Multi-Service IronWare Software R02.7.02e for Brocade BigIron RX Series Switches

Release Notes v1.0

February 5, 2010

Document History

Document Title	Summary of Changes	Publication Date
Multi-Service IronWare Software R02.7.02e for Brocade BigIron RX Series Switches Release Notes v1.0	Release 02.7.02e	February 2010

Contents

Supported devices for Multi-Service IronWare R02.7.02e

This software release applies to the following Brocade products:

- BigIron RX-4 Switch
- BigIron RX-8 Switch
- BigIron RX-16 Switch
- BigIron RX-32 Switch

Note: The software release described in these release notes can only be used on the devices specified above.

All information required to operate the BigIron RX Series Switch is described in the *BigIron RX Series Configuration Guide* or the *Brocade BigIron RX Series Installation Guide*.

Feature support

Below is a list of all the features supported on the BigIron RX switches. See Unsupported features, for features not supported.

Supported features

Category	Feature description
System level Features	
• Cisco Discovery Protocol (CDP)	Allows you to configure a Brocade device to intercept and display the contents of CDP packets. This feature is useful for learning device and interface information for Cisco devices in the network.
• CLI Logging	
• Denial of Service (DoS) protection	Protection from SYN attacks Protection from Smurf attacks
• Foundry Discovery Protocol (FDP)	Enables Foundry devices to advertise themselves to other Foundry devices on the network.
• High Availability	OS Layer 2 Hitless Software Upgrade

Category	Feature description
• Management Options	Serial and Telnet access to industry-standard Command Line Interface (CLI) SSHv2 TFTP Web-based GUI SNMP versions 1, 2, and 3 IronView Network Manager
• Security	AAA Authentication Local passwords RADIUS Secure Shell (SSH) version 2 Secure Copy (SCP) TACACS/TACACS+ User accounts 802.1x: All EAP types, including MD5, TLS, TTLS, and PEAP Multi-device port authentication **Note:** Telnet, SSH, Web and SNMP servers are disabled by default, and can be enabled selectively.
• CPU protection:	There are no CLI commands for CPU protection. The BigIron RX forwards unknown unicast, broadcast and multicast packets in hardware; therefore, the CPU is automatically 'protected' from having to handle too many packets.
• Logging	Multiple SysLogD server logging
• sFlow	sFLow version 5
• Uni-directional Link Detection (UDLD)	Monitors a link between two devices and brings the ports on both ends of the link down if the link goes down at any point between the two devices.
Layer 2 features	
• 802.1d	Spanning Tree Protocol (STP) and Single Spanning Tree Protocol (SSTP)
• 802.1p	Quality of Service (QoS) queue mapping

Category	Feature description
• 802.1q	see VLANs, below
• 802.1s	Multiple Spanning Tree Protocol (MSTP)
• 802.1w	Rapid Spanning Tree Protocol (RSTP)
• 802.1x	Port Security
• 802.3ad	Dynamic Link Aggregation on tagged and untagged trunks
• Jumbo packets	Layer 2 jumbo packet support
• Layer 2 Hitless failover	
• Layer 2 IGMP Snooping	
• MAC Filtering	MAC filtering and address-lock filters to enhance network security
• Foundry MRP	Metro Ring Protocol (MRP) Phase 1 and Phase 2
• PVST / PVST+	Per-VLAN Spanning Tree (PVST)
• Rate Limiting	Port-based, port-and priority-based, port-and vlan-based, and port-and-ACL-based rate limiting on inbound ports are supported.
• SuperSpan	A Brocade STP enhancement that allows Service Providers (SPs) to use STP in both SP networks and customer networks.
• Topology Groups	A named set of VLANs that share a Layer 2 topology. You can use topology groups with the following Layer 2 protocols: STP Foundry MRP VSRP 802.1w

Category	Feature description
• Trunk Groups and LAG	Allows you to manually configure multiple high-speed load-sharing links between two devices or between a device and a server.
• VLANs	802.1Q tagging Port-based VLANs Super Aggregated VLANs (SAV) Dual-mode VLAN ports Transparent Port Flooding VLAN ID to MSTP Instance Pre-assignment Private VLANs
• VSRP	Layer 2 Virtual Switch Redundancy Protocol (VSRP) Layer 3 Virtual Switch Redundancy Protocol (VSRP) VSRP and MRP Signaling
• Layer 2 ACLs	Replaces MAC filters
• Layer 2 PIM Snooping	
Layer 3 features	
• ACLs	Standard, Extended, and Super Inbound ACL logging ACL editing
• BGP	BGP routes BGP peers BGP dampening Graceful Restart
• FDR	Foundry Direct Routing
• IP Forwarding	IPv4 Routing IPv6 Routing

Category	Feature description
• IP Static entries	Routes ARPs Virtual interfaces Secondary addresses
• IS-IS	Routes BGP peers BGP dampening
• Multicast Routing	Multicast cache L2 IGMP table DVMRP routes PIM-DM PIM-SM PIM-SSM IGMP v1, v2, v3 snooping PIM-SM snooping (IPv4 only)
• OSPF	OSPF routes OSPF adjacencies – Dynamic OFPF LSAs OSPF filtering of advertised routes
• PBR	Policy Based Routing (Release 02.2.01 and later)
• RIP versions 1 and 2	RIP routes
• VRRP and VRRPE	Virtual Router Redundancy Protocol (VRRP) and VRRP Extended (VRRPE)
IPv6 features	
• IPv6 ACLs	Extended ACLs

Category	Feature description
• IPv6 Routing Protocols	RIPng OSPFv3 BGP4+

Unsupported features

The following features are not supported in software release 02.7.02 on BigIron RX:

- AppleTalk
- Dynamic IP Routing
- IPX
- Mirroring across VLANs
- MPLS
- NAT
- RARP
- VLANs
    - VLAN translation
    - Subnet VLANs
- Source IP Port Security

Software image files for Multi-Service IronWare R02.7.02e

The following Software Image Files are available for Multi-Service IronWare R02.7.02e for the BigIron RX Series Switches.

Software image files

Module	Image type	Image name
Unified Image	N/A	rx02702e.bin
Management Module	Boot and Monitor	rmb02702e.bin
	IronWare	rmpr02702e.bin

Module	Image type	Image name
BigIron RX-4, BigIron RX-8, and BigIron RX-16	FPGA	mbridge
BigIron RX-32		mbridge32
Interface Module	Boot and Monitor	rlb02702e.bin
	IronWare	rlp02702e.bin

Images and procedures required

The software images required and the procedures for upgrading have been changed as described in the following sections:

- Upgrading Software Images as Required by Version – This sub-section describes the procedures required for your software upgrade depending upon the version you are upgrading from or to. Links are provided to the required procedures as required.
- Displaying the Flash Memory and Version Information – This sub-section describes the commands that allow you to determine the contents of the BigIron RX Series switch's flash memory and how to read the output of those commands.
- Upgrading the device's Monitor and Boot Images – This sub-section describes the procedures required for upgrading the BigIron RX Series Switches Monitor and Boot software images.
- Upgrading the device's Multi-Service IronWare Image – This sub-section describes the procedures required for upgrading the BigIron RX Switches Multi-Service IronWare software image.
- Rebooting the device – This sub-section describes the procedures required for rebooting the device after upgrading the software images.

Upgrading the Multi-Service IronWare software

When performing this upgrade, you will usually only need to upgrade Multi-Service IronWare image. The Boot and Monitor images will only need to be upgraded as specifically directed in the relevant release notes.

The steps for this upgrade include the following:

1. Determine the versions of the software images currently installed and running on the switch.
2. Upgrade the Device's Multi-Service IronWare Image.
3. Reboot the BigIron RX Series switch.

In most cases, this is all that will be required. If you are directed by the release notes to upgrade the Monitor or Boot images, use the following procedures:

4. Upgrade the BigIron RX Series switches Monitor and Boot images.
5. Reboot the BigIron RX Series Switch.

Displaying flash memory and version information

Prior to upgrading the images on a BigIron RX Series switch, it is advisable to check the versions already installed. This allows you to determine which versions need to be upgraded. It is also useful to check the versions installed immediately after an upgrade has been done to make sure that you have installed the versions required in your installation. The following sections describe how to use the **show flash** and **show version** commands to display this information.

Displaying flash information

You can display information concerning the contents of a BigIron RX using the **show flash** command as shown in the following:

```
BigItonRX16#show flash
====================================================================
Active Management Module (Right Slot)
Code Flash - Type MT28F128J3, Size 32 MB
  o IronWare Image (Primary)
    Version 2.7.2eT143, Size 4476851 bytes, Check Sum 85ab
    Compiled on Jan 29 2010 at 16:38:08 labeled as rmpr02702e
  o IronWare Image (Secondary)
    Version 2.7.2eT143, Size 4476851 bytes, Check Sum 85ab
    Compiled on Jan 29 2010 at 16:38:08 labeled as rmpr02702e
  o LP Kernel Image (Monitor for LP Image Type 0)
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
  o LP IronWare Image (Primary for LP Image Type 0)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o LP IronWare Image (Secondary for LP Image Type 0)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o Boot-Monitor Image
    Version 2.7.2eT145, Size 432020 bytes, Check Sum 834b
    Compiled on Jan 29 2010 at 16:23:40 labeled as rmb02702e
  o Startup Configuration
    Size 9825 bytes, Check Sum 1cb0
    Modified on 17:20:02 Pacific Thu Feb 04 2010

Boot Flash - Type AM29LV040B, Size 512 KB
  o Boot-Monitor Image
    Version 2.7.2eT145, Size 432020 bytes, Check Sum 834b
    Compiled on Jan 29 2010 at 16:23:40 labeled as rmb02702e
====================================================================
Line Card Slot 1
Code Flash: Type MT28F640J3, Size 16 MB
  o IronWare Image (Primary)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o IronWare Image (Secondary)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o Boot-Monitor Image
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
Boot Flash: Type AM29LV040B, Size 512 KB
  o Boot-Monitor Image
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
====================================================================
Line Card Slot 3
Code Flash: Type MT28F640J3, Size 16 MB
  o IronWare Image (Primary)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
```

```
  o IronWare Image (Secondary)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o Boot-Monitor Image
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
Boot Flash: Type AM29LV040B, Size 512 KB
  o Boot-Monitor Image
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
==========================================================================
Line Card Slot 4
Code Flash: Type MT28F640J3, Size 16 MB
  o IronWare Image (Primary)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o IronWare Image (Secondary)
    Version 2.7.2eT157, Size 2315865 bytes, Check Sum c2bd
    Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
  o Boot-Monitor Image
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
Boot Flash: Type AM29LV040B, Size 512 KB
  o Boot-Monitor Image
    Version 2.7.2eT155, Size 306154 bytes, Check Sum 80b6
    Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
==========================================================================
All show flash done
```

Code flash and boot flash information

This field...	Displays…
Management Modules	
<type> Management Module (<location>)	The management module for which flash information is displayed. The <type> parameter indicates an active or standby management module. The <location> parameter indicates the top or bottom slot (M1 or M2, respectively).
Code Flash	The model number and size of the management module's code flash.

IronWare Image (Primary or Secondary)	Indicates the IronWare image installed in the primary or secondary location in the management module's code flash. The actual image name depends on the version of software you have running on your BigIron RX. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.
LP Kernel Image (Monitor for LP Image Type 0)	Indicates the interface modules Boot-Monitor image stored in the management module's code flash. The management module stores these images only; it does not run the images. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.
LP IronWare Image (Primary or Secondary for Module Type 0)	Indicates the interface modules' primary and/or secondary IronWare image stored in the management module's code flash if you copied the primary and/or secondary IronWare image to all interface modules using the **copy** command with the **all** keyword. The management module stores these images only; it does not run the images. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.

Boot-Monitor Image	Indicates the monitor image installed in the management module's code flash. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.
Startup Configuration	The output displays the following information about the startup configuration, which is saved in the management module's code flash: • Size – Size, in bytes, of the startup configuration. • Check sum – A unique ID for the file. If the contents of the file change, the check sum changes also. • Modification date and time – Date and time that the startup configuration was last saved.
Boot Flash	The model number and size of the management module's boot flash.
Boot-Monitor Image	Indicates the boot image installed in the management module's boot flash. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.
Interface Modules	
Line Card Slot <number>	The interface module for which flash information is displayed. The <number> parameter indicates the number of the chassis slot, 1 – 16, in which the interface module is installed.

Code Flash	The model number and size of the interface module's code flash.
IronWare Image (Primary or Secondary)	Indicates the IronWare image installed in the primary or secondary location in the interface module's code flash. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.
Boot-Monitor Image	Indicates the monitor image installed in the interface module's code flash. The image must be imlb<xxxxx>. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.
Boot Flash	The model number and size of the interface module's boot flash.
Boot-Monitor Image	Indicates the boot image installed in the interface module's boot flash. The output displays the following information about the image: • Version – "2.2.1Txxy" indicates the image version number. The "Txxy" is used by Brocade for record keeping. The "xx" indicates the hardware type, while the "y" indicates the image type. • Size – The size, in bytes, of the image. • Check sum – A unique ID for the image. If the contents of the image change, the check sum changes also. • Compilation date and time – The date and time that Brocade compiled the image.

FPGA Version Information	The following Images are only displayed from the **show version** command: 1. MBRIDGE Revision – The version number of the MBRIDGE FPGA installed on the Management module for the BigIron RX-16/8/4 2. MBRIDGE32 Revision – The version number of the MBRIDGE32 FPGA installed on the Management module for the BigIron RX-32. 3. SBRIDGE Revision – The version number of the SBRIDGE FPGA installed on the BigIron RX-32 Switch Fabric modules.

Displaying version information

You can display version information for a BigIron RX using the **show version** command as shown in the following:

```
BigIronRX4#show version
================================================================================
HW: BigIron RX Router
BigIron RX-4 CHASSIS (Serial #: SA18065020,  Part #: 31550-000B)
RX-BI-SFM1 Switch Fabric Module 1 (Serial #: SA33060884,  Part #: 35548-000B)
FE 1: Type fe200,  Version 2
RX-BI-SFM1 Switch Fabric Module 2 (Serial #: SA18060405,  Part #: 31548-000B)
FE 1: Type fe200,  Version 2
RX-BI-SFM1 Switch Fabric Module 3 (Serial #: SA12062217,  Part #: 31548-000B)
FE 1: Type fe200,  Version 2
================================================================================
SL M2: RX-BI-MR Management Module Active (Serial #: SA15071733, Part #: 35524-
101C):
Boot     : Version 2.7.2eT145 Copyright (c) 1996-2007 Foundry Networks, Inc.
Compiled on Jan 29 2010 at 16:23:40 labeled as rmb02702e
 (432020 bytes) from boot flash
Monitor  : Version 2.7.2eT145 Copyright (c) 1996-2007 Foundry Networks, Inc.
Compiled on Jan 29 2010 at 16:23:40 labeled as rmb02702e
 (432020 bytes) from code flash
IronWare : Version 2.7.2eT143 Copyright (c) 1996-2007 Foundry Networks, Inc.
Compiled on Jan 29 2010 at 16:38:08 labeled as rmpr02702e
 (4476851 bytes) from Primary
Board ID : 00 MBRIDGE Revision : 21
916 MHz Power PC processor  (version 8003/0101) 166 MHz bus
512 KB Boot Flash (AM29LV040B), 32 MB Code Flash (MT28F128J3)
1024 MB DRAM
Active Management uptime is 5 minutes 18 seconds
================================================================================
SL 1: RX-BI-24C 24-port 1 GbE Copper Module (Serial #: SA01100070, Part #: 35521-
003E)
Boot     : Version 2.7.2eT155 Copyright (c) 1996-2007 Foundry Networks, Inc.
Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
 (306154 bytes) from boot flash
Monitor  : Version 2.7.2eT155 Copyright (c) 1996-2007 Foundry Networks, Inc.
Compiled on Jan 29 2010 at 16:23:24 labeled as rlb02702e
 (306154 bytes) from code flash
IronWare : Version 2.7.2eT157 Copyright (c) 1996-2007 Foundry Networks, Inc.
Compiled on Jan 29 2010 at 16:47:34 labeled as rlp02702e
 (2315865 bytes) from Primary
FAP 1 version: 3
FAP 2 version: 3
FAP 3 version: 0
FAP 4 version: 0
660 MHz Power PC processor 440GP (version 8020/0020) 330 MHz bus
512 KB Boot Flash (AM29LV040B), 16 MB Code Flash (MT28F640J3)
512 MB DRAM, 8 KB SRAM, 0 Bytes BRAM
LP Slot 1 uptime is 4 minutes 35 seconds
--More--, next page: Space, next line: Return key, quit: Control-c
```

The fields are described in the Code Flash and Boot Flash Information, which appears above.

Backing up the current software images

Before performing a software upgrade, Brocade recommends backing up the following current software images in the device's flash memory.

Syntax: cp <original-file-name> <backup-file-name>

Upgrading the monitor and boot images

You can upgrade the management module's monitor and boot images simultaneously.

Brocade highly recommends that the interface monitor and boot images be upgraded to the same software release version as the management module images to keep both code images synchronized on the same version. See Upgrading the interface module monitor and boot images .

To upgrade the management module monitor and boot images simultaneously, perform the following steps.

1. Place the new monitor and boot images on a TFTP server to which the BigIron RX system has access or on a PCMCIA flash card inserted in slot 1 or 2.
2. Copy the new monitor and boot images to the BigIron RX. Enter one of the following commands at the Privileged EXEC level of the CLI (example: BigIron RX#):

Note: When using **copy flash flash <filename>** and **copy flash lp <filename>** commands, you must enter correct filename, such as primary, secondary, monitor, lp-monitor-0, lp-primary-0 and lp-secondary-0. These filenames are found when issuing the **dir** command.

Command syntax for upgrading monitor and boot images on the management module

Command syntax	Description
copy tftp flash <TFTP-server-ip-addr> <image-name> **monitor copy-boot**	Copies the latest monitor and boot images from the TFTP server to flash.
copy slot1 | slot2 flash <image-name> **monitor copy-boot**	Copies the latest monitor and boot images from a flash card in slot 1 or 2 to flash.

For example, to copy the management module boot and monitor image from TFTP server 10.10.12.12, enter

```
BigIron RX# copy tftp flash 10.10.12.12 rmb02702e.bin monitor copy-boot
```

3. Verify that the new monitor and boot images have been successfully copied to flash or slot 1 or 2 by entering one of the following commands at the Privileged EXEC level of the CLI:

- **show flash**
- **dir /<path-name>/** (if the destination is slot 1 or 2)

Check for the boot image, monitor image, and the date and time at which the new images were built.

4. If you want to upgrade other software images, go to the appropriate upgrade section for information. If you have completed upgrading the software images, you must reboot the management module to complete the upgrade process.

Unified software image upgrade

BigIron RX software release 02.6.00 and later can be upgraded using the Unified Software Image Upgrade procedure. When copying the image, you must load the **lp-boot** and **mp-boot**. You can set parameters to limit the images being copied and to direct images to be copied to the secondary image location to a later release by doing the following:

Failure to load the **lp-boot** and **mp-boot** when copying the unified image will cause the LP to become stuck in an interactive mode.

1. Copy the unified software image (rx02702e.bin) from a TFTP server to the switch.

   For example, to copy the entire unified software image, the **lp-boot** and the **mp-boot** from a TFTP server at IP address 10.10.12.12, use the following command.

   ```
   BigIron RX# copy tftp image 10.10.12.12 rx02702e.bin lp-boot mp-boot
   ```

   Syntax: copy tftp image <TFTP-server-ip-addr> <image-name> [lp-boot | lp-sec | mp-boot | mp-sec | mbridge]

   The <TFTP-server-ip-addr> variable is the IP address for the TFTP server you are downloading the image from.

   The <image-name> variable is the name of the unified software image you want to download to the switch.

   The **lp-boot** parameter specifies that you want to download the new interface module boot image.

   The **lp-sec** parameter specifies that interface image be copied to the secondary location in flash.

   The **mbridge** parameter tells the BigIron RX to copy the MBRIDGE image. It will now include two MBRIDGES; one for BigIron RX-16/8/4 (mbridge21.xsvf) and one for the BigIron RX-32(mbridge32.xsvf).

   The **mp-boot** parameter specifies that you want to download the new management module boot image.

   The **mp-sec** parameter specifies that management image be copied to the secondary location in flash

2. Reboot the management module using the **reload** command.
3. If you are using SSH v2, you must clear the crypto key using the **crypto key zeroize** command after you upgrade. Then, regenerate a new crypto key using the **crypto key generate** command.

Special instructions for using interface modules in a 32-slot chassis

The BigIron RX-32 chassis introduced with this release can use interface modules in the BigIron RX

series that have older versions of the Multi-Service IronWare software installed on them. There are however a couple of issues regarding older versions of the software that might be installed on interface modules that you already own. They can work properly but must be installed as described in the following:

Separation of boot and monitor images

Beginning with version 02.5.00 and later of the Multi-Service IronWare software, the boot and monitor images no longer need to be upgraded with each release.

- The Boot images no longer need to be upgraded with each release and in fact will almost never need to be changed. This eliminates one extra step in the upgrade process, thus simplifying the upgrade procedure, reducing the chance of operator error and leading to a faster upgrade process.
- The Monitor image no longer needs to be upgraded with each release. In release 02.5.00, all OS functions have been moved out of the Monitor image into the IronWare image. This has simplified the Monitor image and it no longer needs to be upgraded every time, thus eliminating another step in the upgrade process.
- The first version of the boot and monitor image supporting this separation is 02.5.00

Upgrading the management module monitor and boot images

You can upgrade the management module monitor and boot images simultaneously.

Brocade highly recommends that the interface monitor and boot images be upgraded to the same software release version as the management module images to keep both code images synchronized on the same version. See Upgrading the interface module monitor and boot images .

To upgrade the management module monitor and boot images simultaneously, perform the following steps:

1. Place the new monitor and boot images on a TFTP server to which the BigIron RX system has access or on a PCMCIA flash card inserted in slot 1 or 2.
2. Copy the new monitor and boot images to the BigIron RX. Enter one of the following commands at the Privileged EXEC level of the CLI (example: BigIron RX#):

Command syntax for upgrading monitor and boot images on the management module

Command syntax	Description
copy tftp flash <TFTP-server-ip-addr> <image-name> monitor copy-boot	Copies the latest monitor and boot images from the TFTP server to flash.
copy slot1 | slot2 flash <image-name> monitor copy-boot	Copies the latest monitor and boot images from a flash card in slot 1 or 2 to flash.

For example, to copy the management module's boot and monitor image from TFTP server 10.10.12.12, enter

```
BigIron RX# copy tftp flash 10.10.12.12 rmb02702e.bin monitor copy-boot
```

3. Verify that the new monitor and boot images have been successfully copied to flash or slot 1 or 2 by entering one of the following commands at the Privileged EXEC level of the CLI:
   - **show flash**
   - **dir /<path-name>/** (if the destination is slot 1 or 2)

   Check for the boot image, monitor image, and the date and time at which the new images were built.
4. If you want to upgrade other software images, go to the appropriate upgrade section for information. If you have completed upgrading the software images, you must reboot the management module to complete the upgrade process. For more information, see Rebooting the management module.

Upgrading the management module IronWare image

To upgrade the management module IronWare image (primary or secondary), you must perform the following steps:

1. Place the new IronWare image on a TFTP server to which the BigIron RX system has access or on a PCMCIA flash card inserted in slot 1 or 2.
2. Copy the new IronWare image from the TFTP server or a flash card in slot 1 or 2 to the management module's code flash or a flash card in slot 1 or 2. To perform this step, enter one of the following commands at the Privileged EXEC level of the CLI:
   - **copy tftp flash** <TFTP-server-ip-addr> <image-name> **primary | secondary**
   - **copy tftp slot1 | slot2** <TFTP-server-ip-addr> <image-name> **primary | secondary**
   - **copy slot1 | slot2 flash** <image-name> **primary | secondary**
   - **copy slot1 | slot2 slot1 | slot2** <image-name> <dest-name>

   For example, to copy the management module's Ironware image from TFTP server 10.10.12.12, enter

   ```
   BigIron RX# copy tftp flash 10.10.12.12 rmpr02702e.bin primary
   ```
3. Verify that the new IronWare image has been successfully copied to the specified destination by entering one of the following commands at the Privileged EXEC level of the CLI:
   - **show flash** (if the destination was code flash)
   - **dir /<path-name>/** (if the destination was slot 1 or 2)

   Check for the primary or secondary image and the date and time that it was placed in the directory.
4. If you want to upgrade other software images, go to the appropriate upgrade section for information. If you have completed upgrading the software images, you must reboot the management module to complete the upgrade process. For more information, see Rebooting the management module.

Upgrading the interface module monitor and boot images

We recommend that you perform this upgrade procedure from a PC or terminal that is directly connected to the management module's Console port. You can also perform this procedure via a Telnet or SSHv2 session.

To upgrade monitor and boot images simultaneously for an interface, perform the following steps:

1. Place the new monitor and boot images on a TFTP server to which the BigIron RX system has access or on a PCMCIA flash card inserted in slot 1 or 2.
2. Copy the new monitor and boot images to the BigIron RX. Enter one of the following commands at the Privileged EXEC level of the CLI (example: BigIron RX#):

Command syntax for upgrading the monitor and boot images on the interface module

Command syntax	Description
copy tftp lp <TFTP-server-ip-addr> <image-name>**monitor all** | <slot-number>	Copies the latest monitor image from the TFTP server to all interface modules or to the specified interface module (slot-number).
copy tftp lp <TFTP-server-ip-addr> <image-name>**monitor copy-boot all** | <slot-number>	Copies the latest monitor and boot images from the TFTP server to all interface modules or to the specified interface module (slot-number).

   For example, to copy the interface module's boot and monitor image from TFTP server 10.10.12.12, enter

```
BigIron RX# copy tftp lp 10.10.12.12 rlb02702e.bin monitor all
```

3. Verify that the new images were successfully copied to code flash by entering the following command at the Privileged EXEC level of the CLI:
   - **show flash**

   Check for the monitor image, boot image, and the date and time at which the new images were built.
4. If you want to upgrade other software images, go to the appropriate upgrade section for information. If you have completed upgrading the software images, you must reboot the management module to complete the upgrade process. For more information, see Rebooting the management module.

Upgrading the IronWare image on the interface module

To upgrade the IronWare image (primary or secondary) on all interface modules or an interface module in a specified chassis slot, you must perform the following steps:

1. Place the new IronWare image on a TFTP server to which the BigIron RX system has access or on a PCMCIA flash card inserted in slot 1 or 2.

2. Copy the new IronWare image from the TFTP server or a flash card in slot 1 or 2 to all interface modules or an interface module in a specified chassis slot. To perform this step, enter one of the following commands at the Privileged EXEC level of the CLI (example: BigIron RX#):

   - **copy tftp lp** <TFTP-server-ip-addr> <image-name> **primary | secondary all**
   - **copy tftp lp** <TFTP-server-ip-addr> <image-name> **primary | secondary** <chassis-slot-number>
   - **copy slot1 | slot2 lp** <image-name> **primary | secondary all**
   - **copy slot1 | slot2 lp** <image-name> **primary | secondary** <chassis-slot-number>

   For example, to copy the interface module's IronWare image from TFTP server 10.10.12.12, enter

   ```
   BigIron RX# copy tftp lp 10.10.12.12 rlp02702e.bin primary all
   ```

   NOTE: If you copy the new IronWare image to all interface modules using the **all** keyword, the management module makes a copy of the image (called lp-primary-0 or lp-secondary-0) and stores it in its code flash, thereby synchronizing the new IronWare image on both the interface and management modules.

   If you copy the new IronWare image to a specified chassis slot, the management module does not make a copy of the image or store it. In this case, the new IronWare image on the interface module is unsynchronized or different from the IronWare image on the management module.

   For more information about synchronizing the new IronWare image or retaining unsynchronized versions of the IronWare image on the interface and management modules, see Rebooting the management module.

3. Verify that the new IronWare image has been successfully copied by entering the following command at any level of the CLI:

   ```
   BigIron RX# show flash
   ```

   Check for the IronWare image and the date and time at which the image was built.

If you want to upgrade other software images, go to the appropriate upgrade section for information. If you have completed upgrading the software images, you must reboot the management module to complete the upgrade process. For more information, see Rebooting the management module.

Upgrading MBRIDGE FPGA on the management module

BigIron RX management modules contain an upgradable FPGA images called MBRIDGE and SBRIDGE. The MBRIDGE and SBRIDGE image installed must be compatible with the software version you are running on the BigIron RX.

The following table describes the MBRIDGE FPGA versions required for the 02.7.02e versions.

MBRIDGE versions required per software version

Software image installed on BigIron RX	Current MBRIDGE image		Interface module
02.4.00	14		MP (Management Module)
02.4.00a	14		MP (Management Module)
02.4.00b	18		MP (Management Module)
02.4.00c	18		MP (Management Module)
02.4.00d	18		MP (Management Module)
02.4.00e	18		MP (Management Module)
02.4.00f	21		MP (Management Module)
02.4.00g	21		MP (Management Module)
02.5.00	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	20 20	MP (Management Module)
02.5.00a through 02.5.00f	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)
02.6.00a through 02.6.00c	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)
02.7.00	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)
02.7.01	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)
02.7.01a through 02.7.01b	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)
02.7.02	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)
02.7.02a through 02.7.02e	BigIron RX-16/8/4 BigIron RX-32 (mbridge32)	21 21	MP (Management Module)

Switch Fabric module FPGA versions required per software version (BigIron RX-32)

Software image installed on BigIron RX	FPGA image	Compatible FPGA version
02.5.00	SBRIDGE	6
02.5.00a through 02.5.00j	SBRIDGE	6
02.6.00	SBRIDGE	6
02.6.00a through 02.6.00e	SBRIDGE	6
02.7.00	SBRIDGE	6
02.7.01	SBRIDGE	6
02.7.01a through	SBRIDGE	6

Software image installed on BigIron RX	FPGA image	Compatible FPGA version
02.7.01b		
02.7.02	SBRIDGE	6
02.7.02a through 02.7.02e	SBRIDGE	6

To upgrade the MBRIDGE FPGA image on a BigIron RX management module, you must perform the following general steps:

1. Determine the versions of the images currently installed on the BigIron RX management module using the **show version** command.
2. Place the new MBRIDGE FPGA image on a TFTP server to which the BigIron RX system has access or on a PCMCIA flash card inserted in slot 1 or 2.
3. Copy the MBRIDGE FPGA image from the TFTP server or a flash card in slot 1 or 2 to all management modules or a management module in a specified chassis slot. To perform this step, enter one of the following commands at the Privileged EXEC level of the CLI (example: BigIron RX#):
   - **copy tftp mbridge** <TFTP-server-ip-addr> <image-name> **MBRIDGE**
   - **copy slot1 | slot2 mbridge** <image-name> **MBRIDGE**
4. After the MBRIDGE upgrade is complete, the management module must be reloaded.
5. Verify that the MBRIDGE image(s) have been successfully copied to the specified interface module(s) by entering the following command at any level of the CLI:
   - **show version**

Check for the MBRIDGE image version numbers in the output. See MBRIDGE.

Rebooting the management module

After upgrading one or more software images on the management or interface module, you must reboot the management module. After the management module reboots, it in turn reboots the interface modules.

To reboot the management module, enter one of the following commands:

- **reload** (this command boots from the default boot source, which is the primary code flash)
- **boot system flash primary | secondary**

During the management module reboot, the following synchronization events occur:

- If you have a standby management module, the active management module compares the standby module's monitor, primary, and secondary images to its own. If you have updated these images on the active module, the active module automatically synchronizes the standby module's images with its own.
- If you copied the primary and/or secondary IronWare image to all interface modules using the **copy** command with the **all** keyword, the management module made a copy of the image and stored it in its code flash under the names lp-primary-0 or lp-secondary-0. By default, the BigIron RX system checks the interface modules' IronWare images, which reside in the code flash of the interface modules and the management module to make sure they are the same in both locations. (These

IronWare images are stored on the management module only and are not run by the management or interface modules.) If the IronWare images on the interface and management modules are different, the system prompts you to do the following:

- If you want to update the IronWare images in the interface module's code flash with the images in the management module's code flash, enter the **lp cont-boot sync <slot-number>** command at the Privileged EXEC prompt.
- If you want to retain the IronWare images in the interface module's code flash, enter the **lp cont-boot no-sync <slot-number>** command at the Privileged EXEC prompt.

After the management module finishes booting, do the following:

- Enter the **show module** command at any CLI level, and verify that the status of all interface modules is CARD_STATE_UP.
- Enter the **show version** command at any CLI level, and verify that all management and interface modules are running the new software image version.

If you find that an interface module is in a waiting state or is running an older software image, then you may have forgotten to enter the **lp cont-boot sync <slot-number>** command at the Privileged EXEC prompt.

You also need to upgrade the MBRIDGE FPGA on the management module.

Regenerating SSH v2 crypto key

If you are using SSH v2, you must clear the crypto key using the **crypto key zeroize** command after you upgrade from any release 02.2.01 and later. Then, regenerate a new crypto key using the **crypto key generate** command.

Hitless Layer 2 OS Upgrade

Hitless OS upgrades are supported for Layer 2 switching and Layer 2 protocols only. See the Upgrading Software Images and Configuration Files chapter in the *BigIron RX Installation Guide* for additional information. The hitless OS Layer 2 upgrade allows for upgrading the software in a system between two patch releases of the operating system, which support this functionality and have compatible data structures. A hitless OS Layer 2 downgrade may also be supported if the current and target code releases have compatible data structures.

Note: Hitless OS upgrade is not supported between major releases. It is supported only within a release. For example, Hitless OS Upgrade is available when upgrading from software release 02.7.00a to 02.7.00b. It is not available when upgrading from software release 02.6.00 to 02.7.00.

From time to time, it may become necessary when enhancing the software or adding new features to change or add data structures making releases incompatible. In these cases, an upgrade or downgrade will not be hitless, and will fall back to using the regular Brocade upgrade process – relying on fast reboot.

When performing a hitless O/S Layer 2 upgrade or downgrade, use the following guidance:

- Hitless O/S Layer 2 upgrade or downgrade is not supported in 2.3.00 or earlier.
- Hitless O/S Layer 2 upgrade support is in 2.3.00a and higher patch releases (unless indicated otherwise in the target software's release notes).

- Hitless upgrade maintains forwarding states and control plane functionality of the active software from which you are upgrading (i.e. 2.3.00a to 2.3.00d would only maintain the functionality supported by 2.3.00a).
- Hitless downgrades are recommended only between compatible patch releases of a feature release such as between 2.3.00b to 2.3.00a (to ensure the higher release has no conflicting functional enhancements that do not exist in the lower release).
- Due to the PBIF change introduced in patch release version 02.3.00e and version 02.3.00f, users cannot perform hitless upgrades from earlier 02.3.00 versions or 02.3.00g or higher versions. For information on Hitless Upgrades refer to the “Hitless OS Upgrade” section in the BigIron RX Installation Guide.
- Due to Internal changes introduced in patch release version 02.4.00d ,hitless upgrade is not supported onto 02.4.00b and hitless downgrade is not supported from 02.4.00d.
- The Hitless upgrade feature is not supported on release 02.5.00b to 02.5.00c for the BigIron RX-32 only. It is supported on all other BigIron RX devices.

Using this feature, you can upgrade the Multi-Service IronWare software without a loss of service or disruption in the following supported functions and protocols:

- All ports and links remain operational
- TOS-based QoS
- Layer-2 Switching
- Layer-2 Protocols:
    - MRP
    - STP
    - VSRP
    - RSTP
    - MSTP

Considerations when using the Hitless Layer 2 OS Upgrade feature

Consider the following when using the Hitless Layer 2 OS Upgrade feature:

- You must have both active and standby management modules installed to use this feature.
- To avoid any disruptions of Layer-3 traffic to OSPF or BGP routes, the switch must be configured with OSPF Graceful Restart and BGP Graceful Restart features. In addition, the device’s OSFP neighbors must have OSPF Graceful Restart Helper enabled.

The total time it takes for the hitless upgrade process to finish varies between approximately 1 and 10 minutes. This depends on the size of the MAC table, the number of OSPF and BGP neighbors and the size of the routing table. Switch configuration is unavailable during the entire hitless upgrade process. The message "**---SW Upgrade In Progress - Please Wait---**" is printed at the console when configuration is attempted. Operational command of the switch is allowed during the upgrade process.

- The active management module changes from the initial active management module to the standby management module during the hitless upgrade process. This makes it necessary to have a connection to the console interface on both management modules.

- Upon being reset, the management and interface module CPUs are unable to send and receive any packets. Once the management and interface modules are up and running, their CPUs are able to send and receive packets, even before the hitless upgrade process is complete.
- Switch configuration is not allowed to be changed during the entire hitless upgrade process.
- System-max parameter changes or other configuration changes that require a system reload such as "cam-mode" and cam-profile" changes do not take effect upon hitless upgrade.
- FPGA images cannot be upgraded using the hitless upgrade process.
- This feature cannot be used to downgrade an image to an older major version than the version that the device is currently running.
- If there are protocol dependencies between neighboring nodes, it's recommended that only each node is upgraded: one node at a time.
- After hitless upgrade, the BigIron RX switch will still have the same running configuration as it does before the upgrade. A configuration that is not saved before hitless reload is not removed and the existing startup configuration does not take effect. This behavior is the same as displayed by the management module switchover feature.

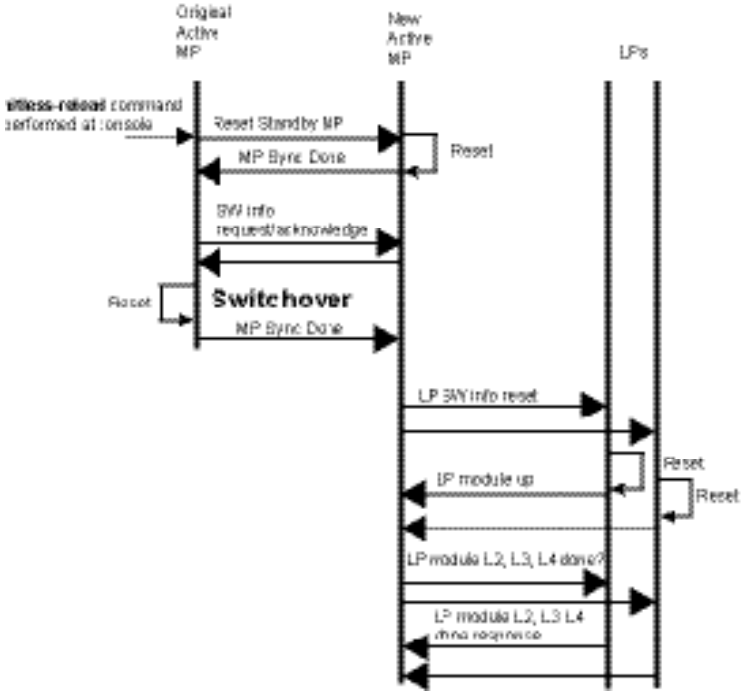
The Hitless OS Layer 2 software process

Hitless OS Layer 2 upgrade of Multi-Service IronWare software is performed in the following steps.

- Version 02.3.00 or later of the Multi-Service IronWare software is installed in flash memory to the primary and secondary image on the active and standby management modules and interface modules.
- The **hitless-reload** command is executed on the active management module.
- The hitless upgrade process is begun on the active management module which initiates the upgrade process on the standby management module.
- The standby management module is reset.
- The active management module is reset and the standby management module assumes control as the active module.
- Active console control is lost to the previously active management module as it becomes the standby management module.
- The active management module initiates the upgrade process on all interface modules.
- The switch is now operating on the new Multi-Service IronWare software. The management module that was initially configured as the standby management module is now the active management module and the management module that was initially configured as the active management module is now the standby.

Management module (MP) and Interface Module (LP) Hitless Upgrade Process provides a detailed diagram of the Hitless reload process.

Figure 1 Management module (MP) and Interface Module (LP) Hitless Upgrade Process



Performing a Hitless Layer 2 OS software upgrade

To perform a hitless Layer 2 OS software upgrade, you must perform the following tasks:

- Copy version 02.3.00 or later of the Multi-Service IronWare software to the primary and secondary image on both the active and standby management modules and interface modules.
- Setup a console connection to both the active and standby management modules. These connections can be through a telnet, SSH, or serial console session.
- Type the **hitless-reload** command at the console of the active management module.

Loading the Multi-Service IronWare software onto the switch

Hitless Layer 2 OS upgrade loads from the primary and secondary images on the Management modules. The first step in performing a hitless Layer 2 OS upgrade is to copy the version 02.3.00 or later images into the flash memory of the active and standby management modules.

For instructions for copying these files, see Upgrading the management module monitor and boot images and Upgrading the management module IronWare image.

Setting up consoles

Hitless Layer 2 OS upgrade is executed at the active management module. During the process of upgrading the image, control of the switch is shifted to the standby management module. For this reason, you need to have management sessions enabled on both the active and the standby management modules. When the reload is complete, the management module that was in the standby condition at the beginning will be in the active state. If you want the original management module to be active, you must manually fail-over control to it.

Executing the Hitless upgrade command

To begin the process of a hitless upgrade, use the following command:

```
BigIron RX(config)# hitless-reload mp primary lp primary
```

Syntax: hitless-reload mp [primary | secondary] lp [primary | secondary]

The **mp** parameter specifies that the management module will be reloaded with either the **primary** or **secondary** image as directed.

The **lp** parameter specifies that the interface module will be reloaded with either the **primary** or **secondary** image as directed.

Verify the new software image

Enter the **show version** command at any CLI level, and verify that all management and interface modules are running the new software image version.

Technical support

Contact your switch supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information immediately available:

General Information

- Technical Support contract number, if applicable
- Switch model
- Switch operating system version
- Error numbers and messages received
- Detailed description of the problem, including the switch or network behavior immediately following the problem, and specific questions
- Description of any troubleshooting steps already performed and the results
- Switch Serial Number

Getting Help or Reporting Errors

Brocade is committed to ensuring that your investment in our products remains cost-effective. If you need assistance, or find errors in the manuals, contact Brocade using one of the following options:

Web Access

Go to kp.foundrynet.com and log in to the Knowledge Portal (KP) to obtain more information about a product, or to report documentation errors. To report errors, click on Cases > Create a New Ticket. Make sure you specify the document title in the ticket description.

Email Access

Send an e-mail to IPsupport@brocade.com

Telephone Access

United States and Canada: 800-752-8061

International: +800-ATFIBREE (+800 28 34 27 33)

> Refer to the Services & Support page on www.brocade.com for additional toll-free numbers that may be available within your country.

Areas unable to access 800 numbers: +1-408-333-6061

Additional resources

Below are some additional publications you can reference to find more information on the products supported in this software release.

Additional publications

Title	Contents
Brocade BigIron RX Series Installation Guide	• Product Overview • Installation • Product Management • Hardware Maintenance and Replacement • Air filters • Fiber optic connectors • Replaceable modules • AC Power supply • Fans • Software Upgrades • Hardware Specifications • Regulatory Statements
BigIron RX Series Configuration Guide	Information on how to configure all the features in a BigIron RX Series switch.
Ironware MIB Reference	Simple Network Management Protocol (SNMP) Management Information Base (MIB) objects.
IronView® Network Manager User Guide	SNMP-based application for managing Brocade switches and switching routers.

Documentation update

Switchover CLI command

In Patch Release 02.7.02c, a prompt has been added to the **switchover** command. When you enter the **switchover** command, the CLI asks you to confirm your request by displaying the following prompt:

```
Are you sure? (enter 'y' or 'n'):
```

You must enter "Y" to continue executing the **switchover** command, or "N" to cancel your request.

The **switchover** command is discussed in the BigIron RX installation guide *Brocade BigIron RX Series Installation Guide* and the *BigIron RX Series Configuration Guide*.

Clear ipv6 ospf command

The **clear ipv6 ospf** CLI command has been deprecated.

SYSMON changes

The system monitoring service (SYSMON) feature was introduced in the 02.6.00c patch release. This feature monitors the hardware in the system to detect, report, and in some cases isolate and recover hardware errors in the system. When an error or event occurs, SYSMON generates Syslog messages, which must be reported to Brocade Technical Support.

In the 02.7.02b patch release, the following enhancements were added:

1. A read and write test was added to detect failed Switch Fabric Module (SFM) FE failures. A Syslog message is generated to indicate a SFM FE failure.
2. The performance of ingress DRAM CRC detection was improved. This detection now has two methods to detect errors; an interrupt routine is used to detect these errors quickly and will trigger a shutdown of the failed TM. Long term polling has been added to detect low rate CRC errors which will be reported with a Syslog message.
3. TM blocked (stuck) buffers can now be detect and recovered from egress. This process generates a Syslog message.

Note: As a result of the extended monitoring enhancements, any marginal hardware may be reported as defective.

Furthermore, The default behavior for TM register monitor action has been changed. The shutdown action is now enabled by default. Enter **no sysmon tm reg shutdown** command to disable this action.

The following table presents the examples of Syslog message generated by SYSMON for the events that trigger them.

Syslog message examples	**Event**	**Description**
`Dec 29 15:31:24:W:System: ALARM:LP15/TM3 has 6 links, less than the minimum to maintain line rate`	Traffic Manager (TM) Link:	Excessive errors on multiple links between the interface module and the switch fabric module.

Syslog message examples	Event	Description
`Dec 29 16:25:24:E:System: ALARM:TM Clock Drift: LP15/TM4 (Reg: 0xbe20, Value: 0x2b013ffc)`	TM clock synchronization	Clock synchronization errors in all TMs of interface modules.
`Dec 29 17:19:26:E:System: ALARM:LP15/TM1 has shutdown (TM Internal Error: LP15/TM1 (Reg: 0x444, Value: 0x70000) (shutdown))`	TM registers	Errors detected in the TM.

`Jan 8 11:48:29:E:System: ALARM:LP3/TM1 has shutdown (TM Q Stuck: LP3/TM1 (Queue 1024, Size 50331648, Credit 2047, RdPtr 0x0) (shutdown))]`
`Jan 8 11:48:19:E:System: ALARM:LP3/TM1 re-initialized (TM Q Stuck: LP3/TM1 (Queue 1024, Size 50331648, Credit 2047, RdPtr 0x0) (QDP reinit))`
`Jan 8 11:48:19:E:System: ALARM:LP3/TM1 QDP re-initialized (TM Q Stuck: LP3/TM1 (Queue 1024, Size 50331648, Credit 2047, RdPtr 0x0) (QDP reinit))`
	TM queue scanner	Blocked traffic queues in the TM.

`Dec 31 13:51:42:E:System: ALARM:LP1/TM1 has shutdown (LP1/NP1 TCAM failure (shutdown))`	TCAM scan	Corruption on the TCAM.
`Jan 8 08:59:29:E:System: ALARM:LP3/NP2 packet path diagnostic failure`	PKT path scan	Problems in the packet path from the LP CPU to the TM to the NP then back to the CPU.
`Sep 13 15:01:29:E:System: ALARM:FE Read-Write Test Error: SNM4/FE1 Reg 0x14, Read 0x48000000 != Written 0x0`	Switch fabric element read/write error	A failure has occurred on the specified switch fabric module

Syslog message examples	Event	Description
`Sep 13 15:01:29:E:System: ALARM: LP9/TM2 has shutdown (TM DRAM CRC: LP9/TM2 (Reg: 0xa50c, Value: 0x7) (shutdown))`	TM ingress DRAM CRC error	A failure was detected on the ingress DRAM. The failed device was shutdown
`Sep 13 15:01:29:E:System: ALARM: LP16/TM1 re-initialized (TM TX BUFFER Stuck: LP16/TM1 (Reg: 0x400000b4, Value: 0x1de) (reinit))`	TM egress buffer stuck error	A blocked Traffic Manager egress buffer was detected and recovered

NOTE: Brocade Technical Support may guide you in using SYSMON commands to obtain additional information. Do not use these commands without guidance from technical support.

Defects

NOTE: In the tables below, "Reported In Release" indicates the product and release that the defect was first identified. If the problem also appeared in other Brocade IP Products, the issue was addressed using the same defect ID.

Closed with code change defects in Multi-Service IronWare R02.7.02e

This section lists defects closed in Multi-Service IronWare R02.7.02e.

Defect ID: DEFECT000271667	**Technical Severity:** Medium
Summary: Interface module may reset due to erroneous PIM memory pool management.	
Risk of Fix: Low	
Feature: IPv4-MC PIM-SM Routing	**Function:** PROTOCOL
Reported In Release: RX 02.6.00	

Defect ID: DEFECT000274156	**Technical Severity:** Medium
Summary: Command "show interface slot 0" may cause a system reset	
Probability: Medium	**Feature:** CLI Infrastructure
Feature: CLI Infrastructure	**Function:** Parser Engine
Reported In Release: RX 02.7.02	

Defect ID: DEFECT000279953	**Technical Severity:** Medium
Summary: STP BPDU's may be dropped across the Q-in-Q link	
Probability: Medium	
Feature: L2 Protocol	**Function:** STP
Reported In Release: RX 02.7.02	

Defect ID: BUG ID 109551	**Technical Severity:** Medium
Summary: In some cases OSPF database summary packet size may not be calculated correctly leading to issues when MD5 authentication is configured.	
Risk of Fix: Low	
Feature: OSPF	**Function:** System
Reported In Release: RX 02.7.02c	

Closed with code change defects in Multi-Service IronWare R02.7.02d

This section lists defects closed in Multi-Service IronWare R02.7.02d.

Defect ID	Technical Severity	Summary of Closed Defects in 2.7.02d
94361	Medium	**Summary:** Router may fail to distribute type 7 LSA's learnt from an OSPF neighbor in NSSA to area 0 as type 5 LSA's. **Probability:** Low **Feature:** OSPF **Function:** OSPF **Reported in:** Release 02.7.02c
109870	Medium	**Summary:** CLI console may lockup due to AAA command accounting. **Probability:** Low **Feature:** AAA accounting **Function:** AAA acounting **Reported in:** Release 02.7.02c
273160	Medium	**Summary:** CLI command 'ip syslog source-interface Ethernet [slot/port]' not functioning. **Probability:** High **Feature:** Syslog **Function:** CLI **Reported in:** Release 02.7.02
278997	High	**Summary:** Deprecate unsupported CLI command 'ipv6 multicast passive' which may cause buffer leakage. **Probability:** High **Feature:** IPv6 multicast snooping **Function:** IPv6 multicast snooping **Reported in:** Release 02.6.00

Defect ID	Technical Severity	Summary of Closed Defects in 2.7.02d
273671	High	**Summary:** Traffic drop may occur when connected interface link-transition for DHCP Snooped host. **Probability:** High **Feature:** DHCP Snoop **Function:** DHCP Snoop **Reported in:** Release 02.7.02b
274156	Medium	**Summary:** Command 'show interface slot 0' caused router to reset. **Probability:** Medium **Feature:** CLI **Function:** CLI **Reported in:** Release 02.7.02a
275397	High	**Summary:** Router may reset if large number on untagged ports are configured to single VLAN. **Probability:** Medium **Feature:** CLI, System **Function:** CLI, System **Reported in:** Release 02.7.02b
275570	High	**Summary:** Port state may not come UP on fiber Interface module with copper SFP media. **Probability:** High **Feature:** System **Function:** System **Reported in:** Release 02.7.02b
277785	Medium	**Summary:** Polling of some hardware registers related to ACLs was not disabled when ACL Accounting is disabled. **Probability:** Medium **Feature:** ACL Accounting **Function:** ACL Accounting **Reported in:** Release 02.7.02b

Closed with code change defects in Multi-Service IronWare R02.7.02c

This section lists defects closed in Multi-Service IronWare R02.7.02c.

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02c
85818	Minor	**Summary**: The CLI command **clear ipv6 ospf** has been deprecated. **Probability**: High **Feature**: CLI **Function**: CLI **Reported in:** Release 02.6.00
99509	High	**Summary**: Management module may reload unexpectedly upon process HTTP request that contains unstructured data with more than 300 bytes. **Probability**: Medium **Feature**: Network Management **Function**: Web Management **Reported in:** Release 02.7.00
105513	Medium	**Summary**: CLI command **switchover** takes effect without prompting customer to confirm. **Probability**: High **Feature**: CLI **Function**: System **Reported in:** Release 02.7.02
105705	High	**Summary**: In some cases, with the RX8 chassis only, the switch fabric mappings to the line cards may not be correct if there are only two switch fabric modules installed and Switch Fabric Slot 3 is empty. **Probability**: Medium **Feature**: Link Monitoring Diagnostics **Function**: System **Reported in:** Release 02.6.00f
107169	High	**Summary**: Management module may reload unexpectedly when it processes a RADIUS packet from a server that gives incorrect attribute length for attributes. **Probability**: Medium **Feature**: AAA, Radius **Function**: System **Reported in:** Release 02.7.00

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02c
107733	Low	**Summary**: If the console timeout is increased through Telnet, the timeout applied to the serial connection is still between the new and the old values. **Probability**: Medium **Feature**: Management **Function**: Console timeout **Reported in:** Release 02.7.00
109551	Medium	**Summary**: In some cases, OSPF database summary packet size may not be calculated correctly, leading to issues when MD5 authentication is configured. **Probability**: Medium **Feature**: IP Protocol **Function**: OSPF **Reported in:** Release 02.7.00
109764	High	**Summary**: When link-redundant is enabled and the Master reloads, the VSRP state may remain in Master-confirm, with no device becoming the Master. **Probability**: High **Feature**: L2 Protocol **Function**: VSRP **Reported in:** Release 02.7.02b

Closed with code change defects in Multi-Service IronWare R02.7.02b

This section lists defects closed in Multi-Service IronWare R02.7.02b.

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02b
102728/105145	High	**Summary:** Management module may reset when changing MSTP or RSTP configuration on a high port density topology. **Probability:** Low **Feature:** Spanning Tree **Function:** MSTP, RSTP **Reported in Release:** BigIron RX R02.6.00

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02b
109301	Medium	**Summary:** Management module may reset when executing remote console (diagnostic) commands from an SSH session. **Probability:** Low **Feature:** SSH Version 2 **Function:** SSH **Reported in Release:** BigIron RX R02.7.00
109567	Medium	**Summary:** When following a specific configuration and module maintenance path, the user may be unable to remove or undeploy a LAG. The error message "**Error:cu_lag_create_trunk: cu_trunk_config() failed -- Trunk Invalid (ret = 14)**" may be displayed. **Probability:** Low **Feature:** LAG **Function:** LAG **Reported in Release:** BigIron RX R02.6.00

Closed with code change defects in Multi-Service IronWare R02.7.02a

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
87485	Medium	**Summary:** Deletion of IGMP static groups may be handled incorrectly such that the deletion does not take effect. **Probability:** Medium **Feature:** IGMP **Function:** IGMP **Reported in Release:** BigIron RX R02.7.02
87842	High	**Summary:** After a reload or an IP rebind action, syslog entries may not be generated for some filters if multiple L2 ACLs with deny logging enabled are configured on the same packet processor ASIC. **Probability:** Medium **Feature:** CLI **Function:** System **Reported in Release:** BigIron RX R02.6.00

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
97953	Medium	**Summary:** Executing the **show ipv6 route x:x::x:x** command shows all routes instead of the best route. **Probability:** High **Feature:** IPv6 **Function:** IPv6 Forwarding **Reported in Release:** BigIron RX R02.7.02
99512	Medium	**Summary:** In some cases, a mcache prune failure may occur. The mcache entry displays the outgoing interface that should have been pruned out. **Probability:** Medium **Feature:** PIM **Function:** PIM Sparse **Reported in Release:** BigIron RX R02.7.01
101677	Medium	**Summary:** In some cases, the system does not correctly calculate the cost of summarized routes. **Probability:** Medium **Feature:** OSPF **Function:** OSPF **Reported in Release:** BigIron RX R02.7.02
102354	Medium	**Summary:** Configuring the time zone using SNMP would result in the wrong time zone being configured in the running configuration. **Probability:** Medium **Feature:** SNMP **Function:** SNMP **Reported in Release:** BigIron RX R02.7.02
102678	Medium	**Summary:** OSPF default interface cost should be higher than "1" for the GRE IP tunnel. **Probability:** Medium **Feature:** GRE Tunneling, OSPF **Function:** GRE Tunneling **Reported in Release:** BigIron RX R02.7.02
103174	High	**Summary:** Packets matching a deny filter with deny-log configuration in place are not counted when ACL accounting is enabled. This applies to the BI-RX 16 port 10GE module (RX-BI-16XG) only. **Probability:** Medium **Feature:** ACL Accounting **Function:** Access Lists **Reported in Release:** BigIron RX R02.7.02

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
103402	Medium	**Summary:** The system does not generate a syslog message indicating the speed and duplex setting if the configuration of a fiber SFP is changed to an unsupported setting. **Probability:** Medium **Feature:** Optics and SFP Support **Function:** System **Reported in Release:** BigIron RX R02.7.01
103451	Medium	**Summary:** A premature flush caused by a group having greater than 122 sources causes PIM to send out a (S, G, RPT) prune separately from (*, G) Join. **Probability:** Medium **Feature:** PIM **Function:** PIM Sparse **Reported in Release:** BigIron RX R02.7.02
103539	High	**Summary:** Adding or modifying a cluster-id under **router bgp** could cause neighbors to flap **Probability:** High **Feature:** IP Protocol **Function:** BGP **Reported in Release:** BigIron RX R02.7.02
103645	High	**Summary**: SNA-LLC frame out-of-sequence may occur when **ip multicast active** is enabled **Probability**: High **Feature**: Multicast active snooping **Function**: Multicast active snooping **Reported in Release**: BigIron RX R02.6.00b
104043	High	**Summary:** Layer 2 ACL accounting information is not updated on the ports belonging to the same packet processor after an ACL rebind, a system reload, management failover, or a hitless L2 OS Upgrade. This occurs only for terms of an ACL containing the log-enable option bound to a port that has enable-deny-logging configured. **Probability:** Medium **Feature:** Layer 2 ACL, ACL Accounting **Function:** Access Lists, System **Reported in Release:** BigIron RX R02.7.02

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
104251	Medium	**Summary:** Standard MIB in experimental tree needs unique name to prevent conflicts when using HPOV. **Probability:** Medium **Feature:** SNMP **Function:** BFD STD MIB **Reported in Release:** BigIron RX R02.7.02
104261	High	**Summary:** OSPFv3 retransmission timer should be per specific LSA for a specific neighbor instead of just per neighbor. **Probability:** Medium **Feature:** OSPFv3 **Function:** OSPFv3 **Reported in Release:** BigIron RX R02.7.02
104313	Medium	**Summary**: The full output of **show ipv6 ospf interface tunnel <N>**" displays type as BROADCAST on POINT-TO-POINT. **Probability**: High **Feature**: IPv6 over IPv4 Tunnels **Function**: IPv6 over IPv4 Tunnels, CLI **Reported in Release**: BigIron RX R02.7.00
104317	High	**Summary:** Some ISIS sessions may flap under a high volume of route updates. **Probability:** Medium **Feature:** ISIS **Function:** ISIS **Reported in Release:** BigIron RX R02.7.02
104331	High	**Summary:** In rare cases, pasting a large ACL configuration containing many remarked entries to a Telnet or SSH session may result in an incorrect configuration synchronization of the standby MP, and may cause a reset. **Probability:** Low **Feature:** Access Lists **Function:** System **Reported in Release:** BigIron RX R02.7.00

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
104389	High	**Summary:** TCP initial sequence number generation does not fully conform to RFC 793. **Probability:** Medium **Feature:** TCP Stack **Function:** IP **Reported in Release:** BigIron RX R02.7.02
104610	Medium	**Summary:** Higher than normal CPU utilization on the management interface when attempting to ping a non-existent host in the OSPF network. **Probability:** High **Feature:** ARP **Function:** IP Stack **Reported in Release:** BigIron RX R02.7.02
104691	Medium	**Summary:** Duplicate syslog messages and traps are generated when configuring "**snmp-server contact**" or "**snmp-server location**" **Probability:** Medium **Feature:** SNMP Management **Function:** Syslog **Reported in Release:** BigIron RX R02.7.02
104759	Medium	**Summary:** No log entry or trap is generated when a standby management module transitions from "standby (ready state)" to "standby (down)" **Probability:** Medium **Feature:** System **Function:** Syslog **Reported in Release:** BigIron RX R02.6.00c
104986	Low	**Summary:** The **show ipv6 route** command give "C" as the type code for directly connected routes in one part of the output and "D" as the type code in another. **Probability:** Medium **Feature:** IPv6 Routing **Function:** CLI **Reported in Release:** BigIron RX R02.6.00f
104988	High	**Summary:** Router continues to send LACPDUs in slow timer mode after the far-end router reloads. **Probability:** High **Feature:** Link Aggregation **Function:** LACP **Reported in Release:** BigIron RX R02.7.02

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
105049	High	**Summary:** The **ipv6 ospf network point-to-multipoint** command can be configured on interfaces, but has no effect on OSPFv3 or the running configuration. **Probability:** Medium **Feature:** IPv6 Routing **Function:** OSPFv3 **Reported in Release:** BigIron RX R02.7.01b
105098	High	**Summary:** A Management Module may reload if a router configured with radius authentication is accessed through telnet from an IPv6 Client. **Probability:** High **Feature:** Management **Function:** Radius **Reported in Release:** BigIron RX R02.7.02
105128	High	**Summary:** After hot swapping a module, ARP broadcasts are not forwarded out the module. **Probability:** Medium **Feature:** System **Function:** ARP **Reported in Release:** BigIron RX R02.7.02
105174	High	**Summary:** A MSTP root-protected port remains in “designated-discarding” stare after root protection times out. **Probability:** Medium **Feature:** MSTP **Function:** Root protect **Reported in Release:** BigIron RX R02.6.00e
105221	High	**Summary:** After hot swapping a module, unicast packets are not forwarded out the module. **Probability:** Medium **Feature:** System **Function:** Forwarding **Reported in Release:** BigIron RX R02.7.02
105367	Medium	**Summary:** A debug statistics message shows a large number of errors for 10G modules when installed in a 16 slot chassis. **Probability:** Medium **Feature:** System **Function:** System **Reported in Release:** BigIron RX R02.6.00e

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
105370	High	**Summary:** Under rare conditions, a system would rest while processing a PIM join/prune message with an invalid source count. **Probability:** Medium **Feature:** PIM **Function:** PIM Snooping **Reported in Release:** BigIron RX R02.7.02
105488	High	**Summary:** All routes are removed and re-installed when an external OSPF route is removed. **Probability:** High **Feature:** OSPF **Function:** Route table manager **Reported in Release:** BigIron RX R02.6.00e
105492	Medium	**Summary:** The mroute table does not get updated upon redistributing a more specific route. **Probability:** Medium **Feature:** MBGP **Function:** Redistribution **Reported in Release:** BigIron RX R02.7.02
105580	Medium	**Summary:** The link LED of a disabled port can light up even when the **show interface** command shows the port to be down. **Probability:** Medium **Feature:** System **Function:** SFP Optics **Reported in Release:** BigIron RX R02.7.02
105635	Medium	**Summary:** When using SSH, ICMP requests to a resolved name with different ICMP sizes will use the size from the previous ICMP request issued. **Probability:** Medium **Feature:** SSH **Function:** ICMP **Reported in Release:** BigIron RX R02.7.00f, and R02.7.01
106120	Low	**Summary:** Syslog packets sent to syslog server do not contain time stamp. **Probability:** High **Feature:** Syslog **Function:** Syslog **Reported in Release:** BigIron RX R02.7.02

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
106129	Low	**Summary:** The command **show ipv6 ospf interface** does not show all the IPv6 OSPF interfaces; the last interface is always omitted. **Probability:** High **Feature:** IPv6 **Function:** OSPF, CLI **Reported in Release:** BigIron RX R02.7.02
107050	High	**Summary:** SYSMON QDP error recovery causes traffic to stop forwarding on all modules. **Probability:** Medium **Feature:** System **Function:** Diagnostics **Reported in Release:** BigIron RX R02.7.02
107368	High	**Summary:** FDP Packets are forwarded out blocked port. This applies to the BI-RX 16 port 10GE module (RX-BI-16XG) only. **Probability:** High **Feature:** System **Function:** FDP, RSTP, STP **Reported in Release:** BigIron RX R02.7.00
107505	High	**Summary:** Improved detection performance in system monitor for TM CRC errors on failed line cards. Added recovery for possible TX lockup on Line cards as a result of ingress CRC errors. **Probability:** Low **Feature:** Sysmon **Function:** Detection and recovery **Report in release –** BigIron RX 2.6.00c
107639	Medium	**Summary**: The output of **show ipv6 bgp <N>/<L> longer-prefixes** displays incorrect routes. **Probability**: High **Feature**: BGP4+ **Function**: BGP4+, CLI **Reported in Release**: BigIron RX R02.7.02
107719	High	**Summary:** Last bit of second mll not set with odd mll entries and receiver of last mll leaves. **Probability:** Low **Feature:** PIM **Function:** PIM Sparse **Reported in Release:** BigIron RX R02.6.00

Defect ID	Technical Severity	Summary of Closed Defects in R02.7.02a
107841	Medium	**Summary**: Not able to read XFP power levels with **show optic** command. **Probability**: High **Feature**: Optic monitor **Function**: Optic monitor, CLI **Reported in Release**: BigIron RX R02.6.00f
107948	Low	**Summary**: The output of **show ip ospf interface neighbor** lists infinite loops if 23 or more neighbors are present. **Probability**: High **Feature**: OSPF **Function**: OSPF, CLI **Reported in Release**: BigIron RX R02.6.00f
108196	High	**Summary**: LAG ports on which MSTP VLAN is configured may not have hardware program in LAG Group. **Probability**: Medium **Feature**: LAG, MSTP **Function**: LAG, MSTP **Reported in Release**: BigIron RX R02.6.00e
105785	High	**Summary:** Using SCP to copy the running configuration may result in corrupted configuration. **Probability:** High **Feature:** Secure Copy **Function:** Network Management **Reported in Release:** BigIron RX 02.7.00
103943	High	**Summary:** VRRP state may change when a large number of multicast groups (IGMP and PIM) are configured. **Probability:** Medium **Feature:** VRRP, PIM, IGMP **Function:** IP Multicast **Reported in Release:** BigIron RX 02.6.00
106127	High	**Summary:** Router may fail to advertise OSPF LSA Type 4 during area exchange. **Probability:** Medium **Feature:** OSPF **Function:** IP Routing Protocols **Reported in Release:** BigIron RX 02.6.00