IBM 8285 NWAYS WORKGROUP SWITCH

INSTALLATION INSTRUCTIONS

for

8285 CONTROL-POINT MICROCODE UPGRADE

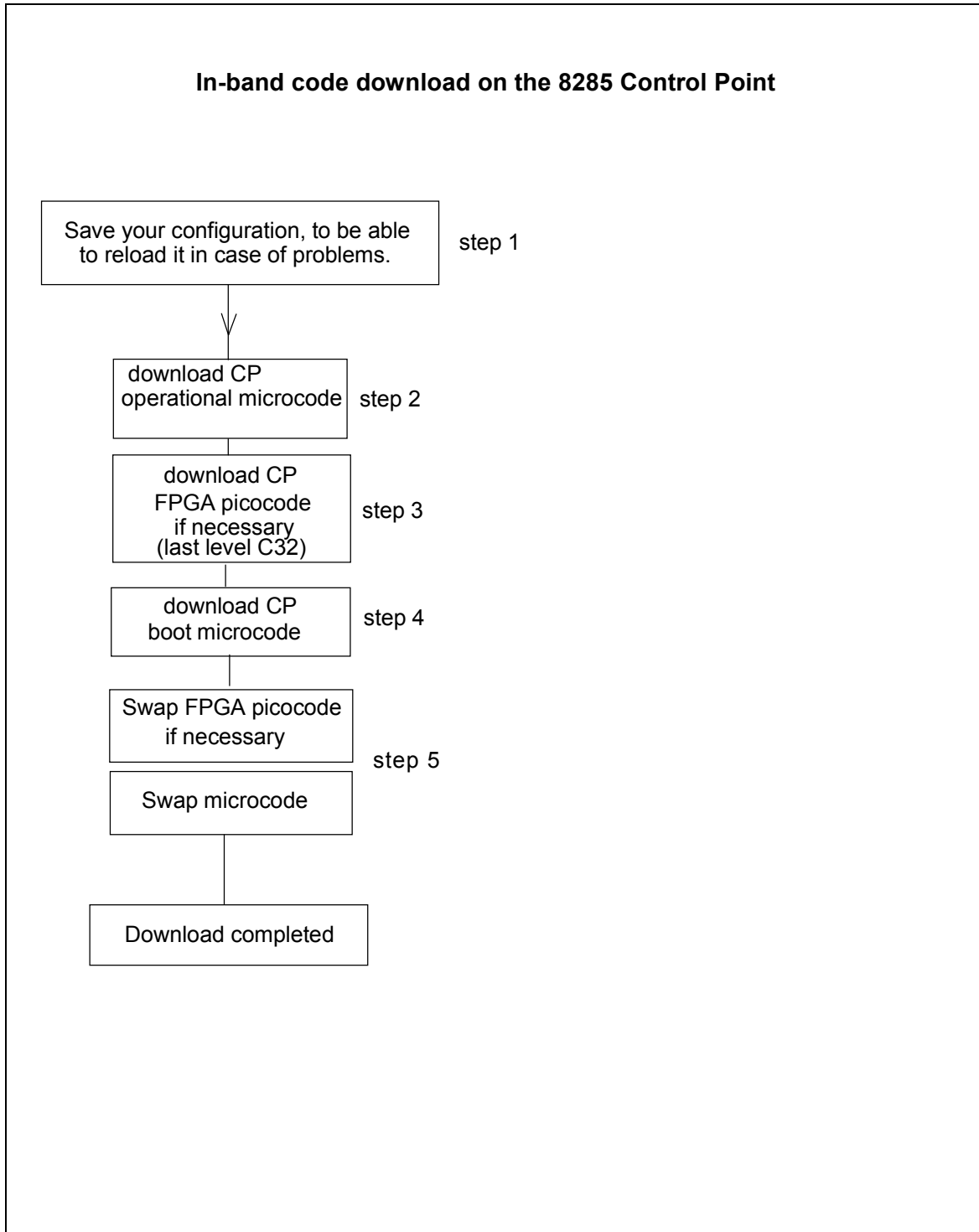# PNNI VERSION V.3.2.3

TABLE of CONTENTS

Upgrade synopsis

In-band code download on the 8285 Control Point

| Save your configuration, to be able to reload it in case of problems. | step 1 |

| download CP operational microcode | step 2 |

| download CP FPGA picocode if necessary (last level C32) | step 3 |

| download CP boot microcode | step 4 |

| Swap FPGA picocode if necessary | |
| Swap microcode | step 5 |

| Download completed |

1.1 Prerequisites

Microcodes V.1.x are no longer supported.

Only V.3.2.3 is now supported.

If your 8285 has not been upgraded with MES 5509, P/N 10J2458 (memory upgrade), this microcode will not run.

The minimum FPGA level required for the 8285 Control Point is C32.

1.2 Copying Operational/Boot and FPGA 8285 Control Point Codes on your workstation

1.2 .1 Code download from the Web

The code upgrade files posted on the Web are available to upgrade (or restore) an 8285 Control Point. They consist of the boot and operational microcodes, the FPGA and MIB codes, so that text files in plain text or PDF (Acrobat reader) format.

These files must be placed in a directory reachable through TFTP, like /tmp for a Unix/AIX station, so that In-Band download toward the CP can be performed.

 After package file has been downloaded and unzipped, 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 8285BTV323.BIN

 Enter: chmod a+r 8285V323.OPE

 Enter: chmod a+r SWPGAC32.ENC

1.2 .2 In-Band download method

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

		June 01, 2001		*Page 4*

- **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. Verify that the following parameters are configured:

- ATM address of the ARP server

- IP address and IP mask of the 8285 Control Point

- IP address of the default gateway

3. Verify the IP connectivity to the ARP server by entering a PING command.

4. Verify the IP connectivity to the TFTP server by entering a PING command.

- **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 8285.

2. You must configure the Ethernet or Token Ring LAN-Emulation Client on your 8285.

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 8285 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 8285 Control Point.

3. The SLIP connection will be broken after a reset of the Base Unit and connection will be operational in normal mode.

1.2 .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.

1   Upgrading the 8285

YOU SHOULD MIGRATE YOUR NETWORK CLUSTER BY CLUSTER AND YOU SHOULD
DOWNLOAD THE FPGA CODE AND MICROCODE ON ALL YOUR 8260 AND 8285 SWITCHES (in
the cluster) BEFORE PERFORMING ANY SWAP COMMAND.

NOTE THAT INTEROPERABILITY BETWEEN V.1.X.X CLUSTERS AND V.3.X.X PEER-GROUPS
IS POSSIBLE THROUGH NNI AND IISP LINK RESPECTIVELY.

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

1.1 Step 1: Saving Configuration before the upgrade

It is recommended to perform the following steps with **NO OPERATIONAL TRAFFIC** flowing in your
ATM campus network. Typically, this would be scheduled as part of a maintenance period. You
should save all your configuration parameters before.
Before you begin the upgrade procedure we recommend to upload the configuration of each 8285 in
your network :

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*

- *Provide the full path of the file when prompted*

2 Start the upload inband procedure by entering: UPLOAD

1.2 Step 2: Download Inband the 8285 Operational microcode

Upgrade the 8285 Control Point operational microcode 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. 3.2.3.**

1.3 Step 3 : Download Inband the 8285 FPGA picocode

 This operation should be done only if your 8285 Control Point FPGA level is not uptodate, the latest level is **C32**.

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 FILE_NAME*

- *Type the full path name of the FPGA file when prompted*

- *SET TFTP TARGET_MODULE <1>*

- *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 INBAND
      When prompted, type "Y" to confirm.

4 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 <1> VERBOSE* displays the FPGA level in backup.
It should appear as **C32**.

1.4 Step 4: Download Inband the 8285 boot microcode

Upgrade the 8285 Control Point boot microcode as follows:

1 Log in as the Administrator on the 8285 console

2 Perform the command:

   •*SET DEVICE MIGRATION NOT_ALLOWED*

3 Upgrade the CP boot microcode (Boot EEPROM) 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*

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

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

IBM

• 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 8285 reset.
It should display: **v.3.2.3.**

1.5 Step 5: Activate the new 8285 microcodes and the new FPGA picocode

DO NOT PERFORM ANY SWAP BEFORE HAVING DOWNLOADED :

1 OPERATIONAL CODE

2 FPGA CODE (If necessary)

3 BOOT CODE

4 Activate the new version of 8285 Control Point FPGA. picocode by entering the command:

- *SAVE ALL*

- *SWAP FPGA_PICOCODE 1.The telnet session, if any, is broken.*

- *Login as* **Administrator** *on the 8285 console.*

5 Activate the new version of 8285 microcode by entering the command:

- *SWAP MICROCODE and confirm with Y. Your remote TELNET session is broken and you have to connect locally an ASCII terminal to the CP console port to get the connectivity again.*

- *Login as* **Administrator** *on the 8285 ASCII console.*

6 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 <1> VERBOSE*

Component	FPGA version	Flash EEPROM version	Boot EEPROM Version
8285 CP	**C32**	**v.3.2.3**	**v.3.2.3**

IBM

WARNING

Because of the major differences of operations between PNNI-1 and SSI, all your PVC are cleared, all logical links and static routes will be deleted.
Before performing any swap, record your network parameters for LOGICAL LINK, STATIC ROUTE, ATM ADDRESS and VPC (record those information on a sheet of paper):

Example for CLUSTER 1:

1. HUBb>**SHOW LOGICAL_LINK ALL** will display

PORT	VPI	ACN	SIDE	MODE	SIG	TRAF	BWITH	STATUS	INDEX
3.1	3	02	USER	ENABLE	3.1	ANY	85000	UP	1

2. HUBb>**SHOW STATIC ROUTE** will display :

INDEX	ACN	STATIC ROUTE
1	02	39.99.99.99.99.99.99.00.00.88.88.03

3. HUBb>**SHOW DEVICE** will display :

   ATM ADDRESS: 39.99.99.99.99.99.99.00.00.77.77.01.02.00.00.82.60.01.02.00

4. HUBb>**SHOW PVC ALL** will display :

port	id	type	Vpi/Vci	Port	Vpi/Vci	Hnb	Party	Role	QOS	Status
1.01	4	PTM-PVC	1/50	4.01	2/40	3	0	Primary	BE	Active

		June 01, 2001		*Page 13*

2 SET MINIMUM PNNI PHASE-1 PARAMETERS.

NOTE THAT INTEROPERABILITY BETWEEN V.1.X.X CLUSTERS AND V.3.X.X
PEER-GROUPS IS POSSIBLE THROUGH NNI AND IISP LINK RESPECTIVELY.

Figure 2, represents a network configured with 8260/8285. In this example there are two subne-
works (X and Y), three clusters and four hubs, using UNI/SSI/NNI links. You should recognize in this
drawing the different components of your current network.

Subnetwork X (ATM address 39.99.99.99.99.99.0.9.77.77)

Cluster 1 (ACN=1)

Cluster 2 (ACN=2)

WS 1

WS 2

UNI

4.3

3.2   **2.1**   **3.1**   **4.1**   **5.1**

SSI   **vpi3**   **NNI** **vpi3**

HUB a (HN=1)   **HUB b (HN=2)**   **HUB c (HN=1)**

NNI   **vpi0**

Subnetwork Y (ATM address 39.99.99.99.99.99.99.0.0.88.88)

Cluster 3 (ACN=3)

WS 3

4.3   **6.1**

HUB d (HN=1)

Figure 2. Example of an ATM network.
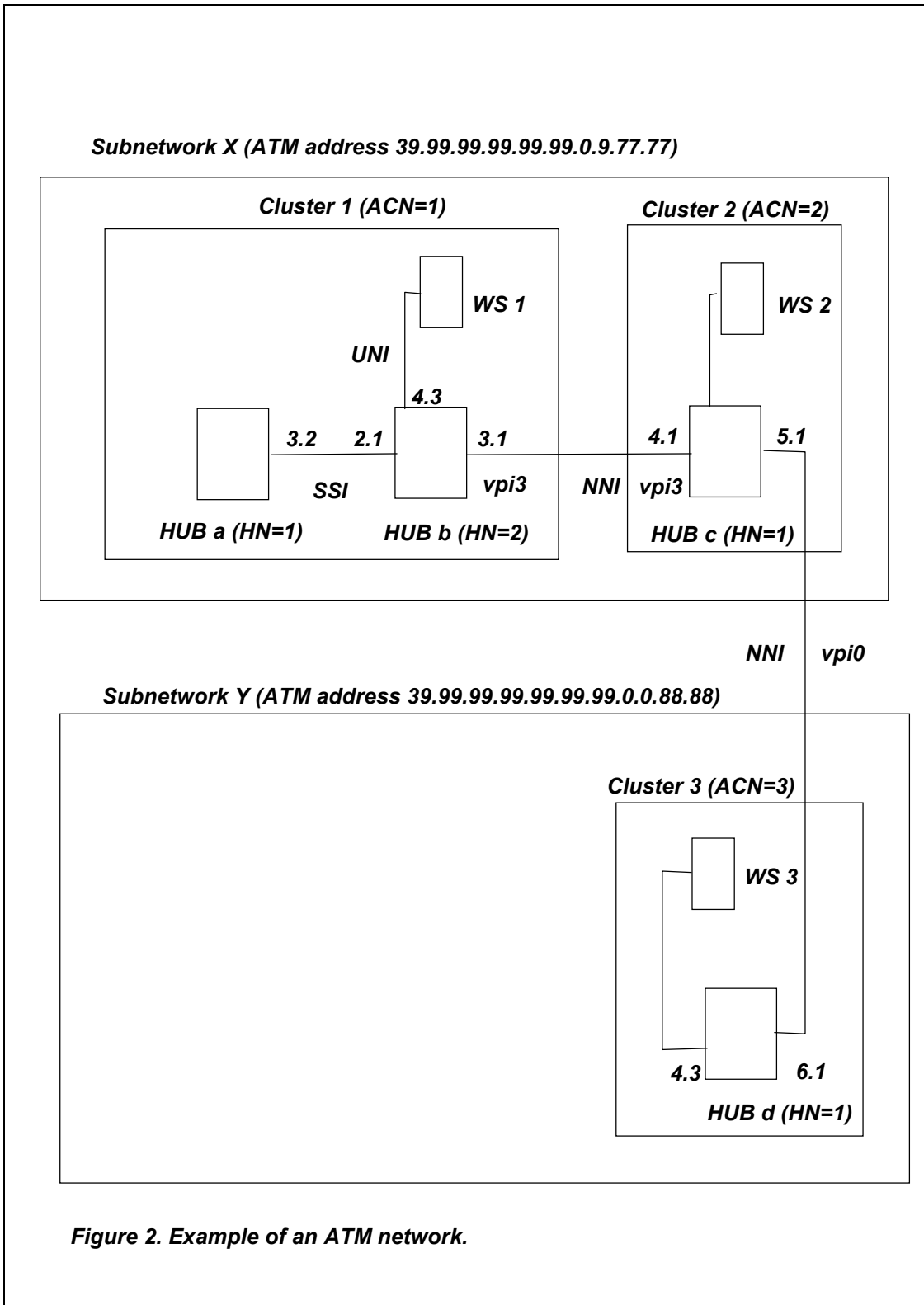
2.1 Example of a migration to PNNI phase 1 (see figure 3)

Figure 3 represents your network after migration to PNNI phase-1.
You can note that

- *CLUSTER changes to PEER GROUP*

- *SSI changes to PNNI*

- *NNI changes to IISP.*

Subnetwork X (ATM address 39.99.99.99.99.99.0.9.77.77)

Peer Group 1

Peer Group 2

WS 1

WS 2

UNI

4.3

3.2   *2.1*   *3.1*   *4.1*   *5.1*

PNNI   vpc3   *IISP*   vpc3
                          void

HUB a (HN=1)   HUB b (HN=2)   HUB c (HN=1)

IISP   *vpc0*

Subnetwork Y (ATM address 39.99.99.99.99.99.99.0.0.88.88)

Peer Group 3

WS 3

4.3   *6.1*

HUB d (HN=1)

Figure 3. Example of a network in level PNNI phase 1
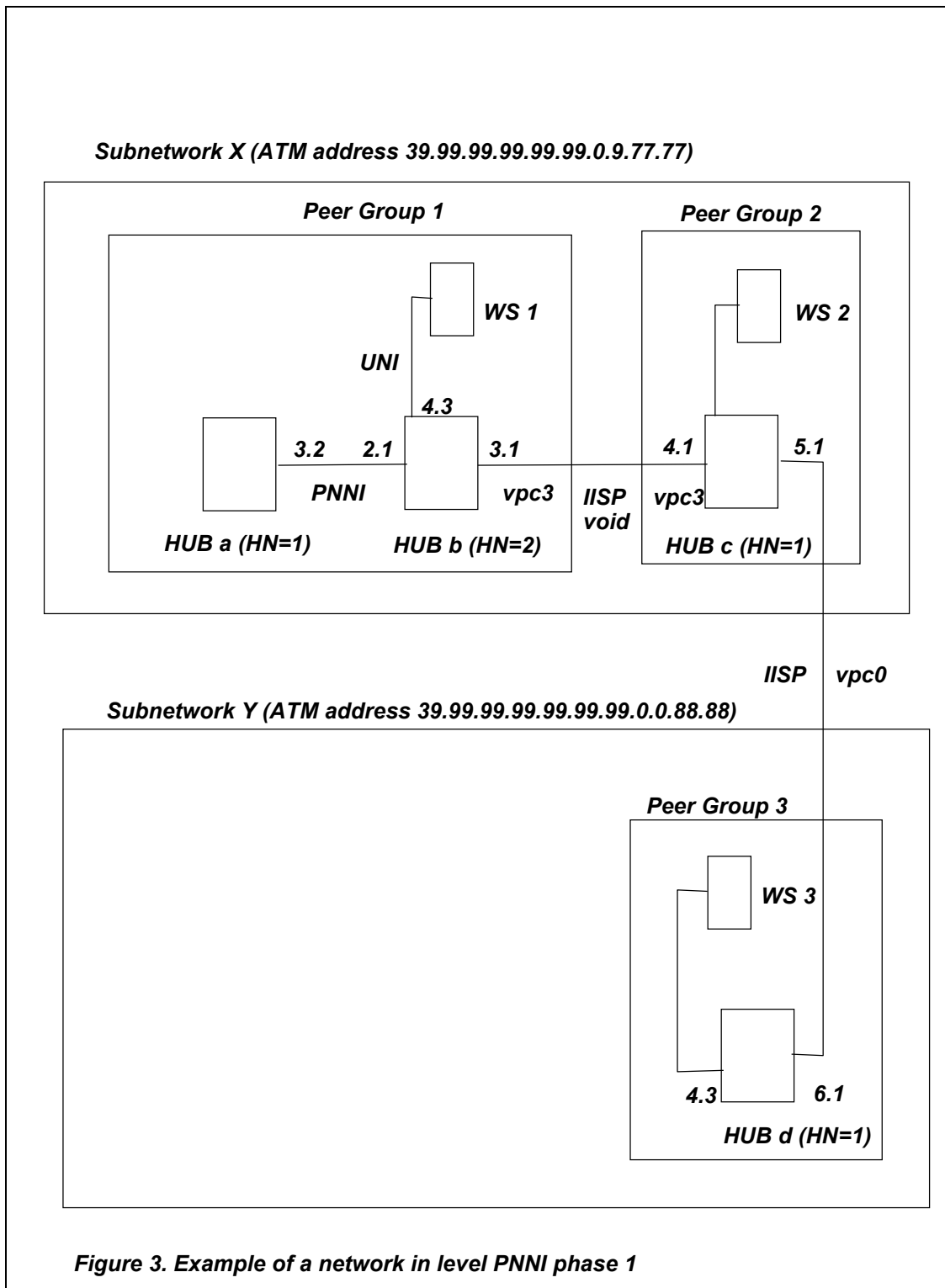
2.1 .1 Migration of PEER GROUP 1 - HUB a

---ATM ADDRESS SETTING --

After having completed the swap, the ATM address has been migrated to the Node-0 ATM
address, but the PNNI Summary Address was set to a default value. So you need to enter the
old ATM address again, *with a new selector*, by issuing the following command :

o HUBa>set pnni node_0 atm_address:
    39.99.99.99.99.99.99.00.00.77.77.01.01.00.00.82.60.01.01.**01**

o HUBa>SHOW FUTURE_PNNI NODE_0
    Check your new ATM address.

o HUBa>COMMIT PNNI , the 8285 will be reset
    The telnet session if any is broken.
    Login as ADMINISTRATOR on the 8285 console.

o HUBa>SHOW PNNI NODE_0
    Check your ATM address. It will display information about : LEVEL
    ID, PEERGROUP ID, NODE ID.

--- PORT SETTING ---

AUTOMATICALLY MIGRATED.

--- VIRTUAL PATH CHANNELS SETTING (VPCS) : --------------------------------

No VPC links need to be defined

--- REACHABLE ADDRESS SETTING : --

No REACHABLE ADDRESS need to be defined

IBM.

2.1 .2 Migration of PEER GROUP 1 - HUB b

--- ATM ADDRESS SETTING ---

   After having completed the swap, the ATM address has been migrated to the Node-0
ATM address, but the PNNI Summary Address was set to a default value. So you need to
enter the old ATM address again, *with a new selector*, by issuing the following command :

   o HUBb>set pnni node_0 atm_address:
       39.99.99.99.99.99.99.00.00.77.77.01.02.00.00.82.60.01.02.**01**

   o HUBb>SHOW FUTURE_PNNI NODE_0
       Check your new ATM address.

   o HUBb>COMMIT PNNI, the 8285 will be reset
       The telnet session if any is broken.
        Login as ADMINISTRATOR on the 8285 console.

   o HUBb>SHOW PNNI NODE_0
       Check your ATM address. It will display information about : LEVEL ID,
        PEERGROUP ID, NODE ID.

---- PORT SETTING --

After having completed the swap, the SSI port automatically became an enabled PNNI port
and the NNI port became a disabled IISP port, so you need to re-enable the IISP port only:
   1. Enable all your old NNI port (now IISP) as VOID port.
        HUBb>SET PORT 3.1 ENABLE VOID

   2. SETTING FOR UNI PORT. No change is needed for the port set as UNI before the
migration, the port 4.3 of HUBb has been left after migration as UNI enabled.

--- VIRTUAL PATH CHANNELS SETTING (VPCS) : -------------------------------

For each LOGICAL LINK in v1.x.x (if VPI was not equal to 0) you must define a VPC link in v.3.x:

1. To set your new VPC_LINKS, YOU NEED THE V2.X.X PARAMETERS YOU
   HAVE WRITTEN DOWN IN STEP 6.
   example for old CLUSTER 1 HUB b (figure2), now PEER GROUP 1,HUB b (fig 3):

   The VPI on the LOGICAL LINK 3.1 was 3.
   Use VPI 3 to set up the new VPC_LINK.
     HUBb>SET VPC_LINK 3.1 3 ENABLE IISP USER BANDWIDTH:85000

--- REACHABLE ADDRESS SETTING : ---

After having completed the swap, you lose your STATIC ROUTES and LOGICAL LINKS

 o Define the reachable address over the IISP link with your old static route and your old VPI.

    example for PEER GROUP 1 HUBb (figure3):
      HUBb>SET REACHABLE_ADDRESS
      3.1 96 39.99.99.99.99.99.99.00.00.77.77.02 VPI:3
      3.1 96 39.99.99.99.99.99.99.00.00.88.88.03 VPI:3

 o Check that your reachable address is active (Y) with the command:
    example for PEER GROUP 1 HUBb (figure3):
    HUBb>SHOW REACHABLE_ADDRESS 3.1

2.1 .3 Migration of PEER GROUP 2 - HUB c

--- ATM ADDRESS SETTING ---

After having completed the swap, the ATM address has been migrated to the Node-0 ATM
address, but the PNNI Summary Address was set to a default value. So you need to enter the
old ATM address again, *with a new selector*, by issuing the following command :

o HUBc>set pnni node_0 atm_address:
   39.99.99.99.99.99.99.00.00.77.77.02.01.00.00.82.60.02.01.**01**

o HUBc>SHOW FUTURE_PNNI NODE_0
   Check your new ATM address.

o HUBc>COMMIT PNNI, the 8285 will be reset
   The telnet session if any is broken.
   Login as ADMINISTRATOR on the 8285 console.

o HUBc>SHOW PNNI NODE_0
   Check your ATM address. It will display information about : LEVEL ID,
    PEERGROUP ID, NODE ID.

--- PORT SETTING --

After having completed the swap, all the NNI ports will become disabled IISP ports,
so you need to re-enable them : enable all your old NNI ports (now IISP) as VOID ports.

1. HUBc>SET PORT 4.1 ENABLE VOID

2. Because in the example the vpc between hubc and hubd is ZERO, you can
    define the port 5.1 as IISP:
    HUBc>SET PORT 5.1 ENABLE IISP

3. SETTING FOR UNI PORT. No change is needed for the port set as UNI
    before the migration.

--- VIRTUAL PATH CHANNELS SETTING (VPCS) : -------------------------------

For each LOGICAL LINK in v1.x.x (if VPI was not equal to 0) you must
  define a VPC link in v3.x :

  1. To set your new VPC_LINKS, YOU NEED THE V1.X.X PARAMETERS YOU HAVE
     WRITTEN DOWN IN STEP 6.

     example for old CLUSTER 2 HUBc (figure2), now PEER GROUP 2,HUB c:
     The VPI on the LOGICAL LINK 4.1 was 3.
     Use VPI 3 to set up the new VPC_LINK on PORT 4.1.
     HUBc>SET VPC_LINK 4.1 3 ENABLE IISP NETWORK BANDWIDTH:85000

---REACHABLE ADDRESS SETTING : ---------------------------------------

After having completed the swap, you lose your STATIC ROUTES and LOGICAL LINKS

  o Define the reachable address over the IISP link with your old static
     route and your old VPI.

     example to set up reachability to PEER GROUP 1 HUBb (figure3):
       HUBc>SET REACHABLE_ADDRESS
       4.1 96 39.99.99.99.99.99.99.00.00.77.77.01 VPI:3

     example to set up reachability to PEER GROUP 3 HUBd (figure3):
       HUBc>SET REACHABLE_ADDRESS
       5.1 96 39.99.99.99.99.99.99.00.00.88.88.03

  o Check that your reachable address is active (Y) with the command:
       HUBc>SHOW REACHABLE_ADDRESS 5.1
       HUBc>SHOW REACHABLE_ADDRESS 4.1

2.1 .4 Migration of PEER GROUP 3 - HUB d

--- ATM ADDRESS SETTING --

> After having completed the swap, the ATM address has been migrated to the Node-0 ATM address, but the PNNI Summary Address was set to a default value. So you need to enter the old ATM address again, *with a new selector*, by issuing the following command :
>
> o HUBd>set pnni node_0 atm_address:
>   39.99.99.99.99.99.99.00.00.88.88.03.01.D0.E0.20.15.16.17.**19**
>
> o HUBd>SHOW FUTURE_PNNI NODE_0
>   Check your new ATM address.
>
> o HUBd>COMMIT PNNI, the 8285 will be reset
>   The telnet session if any is broken.
>   Login as ADMINISTRATOR on the 8285 console.
>
> o HUBd>SHOW PNNI NODE_0
>   Check your ATM address. It will display information about : LEVEL ID,
>   PEERGROUP ID, NODE ID.

--- PORT SETTING ---

> After having completed the swap, your NNI port will become a disabled IISP port, so you need to re-enable it :
> Enable your old NNI port (now IISP) as IISP
> Because in the example, the VPC between hubd and hubc is ZERO, you can define the port 6.1 as IISP:
> HUBd> SET PORT 6.1 ENABLE IISP

--- VIRTUAL PATH CHANNELS SETTING (VPCS) : ---------------------------------

> No VPCs links need to be defined

--- REACHABLE ADDRESS SETTING : --

After having completed the swap, you lose your STATIC ROUTES and LOGICAL LINKS

o   Define the reachable address over the IISP link with your old static
    route and your old VPI.

    example to set up reachability to PEER GROUP 1 HUBa and b (figure3):
      HUBd>SET REACHABLE_ADDRESS
      6.1 96 39.99.99.99.99.99.99.00.00.77.77.01

    example to set up reachability to PEER GROUP 2 HUBc (figure3):
      HUBd>SET REACHABLE_ADDRESS
      6.1 96 39.99.99.99.99.99.99.00.00.77.77.02

o   Check that your reachable address is active (Y) with the command:
    HUBd>SHOW REACHABLE_ADDRESS 6.1

--- NOW TRY TO PING.. --

   To be sure you have successfuly completed PNNI installation, in the case you have set TCP/IP
parameters in a classical IP or LAN Emulation network, enter from HUB b, PING x.y.z.w where
x.y.z.w is the HUB c ip address, then enter from HUB b, PING a.b.c.d where a.b.c.d is the HUB d ip
address.

--- MIGRATION COMPLETE --

END OF DOCUMENT