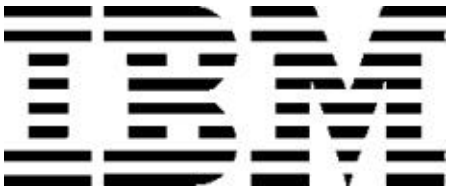
IBM Corporation

IBM Nways RouteSwitch Release Notes
Version 3.1.5.A
Rev. H

November 7, 1997



Nways RouteSwitch Release Notes Version 3.1.5.A

IBM PTF Numbers For Version 3.1.5.A:

8273 RouteSwitch Software:	NP00874
8274 RouteSwitch Software:	NP00876
8273 Advanced Routing Software:	NP00875
8274 Advanced Routing Software:	NP00877
8274 RouteCell Software:	NP00878

These PTFs are available from IBM Software Service
or on the IBM NHD Web Site:
http://www.networking.ibm.com/netprod.html

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REVISION HISTORY

Release	Revision	Date	Description of Changes
3.1.1	A	6/27/97	Initial Release (3.1)
3.1.2	B	7/8/97	Maintenance Release for 3.1.2
3.1.3	C	8/15/97	Maintenance Release for 3.1.3
3.1.3.3.A	D	8/25/97	Maintenance Release for 3.1.3.3.A
3.1.4	E	9/19/97	Maintenance Release for 3.1.4 and includes 8274-W33 Nways RouteSwitch , BPS 250, CSM-155C-8W, CSM-A25-12/24 and ESM-C-16W
3.1.4	F	9/25/97	Maintenance release to include correct MPM.cmd file to disable multicast claiming.
3.1.5	G	11/4/97	Maintenance release to fix problem reports in earlier releases.
3.1.5.A	H	11/7/97	Maintenance release to fix memory usage problem.

1. Introduction

These release notes cover the basic feature set supported, known limitations, bugs and known work-arounds for IBM Nways RouteSwitch Version 3.1.5.A software. Please read this document in its entirety as it contains important operational aspects that may impact your network.

2. 3.0 Feature Set Supported

This publication/document may contain information about 8273 and 8274 features/functions that are not currently offered for sale by IBM. The inclusion of this information should not be interpreted as indicative of IBM's plans to offer these features/functions in the future.

Hardware and software features supported with the release 3.1.5.A are the following:

Hardware:

Nways RouteSwitch:

- 8274-MOD-500 Chassis
- 8274-MOD-513 Chassis
- 8274-MOD-513 Power Supply
- 8274-MOD-913 Chassis
- 8274-MOD-913 Power Supply
- 8274-MOD-900 Chassis
- 8274-MOD-W53 Wide, 5 slot Nways RouteSwitch with RouteCell backplane
- 8274-MOD-W93 Wide, 9 slot Nways RouteSwitch with RouteCell backplane
- 500W Power Supply for 8274-MOD-900, 8274-MOD-913 and 8274-MOD-W93
- MPM-1G, or MPM-1GW; MPM 16Mbyte DRAM, 4 Mbyte Flash, HRE socket, 960M VBUS for narrow or wide chassis
- MPM II-8/16MB
- MPM 8/16Mbytes
- HRE Hardware Routing Engine
- CSM-155-8 or 8W; Eight port, 155Mbps OC3c/STM-1 CSM, multimode fiber for narrow or wide chassis
- CSM-155-8S or 8SW; Eight port, 155Mbps OC3c/STM-1 CSM single mode fiber for narrow or wide chassis
- CSM-155-6M2S six port multimode and two ports single mode 155 Mbps SONET ST3c/STM-1
- CSM-622-2E two port 622 Mbps OC12c/STM-4c CSM multimode fiber, extended memory
- CSM-622-2SE two port 622 Mbps OC12c/STM-4c, CSM single mode fiber, extended memory
- FCSM Frame to Cell Switching Module (Narrow and wide module)
- ESM-U-6 6-port Ethernet Universal Module
- ESM-AB-FL 10BaseFL Adapter Card for ESM-U-6
- ESM-AB-T 10BaseT RJ-45 Adapter Card for ESM-U-6
- ESM-AB-AT 10BaseT RJ-45 and AUI Adapter Card for ESM-U-6
- ESM-AB-B 10Base2 Adapter Card for ESM-U6
- ESM-AB-FL-S Single-mode 10BaseFL Adapter Card for ESM-U-6

- ESM-F-8 10BaseFL 8 port Ethernet Module
- ESM-C-8 10BaseT RJ-45 8-port Ethernet Module
- ESM-C-12 10BaseT RJ-45 12 port Ethernet Module
- ESM-AB-AFD Adapter board for Ethernet Universal Switching Module
- ESM-T-12 10BaseT, 50 Pin Telco Connectors, 12 port Ethernet Module
- ESM-100C-FD-1/2 One or two port Full Duplex 100Tx
- ESM-100-FM-FD-1/2 One or two port 100BaseFx
- ESM-100-FS-FD-1/2 One or two port 100BaseFx (SM)
- ESM-100C-5 4 port shared 100BaseT + 1 Full Duplex 100BaseTx
- ESM-100CFM-5 4 port shared 100BaseTx + 1 Full Duplex 100BaseFx (MM)
- ESM-100CFS-5 4 port shared 100BaseTx + 1 Full Duplex 100BaseFx (SM)
- WSM-4/8-SC Four or 8 Port WAN Switching Module, Universal Serial External DTE/DCE Wide Area Network Interface Daughter Card
- WSM-SC-4 or 4W; WAN Switching module, 4 ports Universal Serial External Interface. Supports the five serial cable types (V.35, RS-232, X.21, RS-530, and RS449) for wide chassis
- WSM-SC-8 or 8W; WAN Switching module, 8 ports Universal Serial External Interface. Supports the five serial cable types (V.35, RS-232, X.21, RS-530, and RS449) for wide chassis
- ASM-E3-1/2 One or two port ATM 500Kbytes SRAM, 34 Mbps E3, BNC connectors
- ASM2-155FM-1/2 One or two port ASM-SAHI multimode fiber
- ASM2-155FS-1/2 One or two; port ASM-SAHI single mode fiber
- TSM-CD-6 Token Ring Dual Mode Module
- FSM-SH-1/2 FDDI Switching Module, SC connectors, supports single mode (category 2)

New Hardware in 3.1 Release*:

Nways RouteSwitch:

- ESM-100C-12 12 10/100 BaseT, RJ45 ports
- ESM-100FM-8 8-port 100BaseFx full duplex, 1 SC pair, multimode fiber
- ESM-C-32 32 port 10BaseT, RJ45
- 8274-W33 Nways RouteSwitch with built-in 150W power supply, supports Frame/Cell Bus.
- CSM-A-25-12/24 12/24 port ATM25 module, RF-45 connectors
- ESM-C-16W 16 port 10BaseT switch module, V-Bus
- CSM-C-155C-8W 8 port 155 Mbps OC-3/STM-1 copper module
- CSM-155C-8, eight port 155 Mbps OC-3/STM-1 copper
- CSM-155-FSL-8
- CSM-155-6M2SL,
- CSM-A25-12/24, 12/24 port ATM25 module, RJ-45 connectors

*New hardware must be supported by version 3.1 MPM software. IBM RouteSwitch Network Management applications must also be version 3.1 to support new hardware.

The following include modules which contain either HSM or HSM2* boards.

- ESM-100C-4/8 100BaseT Switching Module
- ASM-155FM-1/2 Multi-mode ATM Module ½ and 2 Mbyte SRAM
- ASM-155FS-1/2 Single Mode ATM Module ½ and 2 Mbyte SRAM
- ASM-155C-1/2 One or two port, 155 Mbps UTP 5, RJ45 connectors ½ Mbyte

- ASM-155C-1/2E One or two port, 155 Mbps UTP 5, RJ45 connectors 2 Mbytes
- ASM-DS3-1/2 ATM ½ Mbyte w/BNC connectors
- FSM-M-1/2 FDDI Module Multi-mode
- FSM-C-4/8 CDDI Module
- FSM-M-C FDDI/CDDI Module
- FSM-S-1/2 FDDI Single Mode sub-module
- TSM-C-6 Module (4Mbps or 16 Mbps)
- TSM-F-6 Module (4 or 16 Mbps Rev B4 and above, 16 Mbps only for revisions)
- TSM-CD-6 Module (4 Mbps or 16 Mbps)
- Version 2.0.4 and subsequent releases support HSM2. See section 9 for additional information. Version 3.1.5.A and previous software versions support HSM.

8273 Series (RouteSwitch) :

- 8273-MOD-10E (85H7144)
- 8273-MOD-100 (85H7145)
- 8273-MOD-10U) (85H7143)
- RESM-AB-FL 10BaseFL Adapter Card for the 8273-MOD-10U (85H7143) (RouteSwitch 10U)
- RESM-AB-T 10BaseT Adapter Card for the 8273-MOD-10U (85H7143**)** (RouteSwitch 10U)
- RESM-AB-AT 10BaseT RJ-45 and AUI Adapter Card for the 8273-MOD-10U (85H7143) (RouteSwitch 10U)
- RESM-AB-B 10Base2 Adapter Card for the 8273-MOD-10U (85H7143**)** (RouteSwitch 10U)
- RESM-AB-FL-S 10BaseFL Adapter Card for the 8273-MOD-10U (85H7143) (RouteSwitch 10U)
- RFSM-S-1 FDDI sub-module. One DAS port.
- RFSM-M-1 FDDI sub-module Multi-mode
- RFSM-C-4 CDDI sub-module four CDDI ports
- RASM-DS3-1 DS3 sub-module. One port, 45 Mbps, BNC connectors
- RASM-E3-1 E3 sub-module. One port, 34 Mbps, BNC connectors
- RASM-155FM-1 ½ and 2 Mbyte ATM sub-module-Multi-mode
- RASM-155-FS-1 ½ and 2 Mbyte ATM sub-module- Single-mode
- RESM-AB-AFD One full duplex AUI port for 8273-MOD-10U (85H7143) (RouteSwitch 10U)
- RESM-100C-4 4 Port 100BaseT sub-module
- RESM-100C-FD-1 One 100BaseTx full duplex port sub-module
- RESM-100FM-FD-1 One 100BaseFx full duplex port sub-module (MM)
- RESM-100FS-FD-1 One 100BaseFx full duplex port sub-module (SM)
- RWSM-S-2 Frame Relay Sub-module. Two universal external DTE/DCE WAN connectors.
- RWSM-SC-4 Frame Relay Sub-module with compression. Four universal external DTE/DCE WAN connectors.

Software Major Features:

- RouteTracker
- Ethernet RMON (Groups: Ethernet Statistics, History Control, Ethernet History, Alarm and Event)
- IP Routing

- IPX Routing
- ATM Services
  Ethernet LAN Emulation Client
  X-Lane with PVC's
  RFC 1483 (LLC Encapsulation over ATM)
  RFC 1577 (Classical IP over ATM)
  Omni point to point bridging
  VLAN Trunking over ATM
- ATM UNI 3.0/3.1
- PVCs and SVCs
- VLAN Trunking over FDDI
- Source Route Bridging
- Virtual Rings and Virtual Rings over Trunks (backbones)
- STM-1 Coded in accordance with ITU Ch. 4 of I.432 (Geneva July 1995)
- Flooding Limits
- 2K CAMS
- Adaptive MAC Learning Algorithm
- SVC/PVC Recovery Improvements
- SNMP Trap Support
- Hot Swap of like modules
- MPM Redundancy
- IPX Any-to-Any Switching
  LLC Output Option for Translations
- Frame Relay
- Duplicate MAC Support
- Multicast Virtual LAN's
- IEEE 802.10 VLAN Tagging over FDDI
- Router VLAN Management
- IPX Client Network Policy refinement
- Port Forwarding Policy
- Port Mirroring (10BaseT)
- Optional Token Ring Copy Bit Setting
- Banyan Vines Translations
- IPX Raw over FDDI
- IBM Token Ring Support Functional Address
- RouteCell
- DHCP BootP Relay/Translations
- Domain Bridging
- IPX RIP/SAP Filtering
- Group Mobility 1
- IP Multicast Routing
- 802.5 LAN Emulation Client
- X-LANE Enhancements
  - Extending clients from 16 to 32
  - RFC 1483 Encapsulation option
- Advanced Routing including OSPF and RIPII
- Enhanced Diagnostics
- HRE Layer 3 frame forwarding ASIC, IP, IPX route forwarding
- Flood Limits Override
- MPM Port Monitoring

- Distributed CAM Utilization
- IBM RI/RO Format interoperability
- IP Firewall
- Token Ring Source Route RIF Stripping
- LANE Service Module (LSM)

New software features are only supported in version 3.1 IBM Nways RouteSwitch and 8273 Series RouteSwitch software and are only supported by IBM RouteSwitch Network Management Version 3.1 applications.

Note: For ATM interoperability testing results, please contact IBM Technical Support.

3. Technical Support Contacts

This section provides contacts for help if you have questions about the IBM RouteSwitch products or if a RouteSwitch product is not working correctly. It also explains how to access the IBM electronic sites to obtain the latest version of microcode and release notes.

1. **Electronic Support**
   This section explains how to access the IBM electronic site to obtain the latest version of microcode, drivers, and software by using the Internet World Wide Web, FTP or the IBM BBS.
   a. **WWW: http://www.networking.ibm.com/**
      This is the IBM Networking home page. From here, you can access product announcements, publications, and other information regarding hardware and software updates, and a technical support information database. The direct path to the support area is:
      http://networking.ibm.com/nes/neshome.html/
   b. **FTP: lansupport.raleigh.ibm.com**
   c. **IBM Bulletin Board System:**
      Using a modem you can access the IBM BBS to obtain the latest versions of software. See your modem and communications software to 8 data bits, no parity, and 1 stop bit. Dial one of the following numbers:

Unites States:	(919) 517-0001
Toronto:	(905) 316-4255
Toronto:	(416) 956-7877
Vancouver:	(604) 664-6464
Montreal:	(514) 938-3022

2. **Voice Support**
   This section provides contacts for help if you have questions about the IBM RouteSwitch products or if a RouteSwitch product is not working correctly. It also explains how to access the IBM electronic sites to obtain the latest version of microcode and release notes.

3. **Electronic Support**
   This section explains how to access the IBM electronic site to obtain the latest version of microcode, drivers, and software by using the Internet World Wide Web, FTP or the IBM BBS.
   a. **WWW: http://www.networking.ibm.com/**
      This is the IBM Networking home page. From here, you can access product announcements, publications, and other information regarding hardware and software updates, and a technical support information database. The direct path to the support area is:

http://networking.ibm.com/nes/neshome.html/

b. FTP: lansupport.raleigh.ibm.com

c. IBM Bulletin Board System:

Using a modem you can access the IBM BBS to obtain the latest versions of software. See your modem and communications software to 8 data bits, no parity, and 1 stop bit. Dial one of the following numbers:

Unites States:	(919) 517-0001
Toronto:	(905) 316-4255
Toronto:	(416) 956-7877
Vancouver:	(604) 664-6464
Montreal:	(514) 938-3022

4. Voice Support

IBM Network Hardware support: **1-800-772-2227**. Follow the menu prompts for Network Hardware.

4. General Instructions and Notes

1. If you are upgrading from IBM Nways RouteSwitch Version 2.0 or later to 3.1.5.A, you just need to download the 3.1.5.A software and then reboot the IBM Nways RouteSwitch – see Chapter 3, of the *IBM Nways RouteSwitch User's Guide* for details on software downloading and configuration.

2. IBM Nways RouteSwitch and 8273 Series RouteSwitch Version 3.1.5.A requires 16 MB SIMM and 4 MB Flash. (See Section 9)

3. To perform IBM Nways RouteSwitch and 8273 Series RouteSwitch (version 3.1.5.A) installation with floppy diskette(s) which is required on a PC follow these instructions:

   Using a PC, insert the first floppy, CD to the directory where software installation is to occur and type X:install (X = the drive letter for installation). Instructions are provided for the remainder of the installation.

   Warning: File names handled by Windows95 32-bit application programs change the first letter to uppercase, which will not be recognized by IBM Nways RouteSwitch operating system. All filenames must be lowercase.

   - Use ProComm 3.0 or any program that makes the target file names in all lowercases.
   - If not, make sure to rename all file names with lowercases before down loading them.

4. IBM RouteSwitch Network Management 3.1 is required for managing the new features contained in IBM Nways RouteSwitch version 3.1.5.A software. See IBM RouteSwitch Network Management 3.0 release notes for IBM Nways RouteSwitch Network Manager, RouteTracker, and RouteMonitor applications for more detail.

5. If a PC is directly connected to the IBM Nways RouteSwitch, the IBM Nways RouteSwitch Spanning Tree will reconfigure when installed or rebooted (this is generally not a problem). However if a network layer protocol is started at boot time (via the autoexec.bat) of the PC and is dependent upon a connection (such as an IPX connection), then the network layer process will not be able to start until the Spanning Tree process has completed. In the event that the IPX client is unable to attach to its server the following steps may be used to solve the problem:

a) If only 1 client is attached, the port type can be changed to optimize device switching using the modvp command. **This configuration will turn off spanning tree.**
b) If the system constraints allow, the spanning tree forwarding timer can be changed to a lower value. This should not be done without careful consideration for the network needs of spanning tree.
c) If necessary either the NETX or VLM commands can be re-entered. In some versions of NETX the driver is loaded regardless of whether a connection is made. When this occurs the driver must be unloaded then restarted. NETX version 3.32 and VLM version 1.20 were used in the IBM testing and do not require an unload between commands.

6. A modification to the aging timer for transparent bridging will only take place on newly learned entries. Any entries learned on the previous timer will time-out on that value. Once they time-out, and the entry is re-learned, the correct aging timer will be used.

7. Speeds on the console/modem ports greater than 19,200 are not supported using the load command.

8. Hot swap of network interface modules is supported under the condition that the module is swapped with a like module. The command 'Swap' should be turned on before replacing any module. The MPM must be in the ready state prior to insertion. This can be determined by the color of the OK light on the MPM. The light should be blinking green. Any removal or insertion must be completed in a single removal and insertion operation. Partial removals or insertions can cause board and/or IBM Nways RouteSwitch failure. All cables on the interface that is being hot swapped must be removed prior to performing the hot swap function.

9. Please see the Hardware Compatibility Matrix in section 22.0 to verify your IBM Nways RouteSwitch platform is compatible with IBM Nways RouteSwitch software version 3.1.5.A.

10. When changing the encapsulation type (e.g., 802.3 to Ethernet II), you must reset the physical port (either by pulling the physical cable out and pushing it back in or using the User Interface commands to disable and then enable port).

11. When downloading files using ftp , FAT filenames are changed to uppercase which makes files unreadable. The user must change filenames to lowercase. The following versions do not display this problem: WFWG of ftp version 32b, ChameleonNFS, and SUN's PCNFS.

12. Upon initial start-up (or after removal of mpm.cnf file) of a system with large numbers of physical ports, primarily the 9 slot chassis, the message: "File system compaction in progress….." may be seen. This is not a problem, unless it repeats indefinitely. This message may be seen from time to time if network management functions are occurring. One time is not a problem, immediate repetitions are a problem and if they occur contact IBM Technical support.

13. Each group within the IBM Nways RouteSwitch or 8273 Series RouteSwitch executes the IEEE 802.1d spanning tree algorithm. Spanning tree defines its bridge ID as the lowest MAC address of all the virtual ports attached to the given Group. If a virtual port is moved from "Group A" to "Group B", then a spanning tree reconfiguration may result. If 'Group A's" bridge ID is the MAC address of that virtual port, then its bridge ID must change. This will require a spanning tree reconfiguration. If the virtual port added to "Group B" has a MAC address lower than all other virtual ports attached to "Group B", a spanning tree reconfiguration must occur. If the user performs such port moves via a Telnet session, they will experience a temporary lockout (up to 30 seconds) in their session, if spanning tree reconfigures on the Group supporting their Telnet session.

14. Translations from source routing to transparent bridging are not supported (e.g. Token Ring source routing to Ethernet transparent).

15. A configuration file expansion is the operation of adding new configuration parameters to the current config file. In order to perform a configuration file expansion the following criteria must be met. There must be enough flash for the config file expansion. The required amount of free space on flash must be the configuration file size plus 8192 bytes for each configuration. As a general rule 75000 bytes of flash memory should always be available. When using 2 Mbytes of flash on the MPM the total amount of used flash may not exceed 1.45 Mbytes; and when using 4 Mbytes it may not exceed 3.45 Mbytes. The *ls* command will identify how much flash is available. To conserve flash memory remove any files that are not needed. For example, remove tsm.img if the IBM Nways RouteSwitch does not have any token ring modules.

16. Use of the "break" key on a terminal/PC will change the baud rate of the serial port connected to the IBM Nways RouteSwitch. The baud rate will cycle to the next highest baud rate. When it gets to 38,400, it will cycle back to 1200 baud. The cycle is as follows: 9600 ⇒ 19200 ⇒ 38400 ⇒ 1200 ⇒ 9600.

17. When a destination node is moved to a different location in RouteTracker VLAN, the source does not learn the new location until the destination node sends a packet.

18. Do not use different software versions for image files. All image files must be at the same version. Mixing image file versions (e.g. 2.0.3 mpm.img and 3.1.5.A for all other image files such as esm.img, fsm.img, etc.) can cause config file corruption.

19. There is no limit on the number of times a TSM-CD-6 port can detect a difference in ring speed and reset itself. This may be a problem when more than one port in a ring has ring speed auto detect capability and the ports are configured at different speeds. Under these circumstances, it is important to know what the ring speed should be and to configure it explicitly. The default speed is 16 Mbps. In the future, a limit will be placed on the number of times a TSM-CD-6 port will detect ring speed and reset itself.

20. User Guide correction to Chapter 27. This section describes trap mask as two (2) word values with word 1 entered followed by word 0. Trap mask is now four (4) word values with the ordering consistent with the IBM trap mib (words 0-4).

21. If a group is declared to be a Default Group for Frame Relay Virtual Circuit creation, then it cannot be deleted, even if it is not currently being used. Rmgp will display the message "Cannot delete". Group has active entries." **Work-around**: "frm slot/port" to remove the group as a Default and then rmgp. (PR 4549).

22. Vrouter port doesn't support FDDI-raw frame – when vrouter ports are configured as Ethernet 802.3 and FDDI port as FDDI-raw, FDDI-raw packets received on the other side of router are not routed.

23. SNA traffic on Token Ring and RouteTracker VLANs: If the user wants to configure RouteTracker vlans for SNA traffic based on DSAP/SSAP protocol rules, it is recommended that the user also configures port rules for ports that connect the IBM Nways RouteSwitch to the server. The reason being that the servers normally will not generate traffic unless a client talks to it. But before the client initiates the SNA session, it sends out the "Duplicate MAC test" frames which carry the SNA dsap/ssap values. As a result, the client gets assigned to the SNA vlan and subsequent SNA traffic will not go out on the server port as that port is not still part of the SNA vlan.

24. In order to use Autoencaps feature user must create a dummy RouteTracker vlan.

25. Autoencapsulation will not work properly if IPX server is down when IPX client boots up.

26. This version of software supports ATM SVCs on up to 10 ASM ports. Up to 16 LANE LECs are also supported per port and a maximum of 64 LECs per IBM Nways RouteSwitch has been tested.

27. Multicast Routing is not supported over ATM CIP connections in Version 3.0 initial release. If this option is selected, the traffic will not be sent to these connections. Multicast routing is not supported over frame relay connections that have multiple virtual circuits. In order to use Multicast routing over a frame relay connection only one virtual circuit for the connection must be made.

28. Caution should be used when issuing the *mrrtab* command in the user interface. There is a known problem when there are large quantities of routes defined in the system (>3000 routes). Use the *mrrnum* command to display the number of known routes in the system. Use of the *mrrtab* with large quantities of routes may cause the switch to hang, or crash due to lack of memory.

29. The Flash file system has a limit of 32 files. When this limit is reached, which includes crash dumps and other files, the config file will cease to expand properly and new files cannot be loaded. Local files will fail, even if ample room exists on the Flash.

30. For 8273-10U with PESM-AB-AFD (full duplex): Source learning will not flush the MAC table for the port when the cable is moved. This occurs because the link never goes down on these full duplex ports. This will cause traffic to continue to go to the old port and not flood. The MAC will not move correctly to the new port. Wait until the source learning timer expires (normally 5 minutes) after removing the cable before reinstalling to the new port.

31. 'fls' provides a summary of the flood limits for all or a specified Group.

Usage: fls [group number]. If no Group number is specified, then the flood limits override for all Groups is displayed.

32. The ATM Forum IISP Standard does not support a dynamic routing protocol for ATM NSAP addresses. Consequently, when connecting RouteCells together via IISP in a LANE environment, The path to the LANE well known address (wka = 47.00.79.00.00.00.00.00.00.00.00.00.A0.3E.00.00.01.00) needs to be statically configured on all RouteCell's not directly connected to the OmniMSS (or any LANE server). The RouteCell's which have the directly connected server will learn the correct path via the ILMI address registration process.

    Additionally, addresses required for all ATM server connectivity must be statically configured. This includes any LES/BUS requirements. The "prpadd" and "pradd" are used to add these routes.

    Note: PNNI does not require that these addresses be added statically

33. In order for ILMI to participate in the uni version registration, the MPM.CMD file must contain the command "ume_snmp_allowed=1". This command must be input before the "cmInit" command. Without this command the uni version in the connected device must be correctly configured for the version desired.

34. IBM Fiber RI/RO Support:

When connecting to the Ring-In or Ring-Out ports of an IBM token-ring concentrator (8230, 8260, etc.) using the TSM-F-6, the ports of the TSM-F-6 should be configured for IBM RO operation. In addition, if the ports are configured to support either source-routing or source-route transparent (SRT) operation, the TSM should be connected to Ring-In or Ring-out of the concentrator, but not to both.

35. Syslog has been modified so that a user may now select the filtering level for the individual tasks. Changes include new selections in the syslog menu that allow the individual task logging level to be changed (for debugging and critical event capture). The new syslog menu is:

    SYSLOG current configuration:
    1) Log host - UNDEFINED
    2) Log host IP -
    3) Syslog port (514) - 514
    4) Default facility code - local0
       41) Override internals - no
    5) Default priority mask - emerg
       51) Override internals - no
       52) Display internals - no
    6) Console logging - yes
    7) 7) Log Task ID - yes
       71) Use Task Name - no
    8) 8) Message tag - switch

Entries 41, 51, 52, and 71 are new. 41) will force all syslog messages to use the facility code specified in entry 4, regardless of what is hardcoded in the IBM Nways RouteSwitch S/W. 51) allows the user to modify the task log level, again overrides the hardcoded values. Menu entry 51 is especially useful to users that what to use syslog for event notification (like SSCOP/ILMI up down, port enable/disable…..)

36. The atm Service Registry Table can be manipulated with a new command: masrt. This command allows the user to add LECS or ANS entries to the Registry, for subsequent querying via ILMI by atm end stations. Currently entries must be added/modified/deleted via this command. A single LECS entry can be chosen to be mapped to the WKA using this command, though the switch will not currently support the actual mapping. (this is added to support an IBM request for functionality similar to the 8260 – again it LECS WKA mapping is not fully supported yet, the hooks are in the UI only).

37. All IBM mibs need to be reloaded for the 3.1.5.A version release.

38. FCSM does not work in slot 1.

39. When connecting an IBM Nways RouteSwitch CSM port (not an ASM port) to another manufacturer's ATM switch if the user wishes to use SVCs, the following configuration change(s) must be made:

    - If the link is an IISP link, the other manufacturer's port must be configured to be the USER side (as opposed to the NETWORK side).

    - If the link is a PNNI link, the IBM Nways RouteSwitch node identifier must be greater (higher in value) than the other manufacturer's. This can be done by configuring either switch.

40. In a topology where a loop exists do not configure static routes on each of the switches (in the loop) such that each switch points to another switch (in the same loop).

41. There is a label “use_mrouted” which must be set to a non-zero value for mrouted to load and run. Originally the presence of the file “mrd.img” was sufficient to activate multicast routing functionality. Now the file must be present, and the “use_mrouted” flag must be set.

    This flag can be set by inserting the line:

        use_mrouted=1

    into the mpm command file before the line which invokes cmInit.

42. When changing your UNI port to PNNI or IISP and vice versa, you must change PNNI port to UNI and reboot the switch to have the changes become effective.

43. Spanning Tree must be OFF in order for the Enhanced Diagnostics program to function properly. This applies to version 3.0.2 and later. The switch defaults to Spanning Tree ON. Set it to OFF through stc command, save the change, and power recycle. If the problem persists, remove cfg/cnf files, and repeat the steps turning the Spanning Tree off.

44. **Do not use PTOP private with ASM2 modules**. Use PTOP RFC 1483.

45. **Do not use VLAN Advertisement Protocol** .

46. If running IP Multicast Routing over Token Ring:

In this release, multicast packets are sent as broadcast over token ring to work with legacy systems in the field. This causes IP Multicast Routing to be sent "slow path" rather than "fast path".

In order to get maximum performance of IP Multicast Routing over token ring the following parameter needs to go in the mpm.cmd file:

tsmSetGpFunc slot, port, featureOff

    where slot - is the slot of the token ring card

        port - is the port on the card being used for IP multicast routing

        featureOff - is either 1, for "off" or 0 for "on"

Thus if the token ring board is in slot 4, and you are using port 2, the line in the mpm.cmd file should read -

        "tsmSetGPFunc 4, 2, 1"

The line should be added before "cmInit".

*Note: do not use this if you need token ring to broadcast the multicast packets for your systems. In that case, IP Multicast routing will work, but at a much slower speed than normal.

47. There is a restriction on the trunking protocol which does not allow specific routed frames to get to FDDI trunks or ATM trunks when coming from TR LANE side

48. In software version 3.1.4, the default SAR buffer size (segment size in map command) will be based on the memory (SRAM) on the ATM daughter card.

- On a 2Mb board, the default segment size is 16K
- On a 512k board, the default segment size is 8K.

Note: If one board is swapped with another (ie 512k swapped with 2Mb and vice-versa), it is the users responsibility to re-configure the segment sizes appropriately. In the process of swapping, if any of transmission type or media type or SAR type changes (ie oc3 single mode to oc3-multi mode, oc3 to ds3, sahi to midway, etc,), the switch will automatically detect a board change and reset the segment size.

5. Content Addressable Memory (CAM): Advanced Uses

This overview assumes the reader has a basic knowledge of the CAM's function in an IBM Nways RouteSwitch. It is intended to address advanced uses of CAM, such as restrictions, configuration, and the page architecture of CAM. It also provides several examples to illustrate how CAM is allocated to switching modules.

The Goal of CAM

Without any user configuration, every switching module--regardless of its number of CAMs--should come up upon a reset or after a reboot. There are restrictions to CAM usage. The main restriction is that only 13K of CAM is available in the entire switch due to limited VRAM memory. However, when the number of CAMs exceeds the maximum allowed, the user should be able to configure the proper CAM usage on each board (via the camcfg command) to get as close to the maximum limitation as possible.

CAM's Page Architecture

Structurally, the switch's CAM consists of 13 x 1K pages of memory numbered from 0 to 12. A page id identifies each CAM page and is also used to differentiate the CAM allocated to each slot.

Switching modules with 2K or 4K of CAM must start CAM allocation on an even page (i.e., page 0, 2, 4, etc,). In addition, if multiple CAM pages are needed for a 2K or 4K module, then those pages must be contiguous.

Boards with 1K of CAM are first initialized on page 12, then page 11, then page 10, etc. Boards with 2K or 4K of CAM are first initialized on Page 0. So 1K CAM boards start at the bottom of the CAM page structure and 2K and 4K boards start at the top of the CAM page structure. A 4K CAM module in slot 2 may use Page 0 (an even page) through Page 3, and a 1K CAM module in slot 3 may use Page 12. Modules cannot share MAC entries because each MAC entry is unique in the switch.

The MPM and Page 0

Since the CAM database is only used for MAC learning, only 128 entries are needed by the MPM to store router port MACs. Page ID 0 is always used by the MPM CAM. The extra 896 entries in Page 0 that the MPM does not need can be used by modules in other slots. Any board using Page 0 may have 128 entries deducted from its CAM usage because those entries are used by the MPM.

Since the MPM uses 128 entries of the total 13K available in the switch, the maximum number of entries that can be learned by switching modules is actually 13184 instead of 13312.

CAM Initialization

A successful initialization of CAM is important. If CAM initialization on a board fails, then that board will not come up properly. With no user-configuration of CAM, the switch software tries to initialize and set up all CAM available on each module. As long as there is available memory, this is possible.

If there is not enough memory for the entire CAM or the configured amount of CAM on a module, the switch will attempt to find room for 64 contiguous CAM entries. This minimum amount of CAM is enough to initialize the CAM and allow the board to come up.

If 64 contiguous entries are not available, switch software will take 64 entries way from another board, which will usually be the board in the last slot. In this case, the switch will reinitialize the CAM so the board can come up. A warning message similar to the following will be displayed to notify the user during the reboot or reset:

slot x: Cam usage was reduced to y so it can be properly initialized!

The user can see the CAM use by each module through the camstat UI command or through the howCamPage dshell command.

During a reboot, the switch does not know the number of CAMs on a board until the Chassis Manager software initializes the board. Also, boards do not necessarily come up in sequential order (e.g., slot 8 may come up before slot 7). Therefore, CAM page assignments may be altered after hot swapping multiple boards, and hot swapping may also affect the CAM usage by each board.

Restrictions for 2K and 4K CAM Boards

The restrictions for 2K and 4K CAM boards (i.e., CAMs must start on an even page and those pages must be contiguous) can mean that every CAM entry may not be used. The following example illustrates this restriction:

A switch is fully loaded with 8 boards all using 2K or 4K CAMs. The network administrator has previously used the camcfg command to allocate 1500 CAM entries (1.5 K) to each slot. Eight (8) boards using 1.5K of CAM each means that a total of 12K of CAM is required. Since the switch limit is 13K, such a configuration would seem workable and every MAC address should be learned. However, in this configuration, only 6 out of the 8 boards would have full use of the 1500 MACs. The other two boards would use only the 64 default entries.

The reason only 64 CAM entries are allocated to these last two boards is due to the 2K/4K CAM boards' restrictions. Each of the 6 boards that are able to use all of their configured 1500 entries start on an even page. Remember CAM usage by a 2K or 4K CAM board must start on an even page. The first board starts on page 0, the second on page 2, the third of page 4, the fourth on page 6, the fifth on page 8, and the sixth on page 10. Page 12 has room for only 1K of entries so cannot accommodate the requirements of the seventh board.

There is still available CAM. In fact, there are more than 500 entries available on pages 1,3,5,7,9,11, and 12. However, none of these pages can accommodate the full 1500 entries required by the seventh and eighth boards. Usage of CAM must be contiguous and there are no contiguous 1500 CAM entries left. Therefore, the seventh and eighth boards are allocated the default minimum 64 entries from the other boards in the switch.

The camcfg command

The camcfg command is used only when the total number CAMs in the IBM Nways RouteSwitch exceeds the limits. This command allows you to configure the amount of CAM you want a board to use regardless of how

much physical CAM is present on the board. You must reboot the IBM Nways RouteSwitch before a new CAM configuration takes effect. The camcfg command is described in Chapter 12 of the IBM Nways RouteSwitch User's Manual.

An Example Using the camstat Command

The camstat command allows you to view the number of CAMs and the configured CAM usage for each slot. The following is a sample of a camstat display:

Slot	# of CAMs	Cfg Usage	Adj Usage	Max Avail	Actual Usage
2	1	0	960	954	100
3	2	1500	1536	1503	0
4	4	0	4096	4085	0
5	4	3000	3008	2997	0
6	4	2800	2816	2807	0
7	1	64	64	47	0
8	1	1500	64	51	0
9	4	0	64	59	0

Slot - The physical slot number where the module is located.

# of CAMs - The actual size of the CAM installed on this module.

Cfg Usage - The amount of MAC entries configured for this slot through the camcfg command. A value of '0' indicates no configuration has been performed and the entire CAM is used.

Adj Usage - The number of entries actually allocated for this CAM. The number of MAC entries is always rounded to a multiple of 64. If Page 0 is being used, then 128 entries may be deducted from the amount. These 128 entries are used by the MPM.

Max Avail - Some entries in the CAM are reserved for internal use. This column shows the number of entries available for MAC learning.

Actual usage - The total number of MACs learned on this slot.

Some highlights in the example:

Slot 2 has 1K of CAM with no configuration. Only 960 entries are allocated because 128 entries are being deducted for use by the MPM. Only 954 entries are available for MAC learning and 100 MACs have already been learned.

Slot 3 has 2K of CAM and is configured to use 1500 entries. The Adj Usage column shows that the number of CAM entries used is rounded up to 1536.

Slot 8 has only 1K of CAM but is configured to use 1500 entries. The software will not allocate more entries than the size of an actual physical CAM. In addition, the Adj Usage is reduced to only 64 entries because there was not enough memory to use all available CAM on this board.

Slot 9 has 4K of CAM with no configuration. The Adj Usage is also reduced to only 64 entries because there was not enough memory.

6. HRE Notes

1. Large Routed Frames over IBM Proprietary FDDI Trunking:

If a FDDI port is configured for IBM Proprietary FDDI Trunking, large routed frames received from that port, will not be correctly routed by the HRE. Data corruption will occur if the frame is larger than 1856 bytes, including the MAC header. Since Ethernet frames are smaller than 1856 bytes, they will not be affected by this limitation. Only large frames such as those generated by FDDI and Token Ring will be affected.

2. HRE Must be in slot 1:

3. If an MPM has an HRE installed, the MPM must be installed in slot 1. Slot 1 is optimized for high performance routing.

4. Redundant HRE is not currently supported.

7. RouteTracker Notes

1. In order to disable precedence for Network Address Rules over Port Rules and Protocol rules, User must add the following command to the mpm.cmd file.

   Precedence = 0

8. Duplicate MAC Support on IBM 8274 Nways RouteSwitch and 8273 Series RouteSwitch

In some network configurations, the IBM 8274 Nways RouteSwitch and 8273 Series RouteSwitch must interoperate with servers and routers that carry the same MAC address on multiple interfaces. Switch software supports these duplicate MAC addresses. Chapter 11 of your IBM Nways RouteSwitch Users' Manual describes this feature. Support for duplicate MACs can be limited by the lack of internal VRAM memory and CAM space. However, since there are usually a small number of servers or routers in a given network, this limitation usually is not a problem. Therefore, it is not recommended that you bridge multiple VLAN Groups together as this causes most MAC addresses learned to become duplicate entries.

The 8273 Series RouteSwitch has a further limitation when supporting duplicate MAC addresses. The 8273 Series RouteSwitch has only one CAM and less memory than the IBM Nways RouteSwitch. Therefore, 8273 Series RouteSwitch software is not capable of handling duplicate MAC entries if they are learned from different media. For example, duplicate MAC addresses would not supported if the addresses originated from both a FDDI uplink port and an Ethernet 10BaseT port. (Duplicate MACs are also not supported between 10 Mbps Ethernet and 100 Mbps Ethernet in a 8273 Series RouteSwitch.)

The IBM 8274 Nways RouteSwitch does not have the same limitation as the 8273 Series RouteSwitch because each media (Ethernet, Token Ring, etc.) software driver in the IBM 8274 Nways RouteSwitch has its own CAM. In the 8273 Series RouteSwitch, a single CAM must be shared by all ports regardless of media type.

9. IP Firewall

Establishing communications between the IBM switch and the Check Point Enterprise Management Station (EMC) requires the following steps to be taken (refer to the Check Point Firewall-1 product documentation):

1. The switch and EMC must be running and connected to the network. The switch must have a VLAN created and a port attached to the EMC's network. The switch should have the firewall function disabled initially.
2. The switch needs to be configured into the EMC network object database. The network object type must be "Switch". In addition when creating the switch network object you must do an SNMP fetch of the switch's network interfaces. Frequently you must hit the "SNMP Fetch" button twice in order to get the switch's interface list. The network object database must be installed on the EMC before attempting to establish communications with the switch (use the "Install Database" option under the Rule Base Editor window's Policy menu).
3. After the database is installed on the EMC you must establish a Skey seed for the switch. Refer to the appropriate Check Point documentation for details. Then run the "fwconfig" command on the switch. Enable the firewall, enter the IP address of the EMC and the same Skey seed that was entered on the EMC. The firewall should come up and communication with the EMC should be established.
4. The firewall image fwd.img file must be loaded on the switch where FTP or ZMODEM is required to run.

When creating the switch network object, if you want to specify an "External Interface", use the Interface and number indicated under the Network Interfaces list. For example, the network interface name is "vn25" and the "Num." is 2, you must enter "vn252" on the "External Interface" line.

If new groups or VLANs are added or deleted on the switch after the switch network object is created, the switch network object MUST be updated to reflect these changes. This is accomplished by doing an "SNMP Fetch" on the switch object. Also, any filter that is loaded into the switch must be reloaded after a network object interface change. Failure to do this will result in new interfaces running in unprotected mode.

The following enhancements have been made to the "fwconfig" command which are not in the product documentation:

1. The name of the current filter loaded on the switch is now displayed when the view configuration option is selected.
2. The state of the connection to the EMC is now displayed when the view configuration option is selected.

For this release if the switch firewall is running and you disable the firewall using the "fwconfig" command and you then want to re-enable the firewall, you must reboot the switch or unpredictable results may occur.

When using the Check Point management GUI, certain options are present which are not supported by this release of the switch Firewall-1 implementation. These include:

In the "Rule Base Editor" window, under the "Properties…" menu the following are not supported:

Under the Security Policy menu:

1. Apply Gateway Rules to Interface Direction is always "Eitherbound".
2. Enable Decryption on Accept.

3. Use FASTPATH is always enabled.

Under the Services menu:

1. Intel Phone is not supported.

Router Access Lists are not supported.

Authentication is not supported.

Security Servers are not supported.

SYNDefender is not supported.

Under the Miscellaneous menu:

1. Load Balancing is not supported.
2. SKIP Encryption is not supported.

When creating rules using the rule base editor the following are not supported:

Under the "Action" column of the rule:

1. Drop and Reject are equivalent and result in the packet being dropped.
2. Authenticate is not supported.
3. Encrypt is not supported.
4. Network Address Translation is not supported in this release.
5. The EMC does NOT run on Windows'95.

10. IBM Support for Functional Address (IBM Spanning Tree)

1. The user can enable on a per Group basis the IBM spanning tree algorithm. This capability is provided by one of the menu items under the 'stc [Group ID]' command. When the user selects IBM spanning tree, the IBM Nways RouteSwitch automatically sets the default values for maximum age, forward delay, and hello time (6, 4, and 2 seconds, respectively) as seen in the subsequent menu items. Unlike the IEEE spanning tree algorithm, in the IBM spanning tree algorithm these values are fixed. However, for consistency in menu displays, IBM chose to not only display these values as in the IEEE spanning tree case but, in addition, enable the user to change them. In fact, the user should not change these values.

2. The default spanning tree algorithm for each Group is IEEE. If the user wishes to change spanning tree parameters on a per Group basis through use of the 'stc [Group ID]' command, at least 1 virtual port needs to be attached to the Group. An error message is displayed to this effect if the user selects the 'stc [Group ID]' command and there are no virtual ports attached to the specified Group.

3. When the user selects IBM spanning tree, additional default settings are carried out as follows:

    a. all virtual ports attached to the Group in question whose physical port is either 4Mb or 16MB token ring are initialized to use Functional rather than Group addresses;

    b. all virtual ports attached to the Group in question whose physical port is neither 4Mb nor 16Mb are set to manual forwarding mode; and,

c. as additional virtual ports are attached to the given Group, rules a) and b) are applied.

   Virtual ports that are in manual forwarding state means that they are not participating in any flavor of spanning tree (neither IEEE nor IBM). Since this state occurs automatically as a result of rule b), IBM decided to forward any IEEE spanning tree frame received on such a port to all other virtual ports in the Group that are in manual forwarding state. This is to prevent a loop in the topology as a result of applying rule b) mechanically.

4. For a Group configured for IBM spanning tree, the user can override the default settings at his or her discretion. However, as a general rule, overriding the manual forwarding state to enable IEEE spanning tree on that port only is not recommended. The user is now running a "hybrid" of IBM and IEEE spanning tree within the same Group. This may have some unintended consequences, and, although not forbidden, is not recommended.

5. It appears that IBM SRT bridges send on token ring an IEEE-style BPDU with an STE RIF (0xC200). We do not support this mode of operation. The IBM Nways RouteSwitch will neither process nor forward these frames.

6. IBM Spanning Tree uses the following 48-bit Functional Address (FA) given in canonical form to transmit BPDUs: hexadecimal 0300 0000 8000. IBM has discovered that IBM clients and servers are permitted to use this address to transmit data.

7. With the current architecture of the IBM Nways RouteSwitch / 8273 Series RouteSwitch, we cannot support the same FA for data and Spanning Tree. The FA for IBM Spanning Tree is programmed into our MPM CAM; therefore, all data frames with this FA are claimed by the MPM! This prevents the data from passing through our switch. However, we provide the following workarounds:

- There exists an 'mpm.cmd' settable global variable 'faBpGrpDisable' such that when set to 1, Spanning Tree will not program the FA into the MPM CAM. This works for those environments that are not running IBM Spanning Tree. The setting of the variable 'faBpGrpDisable' should be placed BEFORE the 'cmInit' command in file mpm.cmd.

- There exists an 'mpm.cmd' settable global variable 'faBpGrpOverride' which allows the user to set the lower 32-bits of the FA to some value other than hexadecimal 0000 8000 which is the lower 32 bits of the IBM Spanning Tree FA. The upper 16 bits are always hexadecimal 0300. This works for those environments whose applications use FA hexadecimal 0300 0000 8000, who need IBM Spanning Tree, and whose switches are all IBM or third-party bridges / switches whereby their IBM Spanning Tree FA is configurable. The setting of the variable 'faBpGrpOverride' should be placed BEFORE the 'cmInit' command in file mpm.cmd.

11. Memory Requirements

Version 3.1.5.A requires 16 Mbytes of DRAM. 4 Mbytes of Flash memory are available and required for Version 3.1.5.A. Also remember configuration information is also stored in FLASH. See the following table for the flash memory required for each module.

Filename*	Image Size (Bytes)	Module Type
mpm.img	1833252	MPM, MPM II or MPM-1G image
mpm.cmd	18	MPM, MPM II or MPM-1G command file containing system commands for booting.
Mpm.cfg	1k	MPM, MPM II or MPM-1G configuration file fixes at 1K to allow the chassis bootstrap to initialize.
Mpm.cnf, tmpmpm.cnf	32k minimum with a maximum of 512k. Also a temporary shadow file exists (tmpmpm.cnf) during expansion and it will be the same size as the mpm.cnf.	MPM, MPM II, or MPM-1G configuration file (size indicated is the default (or minimum) size. As configurations are added the size will increase.
Asm.img	45122	ASM-155-F, ASM-155-C, ASM-DS3 switching module loadable image
asms.img	40471	ASM2-155-F, switching module loadable image.
Cell.img	672936	RouteCell – Dynamically loadable image for the MPM to manage all types of CSMs.
Diag.img	177488	Off-line Enhanced Diagnostics image for the MPM
dni.img	17895	Off-line Enhanced Diagnostics image for the NI
gated.img	480172	Advanced Routing – Dynamically loadable GateD image for OSPF, and RIP II
mrd.img	64390	Advanced Routing – Dynamically loadable image for Multicast Routing function
mesm.img	22052	Image for the following switching modules: ESM-100C-12, ESM-100F-8, and ESM-C-32
e12.img	32884	Image for the following switching modules : ESM-C-12, ESM-T-12, ESM-F-8
esm.img	32539	Image for the following switching modules : ESM-8, ESM-U
fesm.img	30806	Image for the following switching modules : ESM-100-C with HSM motherboard
fesm2.img	30763	Image for the following switching modules : ESM-100-C with HSM2 motherboard
fsm.img	37735	Image for the following switching modules : FSM-M, FSM-S, FSM-C, FSM-M-C
tsm.img	32378	Image for the following switching modules : TSM-C-6, TSM-F-6
wsm2.img	41894	Image for the following switching modules : WSM-4-SC, WSM-8-SC, PWSM-SC-4
wsmdcser.img	13334	Image for the following WSM modules to support Frame Relay: WSM-SC-4/8, WSM-SC-4W/8W, PWSM-S-2, PWSM-SC-4
wsmdrv.img	122883	Dynamically loadable image for the MPM to support Frame Relay interfaces

Filename*	Image Size (Bytes)	Module Type
trbyr6.pga	11106	6 Ring Out ports for Bytex Interfaces (configuration selection F-RO-6PORT-BYTEX) for TSM-F-6 modules.
trbyrr.pga	11860	3 Ring In/Ring Out ports for Bytex Interfaces (configuration selection F-RI/RO BYTEX) for TSM-F-6 modules.
trlobe.pga	8534	6 IEEE 802.5j Lobe ports for endstation connections (configuration selection F-LOBE-802.5j) for TSM-F-6 module.
trstatn.pga	9242	6 IEEE 802.5j Station ports for connections to a MAU (configuration selection F-STATION-802.5j) for TSM-F-6 module.
trsyr6.pga	7669	6 Ring Out ports for Synoptics Interfaces (configuration selection F-RO-6PORT-SYNOPTICS) for TSM-F-6 module.
trsyrr.pga	8919	3 Ring In/Ring Out ports for Synoptics Interfaces (configuration selection F-RI/RO SYNOPTICS) for TSM-F-6 module.
trxyln3.pga	8919	3 Ring In/Ring Out ports for IBM compatible devices e.g. Synoptics RI/RO devices (configuration selection F-RIRO-IBM) attached to the TSM-F-6 module.
Trxyln6.pga	7669	6 fiber dedicated switch ports for IBM compatible devices e.g. IBM, ODS and Synoptics (configuration selection F-6PORT-IBM) attached to the TSM-F-6 module.
fwd.img	101754	Firewall image
lsm.img	171669	LANE Service Module image

Note: Release 3.0 and higher require 4 Mbytes of FLASH for the IBM Nways RouteSwitch and 8273 Series RouteSwitch.

Due to the increasing number of images files and varying sizes of the image files, the user has an enormous amount of flexibility in configuring an IBM Nways RouteSwitch or 8273 Series RouteSwitch. The table above shows the images with a brief description of what each image is used for. All images will fit into 4 Mbytes of FLASH, however the FLASH is also used to store configuration information so in most cases not all images are used and additional space will be required for configuration information. Therefore it is highly recommended that users remove all images not required for operation on a given switch (make sure you back them up on another device e.g. PC or Unix endstation). Once they are backed up remove (*rm* command) any Network Interface Module files that are not used to conserve flash memory usage. For example, if the token ring module (TSM) is not installed in the IBM Nways RouteSwitch the tsm.img file and all .pga files may be removed.

Very important : The chassis requires a minimum amount of space available in FLASH for booting. All the resident images in FLASH can not exceed 3.520 Mbytes when booting the IBM Nways RouteSwitch or 8273 Series RouteSwitch with the default configuration. If your images exceed this amount you MUST delete some images from FLASH. Also if you are running with any configuration other than the default, you will need additional available FLASH.

12. MPM Upgrade

Release 3.0 and greater requires 16 Mbytes of DRAM memory, therefore there is a memory upgrade available for the MPM, the Model no. Is MPM-UK-16MB. This upgrade kit expands the Management Processor Module DRAM memory to 16 Mbytes. The upgrade includes one 16 Mbyte simm and installation instructions. **For MPM upgrades IBM memory is required.**

13. HSM2 Modules

The HSM is the base switching intelligence for all IBM switching modules except for the 10BaseT switching modules. The HSM2 is an enhanced version of the original HSM, which provides improved performance, specifically for two-way traffic.

HSM2 support requires software release 2.0.5. or later. If any modules in the chassis are equipped with HSM2's, software release 2.0.5 or later must be loaded in the chassis' MPM. Additionally, user's transitioning from 1.x software also requires additional memory. The HSM2 requires images ending in the letter 2, (i.e. asm.2.img, fsm.2.img).

In software release 3.0 all network interface images, except for FESM2 and WSM2 are compatible with HSM and HSM2.

14. Auto Negotiation

The 10/100cfg command used for setting Auto Negotiation was made more flexible by allowing Auto-Negotiation on any link parameters including full-duplex. The default port settings for ESM-100C-12 are still half-duplex and 100Mbit/sec link speed with Auto-Negotiation enabled. With 10/100cfg command, it is now possible to enable full-duplex and Auto-Negotiate with this capability.

The UI command '10/100vc' shows the current state of all the links as illustrated in the table below. The 'SET' columns shows the setting of each port. The 'DETECTED' column shows link parameters detected as a result of Auto-Negotiation. Note that since ESM-100C-12 supports both 10 and 100MB speed, the only valid entry for 'Line Speed' column is 'auto' if Auto-Negotiation is turned on. However, the 'Duplex Mode' may be set to 'auto' or 'half-d' with Auto-Negotiation setting. The first line in the table below shows that because of link partners' ability, the resulting setting is 100MB, 'half-d' even though the IBM Nways RouteSwitch port allows full duplex. The table below shows the only valid settings for Line Speed and Duplex Mode.

/ % 10/100vc

10/100 Configured Values for all slots

Slot/ Intf	Auto-negotiate	DETECTED Line Speed	DETECTED Duplex Mode	SET Line Speed	SET Duplex Mode
5/ 1	enabled	100	HALF-D	auto	auto
5/ 2	enabled	?	?	auto	auto
5/ 3	enabled	?	?	auto	half-d
5/ 4	disabled	?	?	100	full-d
5/ 5	disabled	?	?	100	half-d
5/ 6	disabled	?	?	10	full-d
5/ 7	disabled	?	?	10	half-d
5/ 8	enabled	?	?	auto	half-d
5/ 9	enabled	?	?	auto	half-d
5/10	enabled	?	?	auto	half-d
5/11	enabled	?	?	auto	half-d
5/12	enabled	?	?	auto	half-d

15. ESM-100C-12, ESM-100F-8, and ESM-C-32 modules

The ESM-100C-12 and ESM-100F-8 do not have adequate bandwidth to provide full-wire throughput with full-duplex enabled on all the ports at 100 Mbps. A rule of thumb on ESM-100C-12: Ports 1 to 6 have approximately 700 Mbps bandwidth to use, and ports 7 to 12 also have 700 Mbps of bandwidth. Use these to calculate the expected available full throughput (100 Mbps used for half duplex ports and 200 Mbps used for a full duplex ports). Similarly, on ESM-100F-8 ports 1 to 4 have approximately 700Mbps bandwidth and port 4 to 8 also have 700MBps bandwidth. Note that this limitation does not apply to ESM-C-32 module.

For example, following configuration will only consume 630 Mbps out of 700 Mbps available.

PORTS	SPEED	DUPLEX
Port 1 through 3	100Mbit	Full
Port 4 through 6	10Mbit	Half

Another example show below consumes all available 700Mbps bandwidth.

PORTS	SPEED	DUPLEX
Port 1	100Mbit	Full
Port 2 through 6	100Mbit	Half

Configurations with more than 700 Mbps allocated will likely result in lost and errored packets depending on traffic load.

1. Link Status on ESM-C-32: The ESM-C-32 is a 10Mbit only board. A non-auto-negotiating 100Mbit link should not be plugged into one of the ESM-C-32 ports.

2. Auto-Negotiation on ESM-100C-12: Although, ESM-100c-12 has auto-negotiating feature, above behavior is observed if a non-auto-negotiating 100MB port is connected to 10Mbit configured port.

3. The 10/100 and Full/Half Duplex Configuration: The 10/100 and half/full duplex port configuration is only available from the UI only. The SNMP management objects for these variables will be included in later releases.

4. MPM-1G Hardware Compatibility: The MPM-1G module should be at rev. A9 in order for it to be compatible with all Mammoth based ESM modules.

5. ESM-100C-12, ESM-100F-8, and ESM-C-32 modules do not maintain statistics on the number of frames discarded due to the flood limit. The statistic shows as 0.

6. ESM-C-32 card will not operate outside of ±100ppm tolerance of 16 Megahertz specified in Ethernet Specifications. ESM-C-32 will operate up to ±200 ppm. However, we have observed some NIC cards which are in the tolerance range of ±500 ppm.

15.1. Hot Swapping ESM-100C-12, ESM-100F-8, and ESM-C-32 modules

1. When hot swapping any module the User must first enter *swap on* command.

2. The module must be brought offline using the reset command, reset <slot number of module> reset

3. All cables should be removed from the module and then the module may be hot swapped.

4. After reinserting the new module, the module will be brought into an offline state by the IBM Nways RouteSwitch software. After inserting the cables the module should be brought online using the reset command reset <slot number of module> enable.

5. Before inserting a module into a previously empty slot (for > 5 minutes) or the swap time-out enter the *swap on* command.

15.2. Optimized Ports on ESM-100C-12, ESM-100F-8, and ESM-C-32

The ESM-100C-12, ESM-100F-8 and ESM-C-32 will flood packets with unknown destination addresses on ports configured for optimized device mode.

16. ESM (Mammoth based) Buffering

During application testing of the ESM-C-32 board, we encountered problems passing NFSv3 packets to SUN clients connected to ESM-C-32 ports, running 3.1.3 released images.

The problem relates to the default number of output buffers for each ESM port. This number is not big enough to pass multiple NFS frames that are burst from a server.

In 3.1.3 the default port queue size for the 32 port ESM was set to 40 (decimal). This default should be 0x80 (hex 80). This can be accomplished by adding the following line to the mpm.cmd file BEFORE the line containing 'cmInit':

mam32MaxPortQueueSizes = 0x80

The defaults have been fixed in 3.1.4 to reflect this change (ie. you no longer need to set them in mpm.cmd)

17. IP Address Formats

Release 3.0 will provide the user a more concise syntax to specify the dotted decimal format of a 32-bit IP address. The new syntax conforms to the traditional Internet interpretation. The rules are as follows:

i) a.b.c.d (a, b, c and d treated as 8 bits)
2) a.b.c (a and b treated as 8 bits; c treated as 16-bits)
3) a.b (a treated as 8 bits; b treated as 24 bits)
4) a (a treated as 32 bits)
5) a. (equivalent to a.0.0.0)
6) a.b. (equivalent to a.b.0.0)
7) a.b.c. (equivalent to a.b.c.0)

One can see the more concise syntax in the following 2 examples. The IP address 3.0.0.1 can now alternatively be expressed as 3.1 or 3..1 or 3…1; the IP subnet mask 255.255.0.0 can now alternatively be expressed as 255.255. or 255.255..

The following lists some of the commands where the user can employ this more concise syntax: ftp, telnet, crgp, modvl, ping, snmpc, and xlat.

18. ATM LANE

18.1. 802.3 LEC

All translations performed on outbound 802.3 LECs services are the same translations that are performed on outbound physical Ethernet ports. Under the UI commands “mas”, and ”cas”, there is a field called use_translations. This field controls whether outbound 802.3 LEC services should enable or disable translations when transmitting frames originating from a physical Ethernet segment. It should also be noted that when the field use_translation is set to 0, all translations from dissimilar medias are still performed, and only translations on data frames from physical Ethernet media to 802.3 LECs will be disabled. This option is provided to provide increased performance when moving data between physical Ethernet media and 802.3 LANE.

18.2. 802.5 LEC

All translations performed on outbound 802.5 LECs services are the same translations that are performed on outbound physical Token Ring ports. Under the UI commands “mas”, and ”cas”, there is a field called use_translations. This field should control whether outbound 802.5 LEC services should enable or disable translations when transmitting frames originating from a physical Token Ring segment. However, this option is not applicable to 802.5 LEC services. Please disregard this field.

18.3. ATM 802.3 LEC to Ethernet segment translations

When translating data frames received from an ATM 802.3 LEC service to be output on an Ethernet segment, the user has the option to enable or disable translations. There is a parameter called atm_ethernet_xlat under

the UI “cas” and “mas” command which defaults to a 1, meaning translations are enabled. For details on actual protocol translations and meaning of various translations options please refer to the IBM Nways RouteSwitch User Manual.

18.4. LAN Emulated Client Start–up and Back-off Timers

The IBM Nways RouteSwitch LEC provides the capability of backing-off if the LEC notices calls being released or when multiple LECs on the same IBM Nways RouteSwitch are being enabled at the same time (e.g. physical cable is disconnected/reconnected). The amount (time in ticks) and nature (fixed/random) of the back-off period can be controlled using the variables described in the table below. It should be noted that the adjustment of these values needs to be done only if the ATM Network (which the LECs are connected) is not capable of processing the total number of calls that could be generated by all the LECs connected to the ATM network. This scenario is most likely to occur under the following two situations:

1. During a global restart of all the LECs due to power on/power failure.
2. During a global attempt to join an ELAN when a central LANE server resource such as LECs/LES/BUS is disconnected/reconnected or some failure.

Each LEC needs to setup a call to LEC/ LES and BUS before it stops retrying. If any fails the LEC backs off and continues the process of attempting to join the ELAN.

The default values are chosen so that calls to the LECs/LES/BUS are individually throttled by a time period of 16.66 – 266.56 milliseconds.

For 3.1.5.A, the default timers with comments are as follows;

Default Timers	**Description**	**Value**
atmlec_randomize_throttle = 1	This flag controls if the procedure uses random back-off or fixed back-off. <= 1 (random back-off) =0 (fixed back-off)	0 or 1
atmlec_backoff = 500	The % back-offff in both random and fixed can be controlled using the flag atmlec_backoff,, by default + 500 (for 500%).	> = 100
atmlec_lecs_throttle_ticks = 16	All values for ticks should be power of two (example 8, 16, 32, 64). Each tick is 16.66 milliseconds.	Power of 2 and > = 2
atmlec_les_throttle_ticks = 16	All values for ticks should be power of two (example 8, 16, 32, 64). Each tick is 16.66 milliseconds.	Power of 2 and > = 2
atmlec_bus_throttle_ticks = 16	All values for ticks should be power of two (example 8, 16, 32, 64). Each tick is 16.66 milliseconds.	Power of 2 and > = 2
atmlec_lecs_retry = 3	Retries before restart	> = 3
atmlec_les_retry = 3	Retries before restart	> = 3
atmlec_bus_retry = 3	Retries before restart	> = 3

To modify these default timers, the mpm.cmd files needs to be modified. An example mpm.cmd file with modified timer values is provided below;

```
cmDoDump=1
atmlec_lecs_throttle_ticks=64
atmlec_les_throttle_ticks=64
atmlec_bus_throttle_ticks=64
```

atmlec_lecs_retry=7
atmlec_les_retry=7
atmlec_bus_retry=7
cmInit

18.5. LANE Service Module

The following is the memory used in the LANE Service Module (LSM) assuming one LEC and one LES-BUS (one ELAN) is configured with the ELAN_NAME policy:

LSM code image (un-compressed): 500,000 bytes
LECS runtime memory : 5,200 bytes
LES-BUS runtime memory : 4,300 bytes
Message queue for AM : 504,000 bytes
Message queue for Signaling : 335,000 bytes
Message queue for Timer : 2,000 bytes
Message queue for VSE : 1,200 bytes
==========
Total memory used: 1,351,700 bytes

* Each LEC will consume 4,618 bytes.

If you have 60 LEC's joined in the same ELAN then it will be 60*4,618=277,080 bytes plus the 1,351,700 above which will come up with 1,628,780 bytes usage. If there are 60 LECs and 4 ELANs, divided into two ELANs you need an additional 4,300 bytes for the second ELAN.

A single LSM will support up to 80 total LAN Emulation Client (LES/BUS) which is an average of 20 LECs per ELAN. The BUS forwarding rate is 50,000 packets per second.

The LECS Policy Value of ESI/Selector under the ATM Address Prefix is not supported in release 3.1.5.A. Any user input will have no effect in filtering, any LECS Configuration Request will pass this criteria if it is selected.

LSM LES/BUS redundancy cannot be configured on the same switch.

19. CSM/FCSM Hot Swap Instructions

These instructions must be followed to correctly perform hot swap function.

1) Disconnect all ports from module being pulled before pulling CSM module.
2) If MSS port is pulled, wait for releases before pulling FCSM/CSM module.
3) If PNNI port is pulled, wait 15 seconds and RCC Unavail before FCSM/CSM module pull.
4) PNNI Refresh Interval must be changed from 1800 to 60, otherwise it will take 30 minutes for PNNI to have a route to the next hop FCSM.

Note: FCSM must be in a lower slot number than all CSMs.

20. RouteCell

Partial Packet Discard (PPD: During congestion, a switch can intelligently discard cells associated with an AAL5 PDU, therefore, reducing the bandwidth used along the remaining downstream path.

Partial Packet Discard (PPD)	- Disabled as default - Can be enabled by channel by setting cvc command option 10 "AAL5 Discard Continue" to enable - Can be enabled for all new channels by putting "aal5_dx=1" in the mpm.cmd file before the line "cmInit"

Random Early Detect (RED): During congesion, a switch can invoke PPD on logical connections in a round robin fashion which smooths out the waves of congestion (retransmits) that occur when LAN frames are discarded.

Random Early Detect (RED)	- Disabled as default - Can be enabled for all ports by putting "sp_ccu_enable=1" in the mpm.cmd file before the line "cmInit"

21. IBM Nways RouteSwitch Versions 2.1, 3.0, and 3.1 Problem Resolution

The IBM Nways RouteSwitch Versions 2.1.3.D, 2.1.3.F, 2.1.3.G, and 2.1.4 known problems have been fixed.

The IBM Nways RouteSwitch Versions 2.1.3.D known problems have been fixed in this release.

- 3266 ATM LEC default frame type does not accept a set command from SNMP. (PR 3266)
- 3986 Switch does not operate with IBM 8229 source route transparent bridge. (PR 3986)
- 4191 IP Ethsnap client encapsulation are set to eth2/snap when autoencaps is on. (PR 4191)
- 4271 IBM BPDUs sent with bogus port type. (PR 4271)
- 4610 Repeated RIP and SAP table update requests may cause all memory to be consumed by the switch. (PR 4610)
- 4741 Disconnecting and reconnecting LECS on Cisco7000 causes some Elans never to rejoin. (PR 4741)
- 4938 Enabling multicast claiming causes a break in AppleTalk over FDDI trunking. (PR 4938)
- 4975 LEC's require excessive time (5 minutes) to reconnect when the LANE server is disconnected/reconnected. (PR 4975)
- 5221 When displaying the VAS command bogus VC's are reported which are not associated to the LANE network (PR 5221)
- 5349 100BaseT occasionally locks up and stops receiving packets. (PR 5349)
- 5599 When frames with an unknown source address are received through the LANE bus at a high rate, MPM utilization is high. (PR 5599)
- 5701 Configurations containing redundant bridges with the switch may cause the SNA client to occasionally lose their connection to the host. Unable to ping a switch if source route ring number is higher than 1000 decimal. (PR 5701)
- 5721 The IEEE 802.1D Spanning Tree Bridge Protocol Data Unit (BPDU) is sent out every 2.5 seconds. (PR 5721)
- 5730 A Ping to the MPM fails if the source route bridge ring ID is greater than 1024. (PR 5730)

- 5820 all multicast traffic received from LANE BUS will be claimed by MPM when Multicast Claiming is turned on. (PR 5820)
- 5830 IP and IPX source routing do not operate over FDDI trunking. (PR 5830)
- 5862 Duplicate IP packets occur when framing type is Token Ring source routed. (PR 5862)
- 5865 ILMI inconsistent in setup when using IBM 8260 ATM switches. (PR 5865)
- 5883 When devices associated with RouteTracker port based rules are physically moved to another VLAN they maintain their original VLAN association. (PR 5883)
- 5906 IP ping fails on Token Ring if routing (modvl) frame is set to type Ether 2. (PR 5906)
- 5910 IBM spanning tree should not fast age SR MAC during topology change. (PR 5910)
- 5935 FR sent inverse arp messages every RIP cycle. (PR 5935)
- 5938 Large sap table causes routing delays. (PR 5938)
- 5968 Inaccurate RMON statistics. (PR 5968)
- 5986 With duplicate MACs, the port VLAN membership is not updated to indicate the VLAN membership of the second instance of the duplicate MAC. (PR 5986)
- 6042 When many ATM SVC services are enabled simultaneously, QSAAL may momentarily go down (PR 6042)
- 6099 When using HP OpenView to set value User cannot set VPortManualMode. (PR 6099)
- 6149 Cisco LES/BUS will forward the LE-ARP request back to the LEC which requested the LE_ARP on Control Distribute VC. This may cause an echo effect and a Data Direct is created to the originator. (PR 6149)
- 6161 Port rule VLAN membership is lost when a MAC ages out on another port. (PR 6161)
- 6181 ESM-C-12 may fail if ports 2, 3 or 4 are moved to another group and a large frame is received from the VBUS that requires fragmentation. (PR 6181)
- 6266 High MPM utilization caused by incorrect learning of TB frame on SR port. (PR 6266)
- 6269 SR hop count is one lower than actual. (PR 6269)
- 6299 Lane control time-out default change from 2 min to 20 seconds. (PR 6299)
- 6321 After Map IBM Nways RouteSwitch is not always able to address register with some ATM switches. (PR 6321)
- 6334 Following a map command LEC may remain in a wait state and require a mas command to manually reset the LEC. (PR 6334)
- 6357 Ping and telnet from IBM Nways RouteSwitch not reliable over Source Routing. (PR 6357)
- 6376 ESM modules may crash under certain traffic patterns. (PR 6376)

The IBM Nways RouteSwitch Versions 2.1.3.F known problems have been fixed in this release.

- New defaults are used for new cards added to empty slot. (PR 3034)
- Moving link from one full-duplex port to other full-duplex port causes source learning issues. (PR 5756)
- MPM unable to boot from Bootstrap firmware. MPM hangs. (PR 6009)
- PS LED goes from amber to green when supply is pulled slowly. (PR 6222)
- RouteTracker network rule precedence (6633)
- Domain Bridge groups with large ID number can't be deleted. (PR 6756)
- Console displays FDDI messages after creating FDDI services. (PR 6760)
- Source Learning locks up if to many duplicate and regular MACs fill CAM. (PR 6979)
- Token port priority adjusted to "priority 4". (PR 6906)
- Improved duplicate MAC support on SR ATM network. (PR 6914)
- SNAP packets generated by Vrouter are 8 bytes to short. (PR 6933)
- Remove auto-negotiation from 100 TX cards. (PR 6955)
- Traffic being sent on unlearned port Virtual rings. (PR 6958)
- Address learned on LANE port with invalid VCI causes error messages to be displayed on console. (PR 6983)
- Separate MAC Age timer for Duplicate MAC supported devices. (PR 7006)
- IP broadcasts are resent out the interface that was learned. (PR 7081)

- Packets unable to transmit to Virtual ring. (PR 7082)
- Token Ring lobe port takes excessive time to come up. (PR 7186)
- Full duplex 100BaseT copper performance. (PR 7209)

The IBM Nways RouteSwitch Versions 2.1.3.G and 2.1.4 known problems have been fixed in this release.

- RouteTracker network IP Rule problem. (PR 7170)
- RouteTracker Network rule precedence does not work. (PR 6633)
- 100BaseT with new Dec AE chip does not work properly. (PR 5349)
- IP RIP Version 1 does not handle host routes correctly. (PR 6409)
- Under heavy loads, SSCOP will go down and may not recover. (PR 6519)
- There are intermittent ESM crashes. (PR 6575)
- SSCOP goes down under heavy load with FDDI in the same box. (PR 6588)
- ATM and ESM: Flooding FDDI snap frames over domain bridging may crash the board doing the translations. (PR 7605)
- IP and IPX entries disappear from routing table. (PR 7495)
- UI may hang in "vas" with 32 elans. (PR 7570)
- ATM atmLecLastFailureResp code of 0. (PR 7558)
- Wrong elan name returned from SNMP query. (PR 7559)
- Improper flooding of IEEE BPDU on a SR port. (PR 7649)
- When VC creation fails VC record lingers. (PR 7671)
- When UNI 3.0 is used and if the LEC does not see the mode field present in the AAL parameter, the call is released. (PR 7690)
- Incorrect cause code sent with CIP/release. (PR 7691)
- Unable to add more than one IP static route with subnetted IP network address. (PR 7122)

The IBM Nways RouteSwitch Versions 3.0.1 known problems have been fixed.

- When a new module is added into an empty slot, default encapsulations are not applied automatically, even after rebooting the IBM Nways RouteSwitch. (PR 3034)
- ATM may fail when the MPM is at 90% utilization and the network interface CAM is full. (PR 4104)
- ATM UI display trunk numbers out of sequence. Vi, cas, mas, and vas affected. (PR 4430)
- Command *takeover* does not always respond. It may take awhile before the original primary performs a reboot. (PR 4988)
- Duplicate MAC's do not age out correctly. (PR 5338)
- Multiple IP responses received from MPM when source routing is enabled. (PR 5698)
- Deleting a VP while passing traffic stops traffic in forward direction only. (PR 6182)
- 'vas' does not display VCI connection numbers with X-LANE. (PR 6247)
- Changes to source routing entries in vSr table are not set in SNMP. (PR 6308)
- For RFC 1483 the wrong pid/pdu for the bpdu's are used (uses 0x07 and should use 0x0e). (PR 6328)
- Hot swap of LANE on the last ASM slot does not work. (PR 6330)
- User can change the FCSM port 2 to SVC and start creating services (e.g. lane), and it is not allowed, as is indicated with the following message: pmProtCreate(): invalid pPort=114 Creating service failed. (PR 6388)
- Bridge aging timer changes to 0 on reboot if it was modified before rebooting system. (PR 6395)
- PVC service becomes disabled on reboot or cable break on SVC config port. (PR 6410)
- VAP learned non-canonical link addresses displayed non-canonical in macinfo and fwt that should always be in canonical. (PR 6421)
- ASM accepts a vpi 0 instead of rejecting it. (PR 6449)

- OSPF over multiple ATM connections can cause infinite adjacency loop. (PR 6455)
- Restart of ATM services does not activate OSPF. (PR 6456)
- Routing to or from Token Ring media with default router encapsulation other than Token Ring does not operate. (PR 6494)
- A problem occurs when using the configsync command on the primary MPM and the secondary MPM has 32 files, and a true synchronization of configuration information is required. (PR 6497)
- vcrs command may cause the tUi_more mask crash and the system to reboot automatically. (PR 6501)
- After a soft reboot, the ILMI and SSCOP may not come up on some ports. (PR 6503)
- Entries are not returned on SNMP gets for SVC tables. (PR 6510)
- SNMP configuration for PNNI static routes are not implemented in Version 3.0. (PR 6511)
- When using redundant MPMs, the secondary MPM must have at least one file in FLASH. If not, any attempt to access the secondary MPM from the Primary MPM will result in a Secondary MPM not fully initialized message. There is no workaround to this problem if the only access to the device is through the Primary. (PR 6535)
- CSM-155-8S Single mode Cell Switching Module Slot command shows as "M" and it should be "S". VAP command should be "Single" and shows as "Multi." (PR 6587)
- IISP routing domain loop causes the signalling task to crash. When two RouteCell switches are connected via IISP, the same ATM prefixes are configured on two parallel links between the switches on both sides. When an end system searches for an ATM address that does not exist but matches the prefixes configured on the IISP links, a routing loop is created which causes the signalling task to crash eventually. The user has created a static route loop. Call control is not aware that the remote issuing the request is looping. It only knows that it needs to call PNNI to route the request and PNNI is directing back to the originator. (PR 7041)

The IBM Nways RouteSwitch Versions 3.0.2 known problems have been fixed in this release.

- *fsck* in bootstrap always runs at 9600 baud. Running at a baud rate other than 9600, removing a file, and power cycling during the compaction will cause permanent failure. (PR 1607)
- SNMP Traps sent with a bogus SNMP source IP address will be wrong if the group 1 IP is disabled. (PR 5864)
- Token Ring modules with 2K CAM come up as 1K. (PR 6489)
- There is a problem that occurs when Version 3.0 is used in the primary MPM and secondary MPM is running a pre-3.0.2 version of software, and the user wants to transition the secondary MPM over to Version 3.0. When this overlay occurs some image or images may be corrupted. Version 3.0.1 compacts the configuration when it boots. If reset in the middle of compacting the boot files may be lost. (PR 6521)
- Admin weights are not considered on PNNI IISP static route decisions. Routes are selected based on the order the user configures them. (PR 6355)
- Entries occasionally show up in the route address table under the proutea command multiple times. (PR 6596)
- PNNI SNMP MIB loses knowledge of existing static route. Adding a new route property to an interface with an existing route property (where there are no metrics and the new property has metrics) results in PNNI not generating a new IREACH ptse. The old one disappears and consequently, SNMP loses all knowledge of existing static routes. (PR 6840)
- The vap command displays extra string if transmission type is E3 or media type is UTP. (PR 6872)
- When PNNI is shutdown, an occasional PnMsgRet error message is generated. (PR 7022)
- When a user defined LECs address is specified using the LANE configuration parameters, after a period of time the Well Known Address (WKA) may be respecified and not used until the switch is rebooted. (PR 7034)
- Telnet stack when exceeded causes memory corruption and the switch reboots. (PR 7157)
- During period of extremely high call activity, PNNI links may go into states Exchanging or Negotiating. This causes the links to become unstable causing PNNI routing to cease over those links. (PR 7205)

- PNNI does not flush the port from its port table after changed to uni. (PR 7206)
- When a LANE 802.5 source route service is created with the type = SR and a mas is created on the same service the type is reset to SRT. (PR 7364)
- When the ATM cable is disconnected from RouteCell, SSCOP may not come up after the connection. (PR 7373)
- In a large LANE network (greater than 100 LECs) when LANE server is rebooted or disconnected, all LECs do not join. (PR 7374)
- OSPF hellos are sent to DLC functional address on token ring. Cisco and Wellfleet routers do not listen to this functional address. This problem occurs when running OSPF over Token Ring and there are Cisco, Bay Networks or IBM routers on the Token Ring network. These vendors do not support receiving Token Ring multicast packets, therefore will not interoperate with the switch. (PR 7377)
- Provide adaptive call pacing from Omni-LEC device. (PR 7415)
- SNMP Get fails on chasModule Table (PR 7466)
- SNMP Get fails on chasControlFFSTable (PR 7467)
- CIP client fails with cause code 0x64 when connected to RouteCell. (PR 7498)
- SVC's configured on a DS3 link do not function properly. (PR 7505)
- Port within a port based VLAN drop out of VLAN after reboot. (PR 7507)
- LEC state is not defined in the MIB. (PR 7557)
- PNNI loses topology information. (PR 7562)
- Bay LEC will not rejoin over RouteCell after connection is dropped. (PR 7565)
- OSPF neighbor state stays in exchange state with multiple IP interfaces configured with different netmasks. (PR 7568)
- Multicast routing does not have ability to be settable to "on/off". (PR 7583)
- PNNI metrics are added, but never deleted by PNNI. (PR 7591)
- Some IBM applications are not able to connect to the host because of failure on the self address test with port config and Virtual Ring. These frames are constructed with the same MAC addresses in both destination and source MAC location and re-transmit the frames back out to the same port which causes problems to the application. (PR 7592)
- MAS a bridge service "description" causes the port to be disabled. (PR 7579)
- When a station moves from one Virtual Ring to another, the port shown in the command macinfo does not change to the new port where the station has moved. (PR 7615)
- All Virtual Ring configurations are deleted when removing only one (PR 7616)
- When the input format has changed in srs and src command from slot/intf to index, the input is not parsed to filter out error input. For example, entering 5/1 and the software thinks the user wants index 5 which is wrong. (PR 7617)
- FCSM is unable to ping consistently to a duplicate mac device on multiple elans. (PR 7642)
- Pings from a CIP service may fail. (PR 7652)

The IBM Nways RouteSwitch Version 3.1.1 known problems have been fixed in this release.

- System events for SNMP Traps (ffs image overwrite and erase) are not clearly defined. (PR 7656)
- CSM-622 multimode module is not recognized by vap. (PR 7658)
- Large Token Ring or FDDI frames flooded by ESM-100C-12, ESM-100F-8, and ESM-C-32 modules may destroy buffer system. (PR 7665)
- When Virtual Circuit creation fails, Virtual Circuit record lingers. (PR 7671)
- Flooded traffic may cause buffer system corruption. (PR 7676)
- ESM-C-32's with all ports active and a FDDI card with active ports and trunking services yielding 253 virtual ports may overrun port managers message queues and it's clients message queues. (PR 7683)
- Packet fusion causes buffer overflow causing corruption and the incorrect retrieval of the buffer on packet fusion. (PR 7689).
- Chassis manager displays misleading messages when delay is due to file compaction. (PR 7702)

The IBM Nways RouteSwitch Version 3.1.2 known problems have been fixed in this release.

- Set date correctly beyond 1999 (PR 4109)
- Cannot move a station from one switch to another. (PR 5891)
- IPXPING does not operate correctly. (PR 6259)
- Remove an active OSPF group and reconfig GateD. The GateD tasks goes away. There is no error indication unless the GateD trace is activated. This occurs if a group that has an active OSPF interface is removed via rmgp. (PR 7633)
- Hardware failures occur when hot swapping ESM-100C-12, ESM-100F-8, and ESM-C-32 modules. (PR 7698/7722) [1]
- ESM-C-32 ports intermittently go into Admin Disable State without being commanded to do so. (PR 8091)
- ESM-100-C12W revision B2 intermittently stops forwarding traffic. (PR 8096) [1]
- Sun SPARC-20 systems using the built-in Ethernet port experience very slow performance using NFS RCP for file transfers. (PR 8098)

The IBM Nways RouteSwitch Version 3.1.3 known problems have been fixed in this release.

- vseOpen: camMPMInsertMac fail on Loopback Config change. (PR 4665)
- Hot swap on FCSM boards does not function properly. (PR 5640)
- Xlat command ipfind displays bogus MAC address for Frame Relay interface. (PR 6613)
- ATM is not manageable via any SNMP Manager, including the IBM RouteSwitch Network Management products. (PR 5326, 7185, 7687, 8057, 8065)
- Static Route entries created by SNMP are not fedback to the PNNI layer manager even though PTSEs are received by remote systems showing this route. (PR 6863)
- Enabling/Disabling ILMI on a CSM requires a reboot to take effect. (PR 6936)
- PNNI local hlinks are being indicated with lifetime 0.
  RouteCell (A) + two neighbors (B and C) with links to everyone, 2 links between A and B.
  Local node A is indicating it's own HLINK PTSEs to PNNI-mgr, thus causing the map table to be misleading and the hlink is ignored. (PR 7021)
- CDDI ports and/or boards lockup when multiple devices try to connect simultaneously. (PR 7164)
- Changing interface subnet mask causes OSPF assertion error. This problem occurs if a user changes the IP subnet mask of a VLAN that is running on OSPF. GateD hangs in this situation. (PR 7556)
- ATM statistics "atmLecLastFailureRespCode" reports 0. (PR 7558)
- If FCSM goes to operational state after OC12 modules, data direct does not get established. (PR 7638)
- Port monitoring hangs MPM when capture limit is exceeded. (PR 7711)
- Modify ATM VLAN Cluster does not show change in vas. (PR 7725)
- Provide support for proxy Arp. (PR 7784)
- FDDI Static Bridge address table entries are not reported correctly. (PR 7798)
- Accept Ready_IND on both Data-Direct VC/Flush on MC Send. (PR 7865)
- SNMP traps are sent if an NI module is not initialized. (PR 7872)
- FWD.IMG not working correctly on 8273 Series RouteSwitch. (PR 7878)
- tPmV task may crash when an encapsulation of the router port is modified. (PR 7932)
- TSM port may hang under severe and prolonged error conditions in ring. (PR 7936)
- 100BaseT full duplex may not work properly. (PR 7938)
- Interface table may become stuck in a loop for OC12 ports. (PR 7963)

[1] Note: Contact Customer Support to upgrade ESM-100C-12, ESM-100F-8, and ESM-C-32.

- If a Check Point EMC is not present in the network and the firewall in the switch is enabled, there are situations where the switch will lose memory. The switch must be rebooted to recover from this. If you enable the switch firewall, make sure the EMC is running and configured. (PR 8008)
- User is able to create PTOP SVC service on the ASM2 modules, however, this feature is currently not supported by the hardware. The PTOP SVC service is created successfully, however, the user cannot pass traffic through this unsupported service. (PR 8009)
- Changes in Auto-Negotiation to select different line speeds and duplex mode. (PR 8013)
- Route note information displays "?" in some fields. (PR 8023)
- The PNNI originate advertisement is incorrect. (PR 8024)
- Using Proutea, the learned via value for a directly attached MSS is netmgt instead of local. (PR 8025)
- A source MAC "A" on an ESM-100C-12, ESM-C-32 or ESM-100FM-8 will not be able to send to a destination MAC "B" on any other module if a duplicate destination MAC "B" exists on the same module as the source MAC "A". This is currently true even if the duplicate destination MACs are in different groups. (PR 8028)
- PNNI is not indicating Hlink deletions and additions to PNNI Layer manager correctly. (PR 8049)
- PNNI Address Routes show 2 entries for Well Known Address. (PR 8059)
- Load balancing does not work with admin weight of a PNNI link. (PR 8061, 8062, 7992)
- In PNNI Port Properties Node Info, PTSE counts is in error. (PR 8081)
- PNNI Port Properties Map Info Link displays unsupported version. (PR 8086)
- PNNI Route table has routes deleted erroneously. (PR 8111)
- Some boards do not come up if they contain 2K or 4K CAMs. One NI board may not properly initalize. (PR 8113)
- TSM-F-6 cards combination RI/RO (ports 1&2, ports 2&3) does not operate correctly. (PR 8137)
- HRE locks up and does not forward traffic resulting in 100% utilization. (PR 8141)
- SNMP agent redefined to support ATM Forum definitions. (PR 8161)
- Setting CSM port to PNNI does not set ILMI. (8167)
- When a mammoth based ESM-C32 crashes, it will not recover. (PR 8212)
- Add ability to cache RIF's for IP end-station even if Token Ring port is not enabled. (PR 8222)
- Mammoth based ESM-C32 crashes under heavy flooding. (PR 8251)
- ATM PTOP links lock up. (PR 8253)
- ESM-C32 buffer size increased from 40 to 128. (PR 8254)
- Fix Ethernet packet alignment for stations running Rumba 3270 LLC-2 Application. (PR 8257)
- PNNI causes depletion of memory (PR 8259, 8364)
- Source route frames are being duplicated to MPM when HRE is installed. (PR 8284)
- Null RIF in IP RIF caching is not learned on a blocked port. (PR 8299)
- SNMP agent requires "get_next" request to initialize "ipAdEntTable". (PR 8301)
- Port mirroring does not work if user enables mirroring port while creating a new group. (PR 8315)
- Excessive ring errors cause unnecessary port resets. (PR 8336)
- Two ICMP Echo replies when pinging MPM routed port in source routed environment. (PR 8354)
- VAP packets being sent out on blocked ports. (PR 8367)
- Multicast MAC address is flooded on wrong VLAN. (PR 8379)
- Duplicated MAC addresses occur on ESM-100-C12, ESM-100-FM-8 and ESM-C-32. (PR 8394)
- Source Learning should not learn Source Routed Frames on a "blocked" TSM port with All Routes Explorer blocking "on" (PR 8414)
- Port mirroring does not work if user enables mirroring port while creating a new group. (PR 8415)
- SAR buffer default set to 8k from 16k on 512k ASM cards. (PR 8454)
- Token Ring-LEC port changes from Source Route to a Transparent Bridge functionality when LANE is reset. (PR 8464)
- High MPM utilizations occur in a Domain Bridge environment. (PR 8471)
- Appletalk Multicasts are intermittently not transmitted for ESM-100-C12, ESM-100-FM-8 and ESM-C-32 cards. (PR 8472)

The IBM Nways RouteSwitch Version 3.1.4 known problems have been fixed in this release.

- An unconfigured static route with a prefix length of 0 may cause PNNI to generate an exception. (PR 6243)
- Enable/disable ILMI on RouteCell ports does not take effect until the switch is rebooted. Changing the fcsm/sar&iop side ILMI to false does not show up in vap/csm command. (PR 6471)
- ESM-100C-12, ESM-100-F8 and ESM-C-32 boards may stop bridging port monitoring is configured. (PR 7612)
- Token ring daughter cards do not display the alphanumeric hardware revision correctly, with the "slot" command. The pure numeric hardware revision format is displayed instead. (PR 8060)
- Configuring any PNNI port metric, upon a reboot, port becomes unavailable with port id (-1). PR 8076, 8093)
- SDU discards and SDU errors are not reported by the atm-snmp agent. (PR 8194)
- When STA/P is disabled, VAP packets sent on Domain Bridging ports are sent as BPDU's. (PR 8340)
- SVC connections may go down on an ATM25 module if the vvc,vcs, and vcrs command is executed from the UI without slot/port parameters. (PR 8436)
- Invalid VCI is learned on duplicate MAC when user pulls and reattaches cables many times. (PR 8443)
- LSM does not work properly with ASM2 with default settings. (PR 8536)
- *phalt* command may cause the switch to hang with "memPartAllot: the block is too big" message to appear on the screen. (PR 8540)
- Domain bridging BPDU's have 8 bytes of extra data ad the end of the frame. (PR 8546)
- With duplicate ATM and system addresses, PNNI will route to the first address learned as opposed to routing to the closest addresses. (PR 8556)
- Cannot telnet from IBM Nways RouteSwitch to OmniMSS. (PR 8590)
- Changing prompt to a dot "." and typing "??" will hang the user interface. (PR 8645)
- Default VLAN becomes inaccessible over backbone connection. (PR 8689)
- IPX does not age routes correctly. (PR 8694)
- NT Version of the EMC and firewall on different subnets do not connect. If the switch firewall is configured on a subnet that is not directly connected to the NT version of the EMC, they will not connect. (PR 8722)
- ESM-12 will sometimes crash when fragmenting a large IP packets from an FSM card in the same chassis. (PR 8734)
- ICMP redirects never age out. (PR 8770)
- When fragmenting a large IP packet, the last packet may be corrupted. (PR 8809)
- SNMP agent does not notify Network Management if deletion of LEC configuration record fails. (PR 8810)
- Only cache IP-Rif entry on ARP request only, not on ICMP redirect. (PR 8830)
- Stations that are moved from 1 8273 Series RouteSwitch to another cannot get connectivity. (PR 8860)
- Ability to use duplicate source route ring numbers on a FDDI trunk service. (PR 8898)
- 2K cam fills up with bad entries when configured for 1K. (PR 9014)
- TaskDelay in clear route cache are not settable. (PR 9016)
- Need memory protection when SNMP gets the IP routing table. (PR 9026)
- Decnet packet is translated inadvertently causing loss of connectivity. (PR 9044)
- AutoNegotiation does not work with PCMIA card. (PR 9085)
- Multiple vseTransmit Request can cause a memory expectation error and mpm reset. (PR 9122)
- Memory usage is too high by 1 Mbyte. (PR 9251)

22. Known Problems

The problems listed here include problems known at the time of the product's release. Any problems not discussed in this section should be brought to the attention of the IBM Technical Support organization as soon as possible.

22.1. User Interface and Known General Problems

Problem Report 284
When using the *fportc* command to configure FDDI SMT, a user can enter more than one assignment statement. If the user opts to use more than one assignment then there will be one prompt per assignment. This will not cause any problem, except for visual display.

Work-around: NONE REQUIRED. Visual only

Problem Report 1965
Statistics are not broken down for each group on a FDDI trunk port.

Work-around: NONE. Not a supported capability.

Problem Report 1969
The command srs, which displays source routing parameters, shows counters for duplicate LAN ID's and duplicate segments which increase when there is an external loop.

Work-around: NONE RQUIRED. Visual only.

Problem Report 2383
Static MAC cannot be assigned on any Service/Instance besides the first bridge port,

Work-around: NONE. Not a supported capability.

Problem Report 2600
Cannot change FDDI connection rejection policy via user interface.

Work-around: Use IBM Nways RouteSwitch Network Manager

Problem Report 3157
Macinfo may report more number of MACs than actual in a source routed environment. The actual MAC addresses shown are correct as is the number of MACS shown.

Work-around: NONE REQUIRED. Visual only.

Problem Report 4464
When the UNI version is changed and the option to reset the board is chosen, the change does not become effective. User must reboot the switch to make a change in UNI take effect.

Work-around: Reboot the switch when UNI version or vci/vpi bits are changed.

Problem Report 6261
Packet discards due to insufficient buffers are not properly displayed in the vs command.

Work-Around: NONE.

Problem Report 8130
When RI/RO is set, *src* shows six ports for fiber card instead of three.

Work-around: NONE REQUIRED. Visual only.

22.2. Known Router Problems

Problem Report 549/551 [previously PR 699]
Configuration of a Group without assigning any ports to the Group will result in the routing tables displaying the Group's IP network as being available.

Work-around: Either assign ports to groups when they are created or if the IP network appears in the routing table and is causing a problem with IP routing, the user can reboot the switch. When a reboot is performed, the correct configuration will be displayed in the routing tables.

Problem Report 3982
Token Ring IP Client looses connection when IP virtual router port frame type is set to Ethernet SNAP(8).

Work-around: Do not use Ethernet SNAP encapsulation for IP virtual router ports when Token Ring stations are on the IP subnetwork belonging to that IP router port. You can use any other router port encapsulation.

Problem Report 4122
The Total datagrams received and total PDU's requested for transmit statistics displayed in the ips command can be incorrect. The switch uses TCP packets to enforce paging for the user interface displays, which causes these statistics to increase even when no external IP traffic is being received or transmitted.

Work-around: Turn off the switch "more" function, which allows multiple page user interface output to be displayed one page at a time. This is accomplished by issuing the "nomore" UI command.

Problem Report 6947, 6943
IPX clients were unable to connect to any IPX server when the router port encapsulation was set to SR_FDDI_LLC or SR_FDDI_SNAP and the client and server did not have source routing enabled.

Work-Around: Do not set router port encapsulation to either SR_FDDI_LLC or SR_FDDI_SNAP if source routing is not configured on the bridge ports.

Problem Report 6975
Deleting an active xlat entry causes error number (errno) 0X2 message to be output.

Work-Around: This error message has no effect on the switch operation. The entry is removed successfully.

Problem Report 7063
IPXPING does not work over FDDI trunking with TR_SNAP & TR_LLC router port encapsulation.

Work-Around: IPXPING does work using TR_SNAP & TR_LLC router port encapsulations over other media types.

22.3. Known Bridging Problems

Problem Report 5854
Modifying the spanning tree forward delay parameter using the stc command may cause the forwarding table entrys not to be flushed and relearned properly.

Work-around: NONE. If you change the forward delay, it is recommended that the switch be rebooted.

Problem Report 7543
The Auto Switch Timer does not reflect the same value when set via SNMP. i.e. A user set the timer as 30000 from NMS but the next query of that value comes back with another number.

Work-around: Set this value using UI.

22.4. Known Ethernet Problems

Problem Report 5042
SNMP shows 100BaseT ports as regular Ethernet. There is no distinction between 10 BaseT and 100BaseT ports.

Work-around: NONE REQUIRED. Visual only.

22.5. Known ATM / LANE Problems

Problem Report 2332
When configuring an IPX router port for source routing, the IPX ping across a trunk port will not work.

Work-around: Disable source routing on router port

Problem Report 4335
No mib support for atmAddArpEntry for CIP services.

Work-around: NONE

Problem Report 4579
If one value on a DS3/E3 configuration set is invalid, no other values are set

Work-around: NONE

Problem Report 4730
Peak cell rates do not get initialized on an ATM-DS3 module if ATM-OC3 module was previously in the same slot.

Work-around: NONE

Problem Report 6865
Once the ASM port is reset via the map command, Qsaal may take up to 30 seconds to come up.

Work-Around: NONE

Problem Report 6902
SNMP agent returns NO_SUCH_NAME error when any dsx3ConfigTable objects were set.

Work-Around: NONE

Problem Report 7138
When LANE is in intermediate state and administratively is disabled, VCs are still displayed.

Work-Around: NONE

Problem Report 7185
Services may get corrupted on invalid SNMP modify attempts.

Work-Around: NONE

Problem Report 8159
The representation of the LEC in the MIB-II if Table is not working properly.

Work-Around: NONE

Problem Report 8290
Can create bad CIP Service with CIP group with no IP Router.
Work-Around: NONE

22.6. Known LANE Service Module Problems

Problem Report 8942
The Omni Token Ring proxy LANE clients will not be able to join a Token Ring ELAN configured with only a route descriptor as the policy type in the LECs database supported by LSM. This is caused by the Configuration Request frames sent by the Omni Token-Ring proxy LEC which does not use the route descriptor in the LAN destination field, instead it uses the MAC address. The LECs will reject this configuration request if the route descriptor is the only policy type configured.

This is true if any other third party of Token Ring LEC is used which does not use the route descriptor in the LAN destination field of the configuration request frames.
Work-Around: NONE, do not use the router descriptor as the policy type.

Problem Report 9119
The switch reboots if the ATM cable is pulled and plugged back in.
Work-around: Wait 10 seconds before plugging cable back in.

Problem Report 9180
ESI/Sel type policy under ATM prefix policy does not work.
Work-around: NONE

22.7. Known SNMP Problems

Problem Report 4068
Setting Frame Relay Phys Ports Adm Status = Disabled has no effect on Virtual Ports.
Work-around: Set to disabled using UI

Problem Report 4292
There is no SNMP support for TSM-CD-6 port modes and ring speed auto-detect.
Work-around: NONE

Problem Report 6669
An SNMP get of the atTable returns one extra byte that is erroneous. This is an inconvenience only, as the rest of the data is correct.
Work-Around: NONE

Problem Report 7900
Token Ring IEEE 802.5 MIB is not supported
Work-around: NONE. Not a supported capability

Problem Report 8106
The SNMP agent will return a False value regardless of whether a Token Ring Port in participating as an Active Monitor or not.
Work-around: NONE

Problem Report 8188
Entries in the bridge forwarding database returned by the SNMP agent should be in numeric order.
Work-Around: NONE. All entries are returned.

Problem Report 8380
LED display of ESM-100C-5 is not displayed properly.
Work-around: NONE

Problem Report 8557
The status LED's are not reflected for banks C & D on CSM-A25-24.
Work-around: NONE

Problem Report 8982
SNMP query of ifSpeed on an ESM-100C-12 port shows 10M instead of 100M.
Work-around: Use UI Command 10/100 VC. This will be fixed in a future release.

Problem Report 9108
ESM-32 displays 8 port LEDs are on.
Work-around: NONE

22.8. Known Token Ring Problems

Problem Report 4944
Hot swapping of the dual mode token ring card will cause "Changed ring speed detection" messages to be displayed.
Work-around: NONE

Problem Report 8139
Fiber RIRO-BYTEX will not load onto fiber card properly and ports do not initialize correctly.
Work-around: Use Ring-out only.

Problem Report 8753
IBM Nways RouteSwitch participates as an active monitor even when not configured to participate as an active monitor.
Work-around: NONE

22.9. Known Frame Relay Problems

Problem Report 7601
PWSM-SC-4 with compression enabled may have CRC errors under heavy traffic.
Work-around: NONE

22.10. Known RouteTracker Problems

Problem Report 5660
When creating RouteTracker VLANs from the Network Management System VLANs and rules cannot be created with the admin status set to disabled.

Work-around: The admin status must be in an enabled state to create VLANs and rules. Once the VLANs and rules are created, the admin state can be set to disabled, if desired.

Problem Report 8105
Delete Mobile Group Net IP Rule does not the return port to Group 1.

Work-around: NONE

Problem Report 9031
AppleTalk Phase 1 (EtherII) is not supported on RouteTracker.

Work-around: NONE

22.11. Known MPM Redundancy Problems

Problem Report 7013
Primary MPM issued 'Secondary mpm.cmd has different contents: Bring down Secondary?' message after doing mpmreplace for mpm.cmd file. It was verified that the mpm.cmd files were the same on the primary and secondary MPMs.

Work-Around: Ensure the mpm.cmd files are identical and only reply "y" to the query and reboot will continue as requested.

22.12. Known PNNI Problems

Problem Report 6982
Failure in csmSigtask related to PNNI routing. In some rare conditions, the csmSigTask may generate an exception at boot time, causing LECs to not join the LES. This will result in a dump file being produced on the MPM.

Work-around: Reboot the switch and forward the dump file to IBM tech support.

Problem Report 7422
User side of an IISP is not supported.

Work-around: NONE

Problem Report 7423
Call control doesn't participate correctly in the master/slave dialogue. Omni PNNI requires itself to be the master. As such the Omni ESI must always be of greater value than the other vendors. Workaround: Set Omni to higher value or the other vendor to lower value.

Work-around: NONE

Problem Report 7990 Changing admin weight in ppcfg for a port causes all the default values to go to zero.

Work-around: Map slot port config type = PNNI and ppcfg slot port. This only occurs on ports where the map type has not been set to PNNI. If the user performs the commands described and then

sets the port type tp PNNI, PNNI will still not come up. Further attempts to reset the admin weight on the port type after changing to type PNNI will also result in failure.

Problem Report 8115
When performing a get next on pnnixNodeTable, the getnext operation goes into a loop.

Work-around: Do not perform the table read operation for this table on any network management platform using SNMP.

Problem Report 8632
When PNNI nodes have their IDs reconfigured, their old Nodal Information Group Element PTSEs persist in the network for 30 minutes.

Work-around: NONE, The PTSEs will eventually time out and be removed from the PNNI topology databases. The User Interface and Network Management displays both will show the stale entries until they do time out.

Problem Report 8850
Using Network Director, metric tags of route addresses are always returned as 0.

Work-around: NONE, instead, telnet into the switch and monitor/configure the route addresses via the User Interface shell.

Problem Report 8851
User Network Director, the ifIndex field is always returned as –1 if a static route is created by the Director. This prevents addition or deletion of routes by Network Director.

Work-around: NONE, instead, telnet into the switch and monitor/configure the route addresses via the User Interface shell.

Problem Report 8852
QOS Classes for metric tags are created by value number instead of bit position as mib states. This allows for only UBM classes to be successfully put into a tag.

Work-around: Do not configure the metrics for Port or route via the Network Director. Instead, telnet into the switch and configure them via the user interface shell.

22.13. Known Advanced Routing Problems

Problem Report 5611
Using mask with exact or refines as parameters in route filter do not work together. When the gated.conf file contains:
import proto rip interface xxxx {192.206.184.0 mask 255.255.255.192 exact;};
It should match only the network and not the subnet or hosts of the network. But the network address is not accepted. Replacing exact with refines should match all subnets and hosts but only matches hosts. None of the subnet addresses are accepted. This is explained in section 4.25.2 of gated conf. Guide. The route filters do not work correctly. A class C address with the mask of 255.255.255.240 only accepts subnet 0 and its hosts. It does not accept subnets 16, 32, etc.

Work-around: NONE

Problem Report 6060
OSPF does not pass on route tag if it is an external LS advertisement

Work-around: NONE

Problem Report 6279
Invalid network parameter within the network statement of the Gated.conf may crash the switch.

Work-around: Correct the gated configuration syntax an reboot the switch. You can also insure the gated configuration file syntax is correct before using on the switch by using a UNIX or Linux workstation with gated installed to parse the config file before installing on the switch.

Problem Report 6534
Routes with wrong next hop over Frame Relay.
Three switches within the same network, running GateD routing environment, connected via Frame Relay. When the three switches are connected without a loop via Frame Relay, the top switch(A) advertises the route from its neighbor(B) to the other neighbor(C) with the next hop being switch B. Since there is no physical connection between switch B and C, the advertised network becomes unreachable.

Work-Around: This configuration cannot be expected to work in normal IP routing environments. This requires changes to the way routing works in a non-meashed frmae relay network. Those changes have been made in the RIP routing supported by the base IBM Nways RouteSwitch software. If this configuration is required, use the IBM Nways RouteSwitch RIP implementation, not the Advanced Routing package.

Problem Report 6793
No virtual link information is available within the UI.
If virtual links are configured, the user has no way of finding out information about the status, etc.

Work-Around: NONE

Problem Report 6900
RIPflush does not clear the RIP routes in GateD.

Work-Around: NONE

Problem Report 7448
IBM Nways RouteSwitch switches RIP II multicast packets instead of consuming them entirely. This causes no noticeable problem. This only causes slight increase in traffic on the network.

Work-Around: NONE

Problem Report 7534
OSPF stops when a group is removed from DR Other. It happens after a Link State Update due to the DR Other not sending any more Hello packets resulting in the lost of adjacency.

Work-Around: Do gated reconfig DR Other, after having removed the group.

Problem Report 8089
In certain cases, when using variable length subnet masks where the mask is not a continuous string of ones (i.e. has 0's in the mask) , OSPF will abort.

Work-Around: Use subnet masks that are all ones.

22.14. Known RouteCell/FCSM Problems

Problem Report 6086/5952
The UI does not show the correct traffic descriptors for SVC calls. It shows UBR for all connectors (cosmetic only, it is correct internally).

Work-around: NONE

Problem Report 6167
The RouteCell does not perform a query for vpi/vci bits to a connected device.

Work-around: Manually configure vpi/vci bits with 'map' command only when there are no connections on that port, then reboot.

Problem Report 6721
Switch needs to be rebooted after changing the UNI version on CSM port(s).

Work-Around: NONE

Problem Report 6844
When a connection is created and multicast child, or when reverse connections are created, transmit bandwidth is not decremented.

Work-Around: NONE

Problem Report 6901
When selecting the max vci of 255, the vci is not included and system creates a vpc.

Work-Around: Do not select maximum vci of 255.

Problem Report 6968/6091
Under ptomp connections, if a party is removed, the reverse connection is not removed automatically. The user needs to remove the reverse connection in a 2 step process.

Work-Around: Step 1. Modify the reverse connection so that it points to itself.
Step 2. Delete the reverse connection.

Problem Report 7002
A deleted service on FCSM shows up on the vvc command as if it still exists in the system.

Work-Around: NONE

Problem Report 7126
ILMI and signalling do not go out CSM port when FCSM is in slot 1.

Work-Around: Install FCSM in any other slot.

Problem Report 7203
Switch may not reboot properly after primary MPM-1G is removed from slot 2.

Work-Around: NONE

Problem Report 7380
Vvc and vcs do not work for individual connections on FCSM board.

Work-Around: List all connections.

Problem Report 7869
The calculation of PCR for CBR in lower than 1k values is incorrect.

Work-Around: NONE

Problem Report 8000
VLS and VLRS show port zero on CSM module with dropped cells.

Work-Around: NONE

Problem Report 8268
Upon removing OC12 connection, the signaling channel stays in the hardware and does not get flushed.

Work-Around: NONE, one extra channel left on the system is not a problem.

Problem Report 8392

CSM board introduces excessive CRC errors when total bandwidth exceeds 135MB.

Work-Around: NONE

Problem Report 8475

Changing vpi/vci bits on OC12 ports does not work.

Work-Around: Don't change the number of vpi bits or vci bits on OC12 ports.

Problem Report 8626

The max vpi/vci bits for oc12 modules in the map command should be 2 bits vpi and 10 bits vci respectively.

Work-Around: Do not use more than 12 bits of vpi and vci total. The map command display of 5 bits vpi (default) should be 2 bits vpi. The map command display range of 1..15 bits for vpi and vci should be a range of 1..12 bits for vpi and vci.

Problem Report 8681

Flash parameters of a reverse connection are not deleted after a connection is deleted.

Work-Around: User needs to manually delete the reverse connection on reboot.

Problem Report 8812

After removing a CSM module, all CSM commands show either ports or channels on a slot.

Work-Around: NONE, this occurs only when a board is removed.

Problem Report 9213

If the user changes the peak cell rate in the traffic description table usage the cvc or mvc commands and then changes the sustaining cell rate or the maximum burst size, the available bandwidth will be decremented again.

Work-Around: Do not save the channel if this occurs, cancel the menu and always enter the sustaining cell rate and maximum burst size before changing the peak cell rate (i.e. change the peak cell rate last).

22.15. Known HRE Problems

Problem Report 6121

HRE is unable to route IP FDDI data through FDDI trunking.

Work-around: NONE

Problem Report 8040

If HRE is installed in second slot, routing performance is significantly reduced if the MPM in the second slot becomes the primary MPM.

Work-around: Use HRE in slot 1 MPM only.

Problem Report 8007

Firewall does not work with HRE.

Work-around: NONE

22.16. Known Port Monitoring Problems

Problem Report 5090
Change mirroring ports group disables mirroring.
Work-Around: Reboot the switch, or disable mirroring, change group and enable mirroring.

Problem Report 6211
Port Monitoring byte count displayed is not accurate.
Work-around: NONE

Problem Report 8289
Under heavy traffic, not all packets are sent to 100BaseT mirroring port.
Work-around: NONE

Problem Report 9011
Previously used Mirroring Port on ESM-12 causes CPU utilization to remain at 55-65%.
Work-around: NONE

22.17. Known VAP Problems

Problem Report 7093
The command fwtvl shows all host addresses twice.
Work-Around: NONE

Problem Report 7809
In certain networks where MAC address time out of the MPM CAM frequently (several timeouts per second), there can arise situations where the VLAN memberships of remaining MAC addresses are inconsistent across the network until the next VAP update is generated. This will usually occur on large networks or networks with a lot of instability. The result is that some VLAN leakage can occur for short periods of time. This will be fixed in a future.
Work-Around: NONE

22.18. Known Multicast Problems

Problem Report 6427
IP Multicast works over Frame Relay if only 1 virtual circuit is configured.
Work-around: NONE

Problem Report 7508
If the remote address of an entry in a tunnel table created by the *mrtun* command is configured using an IP address configured in the switch's local configuration, the multicast routing program will continually restart.
Work-around: Do not configure a remote tunnel with a local IP address.

Problem Report 8033
Multicast routing will not operate if ESM-100C-12, ESM-100F-8, and ESM-C-32 (with optimized ports) and Multicast claiming turned on.

Work-around: When using Multicast Routing User must turn off Multicast Claiming by setting the flag to zero in the command file. The command file flag which must be set to zero is: bslLearnMcPkt = 0. Turning off the Multicast Claiming will cause multicast traffic to not operate properly on ESM-100C-12, ESM-100F-8, and ESM-C-32 optimized ports. Do not use optimized ports on ESM-100C-12, ESM-100F-8, and ESM-C-32.

22.19. Known Firewall Problems

Problem Report 9163
Switch can crash when large numbers of events are being logged. In cases where event logging is turned on and the firewall rule base is defined to log a large number of events and those events are being generated faster than the switch can process and send them to the Enterprise Management Console (EMC), the switch can possibly crash.

Work-around: Define event logs for events that are exceptions to normal operation.

23. Hardware Compatibility Matrix

Below are matrices containing 1) IBM RouteSwitch Network Management, IBM Nways RouteSwitch, 8273 Series RouteSwitch Compatibility, and 2) Hardware revision levels with IBM Nways RouteSwitch revision levels compatibility. It should be noted that all high-speed switching modules are comprised of an HSM motherboard and network interface daughter cards.

Network Management

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
IBM Nways RouteSwitch Network Manager						
Rev. 2.0	No	No	No	No	No	No
Rev. 2.0.3	No	No	No	No	No	No
Rev. 2.1	x	x	x	x	x	x
Rev. 3.0	x	x	x	x	x	x
RouteTracker						
Rev. 2.0	No	No	No	No	No	No
Rev. 2.0.6	No	No	No	No	No	No
Rev. 2.1	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*
Rev. 3.0	x	x	x	x	x	x
RouteMonitor						
Rev. 2.1	x	x	x	x	x	x
Rev. 3.0	x	x	x	x	x	x
RouteDirector						
Rev. 3.0	x	x	x	x	x	x

*Yes. Using Revision 2.1 of IBM Nways RouteSwitch Network Manager/RouteTracker/RouteMonitor with IBM Nways RouteSwitch software release 2.1.3 will function, however, it is preferable to use revision 3.0 of IBM Nways RouteSwitch Network Manager / RouteTracker / RouteMonitor with IBM Nways RouteSwitch software 3.0.1, 3.0.2 or 3.1.

IBM Nways RouteSwitch Hardware

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
MPM (P/N 05002600) Requires 16 Meg for 3.0	DISCONTINUED					
Rev. C (2.10)	x	x	x	x	x	x
Rev. D (2.11)	x	x	x	x	x	x
Rev. E (2.12)	x	x	x	x	x	x
Rev. F (2.13)	x	x	x	x	x	x
Rev. G (2.14)	x	x	x	x	x	x
Rev. H (2.15)	x	x	x	x	x	x
Rev. I (2.16)	x	x	x	x	x	x
Rev. J (2.17)	x	x	x	x	x	x
Rev. K (2.18)	x	x	x	x	x	x
Rev. L (2.19)	x**	x**	x**	x**	x**	x**
Rev. L1 (2.20)	x	x	x	x	x	x
Rev. L2 (2.21)	x	x	x	x	x	x
MPM (P/N 05002601) Requires 16 Meg for 3.0						
Rev. C (2.10)	x	x	x	x	x	x
Rev. D (2.11)	x	x	x	x	x	x
Rev. E (2.12)	x	x	x	x	x	x
Rev. F (2.13)	x	x	x	x	x	x
Rev. G (2.14)	x	x	x	x	x	x
Rev. H (2.15)	x	x	x	x	x	x
Rev. I (2.16)	x	x	x	x	x	x
Rev. J (2.17)	x	x	x	x	x	x
Rev. K (2.18)	x	x	x	x	x	x
Rev. L (2.19)	x**	x**	x**	x**	x**	x**
Rev. L1 (2.20)	x	x	x	x	x	x
Rev. L2 (2.21)	x	x	x	x	x	x
Rev. L3 (2.22)	x	x	x	x	x	x
Rev. L4 (2.23)	x	x	x	x	x	x
MPM2-16 (P/N 050120-13)						
Rev. A (1.00)	x**	x**	x**	x**	x**	x**
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
Rev. A6 (1.06)	x	x	x	x	x	x
Rev. A7 (1.07)	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
MPM-1G (P/N 050143-06)						
Rev. A1 (1.01)	x**	x**	x**	x**	x**	x**
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
Rev. A6 (1.06)	x	x	x	x	x	x
Rev. A7 (1.07)	x	x	x	x	x	x
Rev. A8 (1.08)	x	x	x	x	x	x
Rev. A9 (1.09)	x	x	x	x	x	x
MPM-II (P/N 05012006) Requires 16 Meg for 3.0						
Rev. C1 (2.02)	x**	x**	x**	x**	x**	x**
Rev. C2 (2.03)	x	x	x	x	x	x
Rev. C3 (2.04/3.04)	x	x	x	x	x	x
Rev. C4 (2.05)	x	x	x	x	x	x
Rev. C5 (2.06)	x	x	x	x	x	x
Rev. C4 (3.05)	x	x	x	x	x	x
Rev. C5 (3.06)	x	x	x	x	x	x
Rev. C6 (3.07)	x	x	x	x	x	x
Rev. C7(3.08)	x	x	x	x	x	x
Rev. C8 (3.09)	x	x	x	x	x	x
Rev. C9 (3.10)	x	x	x	x	x	x
Rev. C10 (3.11)	x	x	x	x	x	x
Rev. C11 (3.12)	x	x	x	x	x	x
Rev. C12 (3.13)	x	x	x	x	x	x
Rev. C13 (3.14)	x	x	x	x	x	x
HRE Hardware Routing Engine (P/N 050125-06						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
ESM-C-8 (P/N 05001400)	DISCONTINUED					
Rev. D (1.09)	x	x	x	x	x	x
Rev. E (1.10)	x	x	x	x	x	x
Rev. F (1.11)	x**	x**	x**	x**	x**	x**
Rev. F1 (1.12) [2]	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3A	3.1.4	3.1.5.A
ESM-U-6 (P/N 05006706)						
Rev. C (1.03)	x	x	x	x	x	x
Rev. D (1.04)	x**	x**	x**	x**	x**	x**
Rev. E (1.05)	x	x	x	x	x	x
Rev. F (2.00)	x	x	x	x	x	x
Rev. F1 (2.01)	x	x	x	x	x	x
Rev. F2 (2.02) [2]	x	x	x	x	x	x
ESM-C-12 (P/N 05011206)						
Rev. D (1.0)	x**	x**	x**	x**	x**	x**
Rev. D1 (4.01)	x	x	x	x	x	x
Rev. D2 (4.02)	x	x	x	x	x	x
Rev. D3 (4.03)	x	x	x	x	x	x
Rev. D4 (4.04) [2]	x	x	x	x	x	x
Rev. E (5.00)	x	x	x	x	x	x
Rev. E1 (5.01) [2]	x	x	x	x	x	x
Rev. E2 (5.02)	x	x	x	x	x	x
Rev. E3 (5.03)	x	x	x	x	x	x
ESM-T-12 (P/N 050140-06)						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02) [2]	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
Rev. B4 (2.04)	x	x	x	x	x	x
Rev. B5 (2.05)	x	x	x	x	x	x
ESM-F-8 (P/N 05011806)						
Rev. A (1.00)	x**	x**	x**	x**	x**	x**
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05) [2]	x	x	x	x	x	x
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02) [2]	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
Rev. B4 (2.04)	x	x	x	x	x	x
Rev. B5 (2.05)	x	x	x	x	x	x

[2] This revision or above (within the same alpha range) are required to support 960 VBUS Speed.

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
ESM-AB-AFD (P/N 05014406)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
ESM-AB-FL (P/N 05008506)						
Rev. B	x	x	x	x	x	x
Rev. C	x	x	x	x	x	x
Rev. D	x	x	x	x	x	x
Rev. E	x	x	x	x	x	x
ESM-AB-FL-S (P/N 05012306)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
ESM-AB-T (P/N 05009106)						
Rev. A	x	x	x	x	x	x
ESM-AB-B (P/N 05009706)						
Rev. B	x	x	x	x	x	x
Rev. C	x	x	x	x	x	x
ESM-AB-AT (P/N 05007906)						
Rev. B	x	x	x	x	x	x
HSM (P/N 05003106)	DISCONTINUED					
Rev. E (2.05) " "	x	x	x	x	x	x
Rev. F (2.06) " "	x	x	x	x	x	x
Rev. G (2.07) " "	x	x	x	x	x	x
Rev. H (2.08) " "	x	x	x	x	x	x
Rev. J (2.09) " "	x	x	x	x	x	x
Rev. K (3.10)	x*	x*	x*	x*	x*	x*
Rev. L (3.11)	x**	x**	x**	x**	x**	x**
Rev. M (4.12)	x	x	x	x	x	x
Rev. M1 (4.13)	x	x	x	x	x	x
HSM2 (P/N 05011006)						
Rev. C (3.00)	x**	x**	x**	x**	x**	x**
Rev. C1 (3.01)	x	x	x	x	x	x
Rev. C2 (3.02) [2]	x	x	x	x	x	x
Rev. C3 (3.03)	x	x	x	x	x	x
Rev. D (4.00)	x	x	x	x	x	x
Rev. D1 (4.01) [2]	x	x	x	x	x	x
Rev. D2 (4.02)	x	x	x	x	x	x
Rev. D3 (4.03)	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
HSM2 4K (P/N 05016806)						
Rev. A (1.00)	x	x	x	x	x	x
TSM Copper (P/N 05004906)						
Rev. A (1.01)	x	x	x	x	x	x
Rev. B (1.02)	x	x	x	x	x	x
Rev. C (1.03)	x	x	x	x	x	x
Rev. D (1.04)	x	x	x	x	x	x
Rev. D1 (4.01)	x	x	x	x	x	x
Rev. D2 (4.02)	x	x	x	x	x	x
Rev. D3 (4.03)	x	x	x	x	x	x
Rev. D4 (4.04)	x	x	x	x	x	x
TSM Fiber (P/N 05011106)						
Rev. A (1.01)	x	x	x	x	x	x
Rev. B. (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
Rev. B4 (2.04)	x	x	x	x	x	x
TSM Dual Mode (P/N 05012106)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
ATM OC3 Daughter Card (P/N 05004400)	DISCONTINUED					
Rev. A (1.01)	x	x	x	x	x	x
Rev. B (2.00)	x	x	x	x	x	x
ATM OC3 Daughter Card Multimode, ½ MB SRAM (P/N 05011626)						
Rev. A (1.01)	x	x	x	x	x	x
ATM OC3 Daughter Card Multimode, 2 MB SRAM (P/N 05011624)						
Rev. A (1.01)	x	x	x	x	x	x
ATM OC3 Daughter Card Singlemode, 2 MB SRAM (P/N 05011625)						
Rev. A (1.01)	x	x	x	x	x	x
ATM OC3 Daughter Card Singlemode, ½ MB SRAM (P/N 05011627)						
Rev. A (1.01)	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
ATM DS3 Daughter Card (P/N 05010406)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
ATM E3 Daughter Card (P/N 05010413)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
ATM-UTP Daughter Card one UTP (P/N 050115-06)						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
ATM2-155-FM Multimode (P/N 050146-06)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
ATM2-155-FS Single Mode (P/N 050146-13)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
CSM-A25-24 (P/N 050134-13)						
Rev. A (1.00) Initial Release					x	x
CSM-A25-24 (P/N 050134-73)						
Rev. A1(1.01) Initial Release						x
CSM-A25-12 (P/N 050134-06)						
Rev. A (1.00) Initial Release					x	x
CSM-A25-12 (P/N 050134-66)						
Rev. A (1.01) Initial Release						x
CSM-155-6M2S (P/N 050113-25)						
Rev. G1 (7.01)	x	x	x	x	x	x
Rev. G2 (7.02)	x	x	x	x	x	x
Rev. G3 (7.03)	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
CSM-155-6M2S (P/N 050113-85)						
Rev. G4 (7.04) Initial Release						x
CSM-155-6M2SL (P/N 050113-27)						
Rev. F5 (6.05)	x	x	x	x	x	x
Rev. G1 (7.01)	x	x	x	x	x	x
Rev. G2 (7.02)	x	x	x	x	x	x
CSM-155-6M2SL (P/N 050113-87)						
Rev. G4 (7.04) Initial Release						x
CSM-155-8 (P/N 050113-14)						
Rev. F (6.00)	x	x	x	x	x	x
Rev. F1 (6.01)	x	x	x	x	x	x
Rev. F2 (6.02)	x	x	x	x	x	x
Rev. F3 (6.03)	x	x	x	x	x	x
Rev. F4 (6.04)	x	x	x	x	x	x
Rev. F5 (6.05)	x	x	x	x	x	x
CSM-155-8 (P/N 050113-24)						
Rev. G (7.00)	x	x	x	x	x	x
Rev. G1 (7.01)	x	x	x	x	x	x
Rev. G2 (7.02)	x	x	x	x	x	x
CSM-155-8 (P/N 050113-84)						
Rev. G4 (7.04) Initial Release						x
CSM-155C-8 (P/N 050113-83)						
Rev. G4 (7.04) Initial Release						x
CSM-155C-8W (P/N 050113-23)						
Rev. G (7.00) Initial Release					x	x
CSM-155-8S (P/N 050113-08)						
Rev. F (6.00)	x	x	x	x	x	x
Rev. F1 (6.01)	x	x	x	x	x	x
Rev. F2 (6.02)	x	x	x	x	x	x
Rev. F3 (6.03)	x	x	x	x	x	x
Rev. F4 (6.04)	x	x	x	x	x	x
CSM-155-8S (P/N 050113-18)						
Rev. G1 (7.01) Initial Release	x	x	x	x	x	x
CSM-155-8S (P/N 050113-78)						
Rev. G4 (7.04) Initial Release						x
CSM-155-FSL-8 (P/N 050113-86)						
Rev. G4 (7.04) Initial Release						x
CSM-622-2E (P/N 050133-13)						
Rev. A1 (1.01) Initial Release		x	x	x	x	x
Rev. A2 (1.02)		x	x	x	x	x

CSM-622-2E (P/N 050133-93)						
Rev. A (1.00) Initial Release						x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
CSM-622-2SE (P/N 050133-06)						
Rev. A1 (1.01) Initial Release		x	x	x	x	x
Rev. A2 (1.02)		x	x	x	x	x
CSM-622-2SE P/N 050133-86						
Rev. A (1.00) Initial Release						x
FCSM-OC3 (P/N 050129-06)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
FSM Daughter Card (P/N 05003706)	DISCONTINUED					
Rev. C (1.03)	x	x	x	x	x	x
Rev. D (1.04)	x	x	x	x	x	x
Rev. E (1.05)	x***	x***	x***	x***	x***	x***
FSM Daughter Card MM (P/N 05010806)						
Rev. C (2.03)	x***	x***	x***	x***	x***	x***
Rev. C1 (2.04)	x	x	x	x	x	x
FSM Daughter Card Singlemode (P/N 05010813)						
Rev. B Initial Release (2.00)	x	x	x	x	x	x
FDDI/2-S-ATM Cat 2 Laser (P/N 050108-15)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
100BaseT Daughter Card (P/N 05010906)						
Rev. C (3.00)	x	x	x	x	x	x
Rev. C1 (3.01)	x	x	x	x	x	x
Rev. C2 (3.02)	x	x	x	x	x	x
Rev. C3 (3.03)	x	x	x	x	x	x
Rev. C4 (3.04)	x	x	x	x	x	x
Rev. C5 (3.05)	x	x	x	x	x	x
Rev. C6 (3.06)	x	x	x	x	x	x
Rev. C7 (3.07)	x	x	x	x	x	x
Rev. C8 (3.08)	x	x	x	x	x	x
Rev. C9 (3.09)	x	x	x	x	x	x
Rev. C10 (3.10)	x	x	x	x	x	x
Rev. C11 (3.11)	x	x	x	x	x	x
Rev. C12 (3.12)	x	x	x	x	x	x
Rev. C13 (3.13)	x	x	x	x	x	x
ESM-100FM-FD (P/N 050122-13)						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
ESM-100C-FD, AE P/N 050122-15						
Rev. A (1.00)	x	x	x	x	x	x
ESM-100FS-FD P/N 050122-16						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
ESM-100C-FD P/N 050122-06						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
ESM-100FS-FD-1 (P/N 050122-14)						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
ESM-100FM-FD (P/N 050122-17)						

Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
ESM-100C-12 (P/N 050158-06)						
Rev. B2 (2.02) Initial Release		x	x	x	x	x
Rev. B3 (2.03)		x	x	x	x	x
Rev. B4 (2.04)		x	x	x	x	x
Rev. B5 (2.05)		x	x	x	x	x
Rev. B6 (2.06)		x	x	x	x	x
Rev. B7 (2.07)[3]		x	x	x	x	x
Rev. B8 (2.08)		x	x	x	x	x
Rev. B9 (2.09)		x	x	x	x	x
ESM-C-16W P/N 050154-17						
Rev. C5 (3.05) Initial Release					x	x
Rev. C6 (3.06) Initial Release					x	x
Rev. C7 (3.07) Initial Release					x	x
ESM-C-16W P/N 050154-18						
Rev. C (3.00)						
Rev. C1 (3.01)						
Rev. C2 (3.02)						
Rev. C3 (3.03)						
Rev. C4 (3.04)						
Rev. C5 (3.05)					x	x
Rev. C6 (3.06)					x	x
ESM-100FM-8 (P/N 050159-06)						
Rev. A (1.00) Initial Release		x	x	x	x	x
Rev. A1 (1.01)		x	x	x	x	x
Rev. A2 (1.02)		x	x	x	x	x
Rev. A3 (1.03)		x	x	x	x	x
Rev. A4 (1.04)		x	x	x	x	x
Rev. A5 (1.05)[3]		x	x	x	x	x
Rev. A6 (1.06)		x	x	x	x	x
Rev. A7 (1.07)		x	x	x	x	x

[3] This revision or later is required for hot swap of modules. Contact Customer for upgrade.

IBM Nways RouteSwitch Hardware (cont.)

	Software Release					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
ESM-C-32 (P/N 050154-06)						
Rev. B (2.00) Initial Release		x	x	x	x	x
Rev. B1 (2.01)		x	x	x	x	x
Rev. B2 (2.02)		x	x	x	x	x
Rev. B3 (2.03)		x	x	x	x	x
Rev. B4 (2.04)		x	x	x	x	x
Rev. B5 (2.05)		x	x	x	x	x
Rev. B6 (2.06)		x	x	x	x	x
Rev. B7 (2.07)[4]		x	x	x	x	x
Rev. B8 (2.08)		x	x	x	x	x
ESM-C-32 (P/N 050154-16)						
Rev. C (3.00) Initial Release		x	x	x	x	x
Rev. C1 (3.01)		x	x	x	x	x
Rev. C2 (3.02)		x	x	x	x	x
Rev. C3 (3.03)		x	x	x	x	x
Rev. C4 (3.04)		x	x	x	x	x
Rev. C5 (3.05)[4]		x	x	x	x	x
WSM-SC-4/8 WAN (P/N 050117-06)						
Rev. A (1.00)						
Rev. A1 (1.01)						
Rev. A2 (1.02)						
Rev. A3 (1.03)						
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
WSM-S-2 WAN (P/N 050117-13)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
FESM AE Daughter card P/N 050109-13						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x

[4] **This revision or later is required for hot swap of modules. Contact Customer Support for upgrade.**

IBM Nways RouteSwitch Hardware (cont.)

FESM II 100BTX (P/N 050139-06)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
Rev. A6 (1.06)	x	x	x	x	x	x
Rev. A7 (1.07)	x	x	x	x	x	x
FESM II 100BTX (P/N 050139-13)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
CDDI Daughter Card (P/N 05007306)						
Rev. A (1.01)	x	x	x	x	x	x
Rev. B (1.02)	x	x	x	x	x	x
Rev. C (1.03)	x	x	x	x	x	x
Rev. D (1.04)	x	x	x	x	x	x
Rev. E (1.05)	x***	x***	x***	x***	x***	x***

*All FSM-M-2 modules require REV K or greater HSM or any released HSM2.
** This revision and above is required for MPM redundancy.
*** This revision and above is required for Hot Swap.
****Revision 2.1.3.F or above is required.
*****Revision 2.1.3G or above is required.
This revision and above is required to support the 960 VBUS.

8273 Series RouteSwitch Hardware

	8273 Series RouteSwitch Software					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
8273-100/ 8273-10E (P/N 05010306)						
Rev. C1 (3.01)	x	x	x	x	x	x
Rev. C2 (3.02)	x	x	x	x	x	x
Rev. C3 (3.03)	x	x	x	x	x	x
Rev. C4 (3.04)	x	x	x	x	x	x
Rev. C5 (3.05)	x	x	x	x	x	x
Rev. C6 (3.06)	x	x	x	x	x	x
Rev. C7 (3.07)	x	x	x	x	x	x
Rev. D (4.00)	x	x	x	x	x	x
Rev. D1 (4.01)	x	x	x	x	x	x
8273-100(P/N 05015206)						
Rev. D (4.00)	x	x	x	x	x	x
Rev. D1 (4.01)	x	x	x	x	x	x
Rev. D2 (4.02)	x	x	x	x	x	x
Rev. D3 (4.03)	x	x	x	x	x	x
Rev. D4 (4.04)	x	x	x	x	x	x
Rev. D5 (4.05)	x	x	x	x	x	x
Rev. D6 (4.06)	x	x	x	x	x	x
Rev. D7 (4.07)	x	x	x	x	x	x
Rev. D8 (4.08)	x	x	x	x	x	x
Rev. D9 (4.09)	x	x	x	x	x	x
8273-10U (P/N 05013006)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
Rev. A6 (1.06)	x	x	x	x	x	x
Rev. A7 (1.07)	x	x	x	x	x	x
Rev. A8 (1.08)	x	x	x	x	x	x
Rev. A9 (1.09)	x	x	x	x	x	x
Rev. A10 (1.10)	x	x	x	x	x	x
Rev. A11 (1.11)	x	x	x	x	x	x
Rev. A12 (1.12)	x	x	x	x	x	x
Rev. A13 (1.13)	x	x	x	x	x	x
Rev. A14 (1.14)	x	x	x	x	x	x

8273 Series RouteSwitch Hardware

	8273 Series RouteSwitch Software					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
8273-10U (P/N 050130-08)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
8273-10E (P/N 050152-08)						
Rev. D (4.00)	x	x	x	x	x	x
Rev. D1 (4.01)	x	x	x	x	x	x
Rev. D2 (4.02)	x	x	x	x	x	x
Rev. D3 (4.03)	x	x	x	x	x	x
Rev. D4 (4.04)	x	x	x	x	x	x
Rev. D5 (4.05)	x	x	x	x	x	x
PESM-AB-AFD (P/N 050144-06)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
PESM-AB-FL (P/N 05008506)						
Rev. B	x	x	x	x	x	x
Rev. C	x	x	x	x	x	x
Rev. D	x	x	x	x	x	x
Rev. E	x	x	x	x	x	x
PESM-AB-FL-S (P/N 050123-06)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
PESM-AB-T (P/N 05009106)						
Rev. A	x	x	x	x	x	x
PESM-AB-B (P/N 05009706)						
Rev. B	x	x	x	x	x	x
Rev. C	x	x	x	x	x	x
PESM-AB-AT (P/N 05007906)						
Rev. B	x	x	x	x	x	x

8273 Series RouteSwitch Hardware

	8273 Series RouteSwitch Software					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
PASM Daughter Card P/N 05011626 (1/2 MB SRAM) MM						
Rev. A (1.01)	x	x	x	x	x	x
PASM Daughter Card P/N 05011627 (1/2 MB SRAM) SM						
Rev. A1 (1.01)	x	x	x	x	x	x
PASM Daughter Card P/N 05011624 (2 MB SRAM) MM						
Rev. A1 (1.01)	x	x	x	x	x	x
PASM Daughter Card P/N 05011625 (2 MB SRAM) SM						
Rev. A1 (1.01)	x	x	x	x	x	x
PFESM II 100BTX P/N 050139-06						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
Rev. A6 (1.06)	x	x	x	x	x	x
Rev. A7 (1.07)	x	x	x	x	x	x
PFESM II 100BTX P/N 050139-13						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
Rev. A3 (1.03)	x	x	x	x	x	x
PESM-100FM-FD P/N 050122-13						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x			
Rev. B3 (2.03)	x	x	x			
PESM-100C-FD P/N 050122-06						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x

8273 Series RouteSwitch Hardware

	8273 Series RouteSwitch Software					
Product	3.0.2	3.1	3.1.2	3.1.3.3.A	3.1.4	3.1.5.A
PESM-100FS-FD-1 P/N 050122-14						
Rev. B (2.00)	x	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x	x
Rev. B3 (2.03)	x	x	x	x	x	x
PWSM-SC-4 WAN (P/N 050117-06)						
Rev. A2 (1.02)						
Rev. A3 (1.03)						
Rev. A4 (1.04)	x	x	x	x	x	x
Rev. A5 (1.05)	x	x	x	x	x	x
PWSM-S-2 WAN (P/N 050117-13)						
Rev. A (1.00)	x	x	x	x	x	x
Rev. A1 (1.01)	x	x	x	x	x	x
Rev. A2 (1.02)	x	x	x	x	x	x
PFSM Daughter Card P/N 05003706 (MM only)	**DISCONTINUED**					
Rev. A (1.01)	x	x	x	x	x	x
Rev. B (1.02)	x	x	x	x	x	x
Rev. C (1.03)	x	x	x	x	x	x
Rev. D (1.04)	x	x	x	x	x	x
Rev. E (1.05)	x	x	x	x	x	x
PFSM Daughter Card P/N 05010806 (MM)						
Rev. C (2.03)	x***	x***	x***	x***	x***	x***
Rev. C1 (2.04)	x	x	x	x	x	x
PFSM Daughter Card P/N 05010813 (SM)						
Rev. B Initial Release (2.00)	x	x	x	x	x	x
PFSM Daughter Card UTP P/N 05007306						
Rev. A (1.01)	x	x	x	x	x	x
Rev. B (1.02)	x	x	x	x	x	x
Rev. C (1.03)	x	x	x	x	x	x
Rev. D (1.04)	x	x	x	x	x	x
Rev. E (1.05)	x	x	x	x	x	x

24. Appendix - ATM DS3/E3

New Features and Bugs Fixed

1. Fully support FEAC (Far-end Alarm and Control) code recognition and generation based on ANSI T1.107.
   - Recognize FEAC loopback activation/deactivation, and turn on/off line loopback accordingly. Current loopback status can be viewed from UI or SNMP.
   - Recognize FEAC alarm codes sent from far-end. These alarm codes can be viewed from UI or SNMP.
   - Transmit FEAC alarm code to far-end based on alarm detected/received at near-end.
2. Add some statistics counters: LCV (Line Code Violation), DS3 PERR (Parity Bit Error), DS3 PPERR (Path Parity Bit Error), DS3 FEBE (Far-end Block Error), and DS3 FERR (Framing Bit Error).
3. Recognize AIS alarm (or Blue alarm) correctly based on ANSI T1.107.
4. Transmit E3 G.832 frame with correct payload type field (ATM = 010).
5. Allow users to clear physical port interval statistics per port basis.
6. Allow configuring E3 line type (G.821, G.751) and sublayer (PLCP, ADM) independently.
7. Object dsx1LineStatus of RFC 1407 is now set correctly due do loopback configuration changes.
8. Add 50+ DS3 IBM proprietary objects to allow NMS fully managing DS3/E3 interfaces (release 3.1 only).

25. User Interface

The new UI screens due to above changes are captured and shown as follows:

25.1. 'vap' command

25.1.1. ATM E3 interface.

/Interface/ATM % vap 5/2

```
                        ATM Port Table

                                                Conn Tran   Media UNI Max  VCI
Slot Port      ATM Port Description             Type Type   Type  Typ VCC  bits
==== ==== ============================== ==== ====== ===== === ==== ====
5    2    ATM PORT                       PVC  E3     Coax  Pri 1023 10


Slot Port Loopback Cfg Tx Clk Source
==== ==== ============ =============
5    2    NoLoop       LocalTiming

                                      End System   Sig Sig  ILMI   ILMI
Slot Port     ATM Network Prefix      Identifier   Ver VCI  Enable VCI
==== ==== ==========================  ============ === ==== ====== ====
5    2             N/A                    N/A      N/A N/A   N/A   N/A


                                                          Status
                                                   -------------------
Slot Port Tx Seg Sz Rx Seg Sz Tx Buff Sz Rx Buff Sz   Oper   SSCOP ILMI
==== ==== ========= ========= ========== ========== ======== ===== ====
5    2        16384     16384       4600       4600 Dis(T/R) Down  Down


             E3 Configuration

Slot Port Line Type  Sublayer
==== ==== ========== ==========
5    2    G.751      PLCP
```

25.2. 'map' command

25.2.1. ATM E3 interface.

/Interface/ATM % map 5/2

```
                    Slot 5 Port 2 Configuration

1)  Description (30 chars max)                   : ATM PORT
2)  Conn Type { PVC(1), SVC(2) }                 : PVC
3)  Max VCCs (1-1023)                            : 1023
4)  Max VCI bits (1..10)                         : 10
5)  UNI Type                                     : Private
6)  Tx SAR Buffer Size (4096-131072)             : 16384
7)  Rx SAR Buffer Size (4096-131072)             : 16384
8)  Tx Frame Buffer Size (1800-16384)            : 4600
9)  Rx Frame Buffer Size (1800-16384)            : 4600
10) Pl Scramble {(False(1),True(2)}              : True
11) Timing Mode {(Loop(1),Local(2)}              : Local
12) Loopback Config { NoLoop(1), DiagLoop(2),
                      LineLoop(3), CellLoop(4),
                      PayloadLoop(5) }           : NoLoop
13) Line Type { G.751(1), G.832(2) }             : G.751
14) Sublayer  { PLCP(1), ADM(2) }                : PLCP


Enter (option=value/save/cancel) :
```

Note: Since G.832 doesn't support PLCP, changing line type to G.832 will modify sublayer to ADM if current sublayer is not ADM. Similarly, modifying sublayer to PLCP is not allowed if current line type is G.832.

25.3. 'vps' command

New fields were added in this screen. These fields are defined as follows:

- Loopback Status: indicates current loopback status of the DS3/E3 port. It's worth noting that loopback can be activated by local management or far-end via FEAC code. The possible values are:
  - *LocalPayloadLoop* : DS3/E3 port is in payload loopback.
  - *LocalLineLoop* : DS3/E3 port is in line loopback.
  - *LocalOtherLoop* : DS3/E3 port is in diagnostics loopback.
  - *RemotePayloadLoop* : Far-end DS3/E3 port is in payload loopback.
  - *RemoteLineLoop* : Far-end DS3/E3 port is in line loopback.

Note: UI commands activating remote loopback will be added in the future release.

- FEAC Code Rx: indicates FEAC code being received at DS3 interface. This is only displayed if line type is CbitParity. The possible values are:
  - *No Code* : no code.
  - DS3 Eqpt. Failure (SA): Remote DS3 equipment is in failure state (service affecting) which requires immediate attention.
  - *DS3 LOS* : Remote DS3 is in loss of signal.
  - *DS3 OOF* : Remote DS3 is in out of frame.
  - *DS3 AIS Received* : Remote DS3 is receiving AIS.
  - *DS3 IDLE Received* : Remote DS3 is receiving Idle code.
  - *DS3 Eqpt. Failure (NSA)* : Remote DS3 equipment is in failure state (non-service affecting) such as suspended services, not activated, not available for use.
  - *Common Eqpt. Failure (NSA)*: Remote DS3 equipment is in failure state (non-service affecting).
  - *Loopback Received* : Remote DS3 is sending loopback activation code.
  - *Unsupported Code* : DS3 interface is receiving unsupported code such as DS1 loopback activation/deactivation code.
  - *Unknown Code* : DS3 interface is receiving an unknown code.
- LCV : line code violation. It's defined as a count of BPV (Bipolar violation) and EXZ (Excessive zeros).
- PERR: Parity Bit Errors. It represents the number of DS3 P-bit errors or E3 G.832 BIP-8 errors. This field is only displayed for DS-3 or E3 G.832.
- PPERR: Path Parity Bit Error. It represents the number of DS3 path parity errors (or C-bit parity errors). This field is only displayed for CbitParity DS3.
- FEBE : Far-end block error. It represents number of times that E3 G.832 frame received with bit 2 of MA octet set or DS3 frames with three C-bits of M-frame 4 being different from 111.
- FERR : Framing Bit error. It represents number of DS3 F-bit and M-bit errors, or E3 framing pattern errors.
- Elapsed Time : indicate elapsed time that physical port interval statistics have been accumulated. It's displayed in following format ddd days, hh:mm:dd.tt . (e.g 0 days, 00:06:14.62).

25.3.1. ATM E3 Interface

25.3.1.1. Line type = G.751 & sublayer = PLCP.

/Interface/ATM % vps 5/2

```
                  E3 RX Line Status
Slot Port  LOS    OOF    AIS   Cell Loss Loopback Status
==== ==== ====== ====== ====== ========= ===============
5    2    Ok     Alarm  Ok     Alarm     NoLoopBack


             E3 RX Line Status

Slot Port   PLCP    PLCP    PLCP
            OOF     LOF     YEL
==== ==== ======= ======= =======
5    2    Alarm   Alarm   Ok


             E3 RX Line Status

Slot Port  RAI    Nat Use
==== ==== ====== =========
5    2    Ok     On


             E3 RX Line Statistics

Slot Port    LOS         OOF       FERR        LCV    Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    2    0          142716244  142716243  11         1


             E3 RX Line Statistics

Slot Port    AIS        COFA        RAI
==== ==== ========== ========== ==========
5    2    0          0          0


             E3 RX Line Statistics

Slot Port    PLCP       PLCP       PLCP       PLCP       PLCP       PLCP
             OOF        LOF        YEL        FOE        BPE        FEBE
==== ==== ========== ========== ========== ========== ========== =========
5    2    142716550  1          0          2          2          1

Physical layer statistics available only for DS3 and E3.
```

25.3.1.2. Line type = G.732 & sublayer = ADM

/Interface/ATM % vps 5/2

```
             E3 RX Line Status
Slot Port  LOS    OOF    AIS   Cell Loss Loopback Status
==== ==== ====== ====== ====== ========= ===============
5    2    Ok     Ok     Ok     Alarm     NoLoopBack


             E3 RX Line Status

Slot Port  RAI    Nat Use
==== ==== ====== =========
5    2    Ok     On


             E3 RX Line Statistics

Slot Port    LOS          OOF        FERR         LCV    Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    2    0          299895115  299895113  11         1


             E3 RX Line Statistics

Slot Port    AIS        COFA        RAI
==== ==== ========== ========== ==========
5    2    0          2          1

Physical layer statistics available only for DS3 and E3.
```

25.3.1.3. Line type = G.821 & sublayer = ADM

/Interface/ATM % vps 5/2

```
E3 RX Line Status
Slot Port  LOS    OOF    AIS   Cell Loss Loopback Status
==== ==== ====== ====== ====== ========= ===============
5    2    Ok     Ok     Ok     Alarm     NoLoopBack


             E3 RX Line Status

Slot Port  FEBE   FERF    Time   Payload
                          Marker    Type
==== ==== ====== ====== ======== ========
5    2    Ok     Alarm  Off      0


             E3 RX Line Statistics

Slot Port    LOS          OOF        FERR         LCV    Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    2    0          307744909  307744901  11         1


             E3 RX Line Statistics

Slot Port    AIS         COFA        FERF        FEBE        PERR
==== ==== ========== ========== ========== ========== ==========
5    2    0          3          2          8          9

Physical layer statistics available only for DS3 and E3.
```

25.3.2. ATM DS3 Interface

25.3.2.1. Type = CbitParity & Sublayer = PLCP

/Interface/ATM % vps 5/2

```
             DS3 RX Line Status
Slot Port  LOS    OOF    AIS    FERF   RED   Cell Loss Loopback Status
==== ==== ====== ====== ====== ====== ====== ========= ===============
5    1    Ok     Ok     Ok     Ok     Ok     Ok        NoLoopBack

             DS3 RX Line Status

Slot Port        FEAC Code Rx
==== ==== ============================
5    1    No Code

             DS3 RX Line Status

Slot Port    PLCP     PLCP     PLCP
             OOF      LOF      YEL
==== ==== ======== ======== ========
5    1    Ok       Ok       Ok

             DS3 RX Line Statistics

Slot Port    LOS         OOF       FERF       RED     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          2          0          0          0


             DS3 RX Line Statistics

Slot Port      AIS         COFA         LCV          PERR         FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            1            3            7            96

             DS3 RX Line Statistics

Slot Port     FEBE          PPERR
==== ==== ============ ============
5    1    5            5

             DS3 RX Line Statistics

Slot Port    PLCP       PLCP       PLCP       PLCP       PLCP       PLCP
             OOF        LOF        YEL        FOE        BPE        FEBE
==== ==== ========== ========== ========== ========== ========== =========
5    1    1          0          0          2          2          0

Physical layer statistics available only for DS3 and E3.
```

25.3.2.2. Line Type = CbitParity & Sublayer = ADM

/Interface/ATM % vps 5/2

```
             DS3 RX Line Status
Slot Port  LOS    OOF    AIS    FERF   RED   Cell Loss Loopback Status
==== ==== ====== ====== ====== ====== ====== ========= ===============
5    1    Ok     Ok     Ok     Ok     Ok     Ok        NoLoopBack


             DS3 RX Line Status

Slot Port        FEAC Code Rx
==== ==== ============================
5    1    No Code


             DS3 RX Line Statistics

Slot Port    LOS         OOF       FERF       RED     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          2          0          0          0


             DS3 RX Line Statistics

Slot Port      AIS         COFA         LCV          PERR         FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            1            3            7            96


             DS3 RX Line Statistics

Slot Port     FEBE         PPERR
==== ==== ============ ============
5    1    5            5

Physical layer statistics available only for DS3 and E3.
```

25.3.2.3. Line Type = M23 and Sublayer = PLCP

/Interface/ATM % vps 5/2

```
          DS3 RX Line Status
Slot Port  LOS    OOF    AIS    FERF   RED   Cell Loss Loopback Status
==== ==== ====== ====== ====== ====== ====== ========== ===============
5    1    Ok     Ok     Ok     Ok     Ok     Ok         NoLoopBack


             DS3 RX Line Status

Slot Port    PLCP     PLCP     PLCP
             OOF      LOF      YEL
==== ==== ======== ======== ========
5    1    Ok       Ok       Ok


             DS3 RX Line Statistics

Slot Port    LOS         OOF       FERF       RED     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          2          0          0          1


             DS3 RX Line Statistics

Slot Port      AIS         COFA         LCV          PERR         FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            1            3            7            96


             DS3 RX Line Statistics

Slot Port    PLCP       PLCP       PLCP       PLCP       PLCP       PLCP
             OOF        LOF        YEL        FOE        BPE        FEBE
==== ==== ========== ========== ========== ========== ========== =========
5    1    36         1          0          37         10         6

Physical layer statistics available only for DS3 and E3.
```

25.3.2.4. Line Type = M23 & Sublayer = ADM

/Interface/ATM % vps 5/2

```
             DS3 RX Line Status
Slot Port  LOS    OOF    AIS    FERF   RED   Cell Loss Loopback Status
==== ==== ====== ====== ====== ====== ====== ========= ===============
5    1    Ok     Ok     Ok     Ok     Ok     Ok        NoLoopBack


             DS3 RX Line Statistics

Slot Port    LOS          OOF        FERF        RED      Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          2          0          0          1


             DS3 RX Line Statistics

Slot Port      AIS         COFA         LCV          PERR         FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            1            3            7            96

Physical layer statistics available only for DS3 and E3.
```

25.4. ‘vpis’ command

25.4.1. ATM E3 interface

25.4.1.1. Line Type = G.751 & Sublayer = PLCP.

/Interface/ATM % vpis 5/2

```
             E3 RX Line Statistics
Slot Port    LOS         OOF       FERR       LCV     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    2    0          308482135  308481990  0          0


             E3 RX Line Statistics

Slot Port    AIS         COFA         RAI
==== ==== ========== ========== ==========
5    2    0          0          0


             E3 RX Line Statistics

Slot Port    PLCP        PLCP        PLCP        PLCP        PLCP        PLCP
             OOF         LOF         YEL         FOE         BPE         FEBE
==== ==== ========== ========== ========== ========== ========== =========
5    2    308482780  0          0          0          0          0

Slot Port     Elapsed Time
==== ==== ======================
5    2      0 days, 00:00:05.51
```

25.4.1.2. Line Type = G.751 & Sublayer = ADM

/Interface/ATM % vpis 5/2

```
             E3 RX Line Statistics
Slot Port    LOS         OOF       FERR       LCV     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    2    0          313545868  313545723  0          0

             E3 RX Line Statistics

Slot Port    AIS        COFA        RAI
==== ==== ========== ========== ==========
5    2    0          0          0

Slot Port     Elapsed Time
==== ==== =====================
5    2      0 days, 00:00:07.87

Physical layer statistics available only for DS3 and E3.
```

25.4.1.3. Line Type = CbitParity & Sublayer = PLCP

/Interface/ATM % vpis 5/1

```
             DS3 RX Line Statistics
Slot Port    LOS         OOF       FERF       RED     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          0          0          0          0

             DS3 RX Line Statistics

Slot Port      AIS         COFA        LCV           PERR          FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            0            0            0            0

             DS3 RX Line Statistics

Slot Port     FEBE          PPERR
==== ==== ============ ============
5    1    0            0

             DS3 RX Line Statistics

Slot Port    PLCP       PLCP       PLCP       PLCP       PLCP       PLCP
             OOF        LOF        YEL        FOE        BPE        FEBE
==== ==== ========== ========== ========== ========== ========== =========
5    1    0          0          0          0          0          0

Slot Port     Elapsed Time
==== ==== =====================
5    1      0 days, 00:00:01.63
Physical layer statistics available only for DS3 and E3.
```

25.4.1.4. Line Type = CbitParity & Sublayer = ADM

/Interface/ATM % vpis 5/1

```
             DS3 RX Line Statistics
Slot Port    LOS          OOF        FERF       RED      Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          0          0          0          0


             DS3 RX Line Statistics

Slot Port      AIS          COFA         LCV            PERR           FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            0            0            0            0


             DS3 RX Line Statistics

Slot Port     FEBE           PPERR
==== ==== ============ ============
5    1    0            0

Slot Port     Elapsed Time
==== ==== ======================
5    1      0 days, 00:00:03.55

Physical layer statistics available only for DS3 and E3.
```

25.4.1.5. Line Type = M23 & Sublayer = PLCP

/Interface/ATM % vpis 5/1

```
             DS3 RX Line Statistics
Slot Port    LOS         OOF       FERF       RED     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          0          0          0          0


             DS3 RX Line Statistics

Slot Port      AIS         COFA        LCV           PERR          FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            0            0            0            0


             DS3 RX Line Statistics

Slot Port    PLCP       PLCP       PLCP       PLCP       PLCP       PLCP
             OOF        LOF        YEL        FOE        BPE        FEBE
==== ==== ========== ========== ========== ========== ========== =========
5    1    0          0          0          0          0          0

Slot Port     Elapsed Time
==== ==== ======================
5    1      0 days, 00:00:02.43

Physical layer statistics available only for DS3 and E3.
```

25.4.1.6. Line Type = M23 & Sublayer = PLCP

/Interface/ATM % vpis 5/1

```
             DS3 RX Line Statistics
Slot Port    LOS         OOF       FERF       RED     Cell Loss
==== ==== ========== ========== ========== ========== ==========
5    1    0          0          0          0          0

             DS3 RX Line Statistics

Slot Port      AIS         COFA        LCV           PERR          FERR
==== ==== ============ ============ ============ ============ ============
5    1    0            0            0            0            0

Slot Port     Elapsed Time
==== ==== ======================
5    1      0 days, 00:00:02.99

Physical layer statistics available only for DS3 and E3.
```

25.5. ‘cpis’ command

Usage : cpis slot/port

‘cpis’ command is a new command. This command allows users to clear physical port interval statistics per port basis.

For example,

/Interface/ATM % cpis 5/1

Physical layer interval statistics of port 5/1 has been cleared.

26. SNMP/MIB

- New object ***dsx3LoopbackStatus*** has been added to RFC 1407 to allow NMS to query current loopback state of an DS3/E3 port. Please refer to rfc1407.mib for more detailed.
- Object ***dsx3LineType*** in RFC 1407 is used as follows : *dsx3M23(2)* - M23, *dsx3CbitParity(4)* – CbitParity, *e3other(6)* – G.832, *e3framed(7)* – G.751.
- Newly defined IBM proprietary DS3/E3 objects are implemented only in release 3.1 and later. Please refer to IBM-ds3.mib for more detailed.