IBM 8265 Nways ATM Switch

This release note applies

to

ATM Control Point version

V4.1.3

PNNI and IISP

Table of Contents

1.0 WARNING

- The **V4.1.0 is the pre-requesite CPSwitch code to use** the 622Meg 1P SMF module Long Haul (FC 6513) and 622Meg 1P SMF NEBS (FC6514) cards.

- **CPSW2 modules only:** *To prevent unrecoverable hardware damage, do not install a v.3.x PCMCIA card, or download v.3.x code onto the CPSW2 module (FC6502).*

- This code release supports up to 2 levels of PNNI hierarchy (level 0 and level 1).

- In case of multi-vendor ATM switches interconnection in a PNNI hierarchical network, make sure that other switches are able to exercise correctly in a full-PNNI hierarchical network, before connecting it to an 8265 IBM V4 node.

- The CPSW2 module (FC6502) includes an integrated power controller (for fan and inventory management). The module contains a **red switch** located on the bottom left of the circuit board. Before installing the CPSW2 module, check that this switch is correctly set:

    - ❖ Switch OFF: Integrated Power Controller is Active.

    - ❖ Switch ON: Integrated Power Controller is Inactive.

- To interconnect with 8260s, 8285s, or 8265s that do not support PNNI hierarchies, you must upgrade the code on these switches to code level v3.2.1 (for 8260/8285) and v3.3.5 (for 8265). (See *8265 Installation Guide.*)

- The CPSW2 (FC6502) does not support 8260 ATM Media Modules (no backward compatibility).

- Migration limitation from PNNI V3 code to PNNI V4 code (See section *5.3 Address Scoping for Static Reachable Addresses*).

- PNNI related commands have been modified (see *8265 Command Reference Guide*).

- At migration time from V3 to V4, all ports DEFINED as public UNI will turn to VOID.

- If the 8371 blade associated module is "connected", the activation of a LES/BUS on the 8265 CP/Switch CAN BE used for configurations with less than 1000 broadcast frames per second. For bigger configurations, the use of MSS is mandatory, do not use the 8265 LES/BUS.

2.0 New Features and Functions

8265 Release v4.1.2 & v4.1.3 brings the following new features :

- One-slot Multiprotocol Switched Services (MSS) 3.0 module (FC 5403) with an enhanced hardware version performing an average of 50% faster over MSS 2.5 module and preloaded with microcode V2R2.

- Support of the IBM 8371 multilayer Ethernet Switch blade.

2.1 ATM Connection Snooping new function

① Purpose

  Easing PD/PSI by offering the capability to mirror cell traffic over a given connection (P2P or P2M) and in BOTH directions (P2P) .

② Principles

  This new function applies to VCCs (Virtual Channel Connections of SVC or PVC types) and to VPC (Virtual Path Connections of SVP or PVP types).
  The monitored port or vpc-link can be of any type between UNI, PNNI, IISP or VOID type and in a similar way the monitoring port or vpc-link can be of any type.

- The monitored and the monitoring ports need not be of the same type. (eg: VPI/VCI : 0/132 of UNI port 5.3 is mirrored by VPI/VCI 4/434 on PNNI port 3.1)

- On the monitoring port the VPI/VCI must not be already used by another connection (standard connection, control connection (0/5, 0/16, 0/18) or already monitored connection)

- The monitoring connection must be defined on a connected module and an enabled port (eg: for the example above module 3 must be connected and port 3.1 enabled)

- If the monitoring port is disabled, or if the monitoring module is disconnected, then the snooping connections running on this port will be deleted. Conversely if the monitoring port gets in "down-establishing" state then the monitoring connections will recover as soon as the port is up again.

- Normal Data and Control connections, i.e Signalling, ILMI, PNNI and internal port (Control Point) connections can be monitored

- Either the receive or the transmit or both directions can be monitored. When both directions are being monitored different VPI/VCI couples must be used for each direction (eg: if both directions of VPI/VCI 0,125 on port 4.3 are to be monitored then one could select VPI/VCI 4/280 on port 14.2 for transmit and VPI/VCI 6/654 on port 5.4 for receive). Note that both directions could be mirrored on the same monitoring port but on different VPI/VCIs.

- Connection snooping is not disruptive as no cell loss occurs on the monitored connection when snooping is enabled or disabled

- The number of snooped connections should not exceed 100 per 8265 and 8260 modules can not be monitored or can not monitor another blade

- Compared with old port snooping, new ATM connection snooping is much more powerful and requires neither a fully snooping dedicated blade nor a snooping blade identical to the snooped blade

- Old port snooping function capability is still available

- If on a monitoring port a PVC or a PVP is defined to a remote destination then an external analyzer can be installed remotely.(including the monitoring vpi.vci).

③ Details

To help user's investigation the snooped connections currently built can be checked at any time.The user can ask for a specific module/port/Vpi/Vci snooping connection or the complete list of snooped connections.

The following command should be used for connection snooping:

- Enabling Connection:

  snoop_connection|slot.port.vpi.vci |enable|/receive_dir: slot.port.vpi.vci |transmit_dir:slot.port.vpi.vci

  Note that case the snooped connection is an SVP or a PVP , VCI number should be replaced by : vci_none

  vci_none : the connection to be snooped is a VP

- Disabling connection:

  snoop_connection |slot.port.vpi.vci |disable/ *receive_dir*

  Note that here only the receive direction of snooping is deleted

  snoop_connection |slot.port.vpi.vci |disable/ *transmit_dir*

  Note that here only the transmit direction of snooping is deleted

  snoop_connection |slot.port.vpi.vci |disable/

  Note that here both snooping directions are deleted for the given connection

  snoop_connection disable

  Note that here snooping is disabled for all onnections

- Displaying connection:

  show/*snoop_connection |slot.port.vpi.vci*
                                      | *all*

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3.0 Fixes

❍ In case on a CPSW2 FC6502, if the red switch is ON (force RCTL), and no RCTL is present at all, the Control Point (CP) turns is maintenance mode (MNTN code 0026) with the following message displayed on CP Display : "Remote Power Controller is Active and Failing", now it will display "Remote Power Controller is Active and Failing or not present".

❍ 8265 CPSW resets when vpc_link on VPI 0 is cleared after it has been disabled. Here is the exact sequence of commands that caused the reset:
   1. set port x.y enable void
   2. set vpc_link x.y 0 enable ...(the type of link does not seem to matter)
   3. set vpc_link x.y 0 disable
   4. set port x.y disable
   5. set port x.y enable (any other type besides void) => **could not be performed anymore**   6. clear vpc_link x.y 0
This is when the switch was unexpectedly reseting. The error log records the following error:
   atmlmcom.c-1091 F LM Soft MAJOR 06_0C06_LM VPC_UNKNOWN
X:Y:0 while processing extract_vpc function

❍ A 8265 CPSW Ethernet or Token Ring LEC when it is not configured, reports that its AdminStatus is UP, when it should be DOWN. This incorrect status causes NWAYS Campus Manager to report the 8265 node as yellow instead of green.

❍ The following message is logged in the Active CPSW error log without any reason, note that the mirroring is functioning and code levels are the same on both CPSWs.

   0 05|08 02:00:04 atmrdfct.c-269 E RD   Soft minor 00_0505
   active and standby A-CPSW have incompatible microcode versions (NVRAM versions).
   Configuration mirroring is disabled until both A-CPSW are upgraded

❍ In a flat environment (without hierarchy) with PNNI links between a V4.x 8265 and another vendor's PNNI device, the LECs attached to the vendor's switch cannot join the ELAN. The first 8265 PNNI member encountered (running V4.x microcode) rejects the calls with 'No route to destination' (cause code 0x03).
   V4.x microcode does not properly handle the non-null port values (see Ess Tips SF3591E)

❍ With two default gateways (one active and one backup), the internal 8265 LES/BUS is not able to unregister the backup default gateway although the unregister acknoledgment will be sent. The primary default gateway is rejected with cause 04, "Duplicate Mac address" message is logged in the error log.

❍ The 8265 detects external device ATM address re-registration through ILMI and continues to fill up the reachable address table with the same address. This can cause a Hub reset when this table is full. In the error log the following messages are logged :

   16:44:32 T CPlr   double entry of reachable address is detected
   16:44:32 E CPcfg lr_SetReachAddr(addr_notif->atm_address
   addr_notif->length addr_notif->addr_scope vpc_id)
   16:44:32 E CPcfg Soft minor 07_0805_CF PORT PROBLEM:
   ADDR_REG ignored for on vpc id 10/1.0

○ CRC-32 Error was generated due to a buffer queue corruption in module hardware. The fix is composed of 2 parts:
- one by software with v4.1.3 microcode
- another by hardware with the new FPGA picocode level :
  1D24, 2D05, 3D05 or 2D15 which can be applied to 4P155, 1P622 and carrier module 2.0 & 2.5.
  The new FPGA 8265 module with the new 8265 microcode v4.1.3 level, fixes frame corruption on point to multipoint connections.

○ MIB browser is showing negative values for the cell counter, a number variable was used instead of counter variable for MIB

○ Under specific configuration settings where reachable addresses defined on a 8265 border pnni link may be considered as local to the current 8265, the 8265 microcode doesn' t handle the cranback function properly.

○ With the 8265 CPSW (FC6501), the PVC's and VPC's tables are not mirrored correctly to the **standby** CPSW, also when the **standby** CPSW became **active** the PVC's and the VPC's configuration were lost.

○ Problem seen once : under some very heavy traffic on ethernet port (near 100%), the 8265 may reset when trying to send packets on that port. The problem is fixed but PE still highly recommendes to have all 826X LECs on a separate management ELANs, and to have all 8265 Ethernet ports on the same maintenance ethernet segment out of production.

4.0 Known Problems

- A module in slot 12 will be powered up by the new CPSW2 module (FC 6502) only if the chassis is a Release 4 chassis (P/N 26L0112 or 02L4093).

- The chassis level (in fact the backplane level) can be displayed at the console, by issuing the command "SHOW INVENTORY VERBOSE". Alternatively, look for a "Release 4" label on the bottom left-hand side of the front of the chassis.

- Following a power-on or CPSW module reset, the CPSW module may enter Maintenance mode with code 39 and the following message is displayed on the CPSW module LCD:
  " FAT DIAG ERROR IN RB TRAFFIC MODE"
  If this happens, reset the 8265 (or power off and then on again). The problem should not recur.

- When a CPSW2 module is already active in slots 11-12 and a redundant CPSW2 with integrated power control is plugged in slot 9-10, the module must be inserted quickly so as not to disturb current traffic. As the CPSW2 module powers on immediately, the insertion levers must be pressed firmly within 2 seconds of the CPSW module display being lit. Otherwise, the module may start before all connecting pins are properly seated, producing unpredictable results.

- The REVERT PNNI command may produce umpredictable results :
  The "revert" command should not be used after a change in the pnni configuration followed by a "commit pnni" command. In this current release a commit pnni command must always be followed by a "save pnni" command in order to safely apply a new configuration.

- In the current release, in order to change the **pnni peer group ID** of a node keeping the same **pnni level ID**, you must follow the sequence :
  - isolate the switch from the pnni network during the complete sequence
  - change the peer group id (if changing with the node 0, the switch resets)
  - change the atm address (the switch resets)
  - reconnect the switch now reconfigured to the rest of the pnni network
  If the level ID is changed with the peer group ID, the regular procedure can be applied.

- Error log can be filled up with the following msg when a Port is enabled without any daughter card present. The displayed port in the error log (i.e 5.2) must be disable to bypass this problem.This problem can occur with any daughter card like : E1/T1, DS3, E3, STM1...
  1 06|01 14:49:15 atmcshwi.c-1615 e CS Hard minor 05_2032_CS Unexpected Return Code. Write of 0x0 failure in hdw reg of slot 5 (CF=0x6,IS=0x10020196): Reading 0x10020101 while expecting 0x0 (mask=0xFF)
  2 06|01 14:49:15 atme3hwi.c-1695 E E3 Hard minor 05_9005_E3 Unexpected Return Code. E3 - AC_PORT_WRAP_OFF failed on port 5.2
  3 06|01 14:49:15 atme3hwi.c-530 E E3 Soft MAJOR 05_9002_E3 Unexpected Return Code. in Slot = 5 Interrupt enable not yet implemented

- incorrect times stamp in the SVCs logTable

5.0 MIB V4

If you manage your 8265 using network management software, update your MIB to level V4 by downloading the corresponding code from Internet web page:

http://www.networking.ibm.com/support/products.nsf/techsupport/(8265)?OpenDocument

Following are the MIB Changes in V4 (compared to 8265 v3):

- The two following attributes are now R/W:

    - ocPowerOverheatPowerDownMode

    - ocPowerSlotAdminStatus

- The following attribute is new (Ptses Dump):

    - pnniDumpVertex

6.0 8265 Modules FPGA Levels

According to the following 8265 module compatibility table, upgrade each 8265 module to the latest FPGA picocode.

Module	Feature Code	Faceplate	Oldest FPGA level	Latest FPGA level
155 Mbps 4P Flex module	6543	A4-MB155	1D03/DD03/1D23 2D03/2D23/2D04 3D04	**1D24 (1) 2D05 (2) 3D05 (3)**
155 Mbps 4P MMF Integrated module	6540	A4-MF155	1D03/DD03/1D23 2D03/2D23/2D04 3D04	**1D24 (1) 2D05 (2) 3D05 (3)**
622 Mbps 1P MMF module	6511	A1-MF622	2D03/2D23/2D04 3D04	**2D05 (2) 3D05 (3)**
622 Mbps 1P SMF Module	6512 6513 6514	A1-SF622	2D03/2D23/2D04 3D04	**2D05 (2) 3D05 (3)**
Carrier 2.0 module	6558	A-CMU2	2D03/2D23/2D04 3D04	**2D05 (2) 3D05 (3)**
Carrier 2.5 module	6559 6560 6561	A-CMU2.5S A-CMU2.5A A-WAN2.5	2D14 2D14 2D14	**2D15 (4) 2D15 (4) 2D15 (4)**

IMPORTANT NOTE :

> 8265 modules have three implementations involving different families of Xilinx chips. Before downloading FPGA code to an 8265 module, perform a "show module x verbose" and note the current FPGA code level. Apply FPGA code as follows:
>
> **1.** For **4P155** Mbps modules currently running FPGA 1D03, DD03 or 1D23 upgrade with FPGA **1D24**
> **2.** For **4P155**/**1P622** and **carrier 2.0** modules currently running FPGA 2D03, 2D23 or 2D04 upgrade with FPGA **2D05**
> **3.** For **4P155**/**1P622** and **carrier 2.0** modules currently running FPGA 3D04, upgrade with FPGA **3D05**
> **4.** For **carrier 2.5** module currently running FPGA 2D14, upgrade with FPGA **2D15**

7.0 Documentation Update

Information from the Internet

8265 product information and code updates are available on the Internet at the following URL:

http://www.networking.ibm.com/support/products.nsf/techsupport/(8265)?OpenDocument

7.1 VPI_VCI Parameter of SET PORT Command

The minimum number of VCI bits, as specified with the VPI_VCI parameter of the SET PORT command, is changed to 6 for all ranges. This gives the following values:

VPI Bits	VCI Bits (25 Mbps and E1/T1)	VCI Bits (All Other Ports)
0	**6**-12	**6**-14
1-4	**6**-10	**6**-10
5-6	**6**-8	**6**-8

7.2 Address Scoping for Static Reachable Addresses

New and migrated static reachable addresses are assigned a default SCOPE value of 1-3 (PNNI level 96).

Thus, if you change the level identifier of node:0 to a higher value (for example, 88), the default static reachable addresses will not be advertised outside the node. To ensure that static reachable addresses are advertised outside such a node, use the SCOPE parameter of the SET REACHABLE ADDRESS command to change the scope of each static reachable address to, for example, '4' (PNNI level 80).

Note that there is no other way to change the scope in the current code level.

8.0 Networking Rules

This section describes 8265 module performance and lists the rules to follow when building and validating your network.

8.1 ATM Peer Group Intraconnection (PNNI)

An ATM Peer Group is a group of ATM hubs or switches interconnected by Private Network-to-Network Interfaces (PNNI). The PNNI protocol supports networking functions such as routing, node failure and recovery, backup and topology management.

- **Number of Switches in the Same Peer Group:**

  Depending on the network topology and complexity, the peer-group can have up to 100 nodes (assuming there are up to 200 foreign addresses and 500 links in the peer group).

- **Network Recommandations for LAN Emulation System:**

① Limit the number of nodes to 50.
② Separate 8265 Network Management functions (internal LECs) from user workstations.

- **Maximum Number of Physical Links and/or PNNI VPCs per 8265:** 32

8.2 ATM Peer Group Interconnection (IISP)

Interim Inter-switch Signalling Protocol (IISP) defines the interface between two 8265s belonging to different ATM Peer Groups in the same subnetwork or in different subnetworks.

- IISP links are supported over both physical links and Virtual Path connections (VP tunneling).

- Parallel IISP links can be enabled between two clusters.

- The following limitations apply when configuring IISP ports:

  ❖ PVCs cannot be defined through IISP links. It is necessary to define a PVC on each individual Peer Group involved in the connection.
  ❖ The maximum number of reachable addresses that can be defined per 8265 is 64.

8.3 IP Over ATM (RFC 1577)

- The CPSW supports an IP client implementation to be managed over ATM (SNMP, Telnet, TFTP, Ping). The supported MTU size is 9188 bytes.

- The IP Over ATM client imbedded in the CPSW supports up to 64 concurrent IP Over ATM connections.

8.4 ATM Forum Compliant LAN Emulation Client

Each 8265 LAN Emulation Client supports up to 30 connections to other LECs.

End of document