

8660 Smart Router

Reliable, Cost-Efficient Controller and Aggregation Site Router Providing Switching Capacity up to 300 Gbps

The Coriant® 8660 Smart Router is an IP/MPLS-based router designed for carriers' most demanding requirements with full-feature support for 2G, 3G, and the mobile evolution toward LTE along with the requirements of Fixed Mobile Convergence (FMC). With its distributed switching and modular architecture, the 8660 Smart Router offers low initial cost of deployment in a highly scalability platform. The 8660 Smart Router can be deployed in all locations between the core network and local exchange sites in a mobile network, but it is typically co-located with controllers and gateways. The main applications of the 8660 Smart Router are managing traffic aggregation in LTE, 3G, and 2G mobile networks and delivering Ethernet and IP VPN services.

LEVERAGING DISTRIBUTED FORWARDING ARCHITECTURE

The architecture of the 8660 Smart Router is based on a distributed forwarding design and a fully passive backplane. This design provides a low entry cost even for small configurations. The 8660 Smart Router fits in a standard 19-inch rack and can be equipped with a maximum of two Control and DC Power Cards (CDCs) and 12 Ethernet Line Cards (ELC1s) or Interface Module Concentrators (IFCs) that contain two Interface Modules (IFMs). A wide selection of interface modules can support a mixture of protocols including IP, MPLS, Ethernet, ATM, Frame Relay, and TDM. The integrated CDC provides management, routing, signaling, timing, and powering for the 8660 Smart Router.

OFFERING A WIDE SELECTION OF INTERFACES

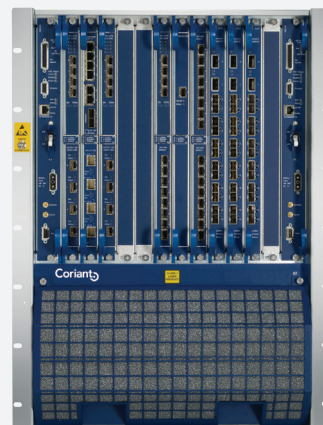
The 8660 Smart Router supports various interfaces from channelized TDM and POS to Ethernet and offers the full redundancy needed in carrier networks. With the combination of the Power Input Modules (PIMs) and ELC1s, the bi-directional switching capacity of the 8660 Smart Router is 300 Gbps. The platform provides the latest QoS-aware bandwidth control, queuing, policing, and shaping techniques. The 8660 Smart Router provides full element and network-level redundancy functionality while delivering real-time voice and video, QoS-aware data, and best-effort services through a wireless or wireline infrastructure.

SUPPORTING ROBUST SYNCHRONIZATION

The synchronization capabilities of the 8660 Smart Router are essential for LTE networks. In addition to frequency synchronization, the 8660 Smart Router supports 1588 phase synchronization that is required by LTE-A and LTE-TDD along with 5G applications in the future. Phase synchronization can be provided using the innovative Coriant® Integrated GPS (SNSS) SFP receiver supported by the 8660 Smart Router. The integrated features of the 8660 Smart Router also enable simple migration to phase synchronization. The 8660 Smart Router multicast capabilities support applications such as IPTV and eMBMS broadcast delivery.

BENEFITS OF THE CORIANT® 8660 SMART ROUTER

- **Support all-IP mobile and fixed networks** with managed traffic aggregation and deliver Ethernet and IP VPN services
- **Provide full-duplex switching capacity of 300 Gbps**
- **Enable flexible LTE network architectures**
- **Reduce operational expenses** with intelligent network management
- **Deploy a range of synchronization options**
- **Scale as required** to deliver a cost-efficient solution even for small configurations
- **Provide full element and network-level redundancy** functionality



The Coriant® Smart Router Series

The Smart Router series offers versatile and scalable solutions for mobile backhaul from small aggregation sites to controller and gateway sites. In addition, Smart Routers serve fixed and mobile convergence and cloud computing networking needs. These solutions are designed to meet the ever-growing requirements of data hungry mobile and enterprise users. All of the Smart Routers are LTE-ready and provide an extensive Ethernet and IP/MPLS feature set. Simultaneous support for multiservice applications in access and aggregation networks protects earlier network investments. The Smart Router product family is supported by the 8000 INM, which is an easy to use end-to-end network management solution. The 8000 INM minimizes operational and maintenance costs and scales up to tens of thousands of network elements.

IMPLEMENTING AN OPEN, PROGRAMMABLE, AUTOMATED SDN SOLUTION

The 8660 Smart Router is fully supported by the Coriant Transcend™ SDN Packet Controller. The Packet Controller is an integral component of the overall Coriant Transcend™ SDN Solution suite, a modular SDN software suite that combines the benefits of open, programmable, and automated multi-layer (Layer 0-3) SDN architecture and a proven portfolio of IP/MPLS edge routing and packet optical transport solutions to enable dynamic, end-to-end network control.

TECHNICAL SPECIFICATIONS

Physical Dimensions

- 425 x 642 x 357 mm / 16.73 x 25.28 x 14.06 in (W x H x D)
- Width with the integrated side adapter front flange: 483 mm / 19.02 in
- Standard 19-inch, 23-inch, or ETSI 600 mm rack mounting
- Weight 26.2 kg / 57.76 lb without cards, 27.7 kg / 61.07 lb with Power Input Modules (PIMs)

Power and Cooling

- -48 Vdc power feed with optional protection
- Power consumption: maximum 2200 W (typical value dependent on the element configuration)
- 6 fans in 3 modules, fan speed controlled by control cards

Architecture

- Hardware-based forwarding
- Distributed switching architecture

Forwarding Plane

- IPv4 and IPv6 routing
- IPv4 multicast
- MPLS switching (LSR and LER)
- Ethernet MAC switching

Functionality

- IP VPN (RFC 4364)
- 6vPE support
- VPLS and H-VPLS
- Integrated Routing and Bridging

- Ethernet/VLAN, SAToP, CESoPSN, ATM, Frame Relay, and HDLC pseudowires
- Single and multi-segment pseudowires
- 802.1ad QinQ
- Seamless MPLS
- MPLS-TP Bidirectional LSP
- MPLS-TP 1:1 Linear Protection
- MPLS-TP OAM
- TDM cross connection
- ATM VP/VC switching
- ATM cell concatenation
- ATM IMA
- MC / ML-PPP, PPPmux
- Y.1731 frame loss, frame delay, and frame delay variation measurement
- IEEE 802.1ag Ethernet OAM loopback, continuity check, ping, and link trace
- IP header compression
- Two Way Active Measurement Protocol (TWAMP)
- BFD (Static routes, OSPF, ISIS, RSVP-TE)

Forwarding Capacity

- 25 Gbps per ELC1
- 3.5 Gbps per IFC
- 300 Gbps with fully equipped system

Chassis Configuration

- Two slots for CDCs (CDC1-A, CDC1-B or CDC2-B)
- Twelve slots for line cards (ELC1, IFC1-A, IFC1-B, IFC2-B)
- Two slots for optional Power Input Modules (PIM)

Interface Modules (IFM)

- 8-Port Ethernet 10/100/1000BASE-TX R2 IFM
- 8-Port Ethernet 100/1000BASE-X R2 IFM
- 1-Port 10GBASE-R R2 IFM (3 Gbps)
- 2+6-Port Ethernet 10/100/1000BASE-COMBO IFM
- 8-Port STM-1/OC-3 POS IFM
- 4-Port STM-4/OC-12 POS IFM
- 1-Port STM-16/OC-48 POS IFM
- 4-Port STM-1/OC-3 ATM IFM
- 4-Port chSTM-1/OC-3 Multiservice IFM
- 24-Port chE1/T1 Multiservice IFM

Resiliency and Load Balancing

- 1+1 CDC protection (DC power, control and timing)
- Non-stop forwarding with control plane redundancy and graceful restart
- 1+1 PIM protection (DC power)
- Switching distributed to all line cards
- 1+1 MSP/APS protection
- Ethernet Link Protection
- Ethernet Link Aggregation
- 1:1 RSVP-TE LSP protection
- Fast Reroute (FRR)
- Pseudowire redundancy (Ethernet, ATM, TDM)
- VRRP
- IP load balancing (Equal Cost Multipath [ECMP])
- IPv4 and IP VPN load balancing to RSVP-TE tunnels

TECHNICAL SPECIFICATIONS

Security

- Wire-speed IP Access Control Lists
- Denial of service protection
- RADIUS and TACACS+ authentication and accounting
- SSH-2 for FTP and Telnet
- MD5, SHA-1 authentication

Synchronization

- ITU-T [G.813] option 1
- ITU-T [G.8262]
- Telcordia [GR-1244] Stratum-3
- Station Clock Input and Output ports on CDC
- Pulse-per-Second (PPS) input and output (CDC2)
- Time-of-Day (ToD) input (CDC2)
- E1/T1, SDH/SONET line synchronization
- Synchronous Ethernet
- SSM over Ethernet [G.8264]
- Adaptive synchronization from SAToP and CESoPSN pseudowires
- IEEE 1588v2 Slave Clock for frequency sync
- IEEE 1588v2 Boundary Clock for phase sync
- SyncE assist
- Support for the Integrated GPS (GNSS) SFP receiver

Routing and MPLS Label Distribution

Protocols

- OSPF-TE, ISIS-TE, BGP, and MP-BGP
- LDP, RSVP-TE
- PIM-SM and PIM-SSM

Traffic Management

- DiffServ support for up to 7 traffic classes
- DiffServ aware MPLS Traffic Engineering (DS-TE)
- IEEE 802.1P/Q mapping to IP or MPLS
- Policing and shaping
- Port, VLAN group, and VLAN shaping
- RED/WRED queue management
- Strict Priority and WFQ scheduling
- Access Control Lists (ACL)
- ATM service categories: CBR, rt-VBR, nrt-VBR, UBR+, UBR
- ATM VC queuing/shaping

Management

- CLI with SSH2, FTP with SSH2
- SNMPv1 and SNMPv2 monitoring
- Coriant® 8000 Intelligent Network Manager (INM)
- Coriant Transcend™ SDN Packet Controller

Standards

- Safety: EN 60950-1:2006 and IEC60950-1:2005
- EMC:
 - EN 300 386:2008
 - FCC 47 CFR Part 15, Subpart B, Class A
- RTTE Directive 1999/5/EC
- NEBS level 3 compliance: SR-3580*
- GR-1089-CORE: Issue 3, October 2002*
- GR-63-CORE: Issue 2, April 2002 *
- MEF 9 and 14 compliance

Environmental Conditions

- Storage: ETSI EN 300 019-1-1, Class 1.1
 - Temperature: -5°C to 45°C / 23°F to 113°F
- Transportation: ETSI EN 300 019-1-2, Class 2.3
 - Temperature: -40°C to 70°C / -40°F to 158°F
- Operating conditions: ETSI EN 300 019-1-3, Class 3.2 (non-condensing)
 - Temperature: -5°C to 45°C / 23°F to 113°F
 - Relative humidity: 5% to 95%

** Tested to be compliant with NEBS Level 3 according to GR-1089-CORE Issue 3 and GR-63-CORE Issue 2 in 2006*

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