AIXlink/X.25 Version 2.1

Release Notes

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Fourth Edition (July 2004)

Contents

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Note: This software may contain errors that could result in critical business impact. It is highly recommended that you install the latest available fixes prior to using this software. Fixes can be obtained from IBM® @server pSeries® Support at the following Web site:

`http://www.ibm.com/servers/eserver/support/pseries/fixes/index.html`

The following information applies to AIXlink/X.25 Version 2.1 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** file. Any readme information not part of the body of the Release Notes is located at the end of these Release Notes.

Prerequisites

AIX 5.1 prerequisites

AIXlink/X.25 Version 2.1 requires the following minimum base release of AIX 5L™ for POWER Version 5.1:

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

If the following filesets are installed on a system running AIX Version 5.1, they must be at the following levels or higher before AIXlink/X.25 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 **sx25.xol** fileset is in use on the system, you must install APARs IY54899 and IY54900 or later.

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.*x*, where *x* is equal to or greater than 3.

If you are using the IBM ARTIC960Hx PCI adapter on AIX 5L for POWER Version 5.1, the **devices.artic960** fileset must be at level 5.1.0.3, APAR IY50420, or later.

AIX 5.2 prerequisites

AIXlink/X.25 Version 2.1 requires the following minimum base release of AIX 5L Version 5.2:

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

If the following filesets are installed on a system running AIX Version 5.2, they must be at the following levels or higher before AIXlink/X.25 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 the **sx25.xol** fileset is in use on the system, you must install APARs IY53495 and IY54048 or later.

If you are using the IBM ARTIC960Hx PCI adapter on AIX 5L Version 5.2, the **devices.artic960** fileset must be at level 5.2.0.2, APAR IY48642, or later.

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AIX 5.3 prerequisites

AIXlink/X.25 Version 2.1 requires the following minimum base release of AIX 5L Version 5.3:

* Version 5.3, when available

If the following filesets are installed on a system running AIX Version 5.3, they must be at the following levels or higher before AIXlink/X.25 will install:

* **bos.rte** must be at level 5.3.0.0 or higher
* **bos.rte.tty** must be at level 5.3.0.0 or higher
* **devices.sys.pci.rte** must be at level 5.3.0.0 or higher

Installing the devices.artic960 fileset

The **devices.artic960add.rte** fileset is not compatible with running AIXlink/X.25 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 **ddriciop** device driver in the system when the **cfgmgr** command is run.

Adding AIXlink/X.25 ports to adapters with this device driver configured will fail. Therefore, do not install the **devices.artic960add.rte** fileset on a system if you use AIXlink/X.25 over the IBM ARTIC960Hx 4-Port Selectable PCI adapter or the IBM ARTIC960 MCA adapter.

The **devices.artic960** fileset, to support the PCI ARTIC960Hx adapter, ships as part of the following:

* AIX 5L for POWER Version 5.1 with the 5100-04 Recommended Maintenance package (APAR IY39794) or later
* AIX 5L Version 5.2 with the 5200-01 Recommended Maintenance package (APAR IY29795) or later
* AIX 5L Version 5.3 or later

For the IBM ARTIC960 MCA adapter, the **devices.artic960** fileset is shipped with the adapter.

Notes:

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

Packaging information

The following packages are available on this media and require the following amount of disk space:

* **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.locale** – 7 MB of disk space
* **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, COMIO, XOT, and XOL. 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.

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 because 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 the **sx25.rte** fileset to 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 the **sx25.rte** fileset to 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 the **sx25.rte** fileset to be installed either before or at the same time as this fileset. The **sx25.tcpip** fileset also requires the **bos.net.tcp.client** fileset at level 5.1.0.10 or later to 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 the **sx25.rte** fileset to 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. The **sx25.server** fileset must be installed in order to get more than four virtual circuits available on the system. The **sx25.server** fileset requires the **sx25.rte** fileset to be installed either before or at the same time as this fileset.

sx25.xot AIXlink/X.25 X.25 over TCP Support
> This fileset provides support for the X.25 protocol running over TCP. This support is defined by RFC1613: X.25 over TCP. This support is commonly known as XOT. The **sx25.xot** fileset requires that the **sx25.rte** fileset be installed before or with this fileset.

sx25.xol AIXlink/X.25 X.25 over LLC2 Support
> This fileset provides support for the X.25 protocol running over LLC2 (Logical Link Control, Type 2) (ISO8881). This support is referred to as XOL in this product. The **sx25.xol** fileset requires that the **sx25.rte** fileset be installed before or with 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 2.1 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** fileset 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 the **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** files requires the **sx25.adt.rte** and **sx25.comio** filesets be installed either before or at the same time as this fileset.

X.25 documentation (sx25.html.*locale*)

This package provides the HTML documentation about using, managing, and programming AIXlink/X.25. This fileset can be installed on AIX 5.1 or later. No additional 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 **x25usrgd.pdf** file is installed in the following location:

`/usr/share/man/info/en_US/a_doc_lib/aixlnk25/x25usrgd`

AIXlink/X.25 electronic license (sx25.license)

The **sx25.license** package contains the electronic license for the AIXlink/X.25 software.

Migration to AIXlink/X.25 Version 2.1

Before you migrate the AIXlink/X.25 software to Version 2.1, stop all applications that are 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 your system to reload all the latest code into the system.

Electronic licensing modifications

Electronic license acceptance was 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

The following list provides information about 64-bit enablement for AIXlink/X.25:
- AIXlink/X.25 Version 2.0 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 added 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** driver 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 code will be cleared. This will leave the adapter in an unusable state.

In the error log, any EEH event indication followed by an ARTIC960Hx I/O error is sufficient evidence that the adapter suffered an unexpected I/O PCI error. If the EEH event is marked as a temporary error, the adapter requires the following manual intervention from you in order to recover:

1. Remove the **twd** driver instance and the X.25 ports.
2. Create the **twd** driver instance and X.25 ports associated with the adapter that is experiencing problems. This process loads the necessary on-card code to recover the adapter.
3. If the process is successful, you can resume X.25 operations. If the process is unsuccessful, use the hot-plug manager 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 Version 1

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

1. Run the following script:

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

2. Save the files produced to tape, diskette, or another AIX system before performing a migration installation.
3. After AIXlink/X.25 is migrated, reboot your system to reload all of the latest code onto the system.
4. If there is a problem, change your directory to the directory where your X.25 backup is saved, 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

You can run scripts in the **/usr/bin** directory to back up, restore, or delete the AIXlink/X.25 configuration. These scripts are the following:

```
backupx25
removex25
restorex25
```

To view the usage statement for each command, use the question mark (?) as the parameter. For example, to view the usage for the **backupx25** script, type the following:

```
$ /usr/bin/backupx25 -?
Usage: backupx25 [-f] [-d dirname] [-v]
Generates backup configuration files for X.25
```

The following flags are available for each script:

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 output.

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 product from the **/usr/lib/drivers/pse** directory on your system. Doing so may result in your inability to configure or unconfigure ports on your system.

Nondefault PVCs

When configuring and unconfiguring ports with nondefault PVC definitions, the following commands *must* be used instead of the **mkdev** command or the **rmdev** command:

```
mksx25
rmsx25
```

The syntax for the **mksx25** command and the **rmsx25** command is the same as for the **mkdev** command and the **rmdev** command. If you configure the ports using the SMIT interface, this is 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 host name and IP address with the word *permanent*. If this word is not displayed, type 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 is implemented in AIXlink/X.25 to provide you 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 COMIO API user space 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 AIXlink/X.25 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 **ddriciop** device driver in the system when the **cfgmgr** command is run. Adding AIXlink/X.25 ports to adapters with this device driver configured will fail. Therefore, do not install the **devices.artic960add.rte** fileset on a system if you want to use the AIXlink/X.25 over the IBM ARTIC960Hx 4-Port Selectable PCI adapter or the IBM ARTIC960 MCA adapter.

Collecting X.25 testcase data for IBM support

This section guides you through the process of collecting the trace 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 or traces.
2. Re-create the problem.
3. Stop the trace or traces.
4. Gather the trace data.

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

Create a directory similar to the following to contain the trace data:

```
mkdir /tmp/traces
```

The **/tmp/traces** directory is used in the following examples, but you can use any directory specified or created with the **mkdir** command in the previous example.

1. Clear the system error log by running the following:

   ```
   # errclear 0
   ```

2. Start the X25mon trace by running the following, where # is the port number in question:

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

   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, run the following:

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

   If more than one trace hook is necessary, the trace hooks must be separated with commas with no spaces. 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
   253 XOT
   47D XOL
   ```

   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 much time to reproduce the problem, add the flags shown in the example 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, run the following:

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

4. Re-create the problem.
5. Stop the trace by running the following:

```
# trcstop
```

6. Stop the X25MON trace by running the following:

```
#  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 engineering 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 to access that TCP/IP configuration data:

```
# x25ip -s
```

For each host shown, run the following, where *host_name* is one of the hosts returned by the **x25ip -s** command:

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

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 the **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 when the problem was created.

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

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

9. Generate a device driver trace file by running the following:

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

Format the **trcfile** file on the system where the file was created so that you can correlate the timestamps with the following:

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

10. Obtain the system levels by running the following:

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

11. Obtain the X.25 configuration by running the following:

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

12. Obtain X25STATUS by running the following:

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

13. Obtain SX25DEBUG status for the **twd** driver. If it is appropriate for your system's configuration, gather the X.25 microcode information by running the **sx25debug** command, where # is the numeric instance of the port board, such as 0:

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

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

14. Obtain HDLCSTAT status for the HDLC drivers. If it is appropriate for your system's configuration, get the HDLC statistics maintained by the HDLC driver by running the following, where # is the numeric instance of the HDLC driver for drivers **hdlc0**, **hdlc1**, and so on:

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

15. Obtain X.25 Network Subscription. Provide a copy of the Network Subscription. This document, usually 1 or 2 pages in length, describes exactly what you have purchased from the Network Provider.

16. Send the testcase data by completing the following steps:

   a. Tar the data files together and compress them by running the following, where *item#* is your actual item number:

```
# cd /tmp/traces
# tar -cvf item#.tar *
# compress item#.tar
```

   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. Upload the testcase to the IBM testcase repository.

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