Ribbon STP, DSC, and SCP/SEPP Solutions

As the telecommunications environment evolves from PSTN to 3G, 4G, and 5G, the Ribbon DSC protects operators' investments by providing a single signaling routing infrastructure for all networks and interworking with legacy equipment.

Telecommunications signaling networks are transitioning from SS7 (used in PSTN and 3G) to Diameter (used in 4G) to https (used in 5G). Ribbon Communications provides cost-effective solutions for this transition, enabling operators to protect their SS7 investments and evolve to 4G and 5G networks.

Ribbon protects operators' investments by combining Signaling Transfer Point (STP), Diameter Signaling Controller(DSC), 5G Security Edge Protection Proxy (SEPP), and Service Communication Proxy (SCP) functionality on a single 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/5G 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 Ribbon 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 Ribbon Session Border Controller (SBC) and Policy Server (PSX) to create more complete, cloud-native VoLTE and unified Policy Control and Signaling solutions. In addition, the Ribbon Element Management System (EMS) is integrated with DSC to provide comprehensive management and control of the Signaling solution.

Ribbon DSC Diameter Functionality

Ribbon 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 cus- tomization. Ribbon 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)
- Routing Clusters
- Transport Security
- Advanced Routing
- Topology Hiding
- Segmented Virtual Routing

Ribbon DSC Signaling Transfer Point (STP) Functionality

Ribbon DSC is a Tier 1 fully featured and robust STP, 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
- TDM, ATM and IP(SIGTRAN) Signaling Interfaces

Ribbon DSC SCP/SEPP Functionality

Ribbon DSCs deliver full featured SEPP and SCP functionality for the expanding 5G network including:

- Multiple Protocol Support
- Simplification of mesh network architecture
- Monitoring and troubleshooting
- Customized routing and message manipulation
- Security hub
- Network Firewall

Ribbon Diameter Signaling Controller (DSC) Portfolio

The Ribbon portfolio of Diameter Signaling Controller (DSCs) including the hardware based Ribbon DSC 8000 and the virtualized or cloud deployed Ribbon 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 Ribbon DSC portfolio, giving operators the flexibility to deploy the platform that best meets business needs, maximizes return on capital expenditure (CapEx) investments and minimizes operational expenses (OpEx) such as integration training.

Ribbon DSC SWe

The importance of software-defined networking (SDN), network functions virtualization (NFV), and cloud deployment is increasing in today's next-generation and Cloud networks. To leverage the benefits of NFV, Ribbon 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 or on Google Cloud Platform.
This allows operators to rapidly deploy DSC, STP, and SCP/SEPP features and functionalities with greater flexibility in all IP-based network.

The Ribbon 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, Ribbon delivers a cloud-native signaling solution.

Cloud-native DSC

Taking a monolithic architecture from dedicated hardware and making it available as virtualized version is not enough to fit seamlessly into today's network operator clouds. Ribbon' DSC SWe is designed with true microservices architecture that allows different components to scale interdependently.

Cloud-native portions of the DSC SWe include:

• Integration with 3rd party Virtual Infrastructure Management for OpenStack, VMware, and Google Cloud Platform.
• VNF life cycle management
• Cloud-native management interfaces via REST APIs
• Geographic redundancy.
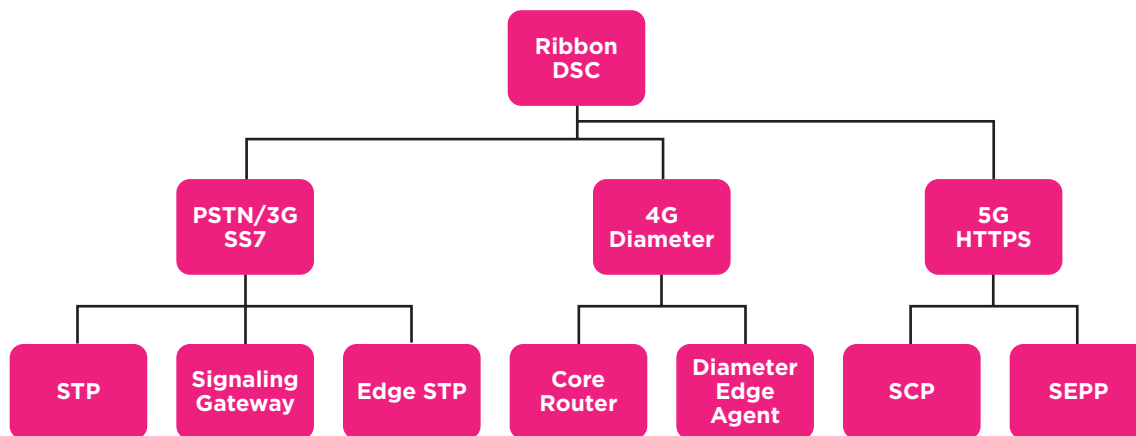
Ribbon DSC 8000

The Ribbon DSC 8000, based on the Enhanced MicroTCA speci-fication 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.
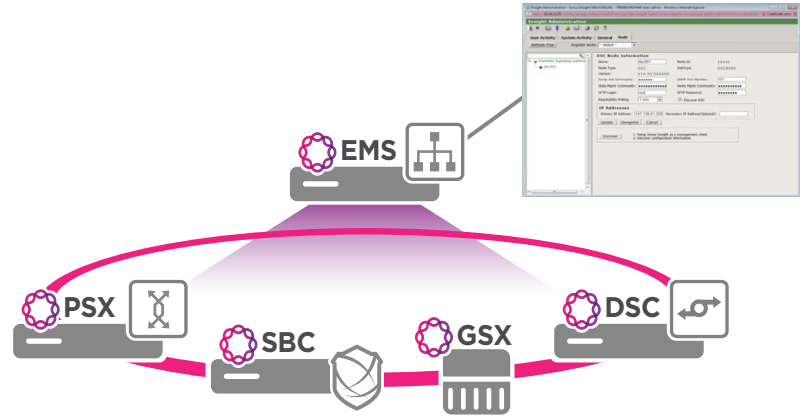
Key features of the DSC 8000 include:

- µTCA open standards SU platform
    - Rear I/0 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 acquisi-tions, consolidation and service expansion.

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Integration with Ribbon Porfolio

Ribbon's 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 solu- tion to consolidate legacy to next gen DB-based Signaling solutions. This al-lows operators to make investments today that can be used in future all-IP Service offerings. The Ribbon EMS has been deployed by Service Providers for over ten years and now includes the support for the DSC product family.

Technical Specifications

Specifications	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 • TS 29.002	√	√
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" • GSMA IR.82, SS7 attacks • GSMA Diameter PRD attacks • GSMA FS.19 Diameter Roaming Security	√	√

Technical Specifications

Specifications	DSC 8000	DSC SWe
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, RFC 6096, RFC7053 • 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)	√	
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 Telecom- munications 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. • A8 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		• Newton

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About Ribbon Communications

Ribbon is a company with two decades of leadership in real-time communications. Built on world class technology and intellectual property, Ribbon delivers intelligent, secure, embedded real-time communications for today's world. The company transforms fixed, mobile and enterprise networks from legacy environments to secure IP and cloud-based architectures, enabling highly productive communications for consumers and businesses. With locations in 28 countries around the globe, Ribbon's innovative, market-leading portfolio empowers service providers and enterprises with rapid service creation in a fully virtualized environment. The company's Kandy Communications Platform as a Service (CPaaS) delivers a comprehensive set of advanced embedded communications capabilities that enables this transformation.

To learn more visit RibbonCommunications.com

Contact Us   Contact us to learn more about Ribbon solutions.