AIXlink/X.25 Version 2.0.0

*

AIXlink/X.25 Version 2.0.0 Release Notes

Memorandum to: Licensees of AIXlink/X.25 Version 2.0.0 *

Subject: AIXlink/X.25 Version 2.0.0

Date: 13 Aug 2001

Release Notes Version: 1.0

Enclosed is information about AIXlink/X.25 Version 2.0.0. **Read this information before installing AIXlink/X.25 Version 2.0.0**.

Table of Contents

AIXlink/X.25 Version 2.0.0

The following information applies to AIXlink/X.25 Version 2.0.0 or later. A README file for AIXlink/X.25 is written to **/usr/lpp/sx25 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 2.0.0 requires a minimum base release of AIX 5L Version 5.1 with the 5100-01 Recommended Maintenance package or later, which is included on the 09/2001 or later AIX Update CD.

In addition, if the following filesets are installed on the system, they must be at the following levels or higher before the AIXlink/X.25 LPP will install.

On a system running AIX version 5.1:

- **bos.rte** must be at 5.1.0 or higher
- **bos.rte.tty** must be at 5.1.0 or higher
- **devices.sys.pci.rte** must be at 5.1.0.0 or higher

If using the IBM ARTIC960 MCA Adapter, the **devices.artic960.rte** fileset must be at 1.3.3 or later 1.3.x fileset.

If using the IBM ARTIC960Hx 4-Port PCI Adapter, the **devices.artic960.rte** fileset must be at 1.4.3 or later.

Please 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 **ddriciop** device driver in the system when **cfgmgr** 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.

Note: The **devices.artic960.rte** Fileset ships with the adapter. The **devices.artic960.rte** fileset may also be downloaded from the Radisys website. As of August 2001, the procedure is:

1. Access the Radisys download site at:

   `http://www.radisys.com/service_support/artic/ibm`

2. For the ARTIC960 MCA adapter, under IBM RS/6000 ARTIC Features, select **IBM ARTIC960 4-Port MultiInterface Adapter**

   - Under **Development Software & Manuals** locate **ARTIC960 Support for AIX V1.3.x** to access. The installation/file creation instructions and the program file, which is the download file.

3. For the ARTIC960Hx PCI adapter, under IBM RS/6000 ARTIC Features, select **IBM ARTIC960Hx 4-Port Selectable PCI Adapter**.

   - Under **Development Software & Manuals** locate **AIX**, then locate **ARTIC960 Support for AIX V1.4.x** to access. The installation/file creation instructions and the program file, which is the download file.

Note: Install only the **devices.artic960** fileset. Do not install the **devices.artic960add** fileset.

Note: If **devices.artic960add.rte** was inadvertently installed, run **rmdev -l ric96add0** and remove fileset **devices.artic960add.rte** via **smitty/install/maint/remove/name=devices.artic960add.rte**.

Packaging Information

The following packages are available on this media.

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. This fileset 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 applications. The **sx25.npi** fileset requires that the **sx25.rte** fileset be installed before or with 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 before or with 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 before or with 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 before or with 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. **sx25.server** 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 2.0.0 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 prerequisitefor all other filesets in the package.

  sx25.adt.rte requires **sx25.rte** fileset to be installed before or with 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 before or with 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 previously written applications 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.

  sx25.adt.comio requires **sx25.adt.rte** and **sx25.comio** filesets be installed before or with this fileset.

X.25 User Guide (sx25.html.en_US)

This package provides the HTML documentation on using, managing, and programming AIXlink/X.25. The current HTML documentation is for Version 1.1. The Version 1.1 documentation in general is valid for Version 2.0. An update of the HTML documentation for Version 2.0 is scheduled for release in December 2001.

This fileset can be installed on AIX 5.1 or higher. No requisite software is required to install this package.

The main addition to the documentation for Version 2.0.0 is listed below in **NPI Enhancements for AIXlink/X2.5 Version 2.0.0**.

sx25.html also provides a pdf format file which could be used for printing the documentation.

The file **x25usrgd.pdf** is installed in **/usr/share/man/info/en_US/a_doc_lib/aixlnk25/x25usrgd**.

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 2.0.0

Before migrating the AIXlink/X.25 Version 1.1 LPP software to version 2.0.0, stop all applications using the X.25 software, and remove all ports and drivers down to the "Defined" state. In addition, we

recommend that you back up the configuration using the **backupx25** command. After the software migration is complete, reboot to reload all the latest code into the system.

NPI Enhancements for AIXlink/X.25 Version 2.0.0

AIXlink/X.25 Version 2.0.0 enhances Network Provider Interface (NPI) support by supplying CCITT cause and diagnostic codes for X.25 to the user's NPI applications.

Existing applications can still continue to run on this new version without any modification. Customers who wish to receive the cause and diagnostic codes must recompile their X.25 applications to take advantage of the modified functions.

The following NPI structures contained in **/usr/include/sys/npi_20.h** have been changed to allow users to use the cause and diagnostics codes (the additions are marked by "<"):

```
/*
 *  NC Reset Request
 */
typedef struct {
     att_ulong PRIM_type;      /* always N_RESET_REQ*/
     att_ulong RESET_reason;   /* the reason for reset */

     uchar cause;              /* Cause value of the reset */  <

     uchar diagnostic;         /* Diagnostic reason of the reset */ <

} N_reset_req_t;


/*
 *  NC Reset Indication
 */

typedef struct {
     att_ulong PRIM_type;      /* always N_RESET_IND*/
     att_ulong RESET_orig;     /* the reset originator */
     att_ulong RESET_reason;   /* the reason for reset */
     uchar cause;              /* Cause value of the reset */       <

     uchar diagnostic;         /* Diagnostic reason of the reset */ <

} N_reset_ind_t;


/*
 *  NC Disconnection Request
 */

typedef struct {
     att_ulong PRIM_type;      /* always N_DISCON_REQ*/
     att_ulong DISCON_reason;  /* reason for disconnection*/
     att_ulong RES_length;     /* responding address length */
     att_ulong RES_offset;     /* the offset of the responding address from the
                                  beginning of the M_PROTO message block */
```

```
     att_ulong SEQ_number;     /* sequence number used by the NS provider to
                               * associate the N_DISCON_RES message with an
                               * unacknowledged N_CONN_IND that is to be
                                 rejected */
     uchar cause;              /* Cause value of the disconnect */  <

     uchar diagnostic;         /* Diagnostic reason of the disconnect */ <

} N_discon_req_t;


/*
 *  NC Disconnection Indication
 */


typedef struct {

     att_ulong PRIM_type;    /* always N_DISCON_IND*/
     att_ulong DISCON_orig;  /* the originator for disconnection */
     att_ulong DISCON_reason;/* reason for disconnection*/
     att_ulong RES_length;   /* responding address length */
     att_ulong RES_offset;   /* the offset of the responding address from
                                the beginning of the M_PROTO message block */
     att_ulong SEQ_number;   /* when its value is non_zero, it identifies
                                sequence number associated with the N_CON_IN
                                that is being aborted */
     uchar cause;            /* Cause value of the disconnect */       <

     uchar diagnostic;       /* Diagnostic reason of the disconnect */ <

} N_discon_ind_t;
```

The cause and diagnostic codes can be used for NPI APIs in the same way they were used for COMIO APIs. See the *AIXlink/X.25 for AIX: Guide and Reference* manual for more information.

Additional Information From The README

The README is written to **/usr/lpp/sx25** during installation.

Note to AIXlink/X.25 LPP Version 1 customers

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. This reloads all the latest code into the system.

If there is a problem, change directory into the directory where your X.25 back up is, and run the following:

- removex25 -q
- restorex25 -v

This reloads your original X.25 configuration.

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

Scripts contained in **/usr/bin** can be run by the system administrator to back up, restore or delete the AIXlink/X.25 LPP configuration if so desired. These scripts are:

```
backupx25
removex25
restorex25
```

The Usage for each command can be found by using a '-?' as the parameter. For example:

```
$ /usr/bin/backupx25 -?
Usage: backupx25 [-f] [-d dirname] [-v]
Generates backup configuration files for the X.25 LPP
f    Force removal of existing backup files if they are already
     present in the save directory
d    Name of save directory. Defaults to current directory
v    verbose
```

Attention: Be extremely careful and make sure 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.

Note to ALL X.25 users

NEVER configure or unconfigure any of the X.25 LPP product from the directory **/usr/lib/drivers/pse** on your system. Failure to do so may result in your inability to unconfigure or configure ports on your system.

Note about "non-default" PVCs

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

```
mksx25
rmsx25
```

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

Note about X.25 TCPIP & PVC use

If you are using a PVC between two hosts configured to use the TCPIP protocols to communicate

between them and data is not flowing between them properly, do the following:

```
arp -a
```

Look for the PVC remote host in that output. There should be an entry with that hostname and ip address and the word "permanent." If it does not appear, execute:

```
x25ip
```

This will re-establish PVC connections. If the PVC remote host still does not appear in the arp output, then use the problem determination guide.

Note About X.25 NPI and COMIO Usage

For customers who want to write threaded applications involving AIXlink/X.25, the NPI programming interface should be used. 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.

For customers using the IBM ARTIC960Hx 4-Port Selectable PCI Adapter and the IBM ARTIC960 MCA Adapters

In order 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.

Please 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 ddriciop device driver in the system when cfgmgr 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.

Notes about collecting X.25 testcase 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 have reported.

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.

Make a directory to contain the trace data, for instance:

```
mkdir /tmp/traces
```

/tmp/traces 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:

   ```
   # 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 the trace hooks and the comma. Select only the trace hook(s) relevant to the problem in order to keep the trace to a manageable size.

   The possible trace hooks for AIXLink/X.25 are:

```
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
```

ARTIC960 MCA adapter and ARTIC960Hx PCI adapter only:

```
29F ddricio
```

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, then add the following flags to the trace command. Otherwise, the trace may fill up the systems **/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>
```

7. Collect the data:

   The following is a set of instructions on how to collect the data that you have just gathered.

8. Create a file **/tmp/traces/README.PROBLEM** that

   a. describes the problem.

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

9. List customer and SE contacts with phone numbers.

10. 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.

11. TCP/IP

    If the problem occurs while using TCP/IP, include the TCP/IP configuration data. Run:

    ```
    # x25ip -s
    ```

    For each host shown, run:

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

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

12. SNMPD

    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
    ```

13. PAD

    If the problem occurs while using x29d pad daemon, include the following

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

14. X.25 Program

    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.

15. Get a system error report:

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

16. Get device driver trace file:

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

format the **trcfile** on the system where it was taken so that the timestamps are easy to correlate.

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

17. Get the system levels:

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

18. Get the X.25 configuration:

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

19. Get X25STATUS

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

20. Get SX25DEBUG status for twd driver:

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

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

    where # is the numeric instance of the port board (such as 0);

    Use lsx25 to find board number for drivers twd0, twd1, etc.

21. Get HDLCSTAT status for HDLC drivers:

    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, etc.

22. Get X.25 Network Subscription:

    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.

23. Send in the testcase data:

    In the following instructions, replace item number with your actual item number.

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

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

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-
```

FTP it 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
```

DISCLAIMER

IBM is not responsible for the confidentiality or reliability of testcase materials transferred over the Internet. Customers should not send testcases containing confidential material and should keep a copy of the testcase in case retransmission is necessary.

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

Footnotes:

[*] IBM is a registered trademark of International Business Machines Corporation.

[*] AIX is a registered trademark of International Business Machines Corporation.