Cisco CRS Distributed Route Processor

The Cisco® CRS-1 Carrier Routing System is the industry's first carrier router offering continuous system operation, unprecedented service flexibility, and system longevity. The Cisco CRS-1 is powered by Cisco IOS® XR Software-a unique, self-healing, distributed operating system designed for always-on operation that scales system capacity up to 92 terabits per second (Tbps). The innovative system architecture combines the Cisco Silicon Packet Processor, the first programmable 40-Gbps application-specific integrated circuit (ASIC), with the Cisco Service Separation Architecture for outstanding service flexibility and speed to service. The Cisco CRS-1 marks a new era in carrier IP Communications by powering the foundation for network and service convergence today while protecting investments for decades to come.

The Cisco CRS-1 Distributed Route Processor (DRP) brings a new level of control plane scaling and processing flexibility to service provider networks. Breaking through the limitation of a single control plane processor per routing system, this solution allows you to add multiple Cisco CRS-1 DRPs to a single CRS system to increase control plane processing power, supporting more services and enhancing reliability. The Cisco CRS-1 DRP takes advantage of Cisco IOS XR Software capability and delivers distributed control plane scaling for applications such as Border Gateway Protocol Version 4 (BGPv4), Label Distribution Protocol (LDP), Protocol Independent Multicast (PIM), and Internet Group Management Protocol (IGMP). This solution allows you to distribute these application processes to specific DRPs across a Cisco CRS-1 Multishelf System – for instance, you can dedicate one or more DRPs to PIM and IGMP for maximum performance in an IPTV service application.

The Cisco CRS-1 DRP is also a prominent part of the Cisco Service Separation Architecture (SSA), which allows service providers to secure virtual public and private services across the same platform through multiple secure domain routers (SDRs), logical routing domains that achieve complete separation of network and system resources on a single CRS-1 system.

The Cisco CRS-1 Distributed Router Processor (CRS-DRP-B) fits into a forwarding slot of the CRS chassis. It consists of two modules, the CRS-DRP-B-CPU board that hosts the two dual processor SMP complexes and the CRS-DRP-PLIM board that hosts the access to management, auxiliary and console ports and accessories such as the hard drive. Both modules are required for DRP operation and are shown Figure 1.

The Cisco CRS-1 Distributed Route Processor is comprised of two independent CPU instances. Each CPU instance has its own memory, hard drive, and management interfaces. To maintain service separation, there is no internal connectivity between these two CPU complexes. The CPU instances can communicate with each other through the fabric, as they would with any other line card, route processor, or DRP located in the CRS system.

For more information about the Cisco CRS-1 or about other interfaces available for the Cisco CRS-1, visit http://www.cisco.com/go/crs.

Figure 1. Cisco CRS-1 DRP CPU Module and PLIM Module

Product Specifications

Table 1 lists the specifications for the Cisco CRS-1 DRP.

Table 1. Product Specifications

Feature	Description
Chassis compatibility	Compatible with 4-slot, 8-slot, 16-slot and Multi-chassis CRS-3 chassis Compatible with all Cisco CRS-1 systems: • 16-slot line-card chassis(CRS-16/S) system • 8-slot line card chassis (CRS-8/S) system • 4-slot line card chassis (CRS-4/S) system • CRS-1 Multi-chassis line card chassis system
Software compatibility	Cisco IOS® XR Software Release 3.3.0 or higher for CRS-1 Cisco IOS XR Software Release 4.0.0 or later for CRS-3
Protocols	• Cisco Discovery Protocol • IPv4 and IPv6 addressing • Internet Control Message Protocol (ICMP) • Layer 3 routing protocols, including BGPv4, Open Shortest Path First Version 2 (OSPFv2), OSPFv3, and Intermediate System-to-Intermediate System (IS-IS) Protocol • Multicast forwarding with support for source-based and shared distribution trees and the following protocols: ◦ PIM sparse mode (PIM-SM) ◦ Bidirectional PIM (Bidir-PIM) ◦ PIM Source Specific Multicast (PIM SSM) ◦ Automatic route processing (AutoRP) ◦ IGMP versions 1, 2, and 3 ◦ Multiprotocol BGP (MBGP) ◦ Multicast Source Discovery Protocol (MSDP) • Multiprotocol Label Switching (MPLS): ◦ MPLS Label Distribution Protocol • Route Policy Language (RPL) • Management: ◦ Simple Network Management Protocol (SNMP) ◦ Programmatic interfaces (Extensible Markup Language [XML]) • Security: ◦ Message Digest Algorithm 5 (MD5) ◦ IP Security (IPsec) Protocol ◦ Secure Shell Version 2 (SSHv2) Protocol ◦ Secure FTP (SFTP) ◦ Secure Sockets Layer (SSL)
Connectivity per SMP	• Console port (RJ-45 connector) • Auxiliary port (RJ-45 connector) • One 10/100/1000 Ethernet port (RJ-45 connector)

Feature	Description
Memory per SMP	• 4 GB of route memory per SMP; total of 8 GB of memory per DRP • 64 MB of boot flash memory • 2 MB of nonvolatile RAM (NVRAM) • One 1-GB PCMCIA card (internal) • One 40-GB hard drive
Options	One 1-GB PCMCIA card
Performance	Two dual processor 1.2GHz PowerPC symmetric multiprocessing (SMP) CPU instances
Reliability and availability	Software features: • Cisco Nonstop Forwarding (NSF) • Hot Standby Router Protocol/Virtual Router Redundancy Protocol (HSRP/VRRP) • Online insertion and removal (OIR) • MPLS Fast Reroute (FRR)
MIBs	SNMP framework support: • SNMPv1 • SNMPv2c • SNMPv3 • MIB II, including interface extensions (RFC 1213) • SNMP-FRAMEWORK-MIB • SNMP-TARGET-MIB • SNMP-NOTIFICATION-MIB System management: • CISCO- BULK-FILE-MIB • CISCO-CONFIG-COPY-MIB • CISCO-CONFIG-MAN-MIB • CISCO-FLASH-MIB • CISCO-MEMORY-POOL-MIB • Cisco FTP Client MIB • Cisco Process MIB • Cisco Syslog MIB • CISCO-SYSTEM-MIB • CISCO-CDP-MIB • IF-MIB (RFC 2233/RFC 2863) Quality of service (QoS): • MQC-MIB (Cisco Class-Based QoS MIB) • CISCO-PING-MIB MPLS: • MPLS-LDP-MIB • MPLS-LSR-MIB • MPLS-TE-MIB • SNMP-USM-MIB • SNMP-VACM-MIB Chassis: • ENTITY-MIB (RFC 2737) • CISCO-entity-asset-MIB • CISCO-entity-sensor-MIB • CISCO-FRU-MIB (Cisco-Entity-FRU-Control-MIB) Fabric: • CISCO-Fabric-HFR-MIB • CISCO-Fabric-Mcast-MIB • CISCO-Fabric-Mcast-Appl-MIB Routing protocols: • BGP4-MIB Version 1 • OSPFv1-MIB (RFC 1253) • CISCO-IETF-IP-FORWARDING-MIB • IP-MIB (was RFC 2011-MIB) • TCP-MIB (RFC 2012) • UDP-MIB • CISCO-HSRP-EXT-MIB • CISCO-HSRP-MIB Traps: • RFC 1157 • Authentication • Linkup • Linkdown • Coldstart • Warmstart
Network management	• Enhanced command-line interface (CLI) • XML interface • XML schemas • Craft Works Interface (CWI) • SNMP and MIB support
Programmatic interfaces	XML schema support
Physical dimensions	CRS-DRP-B-CPU: • Weight: 14.25 lb (6.46 kg) • Height: 20.6 in. (52.3 cm) • Width (occupies a single forwarding line card slot): 1.775 in. (4.5 cm) • Depth: 18.6 in. (47.2 cm) CRS-DRP-B-PLIM (DRP PLIM Module): • Weight: 7.25 lb (3.29 kg) • Height: 20.6 in. (52.3 cm) • Width (occupies a single PLIM front card slot): 1.775 in. (4.5 cm) • Depth: 11.2 in. (28.4 cm)

Feature	Description
Power	• CRS-DRP-B-CPU : 216W • CRS-DRP-B-PLIM : 20W

Approvals And Compliance

Table 2 lists compliance and agency approvals for the Cisco CRS-1 DRP.

Table 2. Compliance and Agency Approvals

Feature	Description
Safety standards	• UL/CSA/IEC/EN 60950-1 • AS/NZS 60950
EMI	• FCC Class A • ICES 003 Class A • AS/NZS 3548 Class A • CISPR 22 (EN55022) Class A • VCCI Class A • IEC/EN 61000-3-2: Power-line harmonics • IEC/EN 61000-3-3: Voltage fluctuations and flicker
Immunity (basic standards)	• IEC/EN-61000-4-2: Electrostatic discharge immunity (8-kV contact, 15-kV air) • IEC/EN-61000-4-3: Radiated immunity (10 V/m) • IEC/EN-61000-4-4: Electrical fast transient immunity (2-kV power, 1-kV signal) • IEC/EN-61000-4-5: Surge AC port (4-kV CM, 2-kV DM) • IEC/EN-61000-4-5: Signal ports (1 kV) • IEC/EN-61000-4-5: Surge DC port (1 kV) • IEC/EN-61000-4-6: Immunity to conducted disturbances (10 Vrms) • IEC/EN-61000-4-8: Power frequency magnetic field immunity (30 A/m) • IEC/EN-61000-4-11: Voltage dips, short interruptions, and voltage variations
ETSI and EN	• EN300 386: Telecommunications network equipment (EMC) • EN55022: Information technology equipment (emissions) • EN55024: Information technology equipment (immunity) • EN50082-1/EN-61000-6-1: Generic immunity standard
Network Equipment Building Standards (NEBS)	This product is designed to meet the following requirements (qualification in progress): • SR-3580: NEBS criteria levels (Level 3) • GR-1089-CORE Issue #3: NEBS EMC and safety • GR-63-CORE: NEBS physical protection

Ordering Information

To place an order, visit Cisco Ordering Home Page.

Table 3 provides ordering information for the Cisco CRS-1 DRP.

Table 3. Ordering Information

Part Number	Product Name
CRS-DRP-B(=)	Cisco CRS-1 Distributed Route Processor
CRS-DRP-B-CPU(=)	Cisco CRS-1 Distributed Route Processor CPU Module
CRS-DRP-B-PLIM (=)	Cisco CRS-1 Distributed Route Processor PLIM Module

To Download the Software

To download the Cisco IOS Software, visit Cisco Software Center.

Service and Support

Cisco Systems® offers numerous innovative services programs to accelerate customer success. These programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, visit Cisco Technical Support Services or Cisco Advanced Services.

For More Information

For more information about the Cisco CRS-1 DRP, contact your local Cisco account representative or visit Cisco at http://www.cisco.com/go/crs.

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