IBM 8265 Nways ATM Switch

Installation Instructions

for

ATM Control Point Version 4.1.2

IISP & PNNI

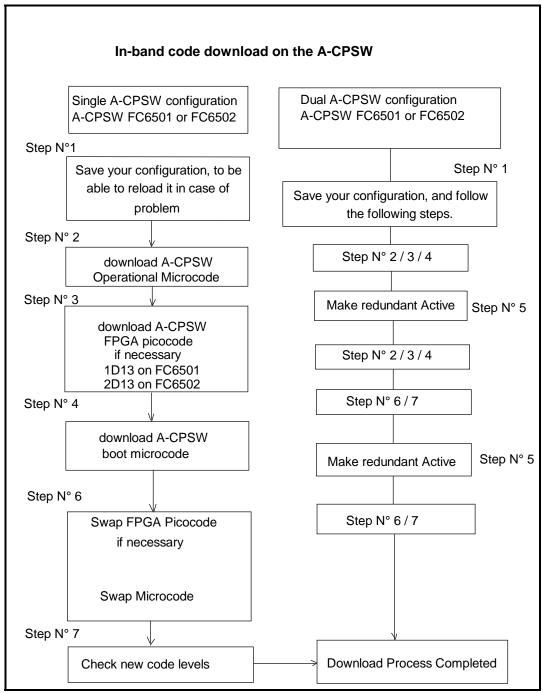# TABLE of CONTENTS

1   Upgrade synopsis

In-band code download on the A-CPSW

| Single A-CPSW configuration
A-CPSW FC6501 or FC6502 | Dual A-CPSW configuration
A-CPSW FC6501 or FC6502 |

Step N°1

| Save your configuration, to be able to reload it in case of problem |

Step N° 1

| Save your configuration, and follow the following steps. |

Step N° 2

| download A-CPSW Operational Microcode |

Step N° 2 / 3 / 4

Step N° 3

| download A-CPSW FPGA picocode if necessary 1D13 on FC6501 2D13 on FC6502 |

| Make redundant Active | Step N° 5

Step N° 4

| Step N° 2 / 3 / 4 |

| download A-CPSW boot microcode |

| Step N° 6 / 7 |

Step N° 6

| Swap FPGA Picocode if necessary |

| Make redundant Active | Step N° 5

| Swap Microcode |

| Step N° 6 / 7 |

Step N° 7

| Check new code levels | → | Download Process Completed |

2 Code Download Method

2.1 Download the 8265 code files on your workstation

After the download of the files, on an AIX Workstation make sure that the files can be read by all users :

Log in as "root" Set the path to the microcode files directory

Enter: chmod a+r BOOTV412.BIN

Enter: chmod a+r PNNIV412.BIN or IISPV412.BIN

Enter: chmod a+r FPGA1D13.BIN (A-CPSW FC6501) or FPGA2D13.BIN (A-CPSW FC6502).

2.2 In-Band download method

You need to perform an inband download operation, using either:

- *Classical IP mode.*

  Make sure that your ATM network is configured for IP Over ATM (RFC 1577).To configure your ATM network for IP over ATM:

  1. Connect an ARP server to the ATM network. The ARP server will be used to map IP addresses to ATM addresses.
  2. For each A-CPSW module verify that the following parameters are configured:
       ➢ ATM address of the ARP server
       ➢ IP address and IP mask of the A-CPSW
       ➢ IP address of the default gateway
  3. Verify the IP connectivity to the TFTP server by entering a PING command for each active A-CPSW module.

- *Ethernet or Token Ring LAN-Emulation mode*

  Make sure your network is configured in Ethernet or Token Ring LAN-Emulation.To configure your network in Ethernet or Token Ring LAN-Emulation :

  1. You must have an Ethernet or Token Ring LAN-Emulation Server configured and ready. You can use the local LES of the 8265.

  2. You must configure the Ethernet or Token Ring LAN-Emulation Client on your 8265.

  3. You must have a TFTP Server somewhere in the IP network (either on the Emulated LAN, either behind an IP Gateway), and the microcode files installed on that TFTP Server.

  4. Check that you can PING the TFTP server from the 8265 LEC.

- *Serial Line IP support (SLIP) mode*

  Make sure your workstation can act as a TFTP server .

  1. Set up a A-CPSW Configuration Console in SLIP Mode:

  2. Then configuring the SLIP interface on the TFTP workstation will allow you to perform Inband Download between your workstation and the A-CPSW.

  3. The SLIP connection will be broken after a reset of the A-CPSW and connection will be operational in normal mode.

- *A-CPSW RJ45 Ethernet Port*

2.3 Out of Band Download method

- **FPGA picocode cannot be downloaded using this method, only boot and operational.**

Once you have the code on your A-disk or hard disk, and you have connected your PC on the RS232 port, using an RS232 emulated terminal, you have to type the following commands on the command line:

MAINTAIN

DOWNLOAD OUT-OF-BAND BOOT (or OPERATIONAL)

You then have to choose the Xmodem protocol and select the path where your code is located.

Note: This method is not recommended since it takes more time than the In-Band method
(15 secs versus 45mins).

3 Upgrading the 8265

- *IMPORTANT*

  The following steps are showing an example of Inband Download.
  You may log into the A-CPSW console either locally using an ASCII terminal connected to the A-CPSW console port, or remotely using a TELNET session. PLEASE, READ WHAT FOLLOWS CAREFULLY :

1. If you have only one A-CPSW (no redundant) follow the steps 1 to 4 then the steps 6 to 7.

2. If you have two A-CPSWs modules (one redundant A-CPSW) follow the steps 1 to 5 for main A-CPSW and the steps 2 to 4 then 6 and 7 for redundant A-CPSW .Then follow the steps 6 and 7 on main A-CPSW (see upgrade synopsis).

- *IMPORTANT*

  It is recommended to perform the following steps with NO OPERATIONAL TRAFFIC flowing your 8265 node. Typically, this would be scheduled as part of a maintenance period. You should save all your configuration parameters before.

Step 1: Saving Configuration before the upgrade

1. Setup the TFTP parameters by entering the following commands:

- *SET TFTP SERVER_IP_ADDRESS <ip address of the TFTP server>*

- *SET TFTP FILE_TYPE CONFIGURATION*

- *SET TFTP FILE_NAME*

  Note : Provide the full path of the file when prompted

2. Start the upload inband procedure by entering: UPLOAD

Step 2: Download Inband the 8265 A-CPSW operational microcode

Upgrade the new active A-CPSW operational microcode (PCMCIA) as follows:

1. Configure the TFTP parameters by entering the following commands:

    • *SET TFTP SERVER_IP_ADDRESS <ip address of the TFTP server>*

    • *SET TFTP FILE_TYPE OPERATIONAL*

    • *SET TFTP FILE_NAME*

    Type the full path name of the operational microcode file when prompted (its actual name is indicated in the Readme file).

2. Make sure you can reach the TFTP server by entering:
    PING <ip adress of the TFTP server>
      (Stop PING by entering: Ctrl+C)

3. Start the download inband procedure by entering:
    DOWNLOAD INBAND
      When prompted, type "Y" to confirm.

4. Wait for successful termination of the download operation. The message *Download successful* is displayed.
    This may also be checked by displaying the TFTP last transfer result through the command:
    "SHOW TFTP".

The command *"SHOW DEVICE"* displays the downloaded operational code level as backup.
It should display : v.4.1.0

Step 3 : Download Inband the 8265 A-CPSW FPGA picocode

This operation should be done only if your CPSW FPGA level is not uptodate, the latest level is 1D13 for A-CPSW FC6501 and 2D13 for A-CPSW FC6502.

1. Configure the TFTP parameters by entering the following commands:

    • *SET TFTP SERVER_IP_ADDRESS <ip address of the TFTP server>*

    • *SET TFTP FILE_TYPE FPGA*

    • *SET TFTP TARGET_MODULE <n>* (n=9 or 11 depending of active A-CPSW position)**.**

    • *SET TFTP FILE_NAME (Note : Type the full path name of the FPGA file when prompted)*

•*SAVE TFTP*

2. Make sure you can reach the TFTP server by entering:
PING <ip adress of the TFTP server>
  (Stop PING by entering: Ctrl+C)

3. Start the download inband procedure by entering:
DOWNLOAD

When prompted, type "Y" to confirm.

Wait for successful termination of the download operation (it may take up to 10 minutes). The message *Download successful* is displayed.
This may also be checked by displaying the TFTP last transfer result with the command: *"SHOW TFTP"*.

The command *SHOW MODULE <n> VERBOSE* (n=9 or 11 depending on A-CPSW active position) displays the FPGA level in backup.
It should appear as **1D13** or **2D13** depending of your A-CPSW feature code, respectively FC6501 and FC6502.

Step 4: Download Inband the 8265 A-CPSW boot microcode

Upgrade the new active A-CPSW boot microcode as follows:

1. Log in as the Administrator on the A-CPSW console

2. Perform the command**:**

•*SET DEVICE MIGRATION NOT_ALLOWED*

3. Upgrade the A-CPSW boot microcode as follows:

• Configure the TFTP parameters by entering the following commands:

  ➢ *SET TFTP SERVER_IP_ADDRESS <ip address of the TFTP server>*

  ➢ *SET TFTP FILE_TYPE BOOT*

  ➢ *SET TFTP FILE_NAME*

- Make sure you can reach the TFTP server by entering:
    PING <ip address of the TFTP server>
        (Stop PING by entering: Ctrl+C)

- Start the download inband procedure by entering:
    DOWNLOAD INBAND
        When prompted, type *"Y"* to confirm.

- Wait for successful termination of the download operation. The message Download successful is displayed.
This may also be checked by displaying the TFTP last transfer result with the command: *"SHOW TFTP"*.

The command *"SHOW DEVICE"* displays the new BOOT code version which will become active after an A-CPSW reset.

It should display: **v.4.1.2**.

If you have only one A-CPSW module go to step 6.

If you were upgrading your backup A-CPSW module go to step 6.

Step 5: Make the backup A-CPSW active

If you have a redundant A-CPSW make the backup one active by entering on the active A-CPSW:
- *SET DEVICE ROLE SECONDARY*

- *SAVE ALL*

- *RESET ATM_SUBSYSTEM*

- *Log in as the Administrator on the A-CPSW console*

- *The hub will reset and the backup A-CPSW will become active. GO TO STEP 2*.

Step 6: Activate the new A-CPSW microcodes and the new FPGA picocode

DO NOT PERFORM ANY SWAP BEFORE HAVING DOWNLOADED :

- OPERATIONAL CODE
- FPGA CODE (If necessary)
- BOOT CODE

1. Activate the new version of A-CPSW FPGA. picocode by entering the command:

  • *SAVE ALL*

  • *SWAP FPGA_PICOCODE 9 (or 11).The telnet session, if any, is broken due to the A-CPSW reset.*

  • *Login as Administrator on the A-CPSW console.*

2. Activate the new version of A-CPSW microcode by entering the command:

  •*SWAP MICROCODE* and confirm with *Y. Your remote TELNET session is broken.*

  •*Login as Administrator to the A-CPSW*

3. If you do not have redundant A-CPSW, go to step 7.
   If you had already swapped new FPGA picocode and microcode on both A-CPSW modules go to step 7. Check the new levels of codes .
      The following table lists the microcode and FPGA versions that must be displayed at completion of the upgrade. Use the following commands

  •*SHOW DEVICE*

  •*SHOW MODULE n VERBOSE (n could be 9 or 11)*

Component	FPGA version	Flash EEPROM version	Boot EEPROM Version
A-CPSW FC6501	**1D13**	**v4.1.2**	**v4.1.2**
A-CPSW FC6502	**2D13**	**v4.1.2**	**v4.1.2**

  Now make this A-CPSW be secondary again as it was before the beginning of the migration :

• *SET DEVICE ROLE SECONDARY*

• *SAVE ALL*

• *RESET ATM_SUBSYSTEM*

The hub will reset and the backup A-CPSW will become active.

Perform the **step 6** *again on the other A-CPSW.*

Step 7: Check the new levels of codes :

1. Login as ADMINISTRATOR on the active A-CPSW

2. The following table lists the microcode and FPGA versions that must be displayed at completion of the upgrade. Use the following commands

• *SHOW DEVICE*

• *SHOW MODULE n VERBOSE (n could be 9 or 11)*

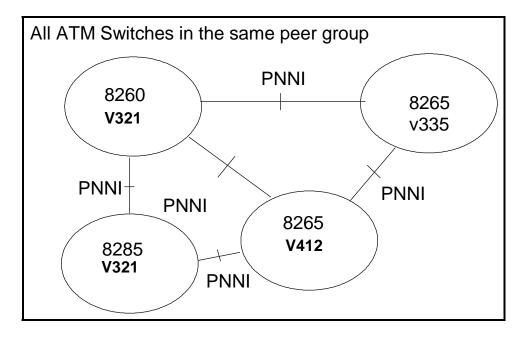| Component	FPGA version	Flash EEPROM version	Boot EEPROM Version
A-CPSW FC6501	**1D13**	**v4.1.2**	**v4.1.2**
A-CPSW FC6502	**2D13**	**v4.1.2**	**v4.1.2**

4 Downgrading from V412 to V401

The configuration is not kept, when downgrading from V412 to V401.

5 V3 Microcode Level Interoperating with PNNI V4

5.1 Within a single peer group

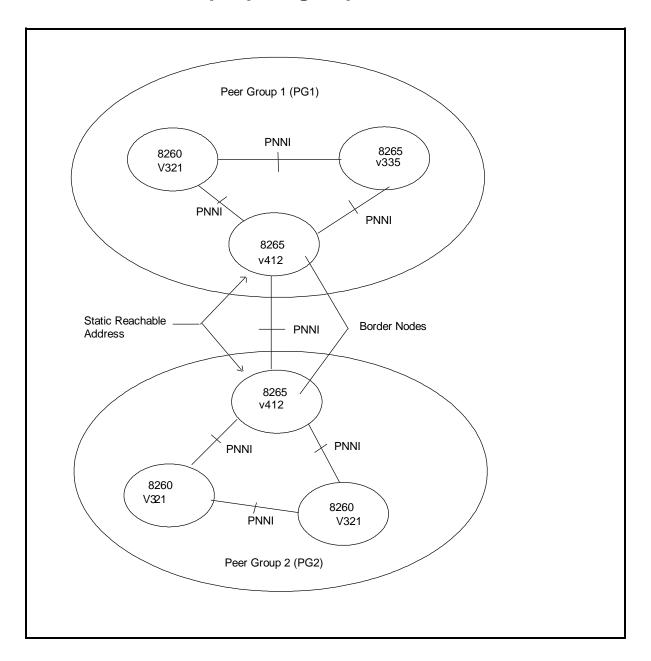Hierarchy function is disabled, the network will be a flat PNNI Network type.

All ATM Switches in the same peer group

8260 **V321** — PNNI — 8265 v335

8285 **V321**

8265 **V412**

PNNI

PNNI

PNNI

PNNI

PNNI

5.1.1 V3/V4 Interoperating microcode levels :

ATM Switch	V3	V4
8260	v3.2.1	not supported
8285	v3.2.1	not supported
8265	v3.3.5	v4.0.1/v4.1.2

5.2   Within a multiple peer group
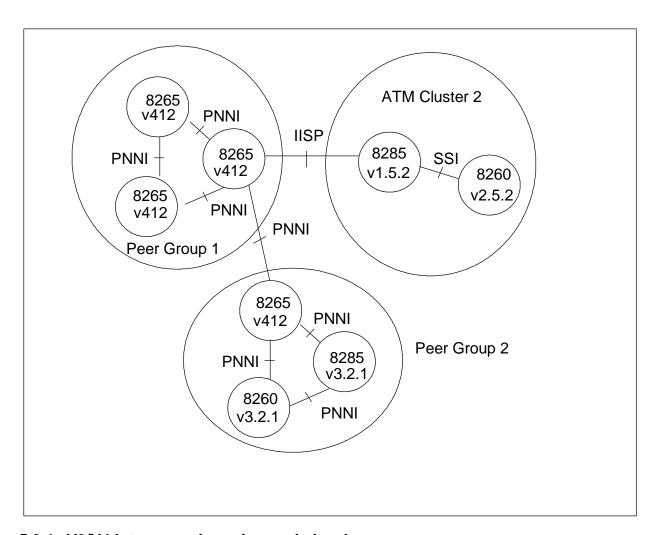
5.2.1 V3/V4 Interoperating microcode levels :

Interoperating microcode levels are the same as the one shown in previous table, V.3.2.1 for 8260 and 8285 and V3.3.5 for 8265.

5.2.2 V3 Nodes limitations

○ No V3 8260/8285 or 8265 ATM Switch can be Border Node in a PNNI Hierarchy Network.
○ No V3 8260/8285 or 8265 ATM Switch can be a Peer Group Leader (PGL) in a PNNI Hierarchy Network.

Turn around to V3 Limitation :

○ Static Reachable address must be entered manually on each 8265 (V4) Border Node PNNI link to other Peer Group.

Static Reachable address length should be shorter than automatic summarized reachable address in order not to disturb the PNNI routing protocol for PNNI V4.

(e.g)
In case over an Inter Peer Groups PNNI link (outside link being an Uplink), an automatic Internal Reachable ATM address is advertised with a given lenght :
    39.99.99.99.99.99.99.00.00.99.99.02 with length=96 bits

To make this Internal Reachability take precedence over the static one, enter this latter with shorter length=95
SET REACHABLE_ADDR<slot.port> 95 39.99.99.99.99.99.99.00.00.99.99.02

5.3 With V2 IISP Link

5.3.1 V3/V4 Interoperating microcode levels :

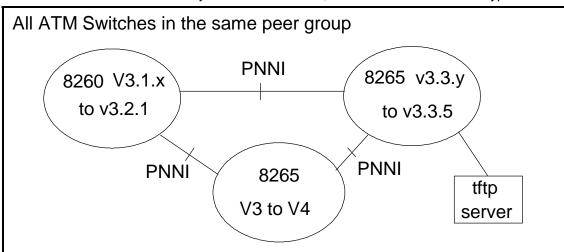| ATM Switch	V2	V3	V4 8265 CPSW FC6501&FC6502
8260	v2.5.4	v3.2.1	not supported
8285	v1.5.4	v3.2.1	not supported
8265	Not supported	v3.3.5	v4.0.0
8265	Not supported	v3.3.5	v4.0.1/v4.1.0/v4.1.2

Note
There is no functional problem on an IISP link connected a PNNI peer group to an ATM cluster, the 8260 or 8285 in V2 must be upgraded to respectively **v2.5.2 and v1.5.2**

6   8260/8285/8265 ATM Switch Migration

6.1 Within one peer group

In this case the full PNNI Hierarchy function is disabled, the network is a flat PNNI type Network.

All ATM Switches in the same peer group

8260 V3.1.x
to v3.2.1

PNNI

8265 v3.3.y
to v3.3.5

PNNI

8265
V3 to V4

PNNI

tftp
server

6.1.1 Migration Process

○ Download and activate v3.2.1 on the 8260 ATM Switch (farthest to closest from tftp server).
○ Download and activate v3.3.5 on the 8265 ATM Switch (farthest to closest from tftp server).
○ Download and activate v4.1.2 on the 8265 ATM Switch (farthest to closest from tftp server)

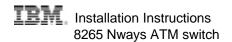This PNNI Peer Group will stay a flat PNNI Network, the hierarchy is disabled.

No PNNI setting is required (see Important Notice below)..

Minimum 8260/8285 code required before upgrade to v3.2.1 : **v3.1.7**
Minimum 8265 code required before upgrade to v3.3.5 : **v3.3.2**

Important Notes :
•   If Node:0 PNNI Level was changed to a level higher than 96 (e.g 88, 80,...), upon migration this higher
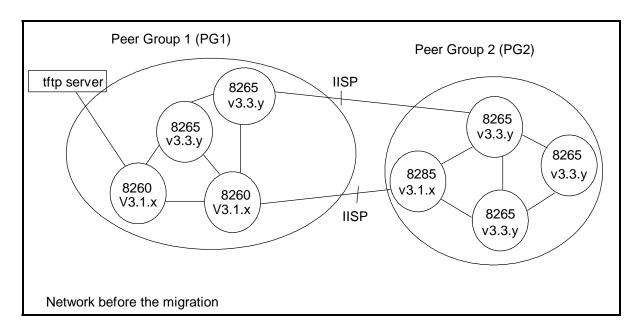   level

will stay the same. But Static Reachable addresses being defaultly migrated to UNI V4 organizational level 1 that maps PNNI scoping level 96 won't even be advertized outside the switch. (Their scoping level being lower than the Node level).
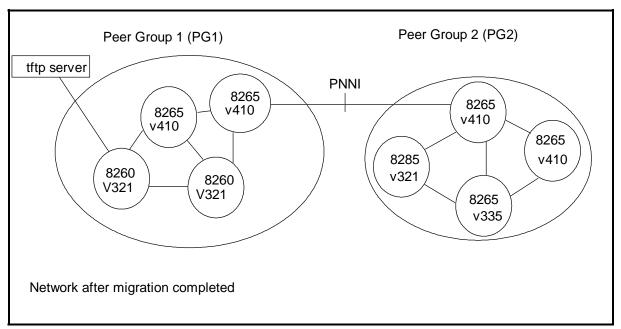 To get rid of this problem, the customer could either, before migration, set back the node:0 level to 96, or, after migration, set the static reachable address scoping to an higher organizational level (to a level at least equal to the node:0 one).

- At migration time from V3 to V4, any **PUBLIC UNI** links will turn to **VOID** links.

6.2 Within multiple peer group

Peer Group 1 (PG1)

Peer Group 2 (PG2)

tftp server

IISP

8265
v3.3.y

8265
v3.3.y

8265
v3.3.y

8265
v3.3.y

8285
v3.1.x

8260
V3.1.x

8260
V3.1.x

IISP

8265
v3.3.y

Network before the migration

Peer Group 1 (PG1)

Peer Group 2 (PG2)

tftp server

PNNI

8265
v410

8265
v410

8265
v410

8265
v410

8285
v321

8260
V321

8260
V321

8265
v335

Network after migration completed

6.2.1 Migration Process & Minimum PNNI settings

I/ Pre-Requisite V3 code Installation and Activation on 8260/8285 and 8265

- Download and Activate v3.2.1 code from the farthest to closest 8260/8285 ATM Switch
- Download and Activate v3.3.5 code from the farthest to closest 8265 ATM Switch

II/ V4 code Installation and Activation on 8265

- Download and Activate v4 code from the farthest to closest 8265 ATM Switch

  Minimum PNNI Hierarchy Settings :
  Set Leader ship priority at least on 2 nodes per Peer Group. One for the active and one as
  Backup Peer Group Leader.
  Command : SET PNNI NODE:0 LEADER_PRIORITY N
  N could be :
  0=> Node can not be Peer Group Leader
  1-205 => Priority level

III/ Enable PNNI Hierarchy
- In case two IISP links linked the two peer groups, you can remotely via telnet session, Disable the 8265(V4) IISP Port and re-enable it as PNNI Port on both ATM Switches.

IMPORTANT NOTE

- In case only one IISP link exists between the two peer groups, after the IISP port is disabled it will be impossible to join the remote 8265 via a telnet session, the disabled Port will be re-enabled locally as a PNNI Port with a local console.

  IV/ Verify the old static Reachable address length, they should be shorter than 96 bits
- Address scoping for Static Reachable addresses
  - ○ Defaultly Static Reachable addresses are migrated with scoping level "96" or UNI V4 scope 1-3 .
  - ○ If you change node :0 level to higher value (eg:88), Static Reachable addresses won't be advertized outside the node.
  - ○ To make the node advertized Static Reachable addresses increase their scope to (at least) node:0 level :
    use the command : *SET REACHABLE_ADDRESS <slot.port> 88 39.99999999999900009999 scope organizational : 4*
  - ○ Scope organizational : 4 maps Peer Group level 80.
  - ○ Note that there is no other means of entering scope in V4.

6.2.2 Default UNI Scope to PNNI Level Mappings
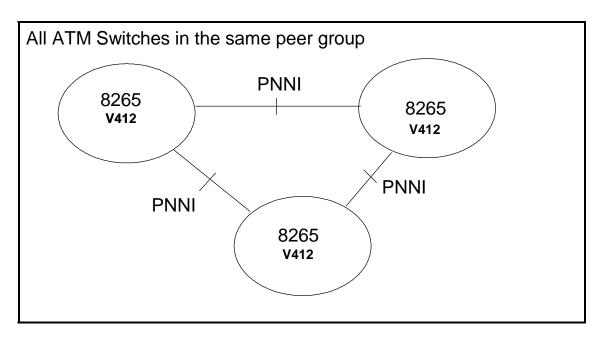
UNI scope	PNNI Routing Level Indicator
1-3	96
4-5	80
6-7	72
8-10	64
11-12	48
13-14	32
15 (global)	0

7   New 8265 ATM Switch R4.1 Installation

Warning : The default memory profile from a new PCMCIA is a P2M

7.1   Multiple 8265 V4 within a single PNNI Peer Group

All ATM Switches in the same peer group
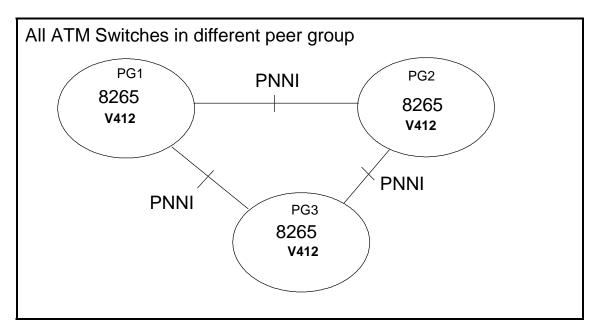

7.1.1 Minimum PNNI Settings

○ ATM address to change on each Node (common Peer Group ID)

Note :

All other settings could be default

7.2 Multiple Peer Group

All ATM Switches in different peer group

PG1
8265
V412

PNNI

PG2
8265
V412

PNNI

PNNI

PG3
8265
V412

7.2.1 Minimum PNNI Settings

❍ ATM address to change in each Peer Group on each node
❍ Common Peer Group ID on each node in each Peer Group

Note :

All other settings could be default

END OF DOCUMENT