



Release Notes for Cisco MWR 2941 Mobile Wireless Edge Router for Cisco IOS Release 15.0(2)MR

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These release notes are for the Cisco MWR Mobile Wireless Edge Router for Cisco IOS Release 15.0(2)MR. These release notes are updated as needed to describe new features, memory requirements, hardware support, software platform deferrals, and changes to the microcode.

For a list of the software caveats that apply to Cisco IOS Release 15.0(2)MR, see the “[Caveats in Cisco IOS Release 15.0\(1\)MR](#)” section on page 18.

To review all Cisco MWR 2941 release notes, including *Release Notes for Cisco MWR 2941 Mobile Wireless Edge Router for Cisco IOS Release 15.0(2)MR*, go to:

http://www.cisco.com/en/US/products/ps9395/prod_release_notes_list.html

To review release notes for the Cisco IOS Software Release 15.0S, go to:

http://www.cisco.com/en/US/products/ps10890/prod_release_notes_list.html

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Americas Headquarters:

Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

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Introduction

The Cisco MWR 2941 Mobile Wireless Router is a cell-site access platform specifically designed to aggregate and transport mixed-generation radio access network (RAN) traffic. The router is used at the cell site edge as a part of a 2G, 3G, or 4G radio access network (RAN). The Cisco MWR 2941 includes the following models:

- Cisco MWR 2941-DC
- Cisco MWR 2941-DC-A

The Cisco MWR 2941 router helps enable a variety of RAN solutions by extending IP connectivity to devices using Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), Node Bs using HSPA or LTE, base transceiver stations (BTSSs) using Enhanced Data Rates for GSM Evolution (EDGE), Code Division Multiple Access (CDMA), CDMA-2000, EVDO, or WiMAX, and other cell-site equipment. It transparently and efficiently transports cell-site voice, data, and signaling traffic over IP using traditional T1 and E1 circuits, as well as alternative backhaul networks such as Carrier Ethernet and DSL, Ethernet in the First Mile (EFM), and WiMAX. It also supports standards-based Internet Engineering Task Force (IETF) Internet protocols over the RAN transport network, including those standardized at the Third-Generation Partnership Project (3GPP) for IP RAN transport. Custom designed for the cell site, the Cisco MWR 2941 features a small form factor, extended operating temperature, and cell-site DC input voltages.

System Requirements

[Table 1](#) lists the supported system configurations for the Cisco MWR 2941:

Memory Requirements

[Table 1](#) lists the required memory for using this software.

Table 1 Cisco IOS Release 15.0(2)MR Memory Requirements

Platform	Feature Set	Software Image	Recommended Flash Memory	Recommended DRAM Memory	Runs From
Cisco MWR 2941 Mobile Wireless Edge Router	RAN Optimization	mwr2941-adviprank9-mz.150-2.MR.bin	128 MB	512 MB	RAM
Cisco MWR 2941 Mobile Wireless Edge Router	RAN Optimization	mwr2941-advipran-mz.150-2.MR.bin	128 MB	512 MB	RAM

Determining the Software Version

To determine the image and version of Cisco IOS software running on your Cisco MWR 2941 router, log in to the router and enter the **show version** EXEC command:

```
Router> show version
Cisco IOS Software, 2900 Software (MWR2900-ADVPRANK9-M), Version 15.0(2)MR, RELEASE
SOFTWARE (fc2)
```

Upgrading to a New Software Release

Release 15.0(2)MR does not support the following features that were supported in Release 12.4(20)MR1:

- GSM Abis optimization
- IP Header Compression (IPHC)
- Reduced HWIC support—Release 15.0(2)MR does not support the HWIC-1GE-SFP, HWIC-4SHDSL, HWIC-1ADSL, and HWIC-1 ADSL-I HWICs.
- GRE offload

For general information about upgrading to a new software release, refer to the *Software Installation and Upgrade Procedures* at:

http://www.cisco.com/en/US/products/hw/routers/ps259/products_tech_note09186a00801fc986.shtml

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco MWR 2941 router.

Support for Existing Cisco MWR 2941 Software Features

Release 15.0(2)MR supports the software features supported in Release 12.2(33)MRB4. For more information about Release 12.2(33)MRB4 and previous releases, see

http://www.cisco.com/en/US/products/ps9395/prod_release_notes_list.html.

New Hardware Features in Release 15.0(2)MR

Release 15.0(2)MR introduces support for the RAD Gigabit Ethernet Copper SFP with Timing over Copper (SFP-ToC) module. For more information about this SFP, see <http://www.rad.com>.

New Software Features in Release 15.0(2)MR

Release 15.0(2)MR introduces the following new software features:

- **PTP Boundary Clock**—Release 15.0(2)MR introduces support for PTP boundary clock based on the 1588 version 2 standard. You can configure the router as a PTP boundary clock using the **ptp mode** global command and the **ptp boundary** interface command, as shown in the following example.

```
Router# configure terminal
Router(config)# ptp mode boundary
Router(config)# ptp priority1 128
Router(config)# ptp priority2 128
Router(config)# ptp domain 1
Router(config)# interface Vlan1
Router(config-if)# ip address 192.168.1.2 255.255.255.0
Router(config-if)# ptp announce interval 3
Router(config-if)# ptp announce timeout 2
Router(config-if)# ptp sync interval -4
Router(config-if)# ptp delay-req interval -4
Router(config-if)# ptp boundary unicast-negotiation
Router(config-if)# ptp clock-source 192.168.1.1
Router(config-if)# ptp enable
```

For more information about how to configure PTP boundary clock, see the *Cisco MWR 2941 Mobile Wireless Edge Router Software Configuration Guide, Release 15.0(1)MR* and the *Cisco MWR 2941 Router Command Reference, Release 15.0(1)MR*.

- **9ESW Precedence Bit Marking**—Release 15.0(2)MR introduces the following new commands for assigning a precedence bit value to incoming traffic on HWIC-D-9ESW interfaces:
 - **switchport priority default**—Configures a default priority value to apply to incoming traffic on the interface.
 - **switchport priority override**—Configures the interface to override the priority value set on inbound traffic.

New Hardware Features in Release 15.0(1)MR

There are no new hardware features in Release 15.0(1)MR.

New Software Features in Release 15.0(1)MR

Release 15.0(1)MR introduces the following new software features:

- **REP Age Timer**—You can configure how long a REP interface remains up without receiving a hello from a neighbor. You can use the **rep lsl-age-timer** value interface configuration command to set the time from 120 ms to 10000 ms. The LSL hello timer is then set to the age-timer value divided by three. In normal operation, three LSL hellos are sent before the age timer on the peer switch expires and searches for hello messages.
- **SSM/ESMC**—Provides clock frequency synchronization on SONET/SDH and synchronous Ethernet links. The SSM/ESMC feature introduces the following new commands:
 - **esmc mode ql-disabled**—Disables quality level mode on a synchronous Ethernet interface.
 - **esmc mode**—Enables ESMC messages on an interface.

- **esmc process**—Enables the router to send and receive ESMC messages on synchronous Ethernet interfaces.
- **network-clock clear wait-to-restore**—Stops the wait-to-restore timer for a clock source.
- **network-clock eec**—Specifies the Ethernet Equipment Clock (EEC) type.
- **network-clock external hold-off**—Overrides the hold-off timer value for an external interface.
- **network-clock hold-off**—Configures a hold-off value on an interface.
- **network-clock hold-off global**—Configures a general hold-off timer.
- **network-clock input-source**—Selects an interface or external timing input as a clock source and sets a priority for the clock.
- **network-clock output-source**—Configures the router to transmit clocking to an external timing source using a timing output interface.
- **network-clock output-source line**—Transmits clocking received from an external source to another external device using timing output interfaces.
- **network-clock quality-level**—Specifies a quality level for a line or external timing device.
- **network-clock revertive**—Specifies whether the router reverts to a higher priority clock when it becomes available.
- **network-clock source quality-level**—Specifies a quality level for a clock source.
- **network-clock synchronization automatic**—Enables automatic selection of a clock synchronization source.
- **network-clock synchronization mode ql-enabled**—Enables automatic selection of a clock source based on quality level (QL).
- **network-clock synchronization participate**—Configures the router to exchange timing messages using the G.781 synchronization option 1 or 2.
- **network-clock synchronization ssm option**—Configures the router to exchange timing messages using the G.781 synchronization option 1 or 2.
- **network-clock wait-to-restore**—Configures the amount of time that an interface waits before reverting to a restored clock source.
- **network-clock wait-to-restore global**—Configures the amount of time that the router waits before reverting to a restored clock source.
- **sabit**—Specifies the S_{an} status bit used to indicate clock quality level for the Synchronization Status Message (SSM) in synchronous Ethernet.
- **ssm**—Enables sync status message
- PTP on multiple VLANs— You can enable PTP on up to three VLANs at a time using the **ptp enable** command. The following restrictions apply:
 - All PTP-enabled VLANs must use PTP master or PTP slave; you cannot configure PTP master and PTP slave VLANs at the same time.
 - All PTP-enabled VLANs must use multicast or unicast, but not both.
- CFM Extension for Microwave 1+1 Hot Standby (HSBY)—The Nokia Siemens Networks (NSN) Microwave 1+1 Hot Standby Protocol (HSBY) feature extends CFM Continuity Check messages to enable detection and handling of hardware failures with microwave outdoor units (ODUs). The feature also adds support for non-Cisco TLVs within Continuity Check messages. In this protection protocol, the MWR 2941 acts as the indoor unit (IDU).

The HSBY feature introduces the following commands:

- **link-protection enable**—Globally enables HSBY protocol on the router.
- **link-protection group**—Specifies the HSBY link-protection group of which the MEP interface is a member.
- **link-protection management vlan**—Specifies the management VLAN used for all configured link protection groups for HSBY protocol.
- **link-protection group pccm vlan**—Specifies the VLAN used for ODU-to-ODU Continuity Check Messages (P-CCMs) for HSBY protocol.
- **show link-protection**—Displays the status of configured link protection groups.
- **show link-protection statistics**—Displays the counters for each link protection port.
- **clear link-protection statistics**—Clears the counters for a link protection port.
- CFM 802.1ag—Release 15.0(1)MR introduces support for the IEEE 802.1ag–2007 version of Ethernet OAM Connectivity Fault Management (CFM), which is the standard for Layer 2 ping, Layer 2 traceroute, and end-to-end connectivity check of the Ethernet network.



Note Release 15.0(1)MR does not support the 802.1ag Draft 1 version of CFM.



Note CFM is not supported on HWIC-D-9ESW interfaces.

Release 15.0(1)MR also supports Ethernet Link Management Interface (E-LMI), which enables Customer Edge (CE) devices to receive notifications and status information for remote User Network Interfaces (UNIs) and Ethernet Virtual Connections (EVC).

This feature introduces the following new commands:

- **ais**—Enables the Alarm Indication Signal (AIS) function for a specific maintenance association.
- **alarm** —Configures an alarm when fault alarms are enabled.
- **clear ethernet cfm ais domain**—Clears a maintenance endpoint (MEP) or server maintenance endpoint (SMEP) out of the Alarm Indication Signal (AIS) defect condition.
- **clear ethernet cfm maintenance-points remote**—Purges the contents of the continuity check database.
- **clear ethernet cfm statistics**—Clears a maintenance endpoint (MEP) or server maintenance endpoint (SMEP) out of the Alarm Indication Signal (AIS) defect condition.
- **clear ethernet cfm traceroute-cache**—Removes the contents of the Ethernet CFM traceroute cache.
- **continuity-check**—Enables the transmission of continuity check messages (CCMs) for a maintenance association.
- **cos**—Sets the class of service (CoS) for a maintenance endpoint (MEP) that will be sent in Ethernet connectivity fault management (CFM) messages.
- **disable**—Disable the generation of Alarm Indication Signal (AIS) frames resulting from a link-status change on a server maintenance endpoint (SMEP).
- **ethernet cfm ais link-status**—Enables Alarm Indication Signal (AIS) generation from a server maintenance endpoint (SMEP).

- **ethernet cfm alarm**—Configures Ethernet connectivity fault management (CFM) alarm settings.
- **ethernet cfm global**—Enables Ethernet connectivity fault management (CFM) globally on a device.
- **ethernet cfm ieee**—Enables the Ethernet Connectivity Fault Management 802.1ag Standard (CFM IEEE) version of CFM.
- **ethernet cfm interface**—Enables Ethernet connectivity fault management (CFM) processing on a port.
- **ethernet cfm mep crosscheck**—Enables cross-checking between the list of configured remote maintenance endpoints (MEPs) of a domain and MEPs learned through continuity check messages (CCMs).
- **ethernet cfm mip**—Globally provisions maintenance intermediate points (MIPs) at a specified maintenance level for VLAN IDs that are not associated with specific maintenance associations (MAs). You can also use this command to enable level filtering.
- **id**—Configures a maintenance domain identifier (MDID).
- **level**—Configures a maintenance level to receive Alarm Indication Signal (AIS) frames transmitted by a link-status change on a server maintenance endpoint (SMEP).
- **maximum meps**—Specifies the number of maintenance endpoints (MEPs) across the network in a maintenance association.
- **mep archive hold-time**—Specifies the amount of time that data from a missing maintenance end point (MEP) is kept in the continuity check database or that entries are held in the error database before they are purged.
- **mip auto-create**—Enables the automatic creation of a maintenance intermediate point (MIP) at a maintenance domain level.
- **mep crosscheck mpid**—Statically defines a remote maintenance endpoint (MEP) within a maintenance domain.
- **mep mpid**—Statically defines the maintenance endpoints (MEPs) within a maintenance association.
- **period**—Configures a specific Alarm Indication Signal (AIS) transmission interval on a server maintenance endpoint (SMEP).
- **ping ethernet**—Sends Ethernet connectivity fault management (CFM) loopback messages to a destination maintenance endpoint (MEP).
- **ping ethernet vlan**—Sends Ethernet connectivity fault management (CFM) loopback messages to a maintenance endpoint (MEP) or maintenance intermediate point (MIP) destination.
- **sender-id**—Indicate the contents of the Sender ID TLV field transmitted in Ethernet connectivity fault management (CFM) messages for the maintenance association.
- **service**—Configures a maintenance association within a maintenance domain and enters CFM service configuration mode.
- **show ethernet cfm errors**—Displays connectivity fault management (CFM) continuity check error conditions logged on a device since it was last reset or since the log was last cleared.
- **show ethernet cfm maintenance-points local**—Displays information about maintenance points configured on a device.
- **show ethernet cfm maintenance-points remote detail**—Displays information about a remote maintenance point in the continuity check database.

- **show ethernet cfm maintenance-points remote domain**—Displays detailed information about remote maintenance endpoints (MEPs) configured statically in the MEP list and their status in the continuity check database (CCDB).
- **show ethernet cfm mpdb**—Display the contents of a maintenance intermediate point (MIP) continuity check database (CCDB).
- **show ethernet cfm smep**—Displays connectivity fault management (CFM) system maintenance end point (SMEP) settings on a device.
- **show ethernet cfm traceroute-cache**—Displays the contents of the traceroute cache.
- **traceroute ethernet**—Send Ethernet connectivity fault management (CFM) traceroute messages to a destination maintenance endpoint (MEP).

This feature modifies the following commands:

- **ethernet cfm domain level**—Release 15.0(1)MR does not support the **direction outward** keywords.
 - **show ethernet cfm maintenance-points remote**—Release 15.0(1)MR does not support the **level** keyword.
 - **show ethernet cfm maintenance-points remote detail**—This command is updated to include the suspend state in the command output. Additionally, the **level** keyword is not supported in this release.
- Spanning Tree Features

Release 15.0(1)MR supports the following spanning tree features:

- Multiple Spanning Tree Protocol (MSTP)—MSTP is defined in the IEEE 802.1s standard and enables multiple VLANs to be mapped to the same spanning-tree instance, reducing the number of spanning-tree instances needed to support a large number of VLANs. MSTP provides for multiple forwarding paths for data traffic and enables load balancing. MSTP improves the fault tolerance of a network because it ensures that a failure on one forwarding path (MSTP instance) does not impact traffic on other forwarding paths. MSTP is commonly deployed on the backbone and distribution layers of a Layer 2 switched network, providing the high availability required in a service-provider environment.
- Rapid Spanning Tree Protocol (RSTP)—RSTP is defined by the IEEE 802.1W standard and improves Spanning Tree Protocol (STP) convergence. RSTP provides rapid convergence by using an explicit handshake, eliminating forwarding delay and improving the speed at which designated and root bridge ports move to a forwarding state. The rapid reconvergence provided by RSTP supports delay-sensitive traffic such as voice and video.
- Disabling MAC Learning—Allows you to manage the available MAC address table space by limiting which VLANs can learn MAC addresses.

This feature introduces the following new commands:

- **abort/exit**—Exits the MST configuration submode.
- **clear spanning-tree counters**—Clears the spanning-tree protocol counters.
- **clear spanning-tree detected protocol**—Forces an MST port to renegotiate with the neighbors, restarting the protocol migration process.
- **instance**—Maps a VLAN or a group of VLANs to a multiple spanning tree (MST) instance.
- **mac address-table learning**—Enables MAC-address learning.
- **name**—Sets the name of a Multiple Spanning Tree (MST) region.

- **private-vlan synchronize**—Maps the secondary VLANs to the same instance as the primary VLAN.
- **revision**—Sets the revision number for the MST configuration.
- **show**—Displays the Multiple Spanning Tree (MST) configuration.
- **show mac address-table learning**—Displays the MAC-address learning state.
- **show spanning-tree mst**—Displays information about the Multiple Spanning Tree (MST) protocol.
- **spanning-tree bpdupfilter**— Enables bridge protocol data unit (BPDU) filtering on an interface.
- **spanning-tree bpduguard**—Enables bridge protocol data unit (BPDU) guard on an interface.
- **spanning-tree guard**—Enables or disables STP guard mode.
- **spanning-tree link-type**—Configures the link type for a port.
- **spanning-tree loopguard default**—Enables loop guard as a default on all ports of a given bridge.
- **spanning-tree mode**—Switches between Per-VLAN Spanning Tree+ (PVST+) and Multiple Spanning Tree (MST) modes.
- **spanning-tree mst**—Sets the path cost and port-priority parameters for a Multiple Spanning Tree (MST) instance.
- **spanning-tree mst configuration**—Enters MST-configuration submode.
- **spanning-tree mst forward-time**—Sets the forward-delay timer for all the instances on the router.
- **spanning-tree mst hello-time**—Sets the hello-time delay timer for all the instances on the router.
- **spanning-tree mst max-age**—Sets the max-age timer for all the instances on the router.
- **spanning-tree mst max-hops**—Specifies the number of possible hops in the region before a bridge protocol data unit (BPDU) is discarded.
- **spanning-tree mst priority**—Specifies a bridge priority for the spanning tree.
- **spanning-tree mst root**—Designates the primary and secondary root, sets the bridge priority, and sets the timer value for an MST instance.
- **spanning-tree portfast**—Enables PortFast mode, where the interface is immediately put into the forwarding state upon linkup without waiting for the timer to expire.
- **spanning-tree portfast bpdupfilter**—Enables bridge protocol data unit (BPDU) filtering on an interface.
- **spanning-tree portfast bpduguard**—Enables bridge protocol data unit (BPDU) guard on the interface.
- **spanning-tree portfast bpdupfilter default**—Enables BPDU filtering on all ports that are already configured for PortFast.
- **spanning-tree portfast bpduguard default**—Enables BPDU guard on all ports that are already configured for PortFast.
- **spanning-tree portfast default**—Enables PortFast by default on all access ports.
- **CEF Load Sharing of Equal Cost Paths**— The CEF Equal Cost Paths feature allows you to define one or more paths to a destination and shares traffic across the available paths of the same cost. CEF defines two types of load sharing: per-packet load sharing, which splits all traffic evenly across the available paths and per-destination load sharing, which balances traffic while ensuring the traffic bound for the same destination uses the same path.

Release 15.0(1)MR introduces support for per-destination load balancing. You can configure per-destination load sharing on Ethernet ports, VLANs, MLPPP bundles, or pseudowires.

This feature introduces support for the following commands:

- **ip cef load-sharing algorithm universal**—Sets the load sharing algorithm to the universal algorithm that uses a source and destination, and ID hash.
- **ip cef load-sharing algorithm include-ports source destination**—Sets the load sharing algorithm to the include-ports algorithm that uses source IP, source port, destination IP, destination port and ID hash.
- **ip load-sharing per-destination**—Per-destination load balancing is enabled by default when you enable Cisco Express Forwarding
- **show ip cef exact-route**—To display the exact route for a source-destination IP address pair, use the show ip cef exact-route command in user EXEC or privileged EXEC mode
- **show ip cef exact-route platform**—To display the exact route in platform for a source-destination IP address pair, use the show ip cef exact-route platform command in user EXEC or privileged EXEC mode
- **802.1Q Tunneling**—802.1Q tunneling enables service providers to use a single VLAN to support customers who have multiple VLANs, while preserving customer VLAN IDs and keeping traffic in different customer VLANs segregated. Release 15.0(1)MR provides support for the following 802.1Q tunneling features:
 - **Cisco QinQ**—A Cisco implementation of 802.1Q that adds an extra layer of 802.1Q tags to 802.1Q-tagged packets that enter the network. The extra tagging layer provided by QinQ allows you to expand the available VLAN space in the network by mapping multiple customer VLANs to a single service provider VLAN.
 - **Layer 2 Protocol Tunneling (L2PT)**—Layer 2 protocol tunneling allows Layer 2 protocol data units (PDUs) (CDP, STP, and VTP) to be tunneled through a network. L2PT allows tunnel ports to process STP, VTP, and CDP packets by creating separate spanning tree domains (different spanning tree roots) for customer switches.

This feature introduces support for the following commands:

- **clear l2protocol-tunnel counters**—Clears the layer 2 tunnel protocol counters on the router.
- **dot1q tunneling ethertype**—Defines the Ethertype field type used by peer devices when implementing QinQ VLAN tagging.
- **l2protocol-tunnel**—Enables the protocol tunneling on an interface and specifies the type of protocol to be tunneled.
- **l2protocol-tunnel drop-threshold**—Specifies the maximum number of packets that can be processed for the specified protocol on that interface before being dropped.
- **l2protocol-tunnel shutdown-threshold**—Specifies the maximum number of packets that can be processed for the specified protocol on that interface in one second.
- **show dot1q-tunnel**—Displays a list of 802.1Q tunnel-enabled ports.
- **show l2protocol-tunnel**—Displays the protocols that are tunneled on an individual interface or on all interfaces.
- **switchport access vlan**—Configures a VLAN when an interface is in access mode.
- **switchport mode**—Specifies the interface type for a port. You can use this command to put a switch port in access or dot1q mode.
- **switchport vlan mapping**—Maps incoming traffic from an original vlan to a translated VLAN. Traffic exiting the network is mapped from the translated VLAN to the original VLAN.

- **switchport vlan mapping enable**—Enables VLAN mapping on a switch port.
- CESoPSN over UDP—Release 15.0(1)MR allows you to configure a CESoPSN pseudowire with UDP as a transport protocol. The feature introduces the following new commands:
 - **encapsulation udp**—Configures a CESoPSN pseudowire to use UDP.
 - **udp port local local-port remote remote-port**—Specifies the local and remove UDP ports used for the CESoPSN pseudowire connection.
- Embedded Event Manager 3.0—Release 15.0(1)MR supports version 3.0 of Embedded Event Manager. For more information, see the [Network Management Configuration Guide, Cisco IOS Release 15.0S](#).

For more information about how to configure the router, see the *Cisco MWR 2941 Mobile Wireless Edge Router Software Configuration Guide, Release 15.0(1)MR*

Limitations and Restrictions



Caution

The Cisco MWR 2941 router does not support online insertion and removal (OIR) of WAN interface cards. Any attempt to perform OIR on a card in a powered-on router might cause damage to the card.

Cisco IOS Release 15.0(2)MR for the Cisco MWR 2941 router has the following limitations and restrictions:

- Synchronous Ethernet is not supported on the SFP-GE-T module.
- Port channels are not supported.
- Release 15.0(2)MR does not support ATM over MPLS N-to-1 Cell Mode or 1-to-1 Cell Mode.
- SPAN and RSPAN are not supported.
- VLAN Query Protocol (VQP) and VLAN Management Policy Server (VMPS) are not supported
- CFM Extension for Microwave 1+1 Hot Standby (HSBY) is only supported on Gigabit Ethernet interfaces 0/0–0/5.
- CEF Limitations—Cisco Express Forwarding (CEF) has the following limitations.
 - Load balancing on GRE interfaces is not supported
 - Load balancing on IOS switch interfaces is not supported
 - Packets may choose different egress interfaces when interface is up/down
 - Up to 16 interfaces are supported for load balancing
 - SNMP traps for CEF load balancing is not supported
- Ingress vlan classification and marking is not supported on dot1q tunnel interfaces.
- Release 15.0(2)MR does not support the 802.1ad standard for VLAN scalability. However, the release supports QinQ, a Cisco-proprietary system for double-tagging to provide VLAN scalability in the provider networks.
- Release 15.0(2)MR does not support the **switchport vlan mapping default drop** command.
- Release 15.0(2)MR does not support translation between CFM draft 1 and IEEE standardized 802.1ag CFM.
- CFM is not supported on HWIC-D-9ESW interfaces.

- Ethernet LCK is not supported.
- OAM Manager is not supported.
- CFM Draft 1.0 is not supported.
- CFM for Customer VLANs (C-VLANs) is not supported.
- Ethernet Locked Signal is not supported.
- Rapid PVST+ is not supported.
- VLAN translation is not supported on HWIC interfaces.
- Rate limiting and policing are not supported on HWIC or onboard Gigabit Ethernet interfaces.
- GSM Abis optimization not supported—Release 15.0(2)MR does not support GSM Abis optimization feature that was supported in Release 12.4(20)MR1.
- Reduced HWIC support—Release 15.0(2)MR does not support the HWIC-1GE-SFP, HWIC-4SHDSL, HWIC-1ADSL, and HWIC-1ADSL-I HWICs that were supported in Release 12.4(20)MR1.
- GRE offload not supported—15.0(2)MR does not support the GRE offload feature that was supported in Release 12.4(20)MR1.
- UMTS Iub Optimization not supported—Release 15.0(2)MR does not support UMTS Iub optimization.
- L2TP not supported—The MWR 2941 currently does not support L2TP.
- Multicast used for PTP redundancy only—This release provides support for multicast in order to establish PTP redundancy; the Cisco MWR 2941 does not support multicast for other uses.
- Out-of-band master mode not supported—This release does not support out-of-band master mode for Timing over Packet/adaptive clock recovery. If your network design requires out-of-band master clocking, you can use the CEoPs SPA on the 7600 router for this purpose.
- ACR out-of-band payload limitation—The MWR 2941 only supports the payload-size values 486 (625 packets per second) or 243 (1250 packets per second) for out-of-band clock recovery.
- T1 SAToP is not supported on the HWIC-4T1/E1.
- Limited OAM support—ATM OAM (Operation, Administration, and Maintenance) is not supported on the short haul side of the Cisco MWR 2941.
- The Cisco MWR 2941 does not support the **mpls traffic-eng tunnels** command at the global or interface level.
- QoS Limitations—The Cisco MWR 2941 provides limited QoS support. For more information, see the *Cisco MWR 2941-DC Mobile Wireless Edge Router Software Configuration Guide, Release 12.2(33)MRB*.
- The Cisco MWR 2941 does not support the following options on offloaded dMLPPP bundles:
 - **ppp multilink idle-link**
 - **ppp multilink queue depth**
 - **ppp multilink fragment maximum**
 - **ppp multilink slippage**
 - **ppp timeout multilink lost-fragment**

**Note**

If you have a bundle that requires the use of these options, contact Cisco support for assistance.

For more information about configuring dMLPPP, see the *Cisco MWR 2941-DC Mobile Wireless Edge Router Software Configuration Guide, Release 15.0(2)MR*.

- MPLS pseudowire ping not supported—This release does not support the **ping mpls pseudowire** command. We recommend that you use the **ping mpls ipv4** command for operation and maintenance of MPLS connections.
- CAS limitations—The Cisco MWR 2941 implementation of CAS has the following limitations:
 - CAS is not supported on T1 and E1 HWICs.
 - When configuring a CESoPSN pseudowire to use CAS, you must configure the controller to use CAS signalling prior to creating a cem group, tdm group, or channel group. Otherwise the Cisco MWR 2941 rejects the **mode cas** command.
 - CAS is only supported on pseudowire connections between two Cisco MWR 2941 routers; the 7600 router does not currently support CAS.
- PTP only supported on Gigabit Ethernet interfaces—The Cisco MWR 2941 only supports PTP traffic on onboard Gigabit Ethernet interfaces.
- PPPoA not supported—This release does not provide support for PPPoA.
- ADSL not supported—This release does not support ADSL.
- PTP Master clocking not supported—Release 15.0(2)MR contains commands to configure the Cisco MWR 2941 as a Master clock. These commands are intended for trial use only and are not designed for use in a production network.
- IP Header Compression not supported—Release 15.0(2)MR does not support IP Header Compression or distributed IP Header Compression.
- BFD interface support limitations—Release 15.0(2)MR only supports BFD on switched virtual interfaces (SVIs).
- Multicast interface limitations—Multicast is only supported on VLANs and Ethernet interfaces. Multicast routing is not supported on other interface types.
- Release 15.0(2)MR supports up to 64 VLANs if the HWIC-D-9ESW card is in use; otherwise it supports a maximum of 255 VLANs as in previous releases.
- The Cisco MWR 2941 does not support access control lists (ACLs) for layer 3 forwarding through the network processor.
- The **show interfaces** command displays inaccurate information when used with the **counters** keyword. The counters for multicast packets display as 0 even if multicast traffic is passing on the router. To display correct multicast counters, use the **show interfaces** command without the **counters** keyword.
- The multicast packet counters in the **show interfaces type number counters** command output are set to 0 even if multicast traffic is enabled. To see accurate counters for multicast traffic, use the **show interfaces** command without the **counters** keyword.
- Virtual path-to-virtual path local switching is not supported.

Supported Hardware—Cisco MWR 2941-DC Router

The Cisco MWR 2941 supports the following interface cards:

- HWIC-4T1/E1
- HWIC-D-9ESW

**Note**

Release 15.0(2)MR does not support the HWIC-1GE-SFP, HWIC-4SHDSL, HWIC-1ADSL, and HWIC-1ADSL-I HWICs that were supported in Release 12.4(20)MR1.

The Cisco MWR 2941 router supports the following SFP modules:

- CWDM-SFP-1470
- CWDM-SFP-1490
- CWDM-SFP-1510
- CWDM-SFP-1530
- CWDM-SFP-1550
- CWDM-SFP-1570
- CWDM-SFP-1590
- CWDM-SFP-1610
- DWDM-SFP-4612
- DWDM-SFP-4692
- DWDM-SFP-4772
- DWDM-SFP-4851
- DWDM-SFP-5012
- DWDM-SFP-5092
- DWDM-SFP-5172
- DWDM-SFP-5252
- DWDM-SFP-5413
- DWDM-SFP-5494
- DWDM-SFP-5575
- DWDM-SFP-5655
- DWDM-SFP-5817
- DWDM-SFP-5898
- DWDM-SFP-5979
- DWDM-SFP-6061
- GLC-BX-D
- GLC-BX-U
- GLC-LX-SM-RGD
- GLC-SX-MM-RGD
- GLC-ZX-SM-RGD
- SFP-GE-L
- SFP-GE-S
- SFP-GE-Z

Other hardware interfaces are not supported.

**Caution**

The Cisco MWR 2941 router does not support online insertion and removal (OIR) of WAN interface cards. Any attempt to perform OIR on a card in a powered-on router might cause damage to the card.

For instructions on how to install HWICs and SFPs, see the documentation included with the product. For information about how to configure HWICs and SFPs, see the *Cisco MWR 2941 Mobile Wireless Edge Router Software Configuration Guide, Release 15.0(1)MR*.

Supported MIBs

The Cisco MWR 2941 router supports the following MIBs:

• CISCO-ACCESS-ENVMON-MIB • CISCO-CDP-MIB • CISCO-CONFIG-COPY-MIB • CISCO-CONFIG-MAN-MIB • CISCO-ENHANCED-MEMPOOL-MIB • CISCO-ENTITY-EXT-MIB • CISCO-ENTITY-FRU-CONTROL-MIB • CISCO-ENTITY-SENSOR-MIB • CISCO-ENTITY-VENDORTYPE-OID-MIB • CISCO-ENVMON-MIB • CISCO-FLASH-MIB • CISCO-IETF-PW-MIB • CISCO-IETF-PW-TC-MIB • CISCO-IF-EXTENSION-MIB • CISCO-IMAGE-MIB • CISCO-MEMORY-POOL-MIB • CISCO-PROCESS-MIB • CISCO-PRODUCTS-MIB • CISCO-RESILIENT-ETHERNET-PROTOCOL-MIB • CISCO-RTTMON-MIB • CISCO-SMI • CISCO-SYSLOG-MIB	• CISCO-TC • CISCO-VTP-MIB • ENTITY-MIB • HCNUM-TC • IANAifType-MIB • IF-MIB • IMA-MIB • INET-ADDRESS-MIB • MPLS-VPN-MIB • OLD-CISCO-CHASSIS-MIB • OLD-CISCO-INTERFACES-MIB • OLD-CISCO-SYS-MIB • OLD-CISCO-TS-MIB • PerfHist-TC-MIB • RFC1213-MIB • RMON2-MIB • RMON-MIB • SNMP-FRAMEWORK-MIB • SNMP-TARGET-MIB • SNMPv2-CONF • SNMPv2-MIB • SNMPv2-SMI • SNMPv2-TC
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Note

Release 15.0(2)MR provides limited support for the CISCO-CLASS-BASED-QOS-MIB MIB for tail drop monitoring; the router supports the cbQosQueueingDiscardPkt64 object within the cbQosQueueingStatsTable table for tail drop accounting. Other objects in this table and other tables within the CISCO-CLASS-BASED-QOS-MIB are not supported.

Caveats

This section documents the open and resolved caveats for the Cisco MWR 2941 router running Cisco IOS Release 15.0(1)MR and later.

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. Only select severity 3 caveats are listed.

For information on caveats in Cisco IOS Software Releases 15.0S, go to:

http://www.cisco.com/en/US/products/ps10890/prod_release_notes_list.html.



Note

If you have an account with Cisco.com, you can use the Bug Toolkit to find caveats of any severity for any release. To reach the Bug Toolkit, log in to Cisco.com and click the **Support** tab and select **Support** from the drop-down menu. Under Frequently Used Resources, click **Bug Toolkit**. You must then log in. Another option is to go directly to: http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

The following sections document the opened and resolved caveats by Cisco IOS release:

- [Caveats in Cisco IOS Release 15.0\(2\)MR, page 17](#)
- [Caveats in Cisco IOS Release 15.0\(1\)MR, page 18](#)
- [Troubleshooting, page 21](#)

Caveats in Cisco IOS Release 15.0(2)MR

Open Caveats

- CSCtg89367

Symptom: The MWR 2941 internal Ethernet tsec interface stops sending host traffic.

Conditions: Occurs when you configure an MTU size of 4470 on a VLAN interface while OSPF routing is enabled. To verify the condition, issue the **show platform hardware ethernet tsec 1** command to see if the number of interface resets increases.

Workaround: Use the default MTU size for the VLAN interface or apply the **ip ospf mtu-ignore** command to the VLAN interface.

- CSCti36876

Symptom: The MWR 2941 displays traceback messages and the MLPPP link can go in and out of service.

Conditions: Occurs when the MLPPP bundles is overloaded.

Workaround: Maintain a traffic load of less than 32 Mbps on the MLPPP bundle.

- CSCto13107

Symptom: PTP connections on the MWR 2941 operating across multiple hops are unstable.

Conditions: Occurs when the MWR 2941 is configured as a boundary clock and exchanging PTP traffic that travels more than one network hop to reach a destination device.

Workaround: None.

Closed Caveats

- CSCtk75664

Symptom: The Cisco MWR 2941 SNMP interface statistics show an abnormally high number of packets being passed on the router.

Conditions: Occurs when there is little to no traffic passing on the router.

Workaround: None.

- CSCtl41986

Symptom: The Cisco MWR 2941 fails to load the correct image from flash memory when booting. The router displays an error message similar to the following example: `boot: cannot determine first file name on device 'flash:.'`

Conditions: Occurs on the 15.0(1)MR image.

Workaround: Perform the following steps to resolve this issue.:

- Load the 12.2(33)MR image on the router.
- Format the flash file system.
- Restore the 15.0(1)MR image.
- Reload the router.

- CSCtl95513

Symptom: The Cisco MWR 2941 does not forward IP address request messages to the DHCP server over MLPPP links.

Conditions: Occurs when the Cisco MWR 2941 is connected to a base transceiver station (BTS) that sends IP address requests using a BOOTP message with a 0.0.0.0 source address. The issue does not occur for BTS units that use IPCP to send IP address requests.

Workaround: None.

- CSCto07772

Symptom: The MWR 2941 sets an L bit in a CESoPSN stream for longer than required, causing the BTS to generate an alarm and the call to be dropped.

Conditions: Occurs under the following conditions:

- The MWR 2941 is connected to a BSC using an E1 connection and a BTS using an Ethernet CESoPSN connection.
- There is a brief break in the connection between the BSC and the MWR 2941 on the E1 interface for approximately 300 ms.

Workaround: None.

Caveats in Cisco IOS Release 15.0(1)MR

Open Caveats

- CSCtg30671

Symptom: The Cisco MWR 2941 does not permit changes to a PVC configured with cell packing. The router displays the following message:

ATMCMDFAIL:Unable to Configure PVC(1) 1/40 on ATM0/IMA0.1.Possibly multiple users configuring IOS simultaneously

Further info about other user:

Process id: 256, Process: ATOM manager, TTY: 0, Location: Console

Conditions: Occurs in the following topology:

mwr1---MPLS---mwr2---MPLS---mwr3---MPLS---7600

The error occurs under the following conditions:

- The mwr2 and mwr3 routers have IMA PVCs configured.
- The mwr2 router has a PVC with cell packing configured and is passing traffic.
- The mwr3 router has a PVC with cell packing configured and is passing traffic.
- The 7600 has cell packing configured for both PVCs.

Workaround: None.

- CSCtg89367

Symptom: The internal tsec Ethernet interface remains in a reset state and does not send host traffic. A reload is required to restore service.

Conditions: Occurs when you configure a VLAN interface with an MTU of 4470 and OSPF routing is enabled. To verify the condition, use the **show platform hardware ethernet tsec 1** command to see if the number of interface resets increases.

Workaround: You can use one of the following workarounds:

- Use the default MTU size for the VLAN interface.
- Issue the **ip ospf mtu-ignore** command on the OSPF-enabled VLAN interface.

- CSCth37415

Symptom: The 1.544 GPS interface is not available when configuring an input network clocking source.

Conditions: Occurs when you configure the network synchronization automatic command. This command assigns a clock source based on clock priority and quality. This clock selection mechanism does not support 1.544 GPS interface as an input clock source.

Workaround: Remove the network synchronization automatic command and use the **network-clock-select** command to configure this interface as a clock source.



Note The **network-clock-select** command only supports priority-based clock source selection; it does not support automatic clock selection.

- CSCti44873

Symptom: The multilink interface fails to restore proper bandwidth after a reload.

Conditions: Occurs when you apply and remove a **bandwidth** statement on a multilink bundle interface.

Workaround: Remove the **bandwidth** statement from the interface.

- CSCtj39710

Symptom: The show mpls forwarding command displays incorrect output; the **bytes label switched** statistic only displays statistics for one path.

Conditions: Occurs when you use equal cost multipath with MPLS forwarding.

Workaround: Use **show platform hardware winpath cef label** command to display statistics for each packet flow that is routed or the **show interface summary** command to display the packets routed through each interface.

- CSCtj52205

Symptom: The Cisco MWR 2941 ATM/IMA interface drops for approximately 30 seconds while the peer IMA interface recovers; this condition can result in packet loss during an interface status transition.

Conditions: Occurs when the ATM/IMA interface changes status, such as when you perform **shutdown/no shutdown** or connect a T1/E1 cable.

Workaround: None.

- CSCtj59001

Symptom: Interface statistics for the Gigabit Ethernet interface such as packets/bytes are inaccurate after processing traffic for a long period of time.

Conditions: Occurs when the Gigabit Ethernet interface processes traffic for an extended period of time.

Workaround: Issue the **clear counters** command to reset the Gigabit Ethernet interface statistics accounting.

- CSCtj63773

Symptom: When you upgrade from a 12.2(33) release to Release 15.0(1)MR and reload the MWR 2941, the router displays an incorrect notification that the configuration register is set to 0x0.

Conditions: Occurs when you upgrade to Release 15.0(1)MR from a 12.2(33) release.

Workaround: Use the **test platform hardware configreg read** command to perform a configuration register read value reset. After you execute this command, the **show version** command displays the correct configuration register value.

Closed Caveats

- CSCtb22933

Symptom: The MWR can display a traceback `error_index=195 [WP_ERR_CH_ALREADY_CREATED]` after an ATM pseudowire VC flaps repeatedly.

Conditions: Occurs when an ATM pseudowire flaps repeatedly due to a timing or IP routing issue.

Workaround: Ensure that the ATM pseudowire is configured properly.

- CSCte14963

Symptom: The MWR 2941 displays traceback messages when you change the IMA group ID on the E1 controller. The traceback messages block configuration of the IMA group on the controller.

Conditions: Occurs when you enable and disable **scrambling-payload** multiple times before changing the ima-group ID.

Workaround: None.

- CSCtf79922

Symptom: The MWR 2941 displays the following traceback and error messages when you delete and reconfigure a VLAN.

```
Mar 24 03:18:32.203 HKT: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan441,
changed state to up
Mar 24 03:18:32.203 HKT: Error Traceback:
```

```

File = ../sources/iw/classifier/wpi_iw_dfc.c
Function=WPI_IwSystemCreateEmc
Line = 1485
error_index=575 [WP_INVALID_IW EMC_FLOW_EXISTS_IN_HASH]
Mar 24 03:18:32.203 HKT: -Traceback= 261314C 26B0BC8 273B3B8 26FEA78 27649B4 2633520
26336B8 2633B98 2633F38 25FE1B8 25FE678 25FF538 30C36B4 3095110 3095780 30DE8A0
Mar 24 03:18:32.203 HKT: Error Traceback:
File = ../sources/iw/core/wpi_iw_flow_aggregation.c
Function=WP_IwFlowAggregationDelete
Line = 2790
error_index=483 [WP_ERR_IW_FLOW_AGG_NOT_EMPTY]
Mar 24 03:18:32.203 HKT: -Traceback= 261314C 26B0BC8 2726D70 26336F4 2633B98 2633F38
25FE1B8 25FE678 25FF538 30C36B4 3095110 3095780 30DE8A0 30DEAB8 3C69C30 2067A08

```

Conditions: Occurs when you delete and reconfigure VLANs quickly.

Workaround: Wait a few seconds when removing and reconfiguring a VLAN.

- CSCtg35849

Symptom: The console becomes unresponsive after a routing change while the MWR 2941 is processing a heavy traffic load. The majority of traffic is dropped and the console can remain unresponsive until the traffic load diminishes or the router is reloaded.

Conditions: Occurs when the router is processing at least 6 Megabits of traffic with small (64 byte) IP packets and the destination route drops or changes. This condition has only been observed on MLPPP backhaul interfaces when multiple links in a bundle switch to a redundant MLPPP bundle path while the router is processing up to 20 Mbps of 64-byte IP packets.

Workaround: None.

- CSCti18895

Symptom: The router does not process the remaining bandwidth percent command on a policy map applied to a Gigabit Ethernet interface.

Conditions: Occurs when the class has the highest **remaining bandwidth percent** configuration of all classes in the policy map and the rate of traffic for the class is significantly lower than the overall bandwidth allocated to the interface.

Workaround: Configure lower priority classes in the policy map with lower percentages until the desired bandwidth allocation is reached.

Troubleshooting

The following sections describe troubleshooting commands you can use with the Cisco MWR 2941.

Collecting Data for Router Issues

To collect data for reporting router issues, issue the following command:

- **show tech-support**—Displays general information about the router if it reports a problem.

Collecting Data for ROMmon Issues

To collect data for ROMmon issues, issue the following command while in EXEC mode:

- **show rom-monitor**—Displays currently selected ROM monitor.

**Note**

If you contact Cisco support for assistance, we recommend that you provide any crashinfo files stored in flash memory. For more information about crashinfo files, see http://www.cisco.com/en/US/products/hw/routers/ps167/products_tech_note09186a00800a6743.shtml.

Related Documentation

Related documents for implementing the Cisco MWR 2941 mobile wireless edge router are available on Cisco.com

To access the related documentation on Cisco.com, go to:

http://www.cisco.com/en/US/products/ps9395/tsd_products_support_series_home.html

Documents related to the Cisco MWR 2941-DC mobile wireless edge router include the following guides:

- Cisco MWR 2941 Mobile Wireless Edge Router documents
 - *Cisco MWR 2941 Mobile Wireless Edge Router Hardware Installation Guide*
 - *Cisco MWR 2941 Mobile Wireless Edge Router Software Configuration Guide, Release 15.0(1)MR*
 - *Cisco MWR 2941 Router Command Reference, Release 15.0(1)MR*
 - *Regulatory Compliance and Safety Information for the Cisco MWR 2941 Mobile Wireless Edge Routers*
- Release Notes—*Release Notes for Cisco MWR 2941 Mobile Wireless Edge Router for Cisco IOS Release 15.0(2)MR*
- Cisco Interface Cards Installation Guides
 - *Quick Start Guide: Interface Cards*
 - Cisco Interface Cards Installation Guide

Services and Support

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.htm>

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