

**IBM 8260 NWAYS MULTIPROTOCOL
SWITCHING HUB**

RELEASE NOTE FOR

**A-CPSW MODULE (FC 5000+MES5001 OR FC 5100)
FPGA LEVEL C31, C30, B50
OPERATIONAL MICROCODE VERSION V.2.5.4
BOOT MICROCODE VERSION V.2.5.4**

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1 Fixes

1.1 New EEproms

When we switch to AMD EEproms we got flash memory error problem. "Download failure" or "Flash memory error" message is appearing when downloading a boot microcode. This was due to a new Flash memory chip not fully compatible with previous code. This has been fixed.

1.2 Year 2000

Minor changes to correctly display date for year 2000 and beyond.

2 Enhancements

None.

3 Known Problems Currently being addressed

No problem at writing time.

4 Warning to customers

Due to the new functions integrated in this release, the A-CPSW operational microcode v.2.5.4 and its corequisite boot microcode v.2.5.4, require the following:

4.1 COREQUISITES

ATM blades with the firmware upgrade kit fpga level will not be able to communicate inside the same chassis with atm blades at a previous fpga level and vice versa. you must upgrade all the ATM blades inside a given chassis with the fpga level given in the present kit.

4.2 PREREQUISITES

The DMM subset function that allows chassis monitoring from the ATM Switch/Control Point module will run only with the operational code level of the 8260 redundant controller module (fc 8000) at level 1.10 or higher.

4.3 WARNING

New functions such as the chassis monitoring and the switch redundancy run only on the new a-cpsw module (fc 5100). In the case of redundant switch upgrade, be careful to have both control point/switch modules at the same upgraded level , otherwise no mirroring of the configuration will occur.

4.4 INCOMPATIBILITY

The permanent virtual circuit (pvc) management involving several switches is not compatible with releases of a-cpsw modules before v.2.1.0 (see pvc management below).

Below are the references to the documents you should always refer to:

- o ATM Control Point and Switch Module Installation and User's guide (SA33-0326).
- o ATM Control Point and Switch Module Command Reference guide (SA33-0385).

They both have useful sections on either Troubleshooting or description of error codes for specific functions.

5 Upgrade Information

Carefully apply the guidances provided in the companion document: Installation Instructions.

5.1 FPGA PICOCODE Upgrade

It is highly recommended to upgrade the FPGA picocode of all installed modules to the latest available level. For this purpose this latest level has been included in the distribution package.

6 Documentation Update

CLEAR TRACE_LOG: The CLEAR command defined in the ATM Control Point and Switch Module Command Reference guide (SA33-0385) has a new option "TRACE_LOG" allowing the clearing of the main trace before being restarted.

7 General Information

7.1 Usage Notes

- When you insert an A-CPSW module into an 8260 hub, be sure to first insert the module so that it touches the connectors on the backplane before you use the module levers.
- In order to run the WRAP EXTERNAL command, you must use the correct wrap device: an 11dB attenuator (AMP 99593-1) or the IBM wrap plug (Part number 92F9003). The WRAP EXTERNAL command lets you diagnose problems on the ports of the A4-FB100 with MIC connectors.
- You can manage ATM modules by using ATMC and optionally IHMP that provides SNMP-based management facilities for the 8260 hub.
- The prerequisite versions of 8260 management modules (DMM or DMM with Ethernet Carrier) that support the ATM modules are as follows:
 - Version 2.1 and higher for A-CPSW module and A4-FB100 module with MIC connectors
 - Version 2.3 for A4-FB100 module with SC connectors and A2-MB155 module
 - Version 3.01 for A04MB-BRG and A-CMU1s.
- If the TRACE options are ON, system PERFORMANCE WILL DECREASE SIGNIFICANTLY.
- **WARNING** : On the A12-TP25 MODULE, in order to activate a new FPGA code after download, please issue the SWAP FPGA_PICOCODE command. If for some reason , you need to go back to a previous level , DOWNLOAD THE PREVIOUS FPGA CODE, and issue the SWAP FPGA_PICOCODE command.

7.2 Operating Requirements

The following operating requirements apply to the A-CPSW and ATM media modules:

- Before you remove an ATM media module from a 8260 hub, first isolate the module by entering the command:

SET MODULE slot ISOLATED

- **WARNING: IF YOU REMOVE THE MODULE WITHOUT ENTERING THIS COMMAND, YOU MAY RESET THE ATM SUBSYSTEM.**

7.3 PVC Management

The Permanent Virtual Circuit (PVC) management over several Switches is not compatible with releases previous to version 2.1 of A-CPSW modules.

- A conversion function is provided with the 2.2 code that converts previous PVC definitions to 2.2 during the upgrade.
- Issue a Show PVC command to check that your PVCs have been successfully migrated .

NOTE: It is strongly recommended to save your current configuration before the upgrade.

In consequence:

- You will not be able to create PVC defined between a v.2.0.x or previous A-CPSW and a v.2.5.2 A-CPSW
- If you add a A-CPSW v.2.5.2 into your existing ATM Campus Network with A-CPSW modules at previous levels, you will have to migrate those previous modules at least to v.2.4.3 to be able to use PVCs .
- In case you have to swap back to the previous level for any reason you will have to clear your PVCs before to issue the swap. If not done unpredictable results may occur.

7.4 Networking Rules

This section lists the 8260 module performance and the rules to follow to build and validate your network.

7.4 .1 Maximum Number of Connections

The following maximum number of connections apply to Switched Virtual Circuits (SVC) and Permanent Virtual Circuits (PVC).

- Maximum number of connections per switch:
The maximum number of connections depends on their type, Point-to-Point (PtP) or Point-to-Multipoint (PtM), and for PtM connections on the number of branches per connection. The following rules apply:
 - The switch has 12000 connection control blocks
 - 2 control blocks are required per PtP connection (up to 6000 PtP connections)
 - 1 control block is required per branch of a PtM connection
 - The switch has 6000 party control blocks (2 party control blocks are required per party)
 - The maximum number of parties over point-to-multipoint connections is 3000.
 - The maximum number of point-to-multipoint is 127.
 - The maximum number of PVC,PVP and PARTY that can be defined per switch is 100. PVC definitions are stored in non-volatile RAM for automatic restart
- Maximum number of connections per port
 - The maximum number of PtP plus PtM connections is 4064.
- Maximum number of connections per media module
 - The maximum number of PtP plus PtM connections is 4064.

7.4 .2 User to Network Interface (UNI)

- The maximum number of ILMI registered addresses per switch is 512.
- The connection identifiers (VPI:VCI) for SVCs are selected with a VPI value equal to 0.
- Both PVCs and SVCs can be defined on the same physical port

7.4 .3 ATM Cluster Intraconnection

An ATM cluster is a group of ATM hubs interconnected by switch to switch interfaces (SSI). The SSI supports networking functions such as routing, node failure and recovery, backup and topology management.

- When configuring SSI ports on an ATM media module, please consider the following:
 - The bandwidth you specify, or which is taken by default, must be identical at both ends of the SSI link.
 - The bandwidth budget of the SSI ports defined on an ATM media module, must not exceed 212 Mbps.

- Parallel SSI links between switches are supported for high availability and (or) throughput increase.

- Configuration recommendations for optimal performance:
 - Up to 25 switches per cluster
 - Up to 5 hops (call set up and cell transit time are proportional to the number of hops)

7.4 .4 ATM Cluster Interconnection

Network to network interface (NNI) defines the interface between two 8260 ATM hubs belonging to different ATM clusters in the same subnetwork or in different subnetworks.

- o NNI links are supported both over physical links and Virtual Path connections (VP tunneling)

- o Parallel NNI links can be enabled between two clusters.

- o The following limitations apply when configuring NNI ports:
 - 64 logical links per NNI port, with a VPI in the range 0-63.

- For the 12 port 25Mbps there are 16 logical links per NNI port, with a VPI in the range 0-15.
- The total bandwidth reserved for NNI links is limited to 85 % of the full bandwidth of the media module per port (for example 85Mbps for the A4-FB100 modules). The limitation is 180 Mbps per media module.
- PVCs are defined over NNI links by defining PVC on each individual Switch involved in the connection
- Multicast support over NNI links can now be on ANY VPs without the constraint of having a vpi value equal to 0.
- The maximum number of static route to ATM Cluster Number (ACN) associations that can be defined is 64.
- The maximum number of logical link that can be defined is 64.

7.4 .5 IP OVER ATM (RFC 1577)

- o The A-CPSW supports an IP client implementation to be managed over ATM (SNMP, Telnet, TFTP, Ping). For that purpose the actual supported MTU size is 944 bytes.
- o The IP over ATM client imbedded in the A-CPSW supports up to 64 concurrent IP over ATM connections.

7.4 .6 ATM Forum Compliant LAN EMULATION CLIENT (LEC)

Each 8260 LEC supports up to 30 connections to other LECs

7.4 .7 ATM Forum Compliant LES/BUS

- o The 8260 A-CPSW only supports one LES/BUS at a time.
- o The maximum number of LECs on the LES/BUS is 128.
- o The LES/BUS supports a maximum of 800 downstream LAN workstations with no more than 500 broadcast frames per second (512 bytes).

- o No classical IP traffic is supported while the LES/BUS is running in the 8260 A-CPSW, at the exception of the Network Management IP (SNMP) traffic when the LAN Emulation Client of the 8260 is disabled (LEC in the 8260 may be enabled in the LES/BUS configuration).

- o The use of 8260 LES/BUS is not recommended in a Redundant A-CPSW configuration.

8 APPENDIX A. Summary of Functions Integrated in Previous Versions

- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.1.1.5:
 - MIB Version 1.1.
 - Support of 8260 10-slot chassis
 - Code upgrade control
 - Unlimited combination of UNI/SSI ports
 - Automatic discovery of IBM 8282 workgroup concentrators
 - Link Aggregate for SSI and NNI configurations

- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.1.2.9:
 - A-CPSW boot performance improvements
 - Support of the ATM 155 Mbps Flexible Concentration Module (A2-MB155) module
 - PNNI phase 0
 - Error log compression
 - Enhanced status display
 - Full multicast capability
 - 16 Virtual Paths (VP) per NNI port (4-bit VPI)
 - Early Packet Discard, Partial Packet Discard
 - Reserved bandwidth support firewall.
 - MIB Version 1.2

- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.0.4/V.2.0.8:
 - Support of the UNI Version 3.1
 - Optional ILMI Address Registration
 - Optional Flow Control for UNI Port
 - Support of SDH and SONET for A2-MB155 Module
 - Fixed Scrambling Scheme for A2-MB155 Module
 - Bandwidth Allocation Setting for SSI Interface
 - LAN Emulation Configuration Servers Address Advertisement
 - PVC Management from the A-CPSW Console
 - Serial Line IP Support for A-CPSW Console Port
 - Upload and Download of the A-CPSW Configuration
 - New Commands in Maintenance Mode
 - Compressed Image of the A-CPSW Operational Microcode
 - Support of MIB Version 1.3
 - Support of Nways 8260 TR/Ethernet LAN Bridge Module
 - Support of Nways 8260 ATM Carrier Modules

- Improvements to Existing A-CPSW Commands
- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.1.0:
 - LAN Emulation Client (LEC) Ethernet 802.3/DIX Ethernet
 - Increased number of connections
 - MIB version 1.4
 - Full Chassis monitoring
 - Redundant Switch support
 - DMM subset
- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.2.2:
 - LAN Emulation Client (LEC) Token-Ring 802.5
 - Static Routes inside a single subnetwork
 - MIB version 1.5
 - DMM subset (full chassis monitoring)
 - LAN emulation Server/Broadcast Unknown Server (LES/BUS)
 - Switch Redundancy versus LES/BUS
 - MSS module support
 - 12 port 25 Mbps module support
 - WAN module support
- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.4.0 OR V.2.4.3:
 - MIB version 1.6
 - Variable range of VPC/VCC values
 - ABR flow control
 - Larger buffer size
 - A3-MB155 module support
 - PVC multipoint
- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.5.0:
 - MIB 1.7
 - A12-TP25/A1-MB155
- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.5.1:
 - Forum compliant way of getting the LECS ATM address through ILMI.
Automatic detection and adaptation for non ILMI Forum Compliant devices.
- o IN A-CPSW OPERATIONAL MICROCODE VERSION V.2.5.2:
 - A3-MB155 - Corrected : When a 3 ports 155Mbps mother card was not fully populated with daughter cards, the Network Management displayed an empty faceplate.
 - CP/SW RESET - Corrected : A congestion situation was encountered (and then the CP/SW was reset) when a non IBM device was using an ILMI community name different from "ILMI".
 - 8271-8272 MODULES: Integrated 8271 (Ethernet) and 8272 (T/R) modules are now supported, with up to 29 ports.
 - FIBERCOM I/O CARD: FIBERCOM circuit emulation I/O card is now recognized.

This card passed the IBM ATM kit certification program, which verify that customer can plug this I/O card in the 8260, without disturbing the operation of the rest of the Hub, and that communication through the UTOPIA interface is running. No test of the functionality of the card itself has been done.

9 APPENDIX B. New Maintenance Codes

Due to the installation migration process for the ATM FIRMWARE kit upgrade, you might encounter the following maintenance codes :

- o >>0050>> No FPGA picocode level (active or backup) in the A-CPSW matches the active microcode level, and the backup microcode of the A-CPSW is either unavailable or identical to the active one.
- o >>0051>> The SWAP of the A-CPSW FPGA picocode terminated in error.
- o >>0052>> A connected ATM media module has no FPGA picocode matching the A-CPSW microcode level (This is a normal condition for the first A-CPSW of a redundant 8260 during the automatic migration process to level B50. It makes the second A-CPSW active, allowing the upgrade of the rest of the 8260. Once the whole 8260 is upgraded, the A-CPSW displaying >>0052>> becomes either active or standby at the next reset).

NOTICE

The three maintenance codes above will not appear once the migration parameter is off. In order to do so , you must issue the SET DEVICE MIGRATION: NOT_ALLOWED command followed by a SAVE DEVICE command.

END OF DOCUMENT