versions of AIXlink/X.25 or the X.25 functionality provided in the AIX Version 3 base. The number of virtual circuits allowed per system is based on the license purchased.

Filesets included in this package are as follows:

sx25.rte AIXlink/X.25 Run-Time Environment

This fileset provides the base X.25 device drivers, configuration methods, and applications necessary to use the other AIXlink/X.25 options. This fileset must be installed as it is a prerequisite for all other filesets in the package.

sx25.npi AIXlink/X.25 NPI and DLPI Support

This fileset provides the device driver necessary to run NPI (Network Provider Interface) applications. The **sx25.npi** fileset requires that the **sx25.rte** fileset be installed either before or at the same time as this fileset.

sx25.comio AIXlink/X.25 COMIO Compatibility Support and Applications

This fileset provides the device driver and applications for the COMIO compatibility interface. This interface provides compatibility with the AIX Version 3 base X.25 product. The **sx25.comio** fileset requires that the **sx25.rte** fileset be installed either before or at the same time as this fileset.

sx25.tcpip AIXlink/X.25 TCP/IP Support

This fileset provides support for the TCP/IP protocol running over X.25. The **sx25.tcpip** fileset requires that the **sx25.rte** fileset be installed before or with this fileset. The **sx25.tcpip** fileset also requires that **bos.net.tcp.client** at level 5.1.0.10 or later be installed either before or at the same time as this fileset.

sx25.pad AIXlink/X.25 Triple-X (PAD)

This fileset provides PAD software supporting the X.3, X.28 and X.29 standards. The **sx25.pad** fileset requires that the **sx25.rte** fileset be installed either before or at the same time as this fileset.

sx25.server AIXlink/X.25 Server Support

This fileset provides an increased number of available virtual circuits based on the customer licensing agreement. The **sx25.server** fileset must be installed in order to get more than 4 virtual circuits available on the system. The **sx25.server** fileset requires that the **sx25.rte** fileset be installed either before or at the same time as this fileset.

AIXlink/X.25 Application Development Toolkit (sx25.adt)

This package provides libraries, include files, and sample programs that can be used in developing NPI, DLPI, and COMIO applications for X.25.

Any new application development should use NPI. COMIO is supplied as a compatibility interface for existing COMIO applications from AIXlink/X.25 Version 1.1 or the AIX Version 3 base X.25 product.

AIXlink/X.25 Version 2 supports 32-bit applications only.

Filesets included in this package are as follows:

sx25.adt.rte AIXlink/X.25 Application Development Toolkit Run-Time Environment

This fileset provides include files, libraries, and sample programs for base X.25 program development. This fileset is a prerequisite for all other filesets in the package. The **sx25.adt.rte** requires the **sx25.rte** fileset to be installed either before or at the same time as this fileset.

sx25.adt.npi AIXlink/X.25 Application Development Toolkit for NPI/DLPI

This fileset provides include files, libraries and sample programs for NPI and DLPI program development. The **sx25.adt.npi** fileset requires **sx25.adt.rte** and **sx25.npi** filesets to be installed either before or at the same time as this fileset.

sx25.adt.comio AIXlink/X.25 Application Development Toolkit for COMIO

This fileset provides include files, libraries, and sample programs for COMIO compatibility program development. This fileset is provided to allow for compatibility with applications previously written to the COMIO interface on Version 1.1 or for the X.25 support in the base AIX Version 3. New program development should use the NPI interface. The **sx25.adt.comio** requires the **sx25.adt.rte** and **sx25.comio** filesets be installed either before or at the same time as this fileset.

X.25 User Guide (`sx25.html.locale`)

This package provides the HTML documentation on using, managing, and programming AIXlink/X.25. This fileset can be installed on AIX 5.1 or later. No requisite software is required to install this package. The `sx25.html` package also provides a PDF file that can be used for printing the documentation. The `x25usrqd.pdf` file is installed in:

```
/usr/share/man/info/en_US/a_doc_lib/aixlnk25/x25usrqd
```

AIXlink/X.25 Electronic License (`sx25.license`)

This package contains the electronic license for the AIXlink/X.25 software.

Approximate Disk Space Required For Each of the Packages

- `sx25` - 6.4 MB of disk space, if the entire package is installed
- `sx25.adt` - 1.1 MB of disk space, if the entire package is installed
- `sx25.html` - 7 MB of disk space

Migration to AIXlink/X.25 Version 2.0.2

Before migrating the AIXlink/X.25 LPP software to version 2.0.2, stop all applications using the X.25 software, and remove all ports and drivers down to the "Defined" state. In addition, it is recommended that you back up the configuration by using the `backupx25` command. After the software migration is complete, reboot to reload all the latest code into the system.

Electronic Licensing for AIXlink/X.25 Version 2.0.1 and Later Modifications

Electronic license acceptance has been added to AIXlink/X.25 in Version 2.0.1. To install the `sx25` filesets you must accept the license agreement. The SMIT option **Accept New License Agreement** must be set to **yes** for the software to install.

64-bit Enablement for ARTIC960Hx 4-Port Selectable PCI Adapter

AIXlink/X.25 Version 2 was modified to take advantage of the 64-bit kernel.

The 2-Port Multiprotocol PCI Adapter was supported in a 64-bit environment for Version 2.0.

AIXlink/X.25 Version 2.0.2 adds support for the IBM ARTIC960Hx 4-Port Selectable PCI Adapter in a 64-bit environment.

Extended Error Handling for PCI Adapters

Extended Error Handling (EEH) is provided for the following supported X.25 PCI adapters:

- IBM ARTIC960Hx 4-Port Selectable PCI Adapter
- 2-Port Multiprotocol PCI Adapter

Support for EEH handling for the 2-Port Multiprotocol PCI Adapter is provided by its device driver, which is included in AIX.

Due to the on-card code for the IBM ARTIC960Hx Adapter, which supports X.25, changes were made in AIXlink/X.25 Version 2.0.2 to support EEH for the IBM ARTIC960Hx Adapter.

For the IBM ARTIC960Hx Adapter running AIXlink/X.25, manual intervention is required to recover from an EEH error.

In the case of a PCI bus I/O error, the X.25 **twd** driver will work with the IBM ARTIC960Hx **ddriciop** adapter driver to avoid a crash. The kernel will freeze the adapter slot allowing either the **twd** or the **ddriciop** driver to reset and recover the PCI adapter.

In the case of the ARTIC960Hx adapter, the X.25 **twd** driver and the ARTIC960Hx **ddriciop** adapter driver will handle the recovery of the adapter after an I/O error. In this case, when the adapter is reset, the ARTIC960Hx on-card software will be cleared. This will leave the adapter in an unusable state.

Looking through the error log, any EEH event indication followed by an ARTIC960Hx I/O error is enough evidence that the adapter suffered an unexpected I/O PCI error. If the EEH event is marked as a temporary error, the adapter will need manual intervention from the user in order to recover.

The adapter should recover by removing the **twd** driver instance and the X.25 ports, then creating the **twd** driver instance and X.25 ports associated with the adapter experiencing problems. This process will load the necessary in-card software to recover the adapter.

If the process is successful, the user can resume X.25 operations. If the process is unsuccessful, the hot plug manager can be used to recover the adapter.

Additional Information From the readme File

The readme file is written to the `/usr/lpp/sx25` directory during installation.

Migrating AIXlink/X.25 LPP Version 1

For migration installations from AIXlink/X.25 Version 1, run the following script:

```
/usr/lpp/sx25/bin/backupx25
```

and save the files that it produces to tape, or diskette, or another AIX system before performing a migration installation.

After the AIXlink/X.25 LPP has been migrated, reboot to reload all the latest code into the system.

If there is a problem, change your directory to the directory where your X.25 backup is, and run the following commands:

```
removex25 -q
```

```
restorex25 -v
```

This reloads your original X.25 configuration.

Utilities Provided for Backing Up and Restoring X.25 Port Configuration

Scripts contained in the `/usr/bin` directory can be run by the system administrator to back up, restore, or delete the AIXlink/X.25 LPP configuration. These scripts are as follows:

```
backupx25  
removex25  
restorex25
```

To view the usage for each command use the question mark (?) as the parameter. For example:

```
$ /usr/bin/backupx25 -?
```

```
Usage: backupx25 [-f] [-d dirname] [-v]
```

```
Generates backup configuration files for the X.25 LPP
```

The following flags are available:

- f** Force removal of existing backup files if they are already present in the save directory
- d** Name of save directory. The default is the current directory
- v** Verbose

Notes:

1. Ensure that you have backed up your X.25 configuration *before* using the `removex25` script. It is recommended that you reboot your system before restoring your X.25 configuration to ensure that the new drivers are loaded.
2. *Never* configure or unconfigure any of the X.25 LPP product from the `/usr/lib/drivers/pse` directory on your system. Failure to do so may result in your inability to configure or unconfigure ports on your system.

Non-default PVCs

When configuring and unconfiguring ports with non-default PVC definitions, the following commands *must* be used instead of the `mkdev` or `rmdev` commands:

```
mksx25  
rmsx25
```

The syntax for the `mksx25` and `rmsx25` commands is the same as for the `mkdev` and `rmdev` commands. If you configure the ports using the SMIT interface, this will be handled automatically.

X.25 TCP/IP and PVC Use

If you are using a PVC between two hosts configured to use the TCP/IP protocols to communicate between them and data is not flowing between them properly, run the following command:

```
arp -a
```

Examine the output for the PVC remote host. There should be an entry with that hostname and IP address with the word *permanent*. If it does not appear, run the following at the command line:

```
x25ip
```

This will re-establish PVC connections.

X.25 NPI and COMIO Usage

To write threaded applications involving AIXlink/X.25, use the NPI programming interface. NPI was implemented in AIXlink/X.25 to provide the user with the ability to write multi-threaded applications for X.25.

The COMIO programming interface cannot be used for threaded applications because the COMIO programming interface is not thread-safe.

The COMIO library API is provided for existing applications that were written to the user space COMIO API provided with the base AIX Version 3 X.25 support. The COMIO API is not intended for new program development.

IBM will not provide any support for problems concerning COMIO running in a threaded environment.

The NPI programming interface should be used for all new program development.

Using the IBM ARTIC960Hx 4-Port Selectable PCI Adapter and the IBM ARTIC960 MCA Adapters

To use the IBM ARTIC960Hx 4-Port Selectable PCI Adapter or the IBM ARTIC960 MCA Adapter, you must have the **devices.artic960.rte** fileset installed.

Note: The **devices.artic960add.rte** fileset is not compatible with running the AIXlink/X.25 LPP over the IBM ARTIC960Hx 4-Port Selectable PCI Adapter or the IBM ARTIC960 MCA Adapter. If this fileset is installed on the system, it automatically configures a **ric960add** device driver over each **ddrnciop** device driver in the system when the **cfgmgr** command is run. Adding AIXlink/X.25 LPP ports to adapters with this device driver configured will fail. Therefore, the **devices.artic960add.rte** fileset may not be installed on a system if use of the AIXlink/X.25 LPP over the IBM ARTIC960Hx 4-Port Selectable PCI adapter or the IBM ARTIC960 MCA Adapter is desired.

Collecting X.25 Testcase Data for IBM Support

This section guides you in collecting the data that IBM requires to be able to determine the cause of the problem you reported.

Note: Customers should not send testcases containing confidential material and should keep a copy of the testcase in case retransmission of the testcase is necessary.

Collect traces as follows:

1. Start the trace(s).
2. Re-create the problem.
3. Stop the trace(s).
4. Gather the trace data.

It is important that you start *all* the traces before you re-create the problem. Then stop all the traces at the same time immediately after re-creating the problem to ensure that the traces are synchronized with respect to when the problem occurs.

Create a directory to contain the trace data. For example:

```
mkdir /tmp/traces
```

The **/tmp/traces** directory is used in all examples that follow, but you can replace that directory with any empty directory.

1. Clear the system error log, as follows:

```
# errclear 0
```

2. Start the X25mon trace, as follows:

```
# x25mon -fpct -n sx25a# > /tmp/traces/xmonitor &
```

where # is the port number in question.

If you want additional packet data in the trace, run the following:

```
# x25mon -fpct -d 2048 -n sx25a# > /tmp/traces/xmonitor &
```

3. Start the device driver trace. For example:

```
# trace -a -j <trace hook>, <trace hook>
```

If more than one trace hook is needed, the trace hooks must be separated with commas with no spaces between the trace hooks and the comma. To keep the trace to a manageable size, select only the trace hooks relevant to the problem.

The possible trace hooks for AIXlink/X.25 are the following:

```
25C Packet layer
    329 X.25 TCP/IP interface
    32A NPI
    32B X.25 system utilities
    32C Triple-X PAD
    33B COMIO emulation
    33C Adapter driver (twd0)
2D8 Frame layer
```

The following is a possible tracehook for the ARTIC960 MCA and ARTIC960Hx PCI adapters only:

```
29F ddricio
```

The following is a possible tracehook for the 2-Port Multiprotocol PCI Adapter only:

```
3A9 - HKWD_DPMP_PCI_XMIT
3AA - HKWD_DPMP_PCI_RECV
3AB - HKWD_DPMP_PCI_OTHER
41E Physical layer (for ports using the hdlc driver)
```

If it takes too long to reproduce the problem, add the following flags to the **trace** command. Otherwise, the trace may fill up the system's **/var** directory. With these flags, the trace is restricted to a certain size and wraps. For example:

```
# trace -a -j 25C,33B -T 1000000 -L 4000000
```

4. Re-create the problem.
5. Stop the trace, as follows:

```
# trcstop
```
6. Stop the X25MON trace, as follows:

```
# kill -9 <pid of x25mon>
```

The following steps are the instructions on how to collect the data that you have just gathered:

1. Create a **/tmp/traces/README.PROBLEM** file that describes the problem. The following are questions you want to answer in the file.

```
What happens?
What do you expect to happen?
```

2. List customer and SE contacts with phone numbers.
3. Describe your network. Provide as much detail as possible to make it easier to determine the problem. Include any information that would help isolate the problem.
4. If the problem occurs while using TCP/IP, include the TCP/IP configuration data. Run the following:

```
# x25ip -s
```

For each host shown, run the following:

```
# x25ip -s -h host_name > /tmp/traces/config.host_name
```

where **host_name** is one of the hosts returned by the **x25ip -s** command.

5. If the problem occurs while using **snmpd -x25smuxd** sessions, include the following:

```
# cp /usr/tmp/x25smuxd.log /tmp/traces/x25smuxd.log
# cp /usr/tmp/snmpd.log /tmp/traces/snmpd.log
# cp /etc/mib.defs /tmp/traces/mib.defs
# cp /usr/sbin/x25smuxd.defs /tmp/traces/x25smuxd.defs
```

6. If the problem occurs while using **x29d pad** daemon, include the following:

```
# mkdir /tmp/traces/pad
# cp /etc/sx25pad/* /tmp/traces/pad
```

7. If the problem occurs while using an X.25 program that you wrote or purchased, include the source program or that segment of the program where you think the problem occurs. Also include any application logs that were generated during problem creation.

8. Generate a system error report with the following command:

```
# errpt -a > /tmp/traces/errlog
```

9. Generate a device driver trace file as follows:

```
# cp -p /usr/adm/ras/trcfile /tmp/traces
```

Format the **trcfile** file on the system where the file was created so that the timestamps are easy to correlate.

```
# trcrpt > /tmp/traces/trcfile.out
```

10. Obtain the system levels as follows:

```
# ls1pp -h > /tmp/traces/ls1pp.out
```

11. Obtain the X.25 configuration as follows:

```
# snap -r
# snap -Xc
# cp /tmp/ibmsupt/snap.pax.Z /tmp/traces
```

12. Obtain X25STATUS as follows:

```
# x25status > /tmp/traces/x25status.out
```

13. Obtain SX25DEBUG status for the twd driver as follows:

If appropriate for your system's configuration, gather the X.25 microcode information by running the **sx25debug** command.

```
# sx25debug -b # > /tmp/traces/sx25debug.b#
```

where # is the numeric instance of the port board, such as 0.

Use the **lsx25** command to find board number for drivers **twd0**, **twd1**, and so on.

14. Obtain HDLCSTAT status for HDLC drivers as follows:

If appropriate for your system's configuration, get the HDLC statistics maintained by the HDLC driver.

```
# hdlcstat hdlc# > /tmp/traces/hdlcstat.hdlc0
```

where # is the numeric instance of the HDLC driver for drivers **hdlc0**, **hdlc1**, and so on.

15. Obtain X.25 Network Subscription as follows:

Provide a copy of the Network Subscription. This document (usually 1 or 2 pages in length) describes exactly what the customer has purchased from the Network Provider.

16. Send in the testcase data with the following steps:

- a. Tar the data files together and compress them, as follows:

```
# cd /tmp/traces
# tar -cvf item#.tar *
# compress item#.tar
Where item# is your actual item number.
```

- b. Verify the compressed file. The following command provides a listing of the files that were compressed into the *.Z file.

```
# uncompress < item#.tar.Z | tar -tvf-
```

- c. Use the **ftp** command to send the testcase to the IBM testcase repository:

```
ftp testcase.boulder.ibm.com
login: anonymous
password: <your email address>
cd aix
put pmr#.branch#.country#.tar.Z (for example)
ls -l
quit
```

Note: To ensure that IBM is aware of your testcase, call the IBM AIX Support Line to confirm that the testcase has been submitted.

Appendix. Notices

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