
Alcatel-Lucent Enterprise OmniSwitch 6860N GOLDEN RFP

Version 8.9R3

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1. Introduction

The Alcatel-Lucent OmniSwitch® 6860N is a family of advanced Stackable Gigabit and Multigigabit Ethernet switches offering high-performance, scalability, resiliency and security. With high-speed flexible uplinks, 200G stacking (creating a 400G aggregate Virtual Chassis through inter-switch Virtual Fabric Links (VFLs) inter-switch connections. Supporting industry leading 95W PoE++, and high density 10G multi-gigabit ports ready for Wi-Fi 6; these platforms are the right choice for the next generation of enterprise switching networks.



Alcatel-Lucent OmniSwitch 6860N models

Alcatel-Lucent OmniSwitch 6860Ns are high performance and high availability switches that offer unmatched features in terms of quality of service (QoS), mobility, programmability and security for network edge deployments. The OmniSwitch 6860N family enables seamless mobility for users and devices with a high degree of integration between the wired and wireless LAN.

The family includes support for next generation wireless LAN standards, Wi-Fi 6 and 802.11ac wave 2 and mix of uplink speeds up to 100G. With best-in-class 95W IEEE 802.3bt compliant support, OmniSwitch 6860N switches are ready for newest PoE and IoT devices, be it the pan tilt zoom camera or Wi-Fi 6 access points. The OmniSwitch 6860N family is the first in the industry to offer application monitoring and visibility for network analytics making it ready to meet the evolving business needs of enterprise networks. These switches run on the widely

deployed and field-proven Alcatel-Lucent Operating System (AOS) offering programmability, industry leading network automation features and maximum investment protection.

These versatile LAN switches can be positioned:

- At the edge of mid- to large-sized converged enterprise networks
- At the aggregation layer
- In a small enterprise network core
- In the datacenter for GigE server connectivity and SDN applications

OmniSwitch 6860N links:

Refer to the published OS6860 Data Sheet for the listing of the supported RFCs, Environmental / Commercial (EMI/EMC), Safety (UL/EN/IEC) and Federal compliance standards (Common Criteria EAL2, CC NDCpp, Joint Interoperability Test Command (JITC), US Trade Agreements Act (TAA), and FIPS 140-2.

Document references:

[OmniSwitch 6860 Family Data Sheet](#)

Common Criteria - Network and Network-Related Devices and Systems

[Common Criteria](#)

FIPS certification – OmniSwitch AOS Cryptographic Module

[csrs.nist.gov](https://csrc.nist.gov)

JICT

[JITC](#)

2. OmniSwitch 6860N models and chassis components

2.1.OS6860N-P24Z

The switch must support the following characteristics:

2.1.1.	Non-blocking architecture	C/PC/NC
2.1.2.	Total RU: 1 RU maximum	C/PC/NC
2.1.3.	Power-redundancy with hot swap (in-service) capabilities	C/PC/NC
2.1.4.	Copper and fiber (SFP) transceiver hot swap capability	C/PC/NC
2.1.5.	Minimum of 12 ports 10/100/1000 BaseT RJ45, 60W 802.3bt PoE	C/PC/NC
2.1.6.	Minimum of 12 100M/1G/2.5G/5G 95W 802.3bt PoE	C/PC/NC
2.1.7.	Minimum of 4 SFP28 ports (10G/25G)	C/PC/NC
2.1.8.	Minimum of 2 QSFP28 VFL ports to build minimum stacking throughput of 400Gbps	C/PC/NC
2.1.9.	The above minimum port count requirements cannot be combo ports. All ports must be capable to operate simultaneously	C/PC/NC
2.1.10.	MACsec support on 4 SFP28 ports (10G/25G)	C/PC/NC
2.1.11.	Minimum PoE budget of 705W with 1 PS	C/PC/NC
2.1.12.	Minimum PoE budget of 1545W with 2 PS	C/PC/NC
2.1.13.	Stack (virtual chassis) up to 8 elements (manageable with single IP address) with dedicated ports to build stack or virtual chassis	C/PC/NC
2.1.14.	Minimum raw fabric throughput capacity (Gbps): 960 Gbps	C/PC/NC
2.1.15.	Minimum forwarding capacity (Mpps): 553.6 Mpps	C/PC/NC
2.1.16.	Operating Temperature: 0 ° C to 45 ° C	C/PC/NC
2.1.17.	Humidity (operation): 5% to 95% non-condensing	C/PC/NC
2.1.18.	Maximum power consumption (idle) of 131W	C/PC/NC
2.1.19.	Maximum power consumption (full load) of 172W	C/PC/NC
2.1.20.	Minimum MTBF of 257,250 h	C/PC/NC

2.2.OS6860N-P48Z

The switch must support the following characteristics:

2.2.1.	Non-blocking architecture	C/PC/NC
2.2.2.	Total RU: 1 RU maximum	C/PC/NC
2.2.3.	Power-redundancy with hot swap (in-service) capabilities	C/PC/NC
2.2.4.	Copper and fiber (SFP) transceiver hot swap capability	C/PC/NC
2.2.5.	Minimum of 36 ports 10/100/1000 BaseT RJ45, 60W 802.3bt PoE	C/PC/NC
2.2.6.	Minimum of 12 100M/1G/2.5G/5G 95W 802.3bt PoE	C/PC/NC
2.2.7.	Minimum of 4 SFP28 ports (10G/25G)	C/PC/NC
2.2.8.	Minimum of 2 QSFP28 VFL ports to build minimum stacking throughput of 400Gbps	C/PC/NC
2.2.9.	The above minimum port count requirements cannot be combo ports. All ports must be capable to operate simultaneously	C/PC/NC
2.2.10.	MACsec support on 4 SFP28 ports (10G/25G)	C/PC/NC
2.2.11.	Minimum PoE budget of 660W with 1 PS	C/PC/NC
2.2.12.	Minimum PoE budget of 1500W with 2 PS	C/PC/NC
2.2.13.	Stack (virtual chassis) up to 8 elements (manageable with single IP address) with dedicated ports to build stack or virtual chassis	C/PC/NC
2.2.14.	Minimum raw fabric throughput capacity (Gbps): 1120 Gbps	C/PC/NC
2.2.15.	Minimum forwarding capacity (Mpps):589.3 Mpps	C/PC/NC
2.2.16.	Operating Temperature: 0 ° C to 45 ° C	C/PC/NC
2.2.17.	Humidity (operation): 5% to 95% non-condensing	C/PC/NC
2.2.18.	Maximum power consumption (idle) of 157.8W	C/PC/NC
2.2.19.	Maximum power consumption (full load) of 176.6W	C/PC/NC
2.2.20.	Minimum MTBF of 233.756 h	C/PC/NC

2.3.OS6860N-P24M

The switch must support the following characteristics:

2.3.1.	Non-blocking architecture	C/PC/NC
2.3.2.	Total RU: 1 RU maximum	C/PC/NC
2.3.3.	Power-redundancy with hot swap (in-service) capabilities	C/PC/NC
2.3.4.	Copper and fiber (SFP) transceiver hot swap capability	C/PC/NC
2.3.5.	Minimum of 24 100M/1G/2.5G/5G/10G with minimum 95W 802.3bt PoE	C/PC/NC
2.3.6.	MACsec on all 100M/1G/2.5G/5G/10G ports	C/PC/NC
2.3.7.	Minimum of 2 QSFP28 VFL ports to build minimum stacking throughput of 400Gbps	C/PC/NC
2.3.8.	The above minimum port count requirements cannot be combo ports. All ports must be capable to operate simultaneously	C/PC/NC
2.3.9.	MACsec support on 4 SFP28 ports (10G/25G)	C/PC/NC
2.3.10.	Minimum PoE budget of 750W @115VAC with 1 PS	C/PC/NC
2.3.11.	Minimum PoE budget of 1660W @115VAC with 2 PS	C/PC/NC
2.3.12.	Minimum PoE budget of 1660W @230VAC with 1 PS	C/PC/NC
2.3.13.	Minimum PoE budget of 2280W @230VAC with 2 PS	C/PC/NC
2.3.14.	Minimum one slot for modular expansion	C/PC/NC
2.3.15.	Uplink module with minimum 4 x 1G/10G SFP+, 256-bit MACsec capable ports	C/PC/NC
2.3.16.	Uplink module with minimum 4 x 10/25G SFP28, 256-bit MACsec capable ports	C/PC/NC
2.3.17.	Uplink module with minimum 2 x 10/40G QSFP+, 256-bit MACsec capable ports	C/PC/NC
2.3.18.	Uplink module with minimum 1 x 25/100G QSFP28 256-bit MACsec capable port	C/PC/NC
2.3.19.	Stack (virtual chassis) up to 8 elements (manageable with single IP address) with dedicated ports to build stack or virtual chassis	C/PC/NC
2.3.20.	Minimum raw fabric throughput capacity (Gbps): 1120 Gbps	C/PC/NC
2.3.21.	Minimum forwarding capacity (Mpps):803.5 Mpps	C/PC/NC
2.3.22.	Operating Temperature: 0 ° C to 45 ° C	C/PC/NC
2.3.23.	Humidity (operation): 5% to 95% non-condensing	C/PC/NC
2.3.24.	Maximum power consumption (idle) of 121W	C/PC/NC
2.3.25.	Maximum power consumption (full load) of 201W	C/PC/NC

2.3.26.	Minimum MTBF of 225.081 h	C/PC/NC
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2.4.OS6860N-P48M

The switch must support the following characteristics:

2.4.1.	Non-blocking architecture	C/PC/NC
2.4.2.	Total RU: 1 RU maximum	C/PC/NC
2.4.3.	Power-redundancy with hot swap (in-service) capabilities	C/PC/NC
2.4.4.	Copper and fiber (SFP) transceiver hot swap capability	C/PC/NC
2.4.5.	Minimum of 36 100M/1G/2.5G with minimum 95W 802.3bt PoE	C/PC/NC
2.4.6.	Minimum of 12 100M/1G/2.5G/5G/10G with minimum 95W 802.3bt PoE	C/PC/NC
2.4.7.	MACsec on all 100M/1G/2.5G/5G/10G ports	C/PC/NC
2.4.8.	Minimum of 2 QSFP28 VFL ports to build minimum stacking throughput of 400Gbps	C/PC/NC
2.4.9.	The above minimum port count requirements cannot be combo ports. All ports must be capable to operate simultaneously	C/PC/NC
2.4.10.	MACsec support on 4 SFP28 ports (10G/25G)	C/PC/NC
2.4.11.	Minimum PoE budget of 665W @115VAC with 1 PS	C/PC/NC
2.4.12.	Minimum PoE budget of 1570W @115VAC with 2 PS	C/PC/NC
2.4.13.	Minimum PoE budget of 1570W @230VAC with 1 PS	C/PC/NC
2.4.14.	Minimum PoE budget of 3390W @230VAC with 2 PS	C/PC/NC
2.4.15.	Minimum one slot for modular expansion	C/PC/NC
2.4.16.	Uplink module with minimum 4 x 1G/10G SFP+, 256-bit MACsec capable ports	C/PC/NC
2.4.17.	Uplink module with minimum 4 x 10/25G SFP28, 256-bit MACsec capable ports	C/PC/NC
2.4.18.	Uplink module with minimum 2 x 10/40G QSFP+, 256-bit MACsec capable ports	C/PC/NC
2.4.19.	Uplink module with minimum 1 x 25/100G QSFP28 256-bit MACsec capable port	C/PC/NC
2.4.20.	Stack (virtual chassis) up to 8 elements (manageable with single IP address) with dedicated ports to build stack or virtual chassis	C/PC/NC
2.4.21.	Minimum raw fabric throughput capacity (Gbps): 1120 Gbps	C/PC/NC
2.4.22.	Minimum forwarding capacity (Mpps):758.9 Mpps	C/PC/NC
2.4.23.	Operating Temperature: 0 ° C to 45 ° C	C/PC/NC
2.4.24.	Humidity (operation): 5% to 95% non-condensing	C/PC/NC
2.4.25.	Maximum power consumption (idle) of 179.9W	C/PC/NC

2.4.26.	Maximum power consumption (full load) of 261.1W	C/PC/NC
2.4.27.	Minimum MTBF of 216.393 h	C/PC/NC

2.5.OS6860N-U28

The switch must support the following characteristics:

2.5.1.	Non-blocking architecture	C/PC/NC
2.5.2.	Total RU: 1 RU maximum	C/PC/NC
2.5.3.	AC & DC power supplies	C/PC/NC
2.5.4.	Power-redundancy with hot swap (in-service) capabilities	C/PC/NC
2.5.5.	Transceiver hot swap capability	C/PC/NC
2.5.6.	Minimum of 24 100/1000 BaseX, SFP	C/PC/NC
2.5.7.	MACsec on all 100/1000 BaseX, SFP ports	C/PC/NC
2.5.8.	Minimum of 4 1/10G SFP+	C/PC/NC
2.5.9.	MACsec on all 1/10G SFP+ ports	C/PC/NC
2.5.10.	Minimum of 4 10/25G SFP28 ports	C/PC/NC
2.5.11.	MACsec on all 10/25G SFP28 ports	C/PC/NC
2.5.12.	Minimum of 2 QSFP28 VFL ports to build minimum stacking throughput of 400Gbps	C/PC/NC
2.5.13.	The above minimum port count requirements cannot be combo ports. All ports must be capable to operate simultaneously	C/PC/NC
2.5.14.	Stack (virtual chassis) up to 8 elements (manageable with single IP address) with dedicated ports to build stack or virtual chassis	C/PC/NC
2.5.15.	Minimum raw fabric throughput capacity (Gbps): 960 Gbps	C/PC/NC
2.5.16.	Minimum forwarding capacity (Mpps):541.7 Mpps	C/PC/NC
2.5.17.	Operating Temperature: 0 ° C to 45 ° C	C/PC/NC
2.5.18.	Humidity (operation): 5% to 95% non-condensing	C/PC/NC
2.5.19.	Maximum power consumption (idle) of 79W	C/PC/NC
2.5.20.	Maximum power consumption (full load) of 171W	C/PC/NC
2.5.21.	Minimum MTBF of 138.559 h	C/PC/NC

3. Resiliency and high availability functionalities

The switch must support the following

3.1.	Unified management & control	C/PC/NC
3.2.	Virtual chassis technology	C/PC/NC
3.3.	Virtual Chassis 1+N redundant supervisor manager	C/PC/NC
3.4.	Virtual Chassis In-Service Software Upgrade (ISSU)	C/PC/NC
3.5.	Split Virtual Chassis protection	C/PC/NC
3.6.	IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) encompasses IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)	C/PC/NC
3.7.	Per-VLAN spanning tree (PVST+)	C/PC/NC
3.8.	1x1 STP mode	C/PC/NC
3.9.	IEEE 802.3ad/802.1AX Link Aggregation Control Protocol (LACP) and static LAG groups across modules	C/PC/NC
3.10.	Virtual Router Redundancy Protocol (VRRP) with tracking capabilities	C/PC/NC
3.11.	IEEE protocol auto-discovery	C/PC/NC
3.12.	Bidirectional Forwarding Detection (BFD) for fast failure detection and reduced re-convergence times in a routed environment	C/PC/NC
3.13.	Redundant and hot-swappable power supplies	C/PC/NC
3.14.	Built-in CPU protection against malicious attacks	C/PC/NC
3.15.	Support Open Standard Plug-N-Play Operation such that a new switch can auto detect and join into existing fabric using protocol like LACP, SPB and MVRP	C/PC/NC
3.16.	The switch must support a fabric technology to enable self-configuration, self-attachment, and self-healing of the network. This Auto-Fabric functionality helps eliminate many manual tasks and human errors during the deployment processes	C/PC/NC
3.17.	Support of IEEE 1588v2 Precision Time Protocol	C/PC/NC

4. Layer-3 IPv4 routing protocols and features

The switch must support the following:

4.1.	Multiple Virtual Routing and Forwarding (VRF) instances	C/PC/NC
4.2.	Static routing	C/PC/NC
4.3.	Routing Information Protocol (RIP) v1 and v2	C/PC/NC
4.4.	Open Shortest Path First (OSPF) v2 with Graceful Restart	C/PC/NC
4.5.	Intermediate System to Intermediate System (IS-IS) with Graceful Restart	C/PC/NC
4.6.	Border Gateway Protocol (BGP) v4 with Graceful Restart	C/PC/NC
4.7.	Generic Routing Encapsulation (GRE) and IP/IP tunneling	C/PC/NC
4.8.	L2 GRE Tunnel Access (Edge) on Bridge Ports	C/PC/NC
4.9.	L2 GRE Tunnel Access (Edge) on Access Ports	C/PC/NC
4.10.	L2 GRE Tunnel Aggregation	C/PC/NC
4.11.	Maximum number of L2 GRE tunnel is 2000	C/PC/NC
4.12.	Virtual Router Redundancy Protocol (VRRPv2)	C/PC/NC
4.13.	DHCP relay (including generic UDP relay)	C/PC/NC
4.14.	Address Resolution Protocol (ARP)	C/PC/NC
4.15.	Policy-based routing and server load balancing	C/PC/NC
4.16.	DHCP V4 server	C/PC/NC

5. Layer-3 IPv6 routing protocols and features

The switch must support the following:

5.1.	Multiple Virtual Routing and Forwarding (VRF) instances	C/PC/NC
5.2.	Internet Control Message Protocol version 6 (ICMPv6)	C/PC/NC
5.3.	Static routing	C/PC/NC
5.4.	Routing Information Protocol Next Generation (RIPng)	C/PC/NC
5.5.	Open Shortest Path First (OSPF) v3 with Graceful Restart	C/PC/NC

5.6.	Intermediate System to Intermediate System (IS-IS) with Graceful Restart	C/PC/NC
5.7.	Multi-Topology IS-IS	C/PC/NC
5.8.	BGP v4 multiprotocol extensions for IPv6 routing (MP-BGP)	C/PC/NC
5.9.	Graceful Restart extensions for OSPF and BGP	C/PC/NC
5.10.	Virtual Router Redundancy Protocol version 3 (VRRPv3)	C/PC/NC
5.11.	Neighbor Discovery Protocol (NDP)	C/PC/NC
5.12.	Policy-based routing and server load balancing	C/PC/NC
5.13.	DHCPv6 server	C/PC/NC
5.14.	DHCPv6 relay & UDPv6 relay	C/PC/NC

6. IPv4/IPv6 multicast protocols and features

The switch must support the following:

6.1.	IGMPv1/v2/v3 snooping and Multicast Listener Discovery (MLD) v1/v2 for fast client joins and leaves of multicast streams and limit bandwidth-intensive video traffic to only the requestors	C/PC/NC
6.2.	Protocol Independent Multicast - Sparse- Mode (PIM-SM), Source Specific Multicast (PIM-SSM)	C/PC/NC
6.3.	Protocol Independent Multicast - Dense-Mode (PIM-DM), Bidirectional Protocol Independent Multicast (PIM-BiDir)	C/PC/NC
6.4.	Distance Vector Multicast Routing Protocol (DVMRP)	C/PC/NC
6.5.	PIM to DVMRP gateway support	C/PC/NC

7. Layer-2 switching and services

The switch must support the following:

7.1.	Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking)	C/PC/NC
7.2.	Ethernet OAM (802.1ag): Connectivity Fault Management (L2 ping & Link trace)	C/PC/NC
7.3.	Ethernet in First mile: Link OAM (802.3ah)	C/PC/NC

7.4.	Fabric virtualization services IEEE 802.1aq Shortest Path Bridging (SPB-M)	C/PC/NC
7.5.	In-band management for IEEE 802.1aq (SPB-M)	C/PC/NC
7.6.	AOS functionality of advertising SPB L3VPN routes is extended to exchange and inject the route-tag field to be carried across the SPB-ISIS network.	C/PC/NC
7.7.	Fabric virtualization service VXLAN	
7.8.	Ethernet network-to-network interface (NNI) and user network interface (UNI)	C/PC/NC
7.9.	Service VLAN (SVLAN) and Customer VLAN (CVLAN) support	C/PC/NC
7.10.	Service Access Point (SAP) profile identification (ID) defining values for ingress bandwidth sharing, rate limiting, CVLAN tag processing (translate or preserve), and priority mapping (inner to outer tag or fixed value).	C/PC/NC
7.11.	Classification of different untagged users to the same UNP dynamic untagged SAP, which can be associated to different services (like SPB, L2GRE, and VXLAN). The untagged SAP creation on different services is supported only for UNP dynamic SAPs.	C/PC/NC
7.12.	Hybrid access port feature allows a single port to function both as an access port and a bridging port. Hybrid configured port can be understood as a bridge port with a default VLAN and tagged VLAN for bridging and the user can configure SAPs for services with mapped tagged VLANs.	C/PC/NC
7.13.	VLAN translation and mapping including CVLAN to SVLAN	C/PC/NC
7.14.	Port Mapping controlling communication between peer users	C/PC/NC
7.15.	DHCP Option 82: Configurable relay agent information	C/PC/NC
7.16.	Multiple VLAN Registration Protocol (MVRP)	C/PC/NC
7.17.	High Availability (HA) -VLAN allowing for sending traffic to send traffic intended for a single destination MAC address to multiple switch ports for Layer 2 clusters such as MS-NLB and active-active Firewall clusters	C/PC/NC
7.18.	Private VLANs	C/PC/NC
7.19.	Jumbo frame	C/PC/NC
7.20.	Bridge Protocol Data Unit (BPDU) blocking	C/PC/NC
7.21.	STP Root Guard	C/PC/NC
7.22.	Multiprotocol Label Switching with the support of the two following VPLS implementation: VPLS using LDP signaling ; VPLS using BGP signaling.	C/PC/NC

8. Security features

The switch must support the following:

8.1.	Autosensing IEEE 802.1X multiclient, multi-VLAN support	C/PC/NC
8.2.	MAC-based authentication for non-IEEE 802.1X hosts	C/PC/NC
8.3.	Web based authentication (captive portal): a customizable web portal residing on the switch	C/PC/NC
8.4.	Dynamically providing pre-defined policy configuration to authenticated clients – VLAN, ACL, BW	C/PC/NC
8.5.	Secure Shell (SSH) with public key infrastructure (PKI) support	C/PC/NC
8.6.	Terminal Access Controller Access- Control System Plus (TACACS+) client	C/PC/NC
8.7.	Centralized Remote Access Dial- In User Service (RADIUS) and Lightweight Directory Access Protocol (LDAP) administrator authentication	C/PC/NC
8.8.	Learned Port Security (LPS) or MAC address lockdown	C/PC/NC
8.9.	Learned Port Security (LPS) on Service Access Port (SAP) ports mapped to SPB service	C/PC/NC
8.10.	Access Control Lists (ACLs); flow based filtering in hardware (Layer 1 to Layer 4)	C/PC/NC
8.11.	DHCP v4 & v6 Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection	C/PC/NC
8.12.	DHCPv6 guard and DHCPv6 Client Guard	C/PC/NC
8.13.	ARP poisoning detection	C/PC/NC
8.14.	IP v4 & v6 Source Filtering as a protective and effective mechanism against ARP attacks	C/PC/NC
8.15.	Role-based authentication for routed domains	C/PC/NC
8.16.	Deployment of comprehensive and secure BYOD: Guest management; device on-boarding and provisioning; device health check and fingerprinting; application management through device on-boarding, device posture/health check and application visibility over SPB	C/PC/NC
8.17.	MACsec is supported between two directly connected Service Access Ports or network ports for service type SPB/VXLAN/L2GRE to provide MACsec security on the tunneled traffic.	C/PC/NC
8.18.	The minimum password size range is 1-30 characters.	C/PC/NC
8.19.	Allows the switch to be authenticated as a supplicant device using X.509 certificates.	C/PC/NC

9. Quality of Service (QoS) features

The switch must support the following:

9.1.	Eight hardware based queues per port for flexible QoS management	C/PC/NC
9.2.	Flow-based QoS	C/PC/NC
9.3.	Flow-based traffic policing and bandwidth management	C/PC/NC
9.4.	32-bit IPv4/128-bit IPv6 non contiguous mask classification	C/PC/NC
9.5.	Egress traffic shaping	C/PC/NC
9.6.	DiffServ architecture	C/PC/NC
9.7.	Support for end- to-end head-of-line (E2EHOL) blocking prevention	C/PC/NC
9.8.	EEE 802.3x Flow Control (FC)	C/PC/NC

10. Data Center and network transport features:

The switch must support the following:

10.1.	Dynamic Virtual Network Profiles (vNP) defining network access based on profile criteria (instead of mac address, IP address or port)	C/PC/NC
10.2.	IEEE 802.1aq Shortest Path bridging (SPB-M)	C/PC/NC
10.3.	Virtual eXtensible Local Area Network (VXLAN)	C/PC/NC

11. Software Defined Networking (SDN) features:

The switch must support the following:

11.1.	Programmable RESTful API	C/PC/NC
11.2.	Fully programmable OpenFlow 1.3.1 and 1.0 agent for control of native OpenFlow and hybrid ports	C/PC/NC
11.3.	OpenStack networking plug-in	C/PC/NC
11.4.	Network Automation and Programmability Abstraction Layer with Multivendor (NAPALM) support	C/PC/NC
11.5.	The switch must support high availability hardware Virtual eXtensible LAN (VXLAN) Virtual Tunnel End-Point (VTEP) gateway to support layer	C/PC/NC

	2 overlay networks that are used to segment and tunnel device traffic through a data center or cloud network infrastructure*	
11.6.	Software-controlled VxLAN hardware VTEP gateway*	C/PC/NC

12. ITU-T recommendations:

The switch must support the following:

12.1.	ITU-T G.8032/Y.1344 2010: Ethernet Ring Protection (ERPV2)	C/PC/NC
12.2.	ITU-T Y.1731 OA&M fault and performance management	C/PC/NC

13. Voice, video and data converged network

The switch must support the following:

13.1.	Session Initiation Protocol (SIP) detection, session monitoring and tracking	C/PC/NC
13.2.	Provides real-time conversation quality information contained in the SIP packets concerning packet loss, delay, jitter, MOS score, R-Factor in real time	C/PC/NC
13.3.	SIP profile for QOS, priority tuning for end-to-end processing	C/PC/NC
13.4.	Multicast DNS Relay: Bonjour protocol support for wired Airgroup	C/PC/NC

14. Management features:

The switch must support the following:

14.1.	Powerful WebView Graphical Web Interface via HTTP and HTTPS over IPv4/IPv6	C/PC/NC
14.2.	Intuitive CLI in a scriptable BASH environment via console, Telnet, or Secure Shell (SSH) v2 over IPv4/IPv6	C/PC/NC
14.3.	This feature allows for a USB-to-Ethernet interface for switches that lack an OOB management port. This interface is treated just like an OOB interface. All functions and CLIs related to an OOB management port are applicable to the USB-to-Ethernet dongle.	C/PC/NC
14.4.	This feature allows for applying an ACL on the EMP port of the switch. It enables policy-based routing on the EMP ports. The configuration is enabled using the empacl policy-list type.	C/PC/NC
14.5.	The equipment can work in a “thin client” mode. In this mode no configuration can be saved in the “Running” directory of the switch. A basic configuration with minimal network reachability configuration is stored on the switch running directory. The final configuration of a thin client is pushed by a Network Management System (NMS).	C/PC/NC
14.6.	Must support hitless upgrade of IP services	C/PC/NC
14.7.	Must support RMON	C/PC/NC

15. Certifications

The switch must support the following:

15.1.	The switch proposed must possess a Common Criteria certification, ensuring compliance with internationally recognized security standards.	C/PC/NC
15.2.	The switch proposed must hold a valid Federal Information Processing Standards (FIPS) certification, meeting the designated FIPS publication 140-2.	C/PC/NC

16. Video surveillance

The switch must support the following:

1.1.	The switch support plugins that enable remote troubleshooting for common camera issues directly from the video surveillance management system.	C/PC/NC
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