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# 7850 VIRTUALIZED SERVICES GATEWAY

**Highlights**

- Ultra-high-density 10 and 40 Gigabit Ethernet (GE) switch providing VTEP gateway, IP routing and top-of-rack functionality for virtualized and non-virtualized datacenter environments
- Industry-leading 10GE density of 96 ports in a compact 1RU form factor, saving valuable datacenter rack space
- Highly efficient power and cooling, with redundant power supplies and options for back-to-front and front-to-back airflow

The Nuage Networks™ 7850 Virtualized Services Gateway (VSG) is the industry's leading 1RU datacenter gateway, supporting Software-Defined Networking (SDN) principles across Layer 2, Layer 3 and Layer 4.

The high-density hardware-based VXLAN gateway functionality of the 7850 VSG incorporates non-virtualized (bare metal) and virtualized servers into an unrestricted datacenter environment as part of the Nuage Networks Virtualized Services Platform (VSP) solution.

Purpose-built for the demanding requirements of datacenters and cloud services, the 7850 VSG delivers ultra high-density performance with a fixed configuration of 32 10GE ports and 16 40GE ports supporting a wire-rate forwarding capacity of 1.92 Tb/s (half duplex).

Flexibility is provided with the 40GE ports supporting physical separation to 4 x 10GE via breakout cables, making the 7850 VSG the leading density 1RU form-factor gateway with support for up to 96 10GE physical ports.

Additionally, the 7850 VSG provides the option to host the Nuage Networks VSP's Virtualized Services Controller (VSC). This flexibility makes it possible to position the SDN controller functionality close to the compute assets within the datacenter.

Front

Back

## Features

**Industry leading density**

At 96 ports, the Nuage Networks 7850 VSG provides the industry's highest 10GE port density in a 1RU gateway. Support includes 1GE (via SFP), 10GE (SFP+) and 40GE (QSFP+).

**Proven operating system**

Operating system functionality is provided with the implementation of the award-winning and widely deployed Nokia Service Router Operating System (SR-OS). SR-OS has been implemented by leading service providers worldwide and delivers a robust, scalable and interoperable foundation proven in the world's largest IP networks. SR-OS provides full functionality across Layer 2, Layer 3 and Layer 4 on the 7850 VSG, with support for the leading IP protocols including MP-BGP, Ethernet protocols including VLAN and VXLAN, and advanced security via ACLs and QoS levels.

**Operational efficiency**

The 7850 VSG supports full configuration and reporting using SNMPv3 to the Nokia 5620 Service Aware Manager (SAM) or third-party network management systems. Local configuration is provided via a console with out-of-bound management provided over a dedicated Ethernet port.

**Gateway functions**

Support for both fully virtualized and non-virtualized compute platforms is critical for today's datacenters. Although the trend is moving towards fully virtualized environments, there is still a high ratio of legacy applications residing on physical servers. The 7850 VSG supports a wire-speed hardware gateway function to bridge the non-virtualized seamlessly into the virtual compute environment. Gateway functionality is delivered by a robust and scalable Virtual Tunnel End Point (VTEP) implementation in hardware that supports VLAN interconnection to VXLAN from the non-virtualized servers for distribution via Layer 2 or Layer 3 to the virtual environment.

**The Nuage Networks VSP Solution in 7 Points**

- Provides SDN-enabled virtualization with support of Layer 2 to Layer 4 services
- Optimizes and scales datacenter connectivity and is deployable on heterogeneous networks
- Uses programmable business logic and policies to fully automate network service creation
- Offers unrestricted placement of VM workloads to maximize efficiency of server resources
- Integrates public, private and hybrid cloud application into managed VPNs
- Includes extensive data analytics and performance monitoring capabilities
- Supports all major compute management systems and hypervisors

**Dev-Ops sandbox**

Support for advanced Dev-Ops functionality is provided via a dedicated Multicore CPU for development and network operations teams to utilize for LINUX-based toolsets. Open for operational requirements, the Dev-Ops sandbox provides the flexibility to run diagnostic and operational tools for management functions directly into the datacenter environment. Common LINUX-based toolsets, like Chef and Puppet, can be implemented on a secured vertical environment within the 7850 VSG. External storage can be accessed via the USB port on the 7850 VSG, which provides portable storage for operational toolsets and environmental configuration files.

**SDN controller**

Network function flexibility is provided with the option to enable the VSC on the 7850 VSG. This provides the flexibility to run SDN controller functions directly at the top of rack or end of row. The VSC supports OpenFlow™ and MP-BGP for network endpoint configuration within the datacenter and seamlessly extends out to the wide area network to enable cloud services.

**Traffic mirroring**

Advanced traffic diagnostics are provided with the ability to mirror traffic to four independent mirroring destinations, including support for local mirroring to the Dev-Ops sandbox within the 7850 VSG or to remote destinations. The mirroring features direct traffic to the destination while maintaining wire-rate performance. Local capability includes capture and analysis at speeds up to 10 Gb/s for Wireshark™ processing on the Dev-Ops sandbox. Captured packet storage options include directly to the Dev-Ops sandbox dedicated compact flash, to storage devices attached to the USB port, or remotely via NFS or Windows® file shares.

## Benefits

**Reduced power and space**

Nuage Networks has significantly lowered the space and power requirements of routing traffic around the datacenter.

Network equipment footprint within the datacenter is at a premium. By leveraging the latest technologies, the 7850 VSG provides the highest density 10GE capacity in a 1RU gateway available on the market. The 7850 VSG delivers significant improvements over older generation hardware and lowers the power requirements to ~0.4 Watts per full duplex Gigabit.

**Flexibility**

Deployment flexibility in the datacenter is provided on the 7850 VSG with support of both AC and DC redundant and hot-swappable power supply units, with the option to order variants for both front-to-back and back-to-front airflow.

**High availability**

High availability features of the 7850 VSG include hardware resiliency with redundant and hot swappable power supply units (1+1) and fan trays (4+1).

## Product Details

| FEATURE | BENEFIT |
|---|---|
| Resiliency and high availability | Operating system resiliency is provided by separating key CPU functions within the 7850 VSG's single control plane.<br>High availability is maintained with redundant and load sharing power supply units supporting AC or DC operation. |
| Extensibility:<br>■ Gateway functions | Wire-speed support is available for gateway bridging of non-virtualized compute assets into the virtual (SDN) environment via VTEP functionality. |
| ■ Dev-Ops sandbox | A secure Dev-Ops environment is included, with dedicated multicore CPU for advanced datacenter network operations and network functions including Chef, Puppet, PXE boot, wire-shark packet capture and analysis. |
| ■ SDN controller | The Nuage Networks VSP's VSC can be optionally enabled on the 7850 VSG to provide a local instance close to virtualized and non-virtualized compute assets. |
| Dual CPU complexes | The dedicated and independent multicore CPU complex provides operations and Dev-Ops sandbox each with dedicated and separated RAM and compact flash memory. |
| Quality of service | QoS features include:<br>■ Per-VLAN/per-port ingress policing<br>■ Per-port egress queuing<br>■ Flexible egress buffer allocation |
| IPv4 routing | IP routing capability includes support for MP-BGP, OSPF, and ISIS. |
| IPv6 routing | The hardware is IPv6-ready with software support in future releases. |
| Advanced Layer 2 | VLANs are implemented with local port significance and VXLAN bridging and routing to Layer 2 and Layer 3 network topologies. |
| Advanced Layer 3 | Advanced Layer 3 features include:<br>■ Local VRF-Lite instances with independent routing tables<br>■ BGP-RR capabilities in all address families including EVPN to support scalable federation of controllers |

# Technical Specifications

| SPECIFICATION | DESCRIPTION | |
|---|---|---|
| System capacity | 1.92 Tb/s (half duplex) | |
| Interface quantities | ■ 32 ports of 10GE (SFP+) with support for 1GE via SFP<br>■ 16 ports of 40GE (QSFP+) with support for 64 ports of 10GE via breakout cables | |
| Common equipment redundancy | Field-replaceable power supply units and fan modules | |
| Route table size | 7,500 IPv4 routes. Control plane support for 1 million BGP routes | |
| Switching table size | 128,000 MAC entries | |
| Dimensions | 440 mm x 470 mm x 44 mm / 17.3 in. x 18.5 in. x 1.7 in. (width x depth x height) | |
| Weight | 10 kg / 22 lb | |
| Operating temperature | 0° to 40° C / 32° to 104° F | |
| Operating relative humidity | 5% to 85% | |
| Power draw and BTU | 475 W maximum | |
| Cooling | Front-to-back and back-to-front via fan tray and power module options | |
| Safety standards and compliance agency certifications | Safety:<br>■ EN 60950-1 2nd Ed CE-Mark<br>■ IEC 60950-1 2nd Ed CB Scheme<br>■ CSA/UL 60950-1 2nd Ed NRTL<br>■ FDA CDRH 21-CFR 1040<br>■ IEC/EN 60825-1<br>■ IEC/EN 60825-2<br><br>EMC Emission:<br>■ ICES-003 Class A<br>■ FCC Part 15 Class A<br>■ EN 55022 Class A<br>■ CISPR 22 Class A<br>■ AS/NZS CISPR 22<br>■ VCCI Class A<br>■ BSMI Class A<br>■ IEC/EN 61000-3-2 Power Line Harmonics<br>■ IEC/EN 61000-3-3 Voltage Fluctuations and Flicker<br><br>EMC Immunity:<br>■ EN 300 386<br>■ EN 55024<br>■ IEC/EN 61000-4-2 ESD<br>■ IEC/EN 61000-4-3 Radiated Immunity<br>■ IEC/EN 61000-4-4 EFT<br>■ IEC/EN 61000-4-5 Surge<br>■ IEC/EN 61000-4-6 Conducted Immunity<br>■ IEC/EN 61000-4-8 Magnetic Immunity<br>■ IEC/EN 61000-4-11 Voltage Interruptions | Telecom:<br>■ IEEE 802.3 (Gigabit Ethernet, 10Gigabit Ethernet and 40Gigabit Ethernet)<br><br>Environmental:<br>■ WEEE<br>■ RoHS<br>■ China CRoHS<br><br>Network Equipment Building System (NEBS):<br>■ NEBS Data Center compliant:<br>• Telcordia GR-1089-CORE<br>• Telcordia GR-63-CORE<br>• RBOC requirements:<br>- TEER per ATIS-0600015.02<br>- VZ.TPR.9205 TEER per ATIS-0600015.02<br>- VZ.TPR.9305<br>- VZ.TPR.9203 |

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