Sonus Diameter Signaling Controller (DSC) and SS7 Solutions

The current status of today's telecommunications signaling network can be described by two important characteristics, the maturity of the Signaling System 7 (SS7) Network and the evolution from SS7 signaling to Diameter signaling, each providing benefits and challenges. Sonus addresses these challenges by providing cost-effective solutions to the legacy SS7 network while enabling an evolutionary path to LTE and the Cloud.

Sonus protects operators' investments by combining Signaling Transfer Point (STP) and Diameter Signaling Controller (DSC) functionality on the same signaling routing platform. This gives mobile operators a simple yet elegant solution to address the dilemma of supporting the legacy SS7 networks while migrating to LTE/EPC/Diameter networks—protecting capital investments, easing the transition to next-generation networks, reducing operational impact and providing support for the SS7 network as long as required.

The demand for mobile networks is expected to grow exponentially due to the explosion of mobile broadband and the Internet of Things (IOT) services consumed by a vast array of devices. Diameter signaling messages in mobile networks are expected to grow correspondingly. Smartphones alone generate several Diameter signaling messages each time they access an application, download data, or roam on a different network, and even when they're simply turned on and off. The Sonus family of DSCs is designed to address the performance, capacity, scalability and roaming needs of the mobile networks for this rapidly expanding market.

The DSC can be combined with the Sonus Session Border Controller (SBC) and Policy Server (PSX) to create more complete, cloud-ready VoLTE and unified Policy Control and Signaling solutions. In addition, the Sonus Insight Element Management System (EMS) is integrated with DSC to provide comprehensive management and control of the Signaling solution

Sonus DSC Diameter Functionality

Sonus DSCs allow network planners and architects to flexibly deploy only the specific features and functionality needed for their network or service. Each Diameter routing feature can be deployed individually or combined within the same device for network customization. Sonus DSCs provide all functionality required for both core and edge within IMS and LTE networks, including:

- Diameter Routing Agent (DRA)
- Diameter Edge Agent (DEA)
- Subscription Location Function (SLF)
- Interworking Function (IWF)
- Transport Security
- Advanced Routing
- Topology Hiding
- Segmented Virtual Routing

Sonus DSC Signaling Transfer Point (STP) Functionality

Sonus DSCs deliver all the standard features and functionality expected of an STP solution while also offering extended capabilities and features, such as:

- Multiple Protocol Support
- Global Title Translation (GTT)
- Gateway Screening (GWS)
- Signaling Gateway (SG)
- SS7 Migration Tools
- Point Code Emulation (PCE)™
- Onboard Protocol Conversion
- Integrated Number Portability
- TDM, ATM and IP(SIGTRAN) Signaling Interfaces

Sonus Diameter Signaling Controller (DSC) Portfolio

The Sonus portfolio of Diameter Signaling Controller (DSCs)—including the hardware based Sonus DSC 8000 and the virtualized Sonus DSC SWe (Software edition)—is designed to address the performance, capacity, scalability and roaming needs of legacy SS7 and mobile networks for the rapidly growing mobile market. The portfolio is architected to deliver critical functions for a wide variety of networks and services. A common DSC software base delivers the same features and functionality across the entire Sonus DSC portfolio, giving operators the flexibility to deploy the platform that best meets business needs, maximizes capital expenditure (CapEx) investments and minimizes operational expenses (OpEx) such as integration training.

Sonus DSC 8000

The Sonus DSC 8000, based on the Enhanced MicroTCA specification along with high-performance processing and high-speed IP-based fabric switching, is a highly tuned carrier-grade platform for Diameter routing and SS7 applications.

Key features of the DSC 8000 include:

- µTCA open standards SU platform
  - Rear I/O connections as defined by MicroTCA.4 standard
- High throughput
  - 40GbE aggregated redundant uplinks
- TDM 56/64 kbps SS7, ATM and Annex-A HSL links, and Sigtran (M2PA, M3UA/SUA and M2UA) connections
- IPv6 Ready
- 99.999% availability
  - Redundant MCH modules for platform monitoring and management (power, sanity, etc.)
  - Redundant Ethernet switches providing two 10GbE and two 1GbE connections per blade
    - Redundant power supplies
    - All critical components are hot-swappable (power supplies, blades, fans)
    - Telco alarms for critical, major, minor
    - Telco clock distribution

The DSC 8000 is also available in multi-shelf configuration to provide extended scale and without the overhead of managing additional network nodes. This flexible scale and configuration is key for today's fast paced business environment with acquisitions, consolidation and service expansion.

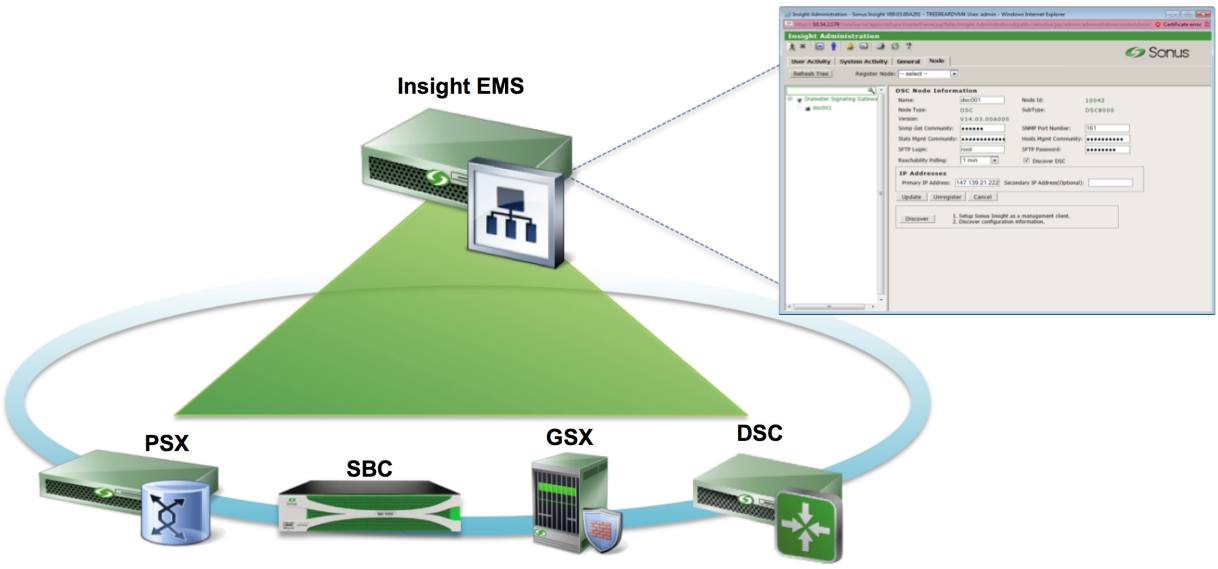
Sonus DSC SWe

The importance of software-defined networking (SDN) and network functions virtualization (NFV) is increasing in today's next-generation and Cloud networks. To leverage the benefits of NFV, Sonus separated its field-proven Diameter and STP SS7 software from the DSC 8000 hardware, and designed it to operate on industry-standard commercial off-the-shelf (COTS) servers. This allows operators to rapidly deploy DSC, STP, and Diameter features and functionalities with greater flexibility in all IP-based network.

The Sonus DSC SWe pulls legacy SS7 networks forward into a cloud-centric environment via NFV. It is designed to operate in an orchestrated cloud deployment, bringing flexibility and efficiency to the network operator. With the DSC SWe, Sonus delivers a cloud-optimized signaling solution.

Integration with Sonus Porfolio

Sonus' comprehensive Service Provider solutions includes DSC, PSX and SBC. The SBC and DSC are used together in VoLTE and IMS solutions to provide an all-IP based voice offering that includes HD voice. The PSX and DSC are integrated into Unified Policy and Signaling solution to consolidate legacy to next gen DB-based Signaling solutions. This allows operators to make investments today that can be used in future all-IP Service offerings. The Sonus Insight EMS has been deployed by Service Providers for over ten years and now includes the support for the DSC product family.



Technical Specifications

Specification	DSC 8000	DSC SWe
IETF RFC 6733 "Diameter Base Protocol"	✔	✔
3GPP • 3GPP Diameter Agent Support: DRA, IWF TS.23.203 • TS.29.213 • TR.29.909 • TS.29.305	✔	✔ No PCRF load balancing
STP • ITU-T Q.700 to Q.709 - Signalling System Number 7 (SS7) • GR-82-CORE- Signaling Transfer Point (STP) Generic Requirements • GR-1272-CORE - Gateway Signaling Transfer Point (GSTP) Local Message Screening Test Capability Generic Requirements • GR-246-CORE - Telcordia Technologies Specification of Signalling System Number 7 • GR-815-CORE - Generic Requirements For Network Element/Network System (NE/NS) Security • ITU-TQ.752	✔	✔
GSMA • GSMA Diameter Agent Support: DEA • GSMA PDR IR.88 "LTE Roaming Guidelines" GSMA PDR IR.33 "GPRS Roaming Guidelines"	✔	✔
MTP Specifications • ITU-T Q.700 through Q.707 • ITU-T Q.703 Annex A • ANSI T1.111-1992 Message Transfer Part GR246-Core T1.111 (Telcordia) • TTC JT-Q704 • JT-Q707	✔	✔ No TDM or ATM links

SCCP Specifications
• ITU-T Q.711 through Q.719
  • Connectionless: Class 0 and 1
  • Connection-Oriented: Class 2
• ETSI ETS 300 589
• ANSI T1.112
• SCTP: RFC 2960, RFC 3309, RFC 4960
• M2PA: RFC4165
• M2UA: RFC 3331
• M3UA: RFC 4666
• SUA: RFC 3868
	✔	✔

ITU HSL • ITU-T Q.2100 • Q.2110, Q.2140 • Q.2144 • Q.2210 - HSL (ATM over T1 or E1)	✔	

Specification	DSC 8000	DSC SWe
System	Physical Dimension: • 17.5" w X 14" h X 17.4" d • 443mm w X 355mm h X 442mm d • Weight: 39lbs / 36kg • Mounting: front Compliance: • ANSI NFPA 70: National Electrical Code (NEC) • Article 110.26 - Spaces About Electrical Equipment • Article 110.27 - Guarding • Article 250 - Grounding and Bonding • GR-63-CORE- NEBS Requirements: Physical Protection • GR-487-CORE - Generic Requirements for Electronic Equipment Cabinets • GR-1089-CORE (Type 2 or Type 4) - Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment	Server Hardware: Two Virtual Machine Containers supporting the following for Diameter only or SS7 only. • 4 cores; 2GHz or higher • 5GB of RAM • 8 virtual NICs (2-MGMT, 2 HA, and 4 packet ports) • 65GB hard disk space Two Virtual Machine Containers supporting the following for SS7 and Diameter: • 8 cores; 2GHz or higher • 5GB of RAM • 8 virtual NICs (2-MGMT, 2 HA, and 4 packet ports) • 65GB hard disk space
Hypervisors		• VMWare vSphere ESXi 6.0 or higher • KVM 0.9.4-23 or higher
Openstack		• Mitaka

About Sonus Networks

Sonus enables and secures real-time communications so the world's leading service providers and enterprises can embrace the next generation of SIP and 4G/LTE solutions, including VoIP, video, instant messaging, and online collaboration. With customers in more than 50 countries and nearly two decades of experience, Sonus offers a complete portfolio of hardware-based and virtualized Session Border Controllers (SBCs), Diameter Signaling Controllers (DSCs), policy/routing servers, and media and signaling gateways. For more information, visit www.sonus.net or call 1-855-GO-SONUS. Sonus is a registered trademark of Sonus Networks, Inc. All other company and product names may be trademarks of the respective companies with which they are associated.

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