



Release Notes for Cisco MGX-RPM-1FE-CP Back Card for Cisco IOS Release 12.2(15)MC2a

July 28, 2004

Cisco IOS Release 12.2(15)MC2a

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These release notes are for the Cisco MGX-RPM-1FE-CP for Cisco IOS Release 12.2(15)MC2a. These release notes are updated as needed to describe new features, memory requirements, hardware support, software platform deferrals, and changes to the microcode and related documents.

For a list of the software caveats that apply to Cisco IOS Release 12.2(15)MC2a, see the [“Caveats in Cisco IOS Release 12.2\(15\)MC2a” section on page 9](#). To review the release notes for Cisco IOS Release 12.2, go to www.cisco.com and click **Technical Documents**. Select **Release 12.2** from the Cisco IOS Software drop-down menu. Then click **Cisco IOS Release Notes > Cisco IOS Release 12.2**.

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Introduction

The MGX-RPM-1FE-CP (one-port, Fast Ethernet-Co-processor) back card is a Cisco MGX 8850 RPM-PR back card that off-loads the following processes from the Route Processor Module (RPM-PR):

- Compression/decompression of Real-time Transport Protocol (RTP)/User Datagram Protocol (UDP) headers (cRTP/cUDP)
- Multiplexing/demultiplexing of Point-to-Point Protocol (PPP) frames

The MGX-RPM-1FE-CP back card is designed to be used with an MGX 8850 that is equipped with one or more RPM-PRs and that terminates some number of T1 lines. Each MGX-RPM-1FE-CP back card has a termination capacity of up to 16 T1s (four per MLP bundle). The MGX-RPM-1FE-CP is only supported with the MLP encapsulation.

The MGX-RPM-1FE-CP back card contains one Fast Ethernet (100Base-Tx) interface. The interface has an RJ45 connector that is used to connect the card to a Category 5 un-shielded twisted pair (UTP) cable. Both half- and full-duplex operation are supported.

MGX-RPM-1FE-CP Back Card in an IP-RAN of a Mobile Wireless Network

The MGX-RPM-1FE-CP back card off loads the compression/decompression of RTP/UDP headers and the multiplexing/demultiplexing of PPP frames.

The supported use of the MGX-RPM-1FE-CP back card is within an IP-RAN of a mobile wireless network. In mobile wireless networks, radio coverage over a geographical space is provided by a network of radios and supporting electronics (Base Transceiver Station or BTS) distributed over a wide area. Each radio and supporting electronics represents a “cell.” In traditional networks, the radio signals or radio data frames collected in each cell are forwarded over a T1 (or similar low-speed, leased) line to a centralized Base Station Controller (BSC) where they are processed.

The implementation of the MGX-RPM-1FE-CP backcard in the IP-RAN solution requires the following components:

- Cisco MGX 8850
- RPM-PR
- MGX-RPM-1FE-CP back card
- FRSM card
- BTS router (Cisco MWR 1941-DC Mobile Wireless Edge Router)

The solution uses OSPF as the routing protocol and requires MLP for transmission of the packets between the aggregation node (MGX8850) and the BTS. It requires you to configure the following:

- The Fast Ethernet (FE) interface to support OSPF. Enable multicast routing and indicate a Protocol Independent Multicast (PIM) mode.
- One or more PPP multilink interfaces with PPP mux and RTP header compression attributes.

- A virtual template for each of the multilink groups.
- A PVC under the switch subinterface that references the virtual template.

In addition, you must configure a connection between the PVC and the FRSM as well as a connection between the FRSM and the PVC.

For detailed information about the MGX-RPM-1FE-CP back card and its implementation in the IP-RAN solution, see the *MGX-RPM-1FE-CP Back Card Installation and Configuration Note*.

System Configuration Requirements

The MGX-RPM-1FE-CP requires the following system configuration:

- Cisco IOS 12.2(8) MC1 or a later Cisco IOS Release 12.2 MC image is installed on the corresponding Cisco MGX 8850 RPM-PR.
- The FE interface is configured via the Cisco IOS software command line interface.

Determining the Software Version

To determine the version of Cisco IOS software copied on the RPM-PR, access the CLI of the RPM-PR and enter the **show version** command:

```
rpm> show version
Cisco Internetwork Operating System Software
IOS (tm) RPM Software (RPM-JS-M), Version 12.2(15)MC2a, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)
```

Upgrading to a New Software Release

For information about copying Cisco IOS images to RPM-PR Flash memory, see the *RPM-PR Installation and Configuration* document.

For general information about upgrading to a new Cisco IOS software release, refer to Software Installation and Upgrade Procedures located at the following URL:

http://www.cisco.com/warp/public/130/upgrade_index.shtml

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco MGX-RPM-1FE-CP for Cisco IOS Release 12.2(15)MC software:

- [New Features in the Cisco IOS Release 12.2\(15\)MC2a Software, page 4](#)
- [New Features in the Cisco IOS Release 12.2\(15\)MC1 Software, page 4](#)

New Features in the Cisco IOS Release 12.2(15)MC2a Software

No features are introduced in Cisco IOS Release 12.2(15)MC2a.

New Features in the Cisco IOS Release 12.2(15)MC1 Software

The following features were introduced in Cisco IOS Release 12.2(15)MC1:

- [Dual MGX-RPM-1FE-CP Back Card Support, page 4](#)
- [Ignoring the IP ID in RTP/UDP Header Compression, page 6](#)
- [Configuring ACFC and PFC Handling During PPP Negotiation, page 7](#)
- [Configuring the cUDP Flow Expiration Timeout Duration, page 8](#)

For information on new features in previous Cisco IOS Release 12.2MC software releases, see the platform release notes:

http://www.cisco.com/univercd/cc/td/doc/product/wireless/ipran/1_0/relnotes/index.htm

Dual MGX-RPM-1FE-CP Back Card Support

With Cisco IOS Release 12.2(15)MC1 and later, support for a second MGX-RPM-1FE-CP back card is available. However, the second card functions as an FE interface only and does not perform any compression functions.

Usage Notes

Please note that when using two MGX-RPM-1FE-CP back cards in an RPM, the interaction between the two cards is as follows:

- When two MGX-RPM-1FE-CP back cards are installed in the RPM and the RPM boots or reboots, the card in the top slot always performs the compression function.
- When an MGX-RPM-1FE-CP back card is inserted via OIR, the slot with the first MGX-RPM-1FE-CP back card always performs the compression function.
- If two MGX-RPM-1FE-CP back cards are installed in an RPM and a card performing the compression function is removed via OIR, no compression functions will be active until one of the following events occurs:
 - a second MGX-RPM-1FE-CP back card is inserted
 - the remaining MGX-RPM-1FE-CP back card is removed and re-inserted
 - the RPM is rebooted
- Never remove a MGX-RPM-1FE-CP via OIR without shutting down all active interfaces on it. For a MGX-RPM-1FE-CP acting as a FE interface only, shut down just the FE port. For the back card performing the compression function, shut down the multilink bundles before removing.



Note

This feature requires that the rpm-boot-mz image be upgraded so that the bootloader recognizes the second MGX-RPM-1FE-CP.

Additionally, the output of the **show diag** command has been updated to reflect the support for a second MGX-RPM-1FE-CP.

```
rpm10#sho diag
Slot 1:
One Port Fast Ethernet With Co-processor Assist Port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 01:13:53 ago
Co-processor enabled
EEPROM contents at hardware discovery:
Top Assy. Part Number :800-16088-04
Part Number :73-6262-04
Board Revision :02
PCB Serial Number :PAD04001DHT
CLEI Code :B@3@24Y@A@
Manufacturing Engineer :00 00 00 00
RMA History :00
RMA Test History :00
RMA Test History :02
EEPROM format version 4
EEPROM contents (hex):
0x00:04 17 40 03 17 C0 46 03 20 00 3E D8 04 82 49 18
0x10:76 04 42 30 32 C1 0B 50 41 44 30 34 30 30 31 44
0x20:48 54 C6 8A 42 40 33 40 32 34 59 40 41 40 84 00
0x30:00 00 00 04 00 03 00 03 02 FF FF FC FF FC FF FC
0x40:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

Slot 2:
ATM CELL BUS Port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 01:14:31 ago
EEPROM contents at hardware discovery:
Top Assy. Part Number :800-00000-00
Part Number :73-0000-00
Board Revision :0
PCB Serial Number :0
EEPROM format version 4
EEPROM contents (hex):
0x00:04 51 40 00 90 C0 46 03 20 00 00 00 00 82 49 00
0x10:00 00 42 30 00 C1 01 30 FF FF FF FF FF FF FF FF
0x20:09 40 C6 8A 30 00 00 00 00 00 00 00 00 84 00
0x30:00 00 00 04 00 03 00 03 00 FF FF FF FF FF FF FF
0x40:04 00 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50:0A 2A FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60:42 D2 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70:00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x80:09 03 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x90:42 82 FF FF FF FF FF FF FF FF FF FF FF FF FF
0xA0:0C 83 FF FF FF FF FF FF FF FF FF FF FF FF FF
0xB0:00 C0 FF FF FF FF FF FF FF FF FF FF FF FF FF
0xC0:40 41 FF FF FF FF FF FF FF FF FF FF FF FF FF
0xD0:82 82 FF FF FF FF FF FF FF FF FF FF FF FF FF
0xE0:8C EC FF FF FF FF FF FF FF FF FF FF FF FF FF
0xF0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x100:02 00 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x110:63 51 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x120:42 C2 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x130:00 20 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x140:38 50 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x150:0C C2 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x160:0C AC FF FF FF FF FF FF FF FF FF FF FF FF FF
```

```

0x170:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x180:62 C0 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x190:82 6C FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1A0:D1 CA FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1B0:00 C0 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1C0:92 C8 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1D0:21 00 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1E0:0C 8C FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1F0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    
```

Slot 3:

```

One Port Fast Ethernet With Co-processor Assist Port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 01:14:07 ago
Co-processor disabled
EEPROM contents at hardware discovery:
Top Assy. Part Number :800-16090-04
Part Number :73-6518-04
Board Revision :02
PCB Serial Number :SAG06021EJ3
CLEI Code :BA3A25YCAA
Manufacturing Engineer :00 00 00 00
RMA History :00
RMA Test History :00
RMA Test History :02
EEPROM format version 4
EEPROM contents (hex):
0x00:04 17 40 03 17 C0 46 03 20 00 3E DA 04 82 49 19
0x10:76 04 42 30 32 C1 0B 53 41 47 30 36 30 32 31 45
0x20:4A 33 C6 8A 42 41 33 41 32 35 59 43 41 41 84 00
0x30:00 00 00 04 00 03 00 03 02 FF FF FF FF FF FF FF
0x40:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    
```

Ignoring the IP ID in RTP/UDP Header Compression

With Cisco IOS Release 12.2(8)MC2c, IP ID checking was suppressed in RTP/UDP header compression. With Cisco IOS Release 12.2(15)MC1 and later, a new option was added to the **ip rtp header-compression** interface configuration command that allows you to enable or suppress this checking. The default is to suppress.

To suppress IP ID checking, issue the following command while in interface configuration mode:

Command	Purpose
Router(config-if)# ip rtp header-compression ignore-id	Suppresses the IP ID checking in RTP/UDP header compression.

To restore IP ID checking, use the **no** form of this command.

This new feature is identified by CSCdz75957.

Configuring ACFC and PFC Handling During PPP Negotiation

With Cisco IOS Release 12.2(15)MC1 and later, ACFC and PFC negotiation can be configured.



Note

By default, ACFC/PFC is not enabled and these commands must be configured on serial interfaces.

Configuring ACFC Handling During PPP Negotiation

Use the following commands beginning in global configuration mode to configure ACFC handling during PPP negotiation:

	Command	Purpose
Step 1	Router(config)# interface <i>type slot/port</i>	Configures an interface type and enters interface configuration mode.
Step 2	Router(config-if)# shutdown	Shuts down the interface.
Step 3	Router(config-if)# ppp acfc remote { apply reject ignore }	Configures how the router handles the ACFC option in configuration requests received from a remote peer. <ul style="list-style-type: none"> apply—ACFC options are accepted and ACFC may be performed on frames sent to the remote peer. reject—ACFC options are explicitly ignored. ignore—ACFC options are accepted, but ACFC is not performed on frames sent to the remote peer.
Step 4	Router(config-if)# ppp acfc local { request forbid }	Configures how the router handles ACFC in its outbound configuration requests. <ul style="list-style-type: none"> request—The ACFC option is included in outbound configuration requests. forbid—The ACFC option is not sent in outbound configuration requests, and requests from a remote peer to add the ACFC option are not accepted.
Step 5	Router(config-if)# no shutdown	Reenables the interface.

Configuring PFC Handling During PPP Negotiation

Use the following commands beginning in global configuration mode to configure PFC handling during PPP negotiation:

	Command	Purpose
Step 1	Router(config)# interface <i>type slot/port</i>	Configures an interface type and enters interface configuration mode.
Step 2	Router(config-if)# shutdown	Shuts down the interface.

	Command	Purpose
Step 3	Router(config-if)# ppp pfc remote { apply reject ignore }	Configures how the router handles the PFC option in configuration requests received from a remote peer. <ul style="list-style-type: none"> • apply—PFC options are accepted and PFC may be performed on frames sent to the remote peer. • reject—PFC options are explicitly ignored. • ignore—PFC options are accepted, but PFC is not performed on frames sent to the remote peer.
Step 4	Router(config-if)# ppp pfc local { request forbid }	Configures how the router handles PFC in its outbound configuration requests. <ul style="list-style-type: none"> • request—The PFC option is included in outbound configuration requests. • forbid—The PFC option is not sent in outbound configuration requests, and requests from a remote peer to add the PFC option are not accepted.
Step 5	Router(config-if)# no shutdown	Reenables the interface.

To restore the default, use the **no** forms of these commands.



Note

For complete details of the ACFC and PFC Handling During PPP Negotiation feature, see the *ACFC and PFC Handling During PPP Negotiation* feature module:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122b/122b_15/12b_acf.htm#1025043

Configuring the cUDP Flow Expiration Timeout Duration

To minimize traffic flow corruption, cUDP flows now expire after an expiration timeout duration during which no packets are passed. When this duration of inactivity occurs on a flow at the compressor, the compressor sends a full header upon receiving a packet for that flow, or, if no new packet is received for that flow, makes the CID for the flow available for new use. When a packet is received at the decompressor after the duration of inactivity, the packet is dropped and a context state message is sent to the compressor requesting a flow refresh.

The default expiration timeout is 5 seconds. The recommended value is 8 seconds.



Caution

Failure of performance/latency scripts could occur if the expiration timeout duration is not changed to the recommended 8 seconds.

To configure the cUDP flow expiration timeout duration, issue the following command while in multilink interface configuration mode:

Command	Purpose
Router(config-if)# ppp iphc max-time <i>seconds</i>	Specifies the duration of inactivity, in seconds, that when exceeded causes the cUDP flow to expire. The recommended value is 8.

To restore the default, use the **no** form of this command.

This new feature is identified by CSCeb44623.

Limitations, Restrictions, and Important Notes

When working with a MGX-RPM-1FE-CP back card, please take note of the following limitations, restrictions, and important notes:

- FastEthernet and multilink interfaces should be shut down before online insertion and removal (OIR) of the MGX-RPM-1FE-CP.
- The MGX-RPM-1FE-CP is only supported on the Cisco MGX 8850 RPM-PR.
- For PPP Multiplexing, MLP must be configured on the MGX-RPM-1FE-CP back card.
- For error messages to be stored, console logging must be configured.
- The IP MTU should be set to 512 bytes or less on multilink interfaces.
- The MGX-RPM-1FE-CP back card supports up to 16 multilink interfaces.
- MLP with LFI is not supported by the Cisco MWR 1941-DC router. Therefore, MLP with LFI must be disabled on peer devices connecting to the Cisco MWR 1941-DC router T1 MLP connections.
- To fully disable PPP Multiplexing, issue the **no ppp mux** command on the T1 interfaces of the routers at both ends of the T1 link. If PPP Multiplexing remains configured on one side of the link, that side will offer to receive PPP multiplexed packets.
- If upgrading to Cisco IOS Release 12.2(8)MC2c or later for the ACFC and PFC support on PPP interfaces, ensure that you upgrade the MGX-RPM-1FE-CP backcard image first. After doing so, immediately upgrade all MWR 1941-DC routers connected to the MGX-RPM-1FE-CP back card.

Caveats in Cisco IOS Release 12.2(15)MC2a

The following sections list and describe the open and resolved caveats for the Cisco MGX-RPM-1FE-CP with Cisco IOS Release 12.2(15)MC2a. Only severity 1 through 3 caveats are included.

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats, severity 2 caveats are less serious, and severity 3 caveats are the least serious of these three severity levels.

Caveats in Cisco IOS Releases 12.2 and 12.2 T are also in Cisco IOS Release 12.2(15)MC2a. For information on caveats in Cisco IOS Release 12.2, see *Caveats for Cisco IOS Release 12.2*. For information on caveats in Cisco IOS Release 12.2 T, see *Caveats for Cisco IOS Release 12.2 T*. These two documents list severity 1 and 2 caveats and are located on CCO and the Documentation CD-ROM.

**Note**

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, Login to Cisco.com and click **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go directly to <http://www.cisco.com/support/bugtools>.

Open Caveats

The following caveat is open in Cisco IOS Release 12.2(15)MC2a.

- CSCeb24086

Description: Administratively shutting down an FE interface while traffic is flowing on a second MGX-RPM-1FE-CP interface might cause a few seconds of packet lost on the second FE interface.

Workaround: Do not administratively shut down an FE interface on an active system when traffic is flowing.
- CSCeb76514

Description: The checkheaps process detects corrupted memory and when packets back up into the bundle output hold queue, causes a router reload.

Workaround: A software workaround (CSCeb74020) is implemented in Cisco IOS 12.2(15)MC1.

Resolved Caveats

This section lists the caveats resolved in Cisco IOS Release 12.2(15)MC2a.

- CSCdz32659

Description: Memory allocation failure (MALLOCFAIL) messages no longer occur for Cisco Discovery Protocol (CDP) processes.
- CSCec16481

A Cisco device running Internetwork Operating System (IOS) and enabled for the Open Shortest Path First (OSPF) Protocol is vulnerable to a Denial of Service (DoS) attack from a malformed OSPF packet. The OSPF protocol is not enabled by default.

The vulnerability is only present in IOS release trains based on 12.0S, 12.2, and 12.3. Releases based on 12.0, 12.1 mainlines and all IOS images prior to 12.0 are not affected. Refer to the Security Advisory for a complete list of affected release trains.

Further details and the workarounds to mitigate the effects are explained in the Security Advisory which is available at the following URL:

<http://www.cisco.com/warp/public/707/cisco-sa-20040818-ospf.shtml>.
- CSCec21937

Description: When the MGX-RPM-1FE-CP FastEthernet interface is administratively shut down, for directly connected devices, the interface still appears to be up.
- CSCec25430

Description: A Cisco device reloads on receipt of a corrupt CDP packet.

- CSCed40563
Description: Problems with the CDP protocol have been resolved.
- CSCin67568
Description: A Cisco device experiences a memory leak in the CDP process. The device sending CDP packets sends a hostname that is 256 or more characters. There are no problems with a hostname of 255 or fewer characters.

Troubleshooting

This section contains the following MGX-RPM-1FE-CP troubleshooting information:

- [Collecting Data for Back Card and Router Issues, page 11](#)
- [Modifying the MLP Reorder Buffer, page 11](#)

Collecting Data for Back Card and Router Issues

To collect data for reporting back card and router issues, issue the following commands:

- **show tech-support**—Displays general information about the router when it reports a problem.
- **show logging**—Displays information in the syslog history table.

Modifying the MLP Reorder Buffer

When PPP multiplexing is disabled on the inbound direction of a MWR 1941-DC multilink, there are many more packets to reorder. Therefore, we recommend that you modify the MLP reorder buffer using the **ppp multilink slippage** interface configuration commands to avoid discarded fragments due to buffer overflow.

Slippage is the amount by which data arriving on one link in a multilink bundle might lag behind data transmitted over another link in that bundle. The amount of slippage might be expressed as a direct byte count, but it is also commonly expressed as a measure of time, in terms of the differential delay between the links.

A small amount of slippage between links is normal. Whenever slippage occurs, the multilink input process must buffer fragment data arriving on the faster channels until it receives all expected fragments on the remaining links, so that it can sort the fragments back into proper order, reassemble datagrams as necessary, and then deliver the datagrams in proper order to the higher network layers (multilink fragments include sequence numbers so that the multilink receiver can readily detect when packets are arriving out of order). The receiver must be capable of buffering enough data to compensate for normal slippage between the links, otherwise it will be incapable of completely sequencing and reassembling datagrams, and some data will be lost.

With Cisco IOS Release 12.2(15)MC1 and later, the MLP reorder buffer can be adjusted for cases where the slippage is larger than the defaults readily accommodate. The buffer size is set by defining a one or more constraints, each of which indirectly implies some byte limit. The limit used is the maximum of the value derived from the constraints.

To define the constraints that set the MLP reorder buffer size, issue the following commands while in interface configuration mode:

	Command	Purpose
Step 6	Router(config-if)# ppp multilink slippage mru <i>value</i>	Specifies that the buffer limit is <i>x</i> bytes where the byte count is expressed as a multiple of the maximum receive unit (MRU) negotiated for the bundle (the buffer limit is derived as the number of times defined for the <i>value</i> times the size of the largest packet received). Valid values are 2 through 32. The default is 8. Note The MRU is dynamically negotiated with the peer when the connection is established, therefore, the byte count also
Step 7	Router(config-if)# ppp multilink slippage msec <i>value</i>	Specifies the buffer limit, in milliseconds worth of data. Valid range is 1 to 16000. Note The actual amount of data buffered depends upon the bandwidth of the links.

Usage Notes

Note that these limits are on a “per-link” basis. For example, issuing **ppp multilink slippage mru 4** means that the total amount of data which is buffered by the bundle is 4 times the MRU times the number of links in the bundle.

The reassembly engine is also affected by the lost fragment timeout, which is configured using the **ppp timeout multilink lost-fragment** command.

The buffer limit derived from the slippage constraints implies a corresponding tolerated differential delay between the links. Since it does not make sense to be declaring a fragment lost due to a timeout when it is within the delay window defined by the slippage, the timeout will be dynamically increased as necessary so that it is never smaller than the delay value derived from the slippage parameters.

Documentation Updates

This section contains information that was not included or was documented incorrectly in the *MGX-RPM-1FE-CP Back Card Installation and Configuration Note*. The heading in this section corresponds with the applicable section title in the documentation.

Configuring RTP/UDP Compression

The maximum number of RTP header compression connections is documented as 150 per T1 interface and up to 600 connections per MLP bundle when in fact, 1000 connections are supported per MLP bundle regardless of whether the bundle contains one T1 interface or four.

The show ppp mux Command

The efficiency improvement factor calculation documented in the **show ppp mux** command section is incorrect. The correct improvement factor calculation uses bytes, not packets, and is as follows:

Multiplex efficiency improvement factor = $100 * (\text{Total bytes saved}) / (\text{Total bytes received})$

Where total bytes saved = bytes_received_at_muxer - bytes_sent_at_muxer.

Demultiplex efficiency improvement factor = $100 * (\text{Total bytes saved}) / (\text{Total bytes sent})$

Where total bytes saved = bytes_sent_at_demuxer - bytes_received_at_demuxer.

The show ip rtp header-compression Command

The **detail** keyword is not supported in the **show ip rtp header-compression** command on the MGX-RPM-1FE-CP back card. Output does not display for the **detail** keyword if specified in command.

Related Documentation

The following sections describe the available documentation related to the Cisco MGX-RPM-1FE-CP back card. These documents consist of hardware and software installation guides, Cisco IOS configuration guides and command references, system error messages, and other documents.

Documentation is available in printed or electronic form.

Platform-Specific Documents

These documents are available for the Cisco MWR 1941-DC Mobile Wireless Edge Router on Cisco.com and the Documentation CD-ROM:

- *MGX-RPM-1FE-CP Back Card Installation and Configuration Note*
- *RPM-PR Installation and Configuration*
- Cisco MWR 1941-DC Mobile Wireless Edge Router
 - *Cisco MWR 1941-DC Mobile Wireless Edge Router Hardware Installation Guide*
 - *Cisco MWR 1900 Mobile Wireless Edge Router Software Configuration Guide*
 - *Cisco MWR 1941-DC Mobile Wireless Edge Router Rack Mounting Instructions*
 - *Cisco MWR 1941-DC Mobile Wireless Edge Router Regulatory Compliance and Safety Information*
- *VWIC-2MFT-T1-DIR, VWIC-2MFT-E1-DIR Installation Instructions*

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.2 MC and are updates to the Cisco IOS documentation set. A feature module consists of an overview of the feature, configuration tasks, and a command reference.

On Cisco.com at:

Technical Documentation: Cisco IOS Software: Cisco IOS Release 12.2: New Feature Documentation: 12.2-Based New Features: New Features in Release 12.2 MC

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

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Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

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For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

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Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

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