

IBM 8260
NWAYS Multiprotocol
Switching Hub

Installation Instructions

for

8281 ATM LAN Bridge Module

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1 IMPORTANT NOTICES

THE NWAYS 8260 ATM LAN BRIDGE MODULE IS AN INTEGRATED VERSION FOR THE 8260 HUB OF THE STAND ALONE 8281 ATM LAN BRIDGE: AS A CONSEQUENCY, THE 8281 PRODUCT NUMBER MAY STILL APPEAR IN THE DOCUMENTATION OR IN THE CONFIGURATOR PROGRAM MENUS OF THE NWAYS 8260 ATM LAN BRIDGE MODULE.

WARNING: PLEASE NOTE THAT BOTH THE CONFIGURATION UTILITY PROGRAMM DISKETTE IMAGE AND THE OPERATIONAL SOFTWARE FILE FOR THE NWAYS 8260 ATM LAN BRIDGE MODULE ARE DIFFERENT FROM THE STAND ALONE 8281 ATM LAN BRIDGE MODULE. IN ORDER TO CLEARLY DISTINGUISH BETWEEN BOTH PRODUCTS, ALL THE NWAYS 8260 ATM LAN BRIDGE MODULE FILES ARE PREFIXED WITH AN "H" (LIKE HUB). THE CONFIGURATION UTILITY DISKETTE IMAGE FILE IS NAMED H8281CXY.DSK (X,Y being the release and subrelease levels), AND THE BRIDGE OPERATIONAL SOFTWARE FILE IS NAMED HX_YY.OPR (same notice for X,Y).

1.1 Operational Software Versions

For logistical reasons, the version of software loaded on the bridge may differ from the version shipped on the accompanying diskette. You will need to locally attach the Configurator, via RS-232 null-modem cable, to the bridge and examine the software Vital Product Data (VPD) returned by the bridge. Go to Utilities->Additional Utilities->Retrieve Bridge Status Report and view the status report which contains the VPD.

The software versions are identified, primarily, by a Release and Subrelease. For example, Release 2, Subrelease 4 would be identified by the dot decimal number : v2.4. If the software VPD returned to the Configurator from the bridge shows Release and Subrelease information that is vastly different (eg, 4.15) from the version information on the "Operational Software and MIB" diskette label, then new Operational Software needs to be loaded onto the bridge. The existing code is under a different (older) versioning scheme.

If the software VPD returned to the Configurator from the bridge has the same Release information as on the diskette but the Subrelease is higher then the bridge has the later version. The version of code already on the bridge is more recent than the version of code on the diskette. You should acquire backup copies of the most recent version of Operational Software (See "1.1.1 Where to Get Updates").

1.1 .1 Where to Get Updates

The most recent versions of the ATM LAN Bridge module software (Configurator and Operational) can be gotten from the following sources:

- 1) The ATMBIN disk on ATMPE user at LGEVMA system (Consult your IBM service representative).

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2) The IBM Networking World Wide Web home page:
<http://www.networking.ibm.com/826/826fix.html>
Select "ATM TR/Ethernet LAN Bridge module (FC 5204)" entry.
Further instructions are provided online.

1.1 .2 What to do if operational code FLASH is corrupted.

If code download terminates abnormally then operational code FLASH may become corrupted. If this happens then bridge can not forward frames, or respond to most configurator commands. However, bridge can still communicate with configurator to load operational code via the serial port.

- 1 - Select "Load new code image via serial port" from "Utilities" menu.
- 2 - Choose the image to load.
- 3 - Select OK.

The configurator will automatically determine that the FLASH is corrupted and print a message stating that fact.

1.2 Configuration Utility Installation

Before you can use the ATM LAN Bridge Module Configuration Utility program you have to run the ATM LAN Bridge Module Configuration install setup program so it will work properly on your computer.

You cannot just copy the files from the Installation disk to your hard disk. The files on the distribution disk are packed to save space. The install program unpacks those files and builds them on your working disk.

1. Make Windows' "Program Manager" the active window.
2. From Windows' "Program Manager", select "File", then select "Run". This will open the "Run" dialog box.

Place the ATM LAN Bridge Module Configuration Utility Installation disk in your floppy drive. Type in the dialog box the command that will run the install program.

If your floppy disk goes in your Drive "A", type:

A:INSTALL

If your floppy disk goes in your Drive "B", type:

B:INSTALL

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Leave the "Run Minimized" box un-selected, and click the "OK" command button (or press "Enter").

3. After a brief moment you will be prompted by a dialog box to enter the desired location for the ATM LAN Bridge Module Configuration Utility. This is the location that you want your Configuration files to be placed. It will suggest a drive and directory of "C:\IBM8281".

If you want the ATM LAN Bridge Module Configuration program files installed on a different drive or directory, just click the pointer to the right of the characters you want to change, backspace over the ones you want to erase, then type in the new designation.

4. The install program will unpack the necessary files and place them into your directory. The status of the operation will be displayed as the setup program does this work.

5. The ATM LAN Bridge Module Configuration Utility will be automatically added to the program manager.

6. The setup program will notify you when the installation is complete.

1.3 TCP/IP SLIP Connection Setup

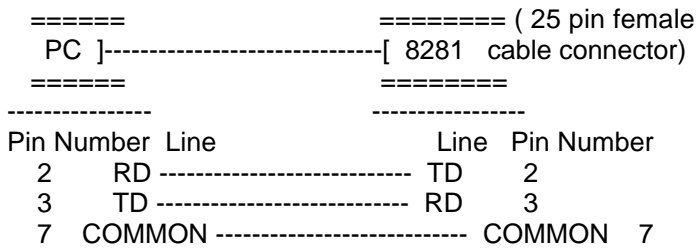
In order to communicate with the ATM LAN Bridge Module hardware, the Configuration Utility uses TCP/IP via the winsock.dll. The configurator has been thoroughly tested with the IBM versions of TCP/IP (DOS & OS/2). However it has been demonstrated to work with the Chameleon TCP/IP protocol stack from NetManage and Win95 from Microsoft.

```
*****
*** You will need a NULL modem cable to directly attach to the bridge ***
*** using the SLIP interface. ***
*****
```

End to end the cable needs the following lines:

```
25 pin
===== ( 25 pin female
PC ]-----[ 8281 cable connector)
=====
-----
Pin Number Line Line Pin Number
3 RD ----- TD 2
2 TD ----- RD 3
7 COMMON ----- COMMON 7
```

9 PIN



NULL MODEM CABLES

NOTICE: The Transmit and Receive line œ's are reversed on the 9 and 25 connectors (on the PC side).

IMPORTANT NOTE REGARDING - UART TYPE

>>>NOTE: It is HIGHLY recommended that you use a workstation that has a Type 2 UART to ensure reliable transfer of data between the workstation and the ATM LAN Bridge Module.

If you are not sure what type of UART your machine has SLIP will display the UART type on bringup. When SLIP is started it will display a line of information in a box across the screen. The UART type will be presented in this display.

If you can locate the UART chip, it's type can be determined from the table below:

- TYPE 1: 8250, 16450
- TYPE 2: 16550, 16550A, 16550AF, 16550AFN

Type 1 UART's only have single character buffer while the Type 2 UART's have a 16 character buffer. The problem is that Windows applications have trouble fetching characters fast enough to prevent the next incoming character from overwriting the single character buffer, resulting in "comm overrun" errors. Sometimes running Windows in the "standard" mode will permit the configurator to work on a Type 1 UART. To start Windows in the "standard" mode bring it up by typing:

```
C:⌘win /s
```

Also, certain TSR's, screen savers, and some video cards can aggravate this problem. This is a well documented problem and much discussion can be found by searching the world wide web for the keyword "UART".

1.3 .1 IBM DOS TCP/IP SLIP Connection Setup

IBM TCP/IP with CSD 2.1.1.4 MUST be already installed on the workstation. This version or later of IBM TCP is required Use the TCP/IP CUSTOM application to set and enable the COM α port as a SLIP interface with the following configuration:

IP Address: 1.2.3.6
Destination Address: 1.2.3.5
Modem speed: 19200 bps
Port: COM α

Note: α is the number of the COM port to be used.

Because communications may be over a SLIP connection, running with Microsoft Windows, statements MUST be added to the SYSTEM.INI file to prevent Windows from taking over the COM ports. Add the following 3 statements to the [386Enh] stanza of SYSTEM.INI for each COM port which is to be used by SLIP:

```
[386Enh]
Com $\alpha$ AutoAssign=0
Com $\alpha$ Base=0
Com $\alpha$ Irq=-1
```

Note: α is the number of the COM port to be disabled.

AFTER YOU MAKE THESE CHANGES, YOU MUST RESTART WINDOWS

Test your SLIP connection by making sure you can ping the bridge (ping 1.2.3.5).
--

Note: You must start TCP/IP (with tcpstart command)before starting Windows.

1.3 .2 Chameleon TCP/IP SLIP Connection Setup

After Chameleon TCP/IP is installed, use the CUSTOM application to set and enable the COM α port as a SLIP interface with the following configuration:

IP Address: 1.2.3.6
Gateway: 1.2.3.5
Modem : direct connection
Modem speed: 19200 bps

Port: COM α
Flow control: "none"

Note: α is the number of the COM port to be used.

The following statement **MUST** be added to the WIN.INI file to setup the mtu size.

```
[TCPIP]
slipmtu=1500
```

You will need a NULL modem cable if you are directly attached to the bridge using the SLIP interface.

Test your SLIP connection by making sure you can ping the bridge (ping 1.2.3.5).
--

1.4 Configuration Utility Program and OS/2 with TCP/IP V2.0

The TCP/IP V2.x for OS/2 must be installed including DOS/Windows access. The latest OS/2 TCP/IP 2.x CSDs must also be applied including the DOS/Windows access CSD.

The TCP/IP SLIP interface must be enabled and configured by running tcipcfg.

check the enable box

```
MTU size:          1500
VJ compression:   off
IP address:        1.2.3.6
destination IP address : 1.2.3.5
```

The speed of the com port is not set through tcipcfg.
You must explicitly change the com port speed by issuing a mode command from the OS/2 prompt.

```
mode com1: 19200, none, 8
```

After setting these parameters and restarting TCP you should first attempt to ping the 8281 bridge to prove connectivity before using the 8281 configurator.

```
ping 1.2.3.5
```

If the ping is successful you may then use the 8281 configurator serially attached.

1.5 Configuration Utility Program and OS/2 with TCP/IP V3.0

1. You must have the following installed.

- Multi-Protocol Transport Services (MPTS V2.0).
... with the Dos+Windows Access Kit selected.
... Configure LAN adapter with TCP/IP protocol.
NOTE: If you don't have a LAN adapter you must
add the following lines to your CONFIG.SYS
following the line containing
"DEVICE=C:\MPTN\PROTOCOL\AFOS2.SYS".
.
.
DEVICE=C:\MPTN\PROTOCOL\AFINET.SYS
DEVICE=C:\MPTN\PROTOCOL\IFNDIS.SYS
.
- TCP/IP V3.0 for OS/2

2. The serial port and TCP/IP SLIP interface must be enabled and configured.

```
MTU size:          1500
VJ compression:   off
IP address:        1.2.3.6
destination IP address : 1.2.3.5
```

You may want to create a command file ...
(NOTE: example shows connection to COM2)

```
Line 1 => mode com2: 19200,n,8
Line 2 => slip -com2 -ifconfig 1.2.3.6 1.2.3.5 -mtu 1500 -speed 19200
```

After setting these parameters and restarting TCP you should
first attempt to ping the 8281 bridge to prove connectivity before
using the 8281 configurator.

```
ping 1.2.3.5
```

If the ping is successful you may then use the 8281 configurator
serially attached.

1.6 SNMP MIB Browser's Handling of Octet Strings

When using some MIB Browsers (eg, NetView for AIX), don't be alarmed when queries for octet string MIB objects yield *strange* results. Typically, the browser is not able to distinguish between octet strings that are suppose to be human readable (ie, ASCII data) and those that are merely hexadecimal data (ie, MAC addresses). Therefore, you may be dealing with a MAC address whose bytes happen to map to the ASCII character set and your browser will reflect readable characters on the screen

The MIB Browser shipped with the current version of NetView for AIX applies the following logic:

IF vector contains all human readable bytes
THEN represent as DisplayString.

IF all but the last byte of the vector are human readable bytes
AND the last byte is the null terminator (ie, '\0')
THEN represent as DisplayString.

ELSE
represent as hexadecimal data.

For example, a MIB variable that is a 6 byte octet string having the value 0x616263313233 will be represented by the browser as "abc123".

The expectation is that additional features of SNMPv2 will allow browsers to better determine the intended representation of octet string data. Until that time, please be aware of this potentially ambiguous situation when using MIB Browser applications.

1.7 OS/2 Japan

This section provides instructions on how to run the Configuration Utility Program in a Japanese OS/2 WARP environment.

The Configurator should be installed on the workstation the same way as any other Windows application. This is accomplished by invoking WIN-OS/2 (fullscreen or Windows-on-OS/2-desktop) and installing according to the instructions in "1.2 Configuration Utility Installation" section of this README file.

Once installed, certain WIN-OS/2 DOS settings need to be set. The below steps are applied in the context of the WIN-OS/2 Fullscreen icon.

- 1) From the WIN-OS/2 Fullscreen icon, open the Settings dialog by double clicking the right mouse button and selecting the "Settings" popup menu item.

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2) From the Settings dialog, select the "Session" tab. From the Session dialog, select the "All DOS and WIN-OS/2 Settings" radio button and click OK.

3) From the All DOS and WIN-OS/2 Settings dialog, select the DOS_DEVICE item from the settings list (on left) and set the value (on right) to "C:\TCPIP\BIN\VDOSTCP.SYS". Click on Save.

The above steps should also be applied if you desire to run the Configurator in the context of a OS/2 program icon (directly on desktop) or Windows-on-OS/2-desktop icon.

Be sure to read, and follow, the "1.4 Configuration Utility Program and OS/2" section of this README in order to insure TCP/IP communication over SLIP.

1.8 N Ways Campus Manager

The ATM Forum Compliant version of the 8281 requires version 1.0.5 or above of the 8281 PSM to provide device management under N Ways Campus Manager for Windows, N Ways Campus Manager for AIX, and N Ways Campus Manager for HP-UX.

1.9 Problems with older ATM adapter code.

The first GA code for the IBM Token Ring FC LAN Emulation ATM adapters had a bug that caused RI fields to be incorrectly constructed. This error resulted in token ring connectivity problems across the 8281 bridge. You should obtain the latest GA drivers for the adapters.

1.10 Migrating from Release 1 to Release 2 code

If you have an 8281 bridge which has Release 1 code and configuration, perform the following steps to migrate to Release 2 (Forum Compliant) code:

- Download Release 2 operational code.
- Reset the 8281 bridge (to activate Release 2 code).
- Setup Release 2 configuration using Release 2 Configurator.
- Send Release 2 profile using Release 2 Configurator.
- Reset the 8281 bridge (to activate Release 2 configuration).

2 RELEASE NOTES

2.1 Prerequisites

2.1 .1 8260 CPSW module code version

The CPSW module boot code must be at version 1.2 (or higher) and the CPSW module operational code must be at version 2.0 (or higher).

Use the SHOW DEVICE command on the CPSW console and contact your IBM service representative if required.

2.1 .2 ATM server with IBM 100M bits adapter TURBOWAYS 100 OS/2 driver

If this adapter is used on the ATM server with the OS/2 device driver, the CSD level of the driver must be 1.22 or higher.

If this is not the case, the MAX FRAME SIZE parameter in the OS/2 device driver PROTOCOL.INI file must be increased from 4096 to 4200 bytes. MAX FRAME SIZE value of 4096 is not compatible with NETBIOS and create a problem if this protocol is used between the LAN clients and the ATM server.

2.2 Network Management.

The 8260 ATM LAN Bridge Module is now fully supported by the Network Management applications (up to release 1.14 of the Operational code software, the 8260 ATM LAN Bridge was handled by the Network management applications strictly in the same way as the Stand Alone 8281 ATM LAN Bridge).

ATMC PTF NUMBER UR45751 MUST BE INSTALLED AS A PREREQUISITE FOR THE 8260 ATM LAN BRIDGE SUPPORT BY THE NETWORK MANAGEMENT APPLICATIONS WITH THE BRIDGE OPERATIONAL CODE STARTING FROM LEVEL 1.15.

2.3 Problems with memory dump on machines with less than 8M RAM.

Memory dump for error log sector aborts with a system error before it completes. Memory dump should be done only at the request of product support. In most cases the partially received dump file contains enough information for analysis.

2.4 User filter clarification.

- ATM bridge supports only inbound filters.
- In Token Ring mode ATM bridge applies filters only on broadcast frames.
- In Ethernet mode ATM bridge applies filters on every frame.
- ATM bridge performs the following computation to determine whether to apply a user filter: if (frame & filter_mask) equal filter_value then apply filter.

2.5 How to connect to the bridge using a modem.

The following paragraphs explain how to configure telephone modems and TCP/IP software to enable communications via telephone lines. The ATM bridge configurator program can be used via telephone modems.

The only modem command issued by ATM bridge is ATE0 to turn echo off. The modem must be configured before it is attached to the bridge. We tested several modems, and found that the following configuration works well for Hayes compatible modems:

- AT &F - Restore to factory setting.
- AT &K0 - Disable flow control.
- AT &D0 - Allow phone connection to stay up when bridge resets.
- AT S0=2 - Auto-Answer on second ring.
- AT &W - Save configuration.

Since ATM bridge communicates via TCP/IP, the SLIP protocol must be configured to dial remote modem. The dial string must be set to ATDTXXXXXXXXX where "XXXXXXXXX" is the telephone number, and the "Auto-Dial" option must be enabled. For some reason not enabling Auto-Dial option and using SLIPDIAL after TCP/IP is started does not work.

Once connection is established between modems, ping the bridge at 1.2.3.5 to verify connectivity. We noticed that it may take up to 30 seconds for some modems to forward pings successfully. The delay is probably due to auto learning of DTE speed between modem and ATM bridge.

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The bridge communicates on it's serial port at 19200, 8 data, 1 stop, no parity.

To insure that your modem is compatible with the bridge, reset the bridge while modem is attached and powered on, but does not have phone connection. After the bridge resets verify that you can dial in and ping the bridge. One modem we tested, Motorola Codex 3260, did not pass this test. The problem was most likely caused by ATM bridge sending various messages out the serial port while it is resetting.

2.6 Problem: Configurator communication errors when Max Frame Size is reduced below 1500 bytes.

Release 1 versions of the bridge and Configurator would allow IP frames as large as 1518 bytes. If the bridge's "Max Frame Size" is set lower than this the 8281 bridge will throw away the IP frames (and subsequent retries) to and from the configurator. Thus the configurator and bridge could not complete Profile sends or retrievals successfully. Release 2 of the 8281 and configurator should work with "Max Frame Size" set to 1112 bytes or higher. If there is a requirement to set the "Max Frame Size" lower than 1112, then you will need to use the serial port for communicating with the bridge.

2.7 Recovering from corrupted 8281 configuration.

If you observe unusual problems after loading bridge profile or loading new operational code then it is possible that 8281 configuration is corrupted. To return the bridge into it's "uninitialized" state use the configurator utilities menu to erase the configuration.

2.8 LECS support Added.

LECS requires an update to the operational code and the Configurator code.

To enable the 8281 to connect to the LECS fill in the "Auto configuration" check box on the "ATM Port LAN Emulation" screen of the configurator.

When the 8281 tries to connect to the LECS, it will search for the LECS address in the following order (as specified by the ATM Forum):

- 1) via ILMI LECS address table (the bridge supports up to 5 entries)
- 2) via the Well Known LECS ATM address
0x4700790000000000000000000000-00A03E000001-00
- 3) via the LECS PVC (VPI=0, VCI=17)

* Note all of these methods probably require configuration setup in your

switch. Also your LECS(s) must be properly configured in order for the 8281 to successfully get configuration from it.

In auto-config mode when the 8281 can not find or successfully get configuration from an LECS through the above 3 methods, it will try signalling the configured LES address.

In auto-config mode the 8281 will reject the following configuration changes:

- . if the LECS tries to change the ATM port type (ie. token ring vs ethernet)
- . if the LECS tries to change the frame size to a size larger than the bridge's maximum frame size.

When the 8281 rejects for one of these reasons it will go to the next LECS if one exist.

In auto-config mode the 8281 does not support the following configuration TLVs (ie. it will ignore sets of these variables from the LECS).

TLV	Reason for not supporting
Maxiumum Unk Frame Time	not a configuration parameter 8281 supports
Aging Time	being a bridge these 2 parms affect more than
Forward Delay Time	other ATM devices (could be dangerous).
Mcast Send VCC Type	currently only best effort supported
Mcast Send VCC AvgRate	currently only best effort supported
Mcast Send VCC PeakRate	currently only 100Meg supported

2.9 How to reduce the time to find backup LECS.

When a primary LECS goes down, 8281 tries to connect to the next LECS. Eventually 8281 tries to use the "PVC" method to connect to an LECS. In this case if the ATM switch does not support PVC the bridge will wait for "Control Timeout" interval times two retries. ATM forum recommends 120 seconds for the control timeout, this is also the default timeout value in the 8281 profile. The default timer setting means that 8281 will spend 4 minutes trying to contact LECS via PVC.

In order to reduce this delay we recommend setting the Control Timeout to 10 seconds.

2.10 IBM Enhanced mode is not recommended in Ethernet.

When IBM enhanced mode is enabled the 8281 does not break point-to-point SVC connections with other ATM devices when LES/BUS goes down. The enhanced mode is useful in token ring because most data connections can stay up. In Ethernet the enhanced mode does not add much value because when 8281 registers with backup LES it must put spanning tree in blocking state. Since no traffic can flow when spanning tree is blocked, the only advantage of enhanced mode is that data traffic can continue to flow while 8281 is searching for the backup LES.

END OF DOCUMENT

