CHAPTER

Overview of the Cisco MWR 1941-DC Router

The MWR 1941-DC Mobile Wireless Edge Router is a networking platform optimized for use in mobile wireless networks; specifically designed to be use at the cell site edge as a part of an IP Radio Access Network (IP-RAN) or Cell Site Data Communications Network (DCN).

The MWR 1941-DC router offers high performance at a low cost while meeting the critical requirements for deployment in cell sites, including small size, high availability, and DC input power flexibility.

This chapter includes the following sections:

Primary Uses of the MWR 1941-DC Router

IP-RAN Solution

Note Cisco IOS Release 12.3(11)T supports the Cisco IOS IP-RAN feature set (software image) for the MWR 1941-DC router.

In an IP RAN application, the MWR 1941-DC router extends IP connectivity to the cell site and Base Transceiver Station (BTS). Through a FastEthernet interface to the BTS, the MWR 1941-DC router provides bandwidth-efficient IP transport of voice and data bearer traffic, as well as maintenance, control, and signalling traffic, over the leased line backhaul network between the BTS and leased line termination and aggregation node via compression (cRTP/cUDP) and packet multiplexing (PPPmux and MLPPP).

Figure 1-1 shows the placement of and connections for the MWR 1941-DC router implemented in an IP-RAN solution.

Figure 1-1 MWR 1941-DC Router in an IP-RAN Solution

In the IP-RAN solution, the BTS site consists of a pair of MWR 1941-DC routers. The pair of MWR 1941-DC routers provides for an active and standby router for redundancy. A failure of the active MWR 1941-DC router causes the standby router to take over as the active router for the BTS site.

Each pair of MWR 1941-DC routers at the BTS site is identical in hardware configuration. They connect to each other through the BTS via the Fast Ethernet interfaces. The individual backhaul links to an MWR 1941-DC router are cabled from a single T1/E1 termination block in the BTS, connecting to both the active and standby routers utilizing a "Y" cable. The redundancy design to control the active/standby transitions of the router pair leverages HSRP to control the relays on the VWIC-2MFT-T1-DIR (or VWIC-2MFT-E1-DIR) in each router to ensure that the relays on the active router are closed and the relays on the standby router are open to avoid double termination of the T1 (or E1).

Cell Site DCN Solution

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Figure 1-2 MWR 1941-DC Router in an Cell Site DCN Solution

BTS and routes management and control traffic via one DS0 from a T1. Additionally, the MWR 1941-DC router supports a variety of interfaces to monitored and controlled devices using Cisco network modules installed in the MWR 1941-DC router.

Cisco IOS Software Features

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Software Features for the IP-RAN Implementation

"Parallel eXpress Forwarding (PXF)." When deployed in an IP-RAN, the MWR 1941-DC router is customized for performance, high availability, quality of service, and link efficiency.

Cisco IOS software functions added to the MWR 1941-DC router for the IP-RAN implementation include:

- Redundancy logic—For monitoring Hot Standby Routing Protocol (HSRP) information to determine the active and standby router and control T1 termination.

  Failover logic—To force a switchover for hardware failures or an over-temperature condition.

  Relay control—To open and close the T1/E1 interfaces on the active and standby routers.

  Diagnostic functions—To monitor the "health" of the standby MWR 1941-DC router.

This section contains the following information:

MIPs-Based Software Features

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- IGMP
- MLP, PPP Control Path (IPCP, NCP, LCP, CLNS)
- ACFC and PFC Handling During PPP Negotiation
- HSRP
- OSPF
- DHCP
- CDP
- NTP
- SNMP

Network Processor (PXF) Software Features

packets per second) at a targeted 80% processor utilization while performing UDP/RTP header compression/decompression (cUDP/cRTP) and PPPmux.

QoS Matching, including IP Access Lists (Input/Output Security ACLs are not supported), QoS Group, IP Precedence, IP DSCP, and Input Interface

QoS Actions, including Set IP Precedence, Set IP DSCP, Set QoS Group, Traffic Shaping, Class Based WFQ (CB-WFQ), and Low Latency Queuing (LLQ)

Maintenance of statistics, such as Forwarding, Drop, and Interface

IPv4

MLPPP, MLP, PPP Data Path (MLP LFI is not supported)

PPPmux

cRTP/cUDP

Link Noise Monitoring (LNM) provides configuration monitoring of individual T1/E1 circuit quality

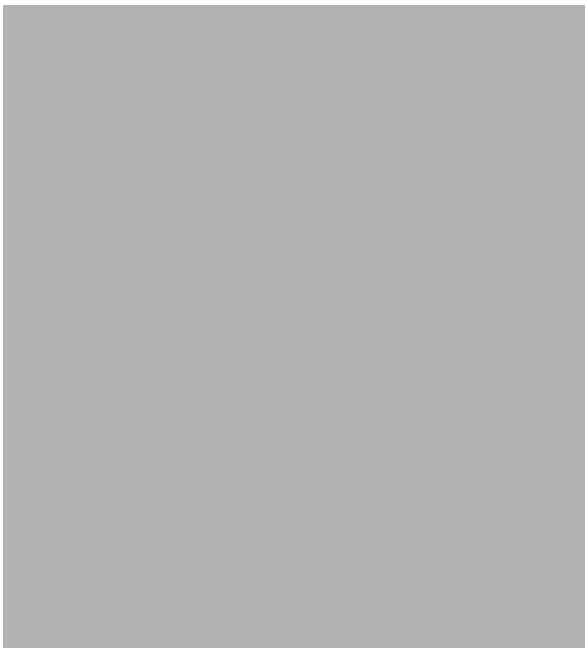
PPP Multiplexing/Demultiplexing

RFC 3153 describes a way to overcome this overhead. On the sending end, a multiplexor concatenates multiple PPP frames (subframes) into a single, multiplexed frame (superframe). One header is included in the superframe and the individual PPP subframes are separated by delimiters. On the receiving end, a demultiplexor uses the delimiters to separate the individual PPP subframes.

The MWR 1914-DC router network processor software conforms to this specification and acts as both a multiplexor and a demultiplexor.

RTP/UDP Header Compression

Figure 1-3 RTP Header Compression



Redundancy Support

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standalone

HSRP

Cisco's Hot Standby Router Protocol (HSRP) is used to control which router is active and which is standby. HSRP uses a priority scheme to determine which HSRP-configured router is to be the default active router. Priority is determined first by the configured priority value, and then by the IP address. In each case a higher value is of greater priority.

IP-RAN Implementation Updates

- **Traffic Recovery Over MLP After T1 Failure**

ACFC and PFC Support on PPP Multilink Interfaces

Ignore IP ID Field Delta in cUDP Packet Flows

Link Noise Monitor

First Two Packets Sent with Full cUDP Headers

Software Features for the Cell Site DCN Application

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- TDM Drop & Insert

  DS0-level grooming

  NTP

  SNMP

MIB Support

Cisco 10000 Series ESR MIB Specifications Guide on CCO

Limitations and Restrictions

Caution

Caution

IP-RAN Implementation Limitations and Restrictions

Cisco IOS Software Features not Supported on the MWR 1941-DC Router

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Upgrading the VWIC-2MFT-T1-DIR Microcode

Disabling PPP Multiplexing

no ppp mux

MLP LFI Support

ACFC and PFC Support on PPP Interfaces

Cell Site DCN Implementation Limitations and Restrictions

Caution

Using the 1-port T3/E3: NM-1T3/E3(=)

Upgrading the VWIC-2MFT-T1-DIR Microcode

New Features in Cisco IOS Release 12.2(15)MC2h

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Support for 6 T1/E1 Interfaces per/MWR

Support for 1800 CIDs per/MWR

ip rtp compression-connections

Command	Purpose
`Router(config-if)# ip rtp compression-connections` ***number***	

no

Support for Enhanced Link Noise Monitoring (LNM)

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