8609 Smart Router
Modular Access Router with Extensive Switching and Interface Capacity for LTE and Multiservice Support

The Coriant® 8609 Smart Router provides a cost-efficient, seamless way to convert a mobile access network from an E1/T1 TDM network to an Ethernet-based packet network without the need to update any of the radio access network equipment. Versatile service capabilities of the 8609 Smart Router including Ethernet, TDM, ATM, and HDLC connectivity along with IP VPN, MPLS switching, IP routing, and VLAN switching enable the migration of 3G ATM and 2G TDM and Ethernet or IP-based networks into a single network infrastructure. In addition to these capabilities, the compact 1RU 8609 Smart Router can be installed at sites where rack space is limited. The 8609 Smart Router is ideal for the access network and cell sites that handle large amounts of mobile traffic.

DELIVERING OPTIMAL FEATURES FOR CELL AND AGGREGATION SITES
The 8609 Smart Router has a packet-based forwarding architecture with QoS awareness enabling network optimization for voice and data services in LTE and 3G networks. The advanced QoS features provide the differentiation of real-time voice and video services from premium and best effort data services. The Ethernet OAM, Two Way Active Measurement Protocol (TWAMP), and Packet Loop Test features, which are all part of the Coriant® Smart Router product portfolio, in conjunction with the Coriant® 8000 Intelligent Network Manager (INM), help to analyze delay, jitter, throughput, and connectivity parameters. Environmentally hardened and optimal for cell and aggregation sites, the 8609 Smart Router offers 12 fixed Gigabit Ethernet ports and 2 slots for interface modules providing throughput up to 7.5 Gbps and 5.5 Gbps with Simple IMIX packet size distribution.

IMPLEMENTING AN OPEN, PROGRAMMABLE, AUTOMATED SDN SOLUTION
The 8609 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.

SUPPORTING ROBUST SYNCHRONIZATION
The 8609 Smart Router supports a high quality Oven Controlled Crystal Oscillator (OCXO), which provides excellent temperature stability for IEEE 1588v2 and adaptive timing recovery. The OCXO also offers a highly stable node clock holdover. In addition to adaptive timing and IEEE 1588v2 clock recovery mechanisms, node timing can be obtained from a BITS or GPS source, any PDH, SONET/SDH interface, or any of the synchronous Ethernet interfaces.
**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.

The 8609 Smart Router supports the transition from TDM to packet synchronization in a controlled way by verifying the packet synchronization performance with professional tools.

By eliminating the need for separate E1/T1s used only for synchronization at every cell site, the 8609 Smart Router provides a cost-optimized solution independent from the legacy network. In addition, the 8609 Smart Router supports IEEE 1588v2 Boundary Clock for phase synchronization, which is required for LTE Time-Division Duplex (LTE-TDD) and LTE Advanced (LTE-A). Phase synchronization can also be provided using the innovative Coriant® Integrated GPS (GNSS) SFP receiver supported by the 8609 Smart Router.

### TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Physical Dimensions</th>
<th>• 441 x 44 x 300 mm / 17.36 x 1.73 x 11.81 in (W x H x D)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Standard 19-inch, 23-inch, or ETSI 600 mm rack mounting</td>
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<tr>
<td></td>
<td>• 3.0 kg / 6.6 lb without fan, power, and line modules</td>
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<tr>
<td></td>
<td>• 1RU high</td>
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<tr>
<td>Power and Cooling</td>
<td>• Power feed options</td>
</tr>
<tr>
<td></td>
<td>• User-changeable dual feed wide range (-48 Vdc to +24 Vdc) power module (one per element)</td>
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<tr>
<td></td>
<td>• Hot swappable single feed -48 Vdc power module (up to 2 per element)</td>
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<tr>
<td></td>
<td>• Power consumption: typical 70 W, maximum 100 W</td>
</tr>
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<td>• Hot swappable air filter and fan module</td>
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<tr>
<td>Forwarding Plane</td>
<td>• IPv4 and IPv6 routing</td>
</tr>
<tr>
<td></td>
<td>• MPLS switching (LSR and LER)</td>
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<td></td>
<td>• Ethernet MAC switching</td>
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<tr>
<td>Functionality</td>
<td>• IP VPN (RFC 4364)</td>
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<td></td>
<td>• 6vPE support</td>
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<tr>
<td></td>
<td>• Ethernet/VLAN, SAToP, CESoPSN, ATM, and HDLC pseudowires</td>
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<td></td>
<td>• Single and multi-segment pseudowires</td>
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</table>

### Forwarding Capacity

- Up to 7.5 Gbps, 5.5 Gbps with Simple IMIX

### Chassis Configuration

- Two slots for power feed modules
- Two slots for user-changeable Line Modules (LMs)
- Twelve fixed Gigabit Ethernet Ports: four 10BASE-T/100BASE-TX/1000BASE-T and eight 100/1000BASE-X SFP

### Security

- L3/L4 Access Control Lists
- Denial of service protection
- RADIUS and TACACS+ authentication and accounting
- SSH-2 for FTP and Telnet
- MD5, SHA-1 authentication

### Line Modules (LM)

- 8 x chE1/chT1 LM
- 8 x 10/100BASE-TX LM

### Resiliency and Load Balancing

- Ethernet Link Aggregation
- 1:1 RSVP-TE LSP protection
- Fast Reroute (FRR)
- Pseudowire redundancy (Ethernet, TDM)
- IP load balancing (Equal Cost Multipath [ECMP])
- BGP multipath for load balancing
- IPv4 and IP VPN load balancing to RSVP-TE tunnels

### Forwarding Plane

- MPLS-TP Bidirectional LSP
- MPLS-TP 1:1 Linear Protection
- MPLS-TP OAM
- 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
- Two Way Active Measurement Protocol (TWAMP)
- BFD (Static routes, OSPF, ISIS, RSVP-TE)
- IP Multicast

### Functionality

- IP VPN (RFC 4364)
- 6vPE support
- Ethernet/VLAN, SAToP, CESoPSN, ATM, and HDLC pseudowires
- Single and multi-segment pseudowires

### Physical Dimensions

- 441 x 44 x 300 mm / 17.36 x 1.73 x 11.81 in (W x H x D)
- Standard 19-inch, 23-inch, or ETSI 600 mm rack mounting
- 3.0 kg / 6.6 lb without fan, power, and line modules
- 1RU high

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- Power feed options
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- Power consumption: typical 70 W, maximum 100 W
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### Forwarding Plane

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

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- IP VPN (RFC 4364)
- 6vPE support
- Ethernet/VLAN, SAToP, CESoPSN, ATM, and HDLC pseudowires
- Single and multi-segment pseudowires

### Forwarding Plane

- 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
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<tr>
<th><strong>Synchronization</strong></th>
<th><strong>Traffic Management</strong></th>
<th><strong>Standards</strong></th>
</tr>
</thead>
</table>
| • ITU-T [G.813] option 1  
• ITU-T [G.8262]  
• Telcordia [GR-1244] Stratum 3  
• Station Clock Input and Output ports  
• Pulse per Second (PPS) input and output  
• Time-of-Day input  
• E1/T1 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  | • 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  
• Access Control Lists (ACL)  
• ATM service categories: CBR, rt-VBR, nrt-VBR, UBR+, UBR  
• ATM VC queuing/shaping  | • 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  |

<table>
<thead>
<tr>
<th><strong>Routing and MPLS Label Distribution Protocols</strong></th>
<th><strong>Management</strong></th>
<th><strong>Environmental Conditions</strong></th>
</tr>
</thead>
</table>
| • OSPF-TE, ISIS-TE, BGP, and MP-BGP  
• LDP, RSVP-TE  
• PIM-SM and PIM-SSM | • CLI with SSH2, FTP with SSH2  
• SNMPv1 and SNMPv2 monitoring  
• Coriant® 8000 Intelligent Network Manager (INM)  
• Coriant Transcend™ SDN Packet Controller  
• Smart Router autoconfiguration based on DHCP client  
• RADIUS and TACACS+ authentication and accounting | • 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: -40°C to 65°C / -40°F to 149°F  
  • Relative humidity: 5% to 95%  
• Minimum cold boot-up temperature: -20°C / -4°F |

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