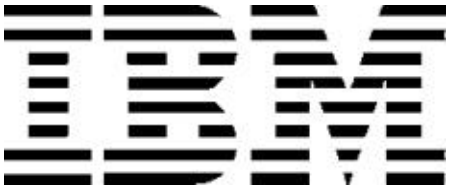
IBM Corporation
IBM Nways RouteSwitch User's Release Notes
Version 2.1.5
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Nways RouteSwitch User's Release Notes Version 2.1.5

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Revision History

Release	Revision	Date	Description of Changes
2.1	A	10/15/96	FCS Release of 2.1 RouteSwitch
2.1.2	B	11/8/96	FCS Release with Token Ring fixes identified since last controlled release.
2.1.3	C	12/2/96	General Availability Release
2.1.3.D	D	2/6/97	Maintenance Release. Updated problems reports. General Availability Release.
2.1.3.D	E	2/21/97	To remove section 10.5 CAM Usage configuration as not applicable.
2.1.3.F	A	3/27/97	Maintenance Release.
2.1.3.G	A	6/2/97	Maintenance Release
2.1.5	A	7/9/97	Maintenance Release

1. Introduction

This release note covers the basic feature set supported, known limitations, bugs and known work-arounds for RouteSwitch Version 2.1.5 software. Please read this document in its entirety as it contains important operational aspects that may impact your network.

2. 2.1.5 Feature Set Supported

Hardware and software features supported with the release 2.1.5 are the following:

Hardware:

Nways 8274 RouteSwitch:

- 8274-MOD-500 (85H7150) Chassis
- 8274-MOD-513 (85H7149) Chassis
- 8274-MOD-513 (85H7141) power supply
- 8274-MOD-913 (85H7147) Chassis
- 8274-MOD-913 (85H7139) Power Supply
- 8274-MOD-900 (85H7146) Chassis
- MPM II-8/16MB
- ESM-U-6 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-12 10BaseT RJ-45 12 port Ethernet Module

New Hardware in 2.1 Release*:

Nways 8274 RouteSwitch:

- 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
- ASM-E3-1/2 One or two port ATM 500Kbytes SRAM, 34 Mbps E3, BNC connectors
- TSM-CD-6 Token Ring Dual Mode Module

*New hardware must be supported by version 2.1.5 MPM software. IBM RouteSwitch Network Management applications must also be version 2.1 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 (16 Mbps only)

* Version 2.0.4 and subsequent releases support HSM2. See section 9 for additional information. Version 2.1.5 and previous software versions support HSM.

Nways 8273 RouteSwitch:

- 8273 RouteSwitch 10E
- 8273 RouteSwitch 100
- 8273 RouteSwitch 10U
- RESM-AB-FL 10BaseFL Adapter Card for the RouteSwitch 10U
- RESM-AB-T 10BaseT Adapter Card for the RouteSwitch 10U
- RESM-AB-AT 10BaseT RJ-45 and AUI Adapter Card for the RouteSwitch 10U
- RESM-AB-B 10Base2 Adapter Card for the RouteSwitch 10U
- RESM-AB-FL-S 10BaseFL Adapter Card for the RouteSwitch 10U
- RFSM-S-1 FDDI sub-module. One DAS port.
- RASM-DS3-1 DS3 sub-module. One port, 45 Mbps, BNC connectors
- RASM-E3-1 E3 sub-module. One port, 34 Mbps, BNC connectors
- RFSM-M-1 FDDI sub-module Multi-mode
- RFSM-C-4 CDDI sub-module four CDDI ports
- 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

New 8273 RouteSwitch Hardware*:

- RESM-AB-AFD One full duplex AUI port for 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)

*New RouteSwitch hardware must be supported by version 2.1.3 RouteSwitch software. IBM RouteSwitch Network Management applications must also be version 2.1 to support new hardware.

Software Major Features:

- RouteTracker including enhancements to Version 2.0.4
- 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)
Route 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

New Software Major Features*:

- 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

New software features are only supported in version 2.1 RouteSwitch software and are only supported by IBM RouteSwitch Network Management Version 2.1 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://www.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**
   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 RouteSwitch Version 1.2 or later to 2.1.5 , you just need to download the 2.1.5 software and then reboot the RouteSwitch - see Chapter 3, of the *RouteSwitch User's Guide* for details on software downloading and configuration.

2. RouteSwitch Version 2.1.5 requires 8 MB SIMM and 4 MB Flash. (See Section 9)

3. To perform RouteSwitch (version 2.1.5) 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.

4. RouteSwitch 100 and RouteSwitch 10U, version 1.0 require 8 MB SIMM and 2 MB Flash. It is recommended that RouteSwitch 10E, version 2.1 be used when performing extended IP or IPX routing. RouteSwitch 10E has a 16MB SIMM and 4 MB Flash.

5. IBM RouteSwitch Network Management 2.1 is required for managing the new features contained in RouteSwitch version 2.1.5 software. See IBM RouteSwitch Network Management 2.1 release notes for IBM Nways RouteSwitch Network Manager, RouteTracker, and ROUTEMonitor applications for more detail.

6. The MPM (management module) may be in slot 1 or 2.

7. A fully loaded (all slots occupied) unconfigured - or reconfigured - Route-5 may require 2 minutes to load the first time. A fully loaded Route-9 may require 5 minutes. Do not become alarmed during boot-time if you have logged in and start processing a command and find yourself locked out. The RouteSwitch is still initializing the virtual port database. During this time no configuration changes should be made

8. If a PC is directly connected to the RouteSwitch, the 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.

9. 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.

10. The mpm.cmd file cannot be altered by any DOS editing because unrecognizable characters are added to the file. However, an on-line editor can be used.

11. Speeds on the console/modem ports of 19,200 or greater are not supported using the load command.

12. Only one Source Route Bridge Number can be assigned to a Group.

13. 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 RouteSwitch failure.

14. Please see the Hardware Compatibility Matrix in section 12.0 to verify your RouteSwitch platform is compatible with RouteSwitch software version 2.1.5.

15. Concurrent Bridging and Trunking of Group 1 is not supported on FDDI interface. In order to Trunk Group 1 on FDDI interface do the following:

    a. Create a new Group (crgp) and move the FDDI interface (ex. 2/1) to this new Group. This action moved the Bridge port of this interface to the new Group.

    b. You can now create a service and Trunk Group 1 on this interface. Ex: cas 2/1, service is Trunk, Group is 1.

c. vi will display:

```
Group  Slot/Intf  Type/Inst/Srvc
  2      2/1      Brg/ 1/na
  1      2/1      Tnk/ 1/na
```

16. 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).

17. 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.

18. Upon initial start-up (or after removal of mpm.cfg 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

19. Each group within the 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.

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

21. 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 please remove any files that are not needed. For example, remove tsm.img if the RouteSwitch does not have any token ring modules.

22. The MIB II traps cold start, linkdown and link up are not supported in this release. Comparable functionality is available through IBM traps. (PR 1195)

23. After removing or deleting a configuration file, the RouteSwitch must be rebooted.

24. When using RouteTracker VLANs to segregate IPX servers, do not enable IPX routing at the Group level (the default VLAN contained in that group). In order to have the RouteSwitch participate in IPX routing along with the server, IPX routing should be enabled on the RouteTracker VLAN.

25. Use of the “break” key on a terminal/PC will change the baud rate of the serial port connected to the 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.

26. When a port is in optimized device mode it will only transmit unicast traffic directed to that device and all broadcast and multicast traffic. It will not transmit any unknown unicast traffic. Therefore, as long as the MAC address is known, communication will exist. If the device is not heard from for 5 minutes, the MAC address will become unknown and communication will cease until the MAC station address is relearned. In most cases this will not be a problem because the device will transmit frames which will cause the MAC to be relearned. If there is a lapsed time, communication will not occur after the time-out and before relearning the MAC address. If client/server relationships exist on a fixed timer using optimized device ports the default time-out value should be altered such that the value is 1 minute greater than the server/client time-out. For example: If IPX server/clients are involved and the default watchdogs are 5 minutes apart, then the RouteSwitch time-out value should be 6 minutes. This will ensure that the RouteSwitch forwarding table will always have the end stations MAC address.

27. Do not attempt to run a UI command while the chassis state is changing. If this occurs a message will appear “please standby, chassis configuration changing.....”. If, however, the “.....” following the message do not discontinue after a maximum of 30 seconds, a module may be hung up. Type control-C to abort the message and attempt to determine the problem either by monitoring the module LEDs, or by using the slot command.

28. 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.

29. If a token ring port is configured as source routed only (SR), then transparent frames received from the network (i.e. those not source routed) will be discarded. If user desires transparent frames to be received, they must configure the token ring port as source route transparent (SRT).

30. 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 2.1.5 for all other image files such as esm.img, fsm.img, etc.) can cause Config File corruption.

31. The flood limit that is applied by ESM code is approximate and can be ± 15%.

32. On a reboot from the UI command line, the system sends a warmStart Trap.

33. 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.

34. User Guide correction to Section 12-6. 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).

35. User Guide correction to Section 12-8. This section is missing Frame Relay and manual mode trap mask from Table 12-2.

Trap Type			Bit Position	Hex Value
FR	DLCI	CREATE	27	800 000
FR	DLCI	DELETE	28	1 000 000
FR	DLCI	UP	29	2 000 000

FR	DLCI	DOWN	30	4 000 000
	Manual Mode	Forwarding	31	8 000 000

36. The RouteSwitch User Guide enabling Multicast Claiming is incorrectly identified in Section 19, page 19-19. The command should be:

    bslLearnMcPkt

    The multicast claiming default is “off” if there are no RouteTracker rules enabled.

37. To disable flood limiting on a switch basis rather than a port-by-port basis user may edit file mpm.cmd and add at the end of the command file the following line: disableFloodLimiting = 1.

38. 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).

39. 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.

40. 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 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.

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

42. Removing and loading in a brand new mpm.cfg, configsync will not sync secondary. The following commands must be performed:

    a) On Primary, remove the mpm.cfg file.

    b) Load in new mpm.cfg file via FTP onto the primary.

    c) Perform ‘configsync’. The messages “syncing. Config files are currently synchronized.” Will be displayed.

    d) Perform ‘ls’. Note size of mpm.cfg

    e) Perform ‘sls’. Note size of mpm.cfg

43. Auto encapsulation will not work properly if IPX server is down when IPX client boots up.

44. This version of software supports ATM SVCs on up to 4 ASM ports. Up to 16 LANE LECs are also supported per port and 16 LECs per RouteSwitch has been tested.

5. 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 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 RouteSwitch will not process or forward these frames.

6. Memory Requirements

Version 2.1.5 requires 8 Mbytes of DRAM. 4 Mbytes of Flash memory are available and recommended, but not required unless the RouteSwitch contains all types of network interface modules. See the following table for the flash memory required for each module.

Filename*	Image Size (Bytes)	Module Type
mpm.img	1640496	MPM, MPM II
mpm.cmd	35	MPM, MPM II
mpm.cfg	32768	MPM, MPM II
asm.img	39085	ASM-155-F, ASM-155-C, ASM-DS3
asm2.img	39085	ASM-155-F, ASM-155-C, ASM-DS3
e12.img	31473	ESM 12, ESM-T-12, ES-F-8
esm.img	31490	ESM-8, ESM-U
fesm.img	29335	ESM-100-C
fesm2.img	29295	ESM-100-C
fsm.img	33975	FSM-M, FSM-S, FSM-C, FSM-M-C
fsm2.img	33975	FSM-M, FSM-S, FSM-C, FSM-M-C
tsm.img	30743	TSM-C-6, TSM-F-6
tsm2.img	30743	TSM-C-6, TSM-F-6
wsm2.img	39295	WSM-4-SC, WSM-8-SC
wsmdcser.img	28608	WSM-4-SC, WSM-8-SC
trbyr6.pga	11106	RO-6PORT-BYTEX, TSM-F-6
trbyrr.pga	11860	RI/RO BYTEX, TSM-F-6
trlobe.pga	8534	LOBE-802.5j, TSM-F-6
trstatn.pga	9242	STATION-802.5j, TSM-F-6
trsyr6.pga	7669	RO-6PORT-SYNOPTICS, TSM-F-6
trsyrr.pga	8919	RI/RO SYNOPTICS
trxyln3.pga	8919	TSM-F-6
trxyln6.pga	7669	TSM-F-6

- Filenames containing a “2” are required for HSM2, e.g. asm2.img is used on an ASM-155-F containing an HSM2.

Note: If the image size of the used files exceeds 1.45 Mbytes, the MPM must have 4 Mbytes of flash memory. Please 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 RouteSwitch the tsm.img file may be removed.

7. MPM Upgrade

Release 2.0 and greater requires 8 Mbytes of DRAM memory, therefore there is a memory upgrade available with this release for the MPM, the Model no. Is MPM-UK-8MB. This upgrade kit expands the Management Processor Module DRAM memory to 8 Mbytes, Flash to 4 Mbytes. The upgrade includes one 8 Mbyte SIMM, and 2 Mbytes Flash (4 chips) and installation instructions. Another upgrade kit Model no. 2M-FLA-UPGR only contains the Flash memory increase to 4 Mbytes. **For MPM upgrades IBM memory is required.**

8. 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, users 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).

9. IP Address Formats

Release 2.1.5 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.

10. ATM LANE

10.1 ATM LANE - Default Mode

No translations are performed on Ethernet frames.

FDDI and Token ring frames are either SNAP or LLC and are transmitted as such on ATM LANE with the exception of Banyan Vines Token ring and Banyan Vines FDDI frames which are translated to Ethertype on ATM LANE.

10.2 ATM LANE - Ethernet II Mode

IPX frames from FDDI, Token ring and Ethernet are translated to Ethertype on ATM LANE.

All other SNAP frames from FDDI, Token ring and Ethernet SNAP are translated to Ethertype on ATM LANE with the exception of Appletalk ARP SNAP frames from Token ring and FDDI which are left as

SNAP on ATM LANE and Banyan Vines frames from FDDI which are translated to Ethertype on ATM LANE.

All other 802.2 frames from FDDI, Token ring and Ethernet are left as is except Banyan Vines frames from Token ring which are translated to Ethertype on ATM LANE.

All Ethernet Ethertype frames are left as is.

10.3 ATM LANE - SNAP Mode

All IPX frames are translated to or left as SNAP on ATM LANE.

All Ethertype and SNAP frames from Ethernet and SNAP frames from Token ring and FDDI are translated or left as SNAP on ATM LANE except for Banyan Vines from FDDI which are translated to Ethertype on ATM LANE.
All other LLC frames are left as is except Banyan Vines from Token ring which are sent as Ethertype.

10.4 ATM LANE - LLC Mode

IPX frames are translated to 802.2 LLC on ATM LANE.

All other SNAP frames from FDDI, Token ring and Ethernet SNAP are translated to Ethertype on ATM LANE with the exception of Appletalk ARP SNAP frames from Token ring and FDDI which are left as SNAP on ATM LANE and Banyan Vines frames from FDDI which are translated to Ethertype on ATM LANE.

All other LLC frames are left as is except Banyan Vines from Token ring which are sent as Ethertype.

11. RouteSwitch Version 2.1 Problem Resolution

The RouteSwitch Version 2.1.1 known problems have been fixed in this release.

- Unnecessary flooding on 8273 RouteSwitch (PR 4514)
- TSM copy bit off option has problem with HSM/2. (PR 4554)
- Frame Relay virtual port goes inactive when two VC's are configured and one is inactive. (PR 4362)
- TSM with HSM/2 performance is less than it should be when transferring files between clients and servers. The reason was due to the last packet of a burst was being held until the next packet of a new burst was sent. The latter occurred when the host asked for a reply because the last packet of a burst was missing. (PR 4612).
- TSM-CD-6 ring speed will not be saved using *tpcfg* if it matches the active speed. (PR 4426)
- TSM copy bit off option does not work properly. Spanning tree blocks the port erroneously. (PR 4588)
- When TSM-CD-6 detects ring speed error it changes the ring speed and resets the port. When the port successfully comes up occasionally other unconnected ports also appear to come up. (PR 4276)

The RouteSwitch Versions 2.1.2 known problems have been fixed in this release.

- ATM trunking of source route packet puts RI twice into packet. This problem occurs when the user disables the bridge port and then creates a trunk service. (PR 2617)
- IPX eth2 clients lose connection when vrouter port is set to ethsnap. (PR 3980)

- Resetting the board at the map command does not reset the board. (PR 4270)
- Status of *syncctl* is not available. (PR 2615)
- Sending ATM 1483 as a vIPRouterFramingType disables CIP IP Router. (PR 2765)
- SNMP Port Mirroring table shows all the module types, not just the Ethernet. (PR 3977)
- *atmxProtocolType* command has invalid value for ASM-E3. (PR 4021)
- Renegotiation fails when disabling compression, while compression is running. (PR 4162)
- Inverse ARP response is lost with compression enabled. (PR 4163)
- When a system runs out of MAC addresses, a duplicate Vport is assigned for the same services. (PR 4242)
- Spanning Tree will send a topology change trap to NMS on a port that goes down and up even if there is no Spanning Tree bridge connected to that port. (PR 4309)
- TSM port will reset constantly if an IBM STP cable is connected, without connecting the cable to the MAU on the other end. (PR 4310).
- Port ring speed was set to 4 Mbps. SmartBits was set to 16 Mbps. When port speed was changed to 16 using tpvcfg, it never came up. (PR 4943).

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

- 4498 Flooding may cause the RouteSwitch with 100BaseT to reboot. (PR 4498)
- 5299 If the beacon state on the ring last longer than 10 seconds, the TSM port will be reset. (PR 5299).
- 5309 Static MAC table does not accept duplicate MAC input. (PR 5309)
- 5310 Unnecessary duplicate MAC traps may be sent when port goes through Spanning Tree changes. (PR 5310, 5292)
- 5318 Topology change increases rapidly for bridges over 4 hops away when the Max Age is set to below 8 seconds. (PR 5318)
- 5344 TI chipset may hang when too many errors are introduced in the ring on the HSM2 board. (PR 5344).
- 5369 RouteSwitch is unable to create NI dump files. (PR 5369)
- 5376 SNMP query for forward table does not return all entries. (PR 5376)
- 5382 Full duplex Ethernet AUI performance issues. (PR 5382, 5296)
- 5445 The Spanning Tree state of the primary link may recycle when reconnected to secondary link. (PR 5445)
- 5502 Implemented DHCP relay over the router interface. (PR 5502)
- 5584 FSM incorrectly strips 64 byte packet padding from Ethernet LLC frames (PR 5584)
- 5692 The command ‘fwtvl’ does not display RouteTracker MAC entries correctly. (PR 5692, 5376)

The 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 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 RouteSwitch not reliable over Source Routing. (PR 6357)
- 6376 ESM modules may crash under certain traffic patterns. (PR 6376)

The 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 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)
- 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)

12. 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.

12.1 User Interface and Known General Problems

Problem Report 284
When using the *fportc* command, 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.

Work-around: NONE.

Problem Report 1607
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.

Work-around: NONE

Problem Report 1965
Statistics are not broken down for each group on an FDDI trunk port.
Work-around: NONE

Problem Report 2383
No ATM service or instance can be specified for Static MAC input.
Work-around: NONE

Problem Report 2600
Cannot change FDDI connection rejection policy via user interface.
Work-around: Use IBM Nways RouteSwitch Network Manager
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.

Problem Report 5107
Incorrect translations of vines redirects.
Work-around: Contact IBM Technical Support.

Problem Report 5698, 5440
Multiple IP responses received from MPM when source routing is enabled.
Work-around: NONE

Problem Report 5060
BootP translation from Token Ring to Any is not supported.
Work-around: NONE

12.2 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: 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 4759
If many routes or servers are present and a system asks for all routes or servers at a high rate, IPX will consume all available memory. For 2000 servers, the maximum rate of requests is 1 request per ½ second. For 2000 routes the rate is 10 per second. The problem is the IPX router specification demands that if the time between requests is less than the time it takes to send all of the RIP or SAP updates then the switch will buffer the responses with no limit.
Work-around: Find the requesting box and reduce rate of requests.

Problem Report 3982
Token Ring IP Client looses connection when ip vrouter port is set to ethsnap(8)
Work-around: Do not use Ethernet snap encaps for ip vrouter port.

Problem Report 4122
ips stats are incorrect.
Work-around: NONE

12.3 Known Bridging Problems

Problem Report 2116
When using the *macinfo* command do not use the space bar to scroll down. Using the space bar will terminate the command.
Work-around: Use the enter key to scroll down.

Problem Report 1969
Misleading statistics for source routing token ring. Duplicate LAN ID's and duplicate segments are identified.
Work-around: NONE

Problem Report 553
Prompt is offset after VLAN display.
Work-around: NONE

Problem Report 3157
Macinfo may report more number of MACs than actual.
Work-around: NONE

Problem Report 4755
MAC addresses are shown in the macinfo table, but not in the fwt table.
Work-around: NONE

12.4 Known FDDI Problems

Problem Report 539
Trunk services cannot be removed once the FDDI board is removed.
Work-around: Remove all trunk services before removing the FDDI board.

12.5 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 4471
ILMI stack does not support UNI version auto-detection from the ATM switch. RouteSwitch returns NO_SUCH_NAME to the *get* request for the UNI version in ILMI and most ATM switches will then default to UNI 3.0. As a side effect, if UNI 3.1 is used on the RouteSwitch while the ATM switch defaults to UNI 3.0. Upper layer applications such as LANE will not be able to complete SVC setups due to UNI version mismatch. If this is not corrected LANE will keep on trying to join the ELAN and fail. This will cause memory to be used up and does not subsequently clear memory. Over time if the system is running in this mode all the memory of the RouteSwitch may be used up.

Work-around: When using UNI 3.1 ensure the ATM switch is manually set to UNI 3.1 and do not relay on the auto-detection feature of the ATM switch.

Problem Report 4430
ATM UI display trunk numbers out of sequence. vi, cas, mas, and vas affected.

Work-around: NONE

Problem Report 4452
CIP group can be disabled even though CIP services exists.

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 4665
vseOpen: camMPMInsertMac fail on Loopback Config change.

Work-around: NONE

Problem Report 4684
Macinfo- multiple VLAN in trunk, only one has vci number, the rest are zero.

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 5294
Pings between switches may traverse the multicast virtual circuit (BUS) and new data direct virtual circuit's may not be established.

Work-around: NONE

The following problems PR 5734, 5822, 5667, and 5568 only occur when the MPM utilization is almost 100%:

Problem Report 4104
ATM may fail when the MPM is at 90% utilization and the network interface CAM is full.

Work-around: Contact IBM Technical Support.

Problem Report 5667
With redundant LES/BUS and heavy MPM traffic may be forwarded to a blocked port and may not recover.

Work-around: Contact IBM Technical Support.

Problem Report 5568
With redundant LES and heavy MPM traffic the switchover to the backup LES may not function.
Work-around: Contact IBM Technical Support.

Problem Report 5734, and 5822
When MPM utilization approaches 100% ATM may lose SSCOP and may not recover.
Work-around: Contact IBM Technical Support.

12.6 Known SNMP Problems

Problem Report 4068
Setting FR Phys Ports Adm Status = Disabled has no effect on VPs.
Work-around: NONE

12.7 Known Token Ring Problems

Problem Report 4565
The 'tsc' command shows Token Ring cards that used to be in the chassis but were replaced by other types of cards.
Work-around: NONE

Problem Report 4732
The auto ring speed detection will switch between 4 and 16 Mbps four times maximum. After this maximum limit is reached, the port will not switch anymore but there is no indication that this limit has been reached.
Work-around: NONE

Problem Report 4925
A TSM-CD-6 port is configured as a lobe and set at 4 Mbps. A station running at 16 Mbps is connected to the port and the port comes up. Tpvc command shows it is open and speed is 4 Mbps and the rest of the ports configured on the same module to Auto. If user pulls one of the cables connected to port configured as auto, the port goes down, as well as the port configured for 4 Mbps also goes down.
Work-around: NONE

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

12.8 Known Frame Relay Problems

Problem Report 3876
Frame relay port does not get initialized when hot swapped.
Work-around: NONE

Problem Report 4275
If 50 or more VCs are configured, all VCs become active and inactive constantly.
Work-around: Do not use more than 50 VCs on a single physical port.

Problem Report 4803
After reboot, default routing service is not created when there is trunking services entry on the same Slot/Port. This problem occurs when user first configure default ROUTING service on a given port level, then configure the trunking services. After configure trunking services, user REMOVE the default ROUTING service on the same port. Reboot the switch, re-enter the default ROUTING service on the same port then reboot the switch one more time and at this time the problem occurs where the default routing service is not assigned.

Work-around: Use the CAS command to manually create individual ROUTING service per VC.

Problem Report 4870
Inverse arp debug msgs. are displayed.

Work-around: NONE

Problem Report 4920
Removing Frame Relay service removes vport from existing VLAN rules.

Work-around: Make sure the VLAN port rule does not include Frame Relay vport service before deleting the service. If the service is deleted, than the VLAN has to be removed and rebuilt.

12.9 Known 802.10 Problems

Problem Report 3952
Port translation defaults to the factory set up. Default should be to the fddidef set up.

Work-around: Use "swch" command for the desired 802.10 port setting.

12.10 Known MPM Redundancy Problems

Problem Report 4988
Command *takeover* does not always respond. It may take awhile before the original primary performs a reboot.

Work-around: Recommended not to use *takeover* command.

Problem Report 4989
New primary may give invalid block message when it takes over.

Work-around: Ignore error message.

Problem Report 4990
When the secondary MPM is becoming primary the following message may be received:

cmInit: Taking over as Master
Chassis mgr discovered Takeover (0x48bd9ca0) has a problem!
RouteSwitch preparing for reboot.....rebooting.

Work-around: The takeover may take more than 90 seconds to occur.

12.11 Known VLAN Problems

Problem Report 4837
Changed a VLAN from CIP to no CIP. System still believes that VLAN is CIP

Work-around: NONE

12.12 Known X-LANE Problems

Problem Report 5891
Cannot move a station from one switch to another.

Work-around: Wait until the MAC address has aged out before attaching station to the second RouteSwitch.

13. Hardware Compatibility Matrix

Below are matrices containing 1) IBM RouteSwitch Network Management, RouteSwitch Compatibility, and 2) Hardware revision levels with 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	2.0.4	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
IBM Nways RouteSwitch Network Manager							
Rev. 2.0	x	x	No	No	No	No	No
Rev. 2.0.3	x	x	No	No	No	No	No
Rev. 2.1	*Yes	*Yes	No	No	x	x	x
RouteTracker							
Rev. 2.0	No	No	No	No	No	No	No
Rev. 2.0.6	x	x	No	No	No	No	No
Rev. 2.1	No	No	No	No	x	x	x
ROUTEMonitor							
Rev. 2.1	No	No	No	No	x	x	x

*Yes. Using Revision 2.1 of IBM Nways RouteSwitch Network Manager with RouteSwitch software release 2.0.3, 2.0.4, and 2.0.5 will function, however, it is preferable to use revision 2.0 or 2.0.3 of IBM Nways RouteSwitch Network Manager with RouteSwitch software 2.0.3, 2.0.4, and 2.0.5.

RouteSwitch Hardware

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
MPM (P/N 05002600)	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)						
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

RouteSwitch Hardware (cont.)

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
MPM-II (P/N 05012006)						
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 (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
ESM-C-8 (P/N 05001400)	DISCONTINUED					
Rev. A (1.06)						
Rev. B (1.07)						
Rev. C (1.08)						
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)	x	x	x	x	x	x
ESM-U-6 (P/N 05006706)						
Rev. A (1.01)						
Rev. B (1.02)						
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 (2.0)	x	x	x	x	x	x
Rev. F1 (2.01)	x	x	x	x	x	x
Rev. F2 (2.02)	x	x	x	x	x	x
ESM-C-12 (P/N 05011206)						
Rev. A (never released)						
Rev. B. (never released)						
Rev. C. (never released)						
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)	x	x	x	x	x	x
Rev. E1 (5.01)	x	x	x	x	x	x
Rev. E2 (5.02)	x	x	x	x	x	x

RouteSwitch Hardware (cont.)

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
ESM-T-12 (P/N 050140-06)						
Rev. B (2.00)		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
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. 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-AB-AFD (P/N 05014406)						
Rev. A (1.00)		x	x	x	x	x
Rev. A1 (1.01)		x	x	x	x	x
ESM-AB-FL (P/N 05008506)						
Rev. A						
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. A (never released)						
Rev. B	x	x	x	x	x	x
Rev. C	x	x	x	x	x	x
ESM-AB-AT (P/N 05007906)						
Rev. A (never released)						
Rev. B	x	x	x	x	x	x
HSM (P/N 05003106)	DISCONTINUED					
Rev. A (2.01) Rev. "B"						
Rev. B (2.02) " "						

RouteSwitch Hardware (cont.)

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
HSM (P/N 05003106) Cont.	DISCONTINUED					
Rev. C (2.03) " "						
Rev. D (2.04) " "						
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. B. Initial Release						
Rev. C (3.00)	x**	x**	x**	x**	x**	x**
Rev. C1 (3.01)	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
Rev. D2 (4.02)	x	x	x	x	x	x
Rev. D3 (4.03)	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. A1 (1.01)		x	x	x	x	x
Rev. A2 (1.02)		x	x	x	x	x

RouteSwitch Hardware (cont.)

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
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
ATM DS3 Daughter Card (P/N 05010406)						
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
Rev. A1 (1.01)		x	x	x	x	x
Rev. A2 (1.02)		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

RouteSwitch Hardware (cont.)

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
FSM Daughter Card (P/N 05003706)	DISCONTINUED					
Rev. A (1.01)						
Rev. B (1.02)						
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. B. Initial release (2.02)						
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
100BaseT Daughter Card (P/N 05010906)						
Rev. A (never released)						
Rev. B (never released)						
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
ESM-100FM-FD (P/N 050122-13)						
Rev. B (2.00)		x	x	x	x	x
Rev. B1 (2.01)		x	x	x	x	x
Rev. B2 (2.02)		x	x	x	x	x

RouteSwitch Hardware (cont.)

	Software Release					
Product	2.0.5	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
ESM-100C-FM P/N 050122-15						
Rev. A (1.00)		x	x	x	x	x
ESM-100FS-FD P/N 050122-15						
Rev. A (1.00)		x	x	x	x	x
ESM-100C-FD (P/N 050122-06)						
Rev. B (2.00)		x	x	x	x	x
Rev. B1 (2.01)		x	x	x	x	x
ESM-100FS-FD-1 (P/N 050122-14)						
Rev. B (2.00)		x	x	x	x	x
Rev. B1 (2.01)		x	x	x	x	x
Rev. B2 (2.02)		x	x	x	x	x
ESM-100FM-FD (P/N 050122-17)						
Rev. A (1.00)		x	x	x	x	x
FESM AE Daughter card P/N 050109-13						
Rev. A (1.00)		x	x	x	x	x
Rev. A1 (1.01)		x	x	x	x	x
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
WSM-4/8-SC WAN (P/N 050117-06)						
Rev. A2 (1.02)		x	x	x	x	x
Rev. A3 (1.03)		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.

RouteSwitch Hardware	RouteSwitch Software				
Product	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
RouteSwitch 100 / RouteSwitch 10E (P/N 05010306)					
Rev. C (never released)					
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)					
Rev. C6 (3.06)					
Rev. C7 (3.07)					
P/N 05015206 Rev. D (4.00)	x	x	x	x	x
Rev. D1 (4.01)	x	x	x	x	x
Rev. D2 (4.02)	x	x	x	x	x
Rev. D3 (4.03)	x	x	x	x	x
Rev. D4 (4.04)	x	x	x	x	x
Rev. D5 (4.05)	x	x	x	x	x
RouteSwitch 10U (P/N 05013006)					
Rev. A (1.00)	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)	x	x	x	x	x
Rev. A6 (1.06)	x	x	x	x	x
Rev. A7 (1.07)	x	x	x	x	x
Rev. A8 (1.08)	x	x	x	x	x
Rev. A9 (1.09)	x	x	x	x	x
RouteSwitch 10UE (P/N 050130-08)					
Rev. A (1.00)				x	x
RouteSwitch 10E (P/N 050152-08)					
Rev. A (1.00)				x	x
RESM-AB-FL (P/N 050085-06)					
Rev. A					
Rev. B	x	x	x	x	x
Rev. C	x	x	x	x	x
Rev. D	x	x	x	x	x
Rev. E	x	x	x	x	x
RESM-AB-T (P/N 05009106)					
Rev. A	x	x	x	x	x

	RouteSwitch Software				
Product	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
RESM-AB-B (P/N 05009706)					
Rev. A (never released)					
Rev. B	x	x	x	x	x
Rev. C	x	x	x	x	x
RESM-AB-AT (P/N 05007906)					
Rev. A (never released)					
Rev. B	x	x	x	x	x
RASM Daughter Card P/N 05011626 (1/2 MB SRAM) MM					
Rev. A (1.01)	x	x	x	x	x
RASM Daughter Card P/N 05011627 (1/2 MB. SRAM) SM					
Rev. A (1.01)	x	x	x	x	x
RASM Daughter Card P/N 05011624 (2 MB SRAM) MM					
Rev. A (1.01)	x	x	x	x	x
RASM Daughter Card P/N 05011625 (2 MB SRAM) SM					
Rev. A (1.01)	x	x	x	x	x
FESM II 100BTX P/N 050139-06					
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
RESM-100FM-FD P/N 050122-13					
Rev. B (2.00)	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x
RESM-100C-FD P/N 050122-06					
Rev. B (2.00)	x	x	x	x	x
Rev. 1 (2.01)	x	x	x	x	x
RESM-100FS-FD-1 P/N 050122-14					
Rev. B (2.00)	x	x	x	x	x
Rev. B1 (2.01)	x	x	x	x	x
Rev. B2 (2.02)	x	x	x	x	x

	RouteSwitch Software				
Product	2.1.1	2.1.2	2.1.3	2.1.3.G	2.1.5
RFSM Daughter Card P/N 05003706 (MM only)	**DISCONTINUED**				
Rev. A (1.01)	x	x	x	x	x
Rev. B (1.02)	x	x	x	x	x
Rev. C (1.03)	x	x	x	x	x
Rev. D (1.04)	x	x	x	x	x
Rev. E (1.05)	x	x	x	x	x
RFSM Daughter Card P/N 05010806 (MM)					
Rev. B. Initial release (2.02)					
Rev. C (2.03)	x***	x***	x***	x***	x***
Rev. C1 (2.04)	x	x	x	x	x
RFSM Daughter Card P/N 05010813 (SM)					
Rev. B Initial Release (2.00)	x	x	x	x	x
RFSM Daughter Card UTP P/N 05007306					
Rev. E (1.05)	x	x	x	x	x