Cisco RF Gateway 10 Supervisor Engine V-10GE

Product Overview

The Cisco® RF Gateway 10 Supervisor Engine V-10GE, Figure 1, for the Cisco RF Gateway 10 universal edge quadrature amplitude modulation modulator (U-EQAM) redefines the way aggregation and traffic management features are managed at the edge of the cable network. Specially optimized for the Cisco RF Gateway 10, the Supervisor Engine V-10GE can be deployed in a redundant configuration with automatic failover. It runs the comprehensive feature set available in Cisco IOS® Software Release 12.2 S, with an array of management, Ethernet aggregation, and packet filtering functions -- now all embedded in the carrier-class Cisco RF Gateway 10 platform.

Before, switches and routers had to be externally connected to edge QAMs and configured separately to manage them. As separate elements, switches and routers and edge QAMs provided limited management functionality, and the result has been less-scalable edge solutions. Now, with the integrated Cisco RF Gateway 10 Supervisor Engine V-10GE, the intelligence of the Cisco IP next-generation network (IP NGN) is available for more efficient and scalable packet forwarding and management of line cards in the gateway.

Figure 1. Cisco RF Gateway 10 Supervisor Engine V-10GE

Management of data and video traffic can be split into data plane and control plane processing. The data plane manages the aggregation and forwarding of multiple services to the edge QAM resources (for example, Ethernet switching, routing, aggregation, and filtering). Interactions with control interfaces for video and DOCSIS® are managed by the control plane (for example, setup and tear down of video sessions, creation of voice-over-IP [VoIP] calls, management of high-speed data services, and management of the distribution of packets and environmental factors in the gateway). The aggregation management utility in the supervisor engine allows cable operators to extract detailed information from a single line card on the overall operational status of the entire gateway.

Features and Benefits

Table 1 lists the features and benefits of the Cisco RF Gateway 10 Supervisor Engine V-10GE.

Table 1. Features and Benefits

Feature	Benefit
102 Mpps and 136 Gbps total switching capacity	Ethernet aggregation for edge QAM applications can be conducted directly on the supervisor of the RF Gateway 10, thus saving rack space, reducing the total number of boxes in the network, and providing network architectural flexibility.
Integrated two 10GE ports and four GE ports	Flexible uplink connections accommodate multiple customer network architectures.
Supervisor redundancy support	Carrier class high-availability performance.
Supervisor design from Cisco Catalyst® Series switch supervisor family	Comprehensive feature set from parent platform includes Layer 2 switching, Layer 3 routing, advanced security, and IPv6 support. Continual expansion of feature set from parent platform, with future hardware and software roadmap.
Distributed architecture with control plane terminations on supervisor and data plane terminations on RF line cards	Advanced management of control and data plane processing, optimizes performance, high-availability switchover times, resource utilization, and operational efficiencies.
Operates Cisco IOS software version 12.2S	Common and customized service provider feature set across high-end Cisco switches and routers. Support for end-to-end advanced networking architectures with functional compatibility.

Product Specifications

Table 2 lists the hardware specifications for the Cisco RF Gateway 10 Supervisor Engine V-10GE.

Table 2. Product Specifications

Specification	Value
Physical	Occupies a single supervisor slot in the Cisco RF Gateway 10 chassis
Weight	5.5 lbs (2.5 kg)
Environmental	Operating altitude: –60 to 3000 m
	Storage temperature: –40 to 158°F (–40 to 70°C)
	Operating temperature: 32 to 104°F (0 to 40°C)
	Relative humidity: 10% to 85%, noncondensing
LEDs	System status: green (operational); red (faulty)
	Switch utilization load: 1% to 100% aggregate switching usage
Console port	RJ-45 female
Management port	10/100 BASE-TX Ethernet
Reset button	Switch recessed protected
Synchronous Dynamic RAM (SDRAM)	512 MB
Compact Flash	128 MB configurable
Ethernet Uplink Interfaces	**Value**
Dual supervisors operating in active/standby redundancy mode	Up to four GE and two 10GE per chassis
Single supervisor operating in nonredundant mode	Up to four GEs and two 10GEs per chassis
Small Form Factor Pluggables Supported	
GE interfaces	SFP-GE-S, SFP-GE-L
10GE Interfaces	X2-10GB-SR, X2-10GB-LR

The Cisco RF Gateway 10 Supervisor Engine V-10GE has a very high performance Ethernet switching feature set. Advanced traffic management features include:

- Quality of service (QoS)
- Virtual LANs (VLANs)
- Multiple traffic queuing techniques such as IP differentiated services code points (DSCPs)
- Full-featured traffic classification, marking, and policing

Table 3 lists the software specifications for the Cisco RF Gateway 10 Supervisor Engine V-10GE.

Table 3. Software Specifications

Specification	Value
Total centralized switching capacity	102 Mpps and 136 Gbps
IPv4 routing entries	128000
Access control lists (ACL)	32,000
Switched Port Analyzer (SPAN)	• Two ingress and four egress • SPAN port permits traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe.
High-Availability Features	
High-availability software features	• Route Processor Redundancy (RPR) (warm reboot, nonstateful, line card reset) • Open Shortest Path First (OSPF) fast convergence: incremental shortest path first (SPF) and link-state advertisement (LSA) throttling • 1:N RF line card redundancy management • Rich roadmap of enhanced high-availability features in future software releases including Stateful Switchover (SSO) and In Service Software Upgrade (ISSU)
Multicast Features	
Combination of base Cisco IOS multicast feature set and enhanced edge QAM multicast functionality.	
Multicast	• IP multicast routing protocols: Protocol Independent Multicast (PIM), including sparse mode and dense mode • Source Specific Multicast (SSM) and Any-Source Multicast (ASM) • Internet Group Management Protocol (IGMP)
Multicast routes	32,000
Maximum unique video multicast Sessions	2048 load balanced
Security Features	
The Cisco RF Gateway 10 Supervisor Engine V-10GE has a strong contingent of security features, including TACACS+, Secure Shell (SSH) Protocol, and RADIUS, which enable centralized control of the switch and restrict unauthorized users from altering the configuration; standard and extended ACLs on all ports; 802.1X user authentication and accounting; and Unicast MAC filtering.	
Control plane policing	In hardware
Layer 2 Switching and Layer 3 Routing Features	
The substantial Cisco IOS portfolio of switching and routing features includes high performance hardware-based packet forwarding, a full suite of VLAN features, IPv4, EIGRP, OSPF, IS-IS, RIP, RIP2, and BGP routing protocols, UniDirectional Link Routing (UDLR), and Layer 2 Tunneling Protocol (L2TP).	

Table 4. Management

Table 4 lists the management features of the Cisco RF Gateway 10 Supervisor Engine V-10GE.

Platform Management and SNMP Features	
A feature-rich set of management functions for provisioning and for maintaining and resolving faults	• Single console port and single IP address to manage all system features • Software configuration management, including local and remote storage • Optional compact Flash memory card to store software images for backup and easy software upgrades • Simple Network Management Protocol (SNMP) v1, v2, and v3 instrumentation, delivering comprehensive in-band management • Command-line interface (CLI)–based management console to provide detailed out-of-band management • Show commands for granular monitoring and troubleshooting • Cisco NetFlow statistics • Cisco Discovery Protocol v1, v2 • Network Timing Protocol • Layer 2 traceroute • SNMP MIBs: ◦ Cisco Network Element Management 1.3 compliance ◦ IF-MIB ◦ ENTITY-MIB ◦ DOCS-IF-MIB ◦ DOCS-IF-MCMTS-MIB ◦ DOCS-CABLE-DEVICE-MIB ◦ DTI-MIB ◦ SCTE HMS Video MIB ◦ SCTE HMS QAM MIB

Regulatory Compliance

Table 5 gives compliance and emissions figures for the RF Gateway 10 and its components.

Table 5. Compliance and Emissions for the RF Gateway 10

Specification	Value
Network Equipment Building Standards (NEBS)/European Telecommunications Standards Institute (ETSI)	UL 60950CAN/CSA-C22.2 No. 60950, EN 60950, IEC 60950, TS 001, AS/NZS 3260
EMC	FCC Part 15 (CFR 47) Class A, ICES-003 Class A, EN55022 Class A, AS/NZS CISPR22 Class A, AS/NZS 3548 Class A, VCCI Class A, ETS 300 386, EN 55022, KN22, EN 61000-3-2, EN 61000-3-3
EMI	EN550082-1, EN55024, EN61000-4-2, EN61000-4-3, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-6-1
Safety	GR-1089-Core Level 3, ETS 300 019 Storage Class 1.1, ETS 300 019 Transportation Class 2.3 (pending), ETS 300 019 Stationary Use Class 3.1, ETS 300 386
Industry EMC, safety, and environmental standards	Designed to meet NEBS standard GR-63-Core and GR-1089-Core
Other industry standards	Cisco corporate compliance standards

System Requirements

Table 6 lists the system requirements for the Cisco RF Gateway 10 Supervisor Engine V-10GE.

Table 6. System Requirements for the RF Gateway 10 Supervisor Engine V-10GE

Chassis	Cisco RF Gateway 10 (RFGW-10)
Software	Cisco IOS software 12.2(44) SQ

Ordering Information

Table 7 gives ordering information for the Cisco RF Gateway 10 Supervisor Engine V-10GE. To place an order, visit the Cisco Ordering Homepage. To download software, visit the Cisco Software Center.

Table 7. Ordering Information for the RF Gateway 10 Supervisor Engine V-10GE

Product	Product Name	Product Description
Cisco RFGW Series Supervisors	RFGW-X4516-10GE	RFGW supervisor V-10GE, 2x10GE (X2) and 4x1GE (SFP)
	RFGW-X4516-10GE	RFGW supervisor V-10GE, 2x10GE (X2) and 4x1GE (SFP) Spare
Cisco RFGW Series Supervisor memory options	MEM-C4K-FLD128M	Cat 4500 IOS-based supervisor, compact Flash, 128MB Option
	MEM-C4K-FLD128M=	Cat 4500 IOS-based supervisor, compact Flash, 128MB spare
Cisco RFGW Series transceiver modules	SFP-GE-S	1000BASE-SX short wavelength; with DOM (550m of MMF)
	SFP-GE-L	1000BASE-LX/LH short wavelength; with DOM (10Km on SMF)
	X2-10GB-SR	10GBASE-SR X2 module (26m on MMF)
	X2-10GB-LR	10GBASE-LR X2 module (10Km on SMF)
Cisco RFGW Series spares and accessories	RFGW-SUP-COVER	RFGW Supervisor slot cover
	RFGW-SUP-COVER=	RFGW Supervisor slot cover spare

Service and Support

Using the Cisco lifecycle services approach, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed, by technology and by network complexity, to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

For More Information

For more information about the Cisco RF Gateway 10 Supervisor Engine V-10GE, visit http://www.cisco.com/en/US/products/ps8360/index.html or contact your local account representative.

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