



# 7850 NETWORK SERVICES GATEWAY

## Highlights

- SDN-based branch networking for the Cloud IT era
- Policy-based branch traffic offload
- Open compute-based hardware architecture
- Full encryption services for branch traffic

Nuage Networks 7850 Network Services Gateway (7850 NSG-E) enables branch office networking to evolve to meet the challenges of wide area network services in Cloud IT environments. Based on the industry’s most comprehensive Software Defined Networking (SDN) solution, the 7850 NSG-E seamlessly integrates into the Nuage Networks Virtualized Network Services (VNS) solution. The 7850 NSG-E is used to connect private and public datacenters to branch locations. The solution offers multiple service scenarios, namely Layer 2 VPN, Layer 3 VPN and Internet breakout. The 7850 NSG-E is one of the supported form factors for the Network Services Gateway (NSG) component of the Nuage Networks VNS solution. Using the NSG-V software image, NSG functionality can be deployed as a software-only form factor on a customer-provided appliance or as a virtual machine.

The Nuage Networks 7850 NSG-E has a small footprint, and can be shipped and installed at an enterprise branch location without requiring any network engineering expertise. Since the 7850 NSG-E is centrally managed, it improves the efficiency and productivity of branch operations while eliminating the need for any on-site IT support. The 7850 NSG-E is on-boarded via a secure bootstrapping process that uses zero, one or two-factor authentication depending on the branch and installer trust-model and security posture. Once bootstrapped, it enables instant networking capabilities at the branch.

The 7850 NSG-E easily connects to any provider’s IP underlay network (private, public or hybrid) over any access using its WAN-facing ports. The policy-based network automation capabilities are seamlessly extended to the branch allowing users to automatically connect to any applications in any cloud (public or private). Thus, the delivery and consumption of network services is greatly simplified.

In addition, multiple network functions can be service chained and, using policy-based routing, traffic can be routed to one or more appliances (such as firewalls or IDS/IPS systems) or virtualized functions at any location before being forwarded to the final destination.

For branch locations that have high availability requirements, the 7850 NSG-E may be deployed in a high-availability configuration providing device, link and subnet-level resiliency models. The 7850 NSG-E also supports network uplink redundancy for protection of WAN services.

The LAN-facing ports of the 7850 NSG-E can be used for logical and physical isolation and segmentation of users or applications to support creation of security zones aligned to the enterprise’s IT practices.

For enterprises that require IPsec encryption for overlay traffic, the 7850 NSG-E has built-in hardware-based cryptographic acceleration capabilities, ensuring optimized forwarding for both unencrypted and encrypted communications. The 7850 NSG-E supports path selection to ensure that priority traffic is forwarded over the desired underlay network with selectable failover modes.



Front



Back

## Nuage Networks VNS

Nuage Networks VNS provides a comprehensive networking service that removes the limitations that exist with traditional wide area networks. Nuage Networks VNS offers:

- Extensive service functionality that enables flexible branch networking
- Unlimited geographic reach; by abstracting the virtualized network service from the underlying IP connectivity, you aren't tied to a single connectivity service
- Ability to adapt to the dynamic business environment and respond quickly to simple move, add and change requests
- Support for virtualized network functions, which eliminates the need for additional hardware (firewalls and routers) and associated professional services

## Features

**Small branch optimized density** - The small footprint and energy efficiency of the fan-less design of the 7850 NSG-E provides flexibility for both cabinet (rack mount) or desktop installations. With the flexibility for dual WAN uplink and four dedicated LAN ports, the 7850 NSG-E provides options for both logical and/or physical separation of network services within the branch.

**Proven operating system** - The 7850 NSG-E utilizes the widely used network operating system of the Nuage Networks VNS SDN solution. Operators can be confident that the 7850 NSG-E is completely interoperable with global IP network services and that its robust networking environment has been field proven.

**Management efficiencies** - As part of the Nuage Networks VNS, the 7850 NSG-E is centrally managed. Network engineering expertise is not required at the branch during installation or for day-to-day operation. Configuration changes are centrally administrated and pushed to the branch via policy.

**Network function optimization** - The Nuage Networks VNS solution provides SDN-based optimization of network functions. With Nuage Networks VNS, complex functions can be virtualized and chained into the branch office connection. For branch-specific requirements the 7850 NSG-E supports advanced functions such as DHCP server, quality of service and advanced firewall rules. The flexibility of SDN provides the opportunity for deployment of third-party functions on the 7850 NSG-E should market demands arise.

**Selective uplink forwarding** - Today's Cloud IT consumption models are straining traditional IP-VPN uplinks. With the 7850 NSG-E the option to split traffic across a primary WAN uplink and a secondary link such as Business Internet services is possible. With options to encrypt this traffic based on the transport method, the 7850 NSG-E provides flexibility to grow the bandwidth to the branch without compromising corporate integrity.

**Traffic security** - The 7850 NSG-E and the Nuage Networks VNS solution support per-connection encryption based on IPsec. Through the solution's central policy engine, the enterprise has complete control of which traffic is encrypted.

**Multiple WAN uplink support** - As an SDN-based solution the 7850 NSG-E supports a mix of multiple WAN uplinks. These can include a primary link via private and alternative (either active/active or active/standby) connections over diverse access IP technologies such as the Internet or mobile broadband.

**High availability at the branch** - For branch locations that have high availability requirements the 7850 NSG-E may be deployed in active/standby pairs, allowing for protection of WAN/LAN services in the event of device or circuit failure. Seamless failover and recovery of all failure scenarios provide WAN administrators with peace of mind.

**Physical LAN isolation** - With multiple LAN ports the 7850 NSG-E provides the versatility to assign specific ports to individual hosts within the branch environment. This can provide isolation for IP voice trunks (IP-PBX) or IP security cameras. It can also be used to provide completely separated network environment(s) from the business LAN, which could then be used for public kiosk access or public Wi-Fi® networking.

## Software technical specifications

Automation	<ul style="list-style-type: none"> <li>■ Secure 7850 NSG-E activation and authentication (X.509)</li> <li>■ 7850 NSG-E software lifecycle management</li> <li>■ Policy server northbound ReSTful API and push-based notification-driven event bus</li> </ul>
Management	<ul style="list-style-type: none"> <li>■ Unified management plane for datacenter (Nuage Networks Virtualized Services Platform) and WAN (Nuage Networks VNS)</li> <li>■ Centralized, template-based policy management for all managed objects (including service, security and QoS)</li> <li>■ Multi-tenanted with role-based administration, optional LDAP integration</li> </ul>
Network services	<ul style="list-style-type: none"> <li>■ Full-mesh and hub-and-spoke topologies</li> <li>■ Layer 2 and Layer 3 Virtual Private Network (VPN) services</li> <li>■ Local Internet breakout service</li> <li>■ 802.1Q locally significant VLANs</li> <li>■ Overlay services supporting VXLAN and VXLANoIPsec encapsulation</li> <li>■ DHCPv4 Server, PAT, 1:1 NAT, underlay offload</li> <li>■ Dynamic NAT traversal</li> <li>■ Flow-based WAN uplink load balancing, advanced traffic steering</li> <li>■ IPv6-ready hardware with software support in future releases</li> </ul>
Quality of Service	<ul style="list-style-type: none"> <li>■ DSCP-based classification with DSCP rewrite options</li> <li>■ Ingress QoS classification and rate limiting</li> <li>■ Hierarchical QoS color-aware egress shaping based on 4 WRR queues</li> <li>■ Network control queue for control plane traffic</li> </ul>
Security services	<ul style="list-style-type: none"> <li>■ Directional Layer 2 to Layer 4 traffic classification with accept/deny/redirect actions</li> <li>■ Template-based domain-wide ingress and egress reflexive ACL</li> <li>■ Advanced dynamic security policy creation</li> <li>■ Policy auditing through template inheritance</li> </ul>
Encryption	<ul style="list-style-type: none"> <li>■ Secure key generation and distribution</li> <li>■ IPsec authentication: SHA1, SHA2</li> <li>■ IPsec encryption: 3DES, AES-128, AES-192 and AES-256</li> <li>■ Authenticated and encrypted control plane connections</li> </ul>
Analytics and visibility	<ul style="list-style-type: none"> <li>■ Real-time analytics engine based on Hadoop® cluster</li> <li>■ Central usage statistics collection for ports, flows, QoS queues</li> <li>■ Event-based logging</li> <li>■ Secure syslog integration</li> <li>■ Remote port mirroring</li> </ul>
High Availability	<ul style="list-style-type: none"> <li>■ Cluster-based policy and statistics collection infrastructure</li> <li>■ Policy federation supporting geo-redundancy and load-balancing</li> <li>■ Scale-out control-plane architecture leveraging federation based on MP-BGP</li> <li>■ High Availability configuration for 7850 NSG-E with per subnet resiliency</li> <li>■ WAN uplink redundancy options with selective uplink forwarding</li> <li>■ Independent active/active management and control plane connections per 7850 NSG-E</li> </ul>

## Hardware specifications

CPU specifications	Intel Atom CPU with built-in Quick-Assist cryptographic acceleration
Interface quantities	<ul style="list-style-type: none"> <li>■ 6 x 10/100/1000BASE-T Gigabit Ethernet (RJ45) interfaces</li> <li>■ 2 x USB 2.0 Standard-A female interfaces</li> <li>■ 1 x RS-232 RJ-45 console interface</li> </ul>
Aggregate throughput*	<ul style="list-style-type: none"> <li>■ Overlay VXLAN: 300 Mb/s IMIX / 850 Mb/s 1500 byte</li> <li>■ Overlay IPsec: 180 Mb/s IMIX / 640 Mb/s 1500 byte</li> </ul>
Dimensions	177 mm x 145.5 mm x 44 mm / 7.0 in. x 5.7 in. x 1.7 in. (width x depth x height)
Weight	1.2 Kg / 2.65 lb
Operating temperature	0 ~ 40° C / 32° ~ 104° F
Operating relative humidity	5 ~ 90%, non-condensing
Power	<ul style="list-style-type: none"> <li>■ Draw: 36 W (maximum)</li> <li>■ Input: 100 ~240 V at 50-60 Hz</li> </ul>
Cooling	Fan-less design with integrated cooling via corrugated aluminum enclosure
Compliance agency certifications	<p>Safety:</p> <ul style="list-style-type: none"> <li>■ EN 60950-1 2nd Ed CE-Mark</li> <li>■ IEC 60950-1 2nd Ed CB Scheme</li> <li>■ CSA/UL 60950-1 2nd Ed NRTL</li> </ul> <p>EMC Emission:</p> <ul style="list-style-type: none"> <li>■ ICES-003 Class B</li> <li>■ FCC Part 15 Class B</li> <li>■ EN 55022 Class B</li> <li>■ CISPR 22 Class B</li> <li>■ AS/NZS CISPR 22</li> <li>■ VCCI Class B</li> <li>■ IEC/EN 61000-3-2 Power Line</li> </ul> <p>Harmonics:</p> <ul style="list-style-type: none"> <li>■ IEC/EN 61000-3-3 Voltage Fluctuations and Flicker</li> </ul> <p>EMC Immunity:</p> <ul style="list-style-type: none"> <li>■ EN 55024</li> <li>■ IEC/EN 61000-4-2 ESD</li> <li>■ IEC/EN 61000-4-3 Radiated Immunity</li> <li>■ IEC/EN 61000-4-4 EFT</li> <li>■ IEC/EN 61000-4-5 Surge</li> <li>■ IEC/EN 61000-4-6 Conducted Immunity</li> <li>■ IEC/EN 61000-4-8 Magnetic</li> </ul> <p>Immunity:</p> <ul style="list-style-type: none"> <li>■ IEC/EN 61000-4-11 Voltage Interruptions</li> </ul>
Security	<ul style="list-style-type: none"> <li>■ Built-in Trusted Platform Module to ensure integrity of system, operating system, and confidentiality of management and data-plane encryption</li> <li>■ Kensington® anti-theft lock for securing 7850 NSG-E physical installation</li> </ul>
Installation	Optional rack mount kit that mounts 2 x 7850 NSG-E in 1 Rack Unit

\* The performance capabilities of the 7850 NSG-E are dependent on the device configuration, the traffic pattern used and the deployment model.