Alcatel-Lucent Enterprise OmniSwitch 6465T GOLDEN RFP

Version 8.9R3

Alcatel·Lucent Enterprise

Contents

1. Introduction

The Alcatel-Lucent OmniSwitch® 6465T is a family of extended temperature, value, Layer 3 Gigabit Ethernet switches. These switches are versatile in nature and can be deployed in a variety of environments such as residential and business metro Ethernet access offered by service providers, in smart cities/buildings or for transportation deployments.

OmniSwitch 6465T-12

OmniSwitch 6465T-P12

OmniSwitch 6465T switches are a family of extended temperature, compact, gigabit Ethernet switches that are ideal for residential/metro Ethernet triple play applications. The PoE switches offer a value, power-efficient access for powering smart building subsystems such as lighting, CCTV and HVAC. The switches run on the widely deployed and field-proven Alcatel-Lucent Operating System (AOS) that offers high security, reliability, performance and easy management. These switches are designed to operate in an extended temperature range offering reliable operation in -10°C to 60°C ambient temperature range.

The OmniSwitch 6465T 12-port models are designed with an optimized size, low-power consumption and a rich software feature set. This extended temperature PoE model can provide power to a range of new age devices from IP cameras on toll booths to LED lights and building management gateways in smart buildings. These switches are easy to deploy and offer out-of the-box plug-and-play, zero-touch provisioning, network automation and disaster recovery options. These switches support IEEE 1588v2 PTP for the nanosecond-level precision timing requirements of devices and applications. With support for MACsec on all ports, OmniSwitch 6465T enables end-to-end encrypted networks.

The OmniSwitch 6465T family offers advanced system and network level resiliency features and convergence through standardized protocols in a space efficient form factor. OmniSwitch 6465T models can operate without fan up to 45°C ambient temperature.

OmniSwitch 6465 Links:

https://www.al-enterprise.com/en/products/switches/omniswitch-6465t

2. OmniSwitch 6465T models and chassis components

2.1.OS6465T-12

The switch must support the following characteristics:

2.1.1.	Non-blocking architecture	C/PC/NC
2.1.2.	Operate with out fan up to 45°C ambient temperature	C/PC/NC
2.1.3.	Maximum height of 4.4 cm (1.73 in)	C/PC/NC
2.1.4.	Maximum width of 21.7 cm (8.55 in)	C/PC/NC
2.1.5.	Maximum depth (without power supplies) of 28 cm (11.05 in)	C/PC/NC
2.1.6.	Maximum weight (without power supplies) of 1.7 Kg (3.8 lbs)	C/PC/NC
2.1.7.	Minimum of 10 ports 10/100/1000 Base T RJ45	C/PC/NC
2.1.8.	Minimum of 2 100/1000 SFP ports (could be combo with 10/100/1000 Base-T RJ45 ports)	C/PC/NC
2.1.9.	Minimum of 2 1000Base-X SFP ports (1 Gbps)	C/PC/NC
2.1.10.	Support of MACsec on all ports	C/PC/NC
2.1.11.	Support of IEEE 1588v2 on all ports	C/PC/NC
2.1.12.	Minimum switching capacity (Gbps): 24 Gbps	C/PC/NC
2.1.13.	Minimum Processing Capacity (Mpps): 17.9 Mpps	C/PC/NC
2.1.14.	Operating Temperature: -10°C to 60°C (-14ºF to 140ºF)	C/PC/NC
2.1.15.	Maximum system power consumption (idle) of 8.5W (at 120V AC)	C/PC/NC
2.1.16.	Maximum system power consumption (full load) of 16W	C/PC/NC
2.1.17.	Minimum MTBF of 1,953,053 h	C/PC/NC
2.1.18.	Support of E-Line (EPL and EVPL) and E-LAN (EP-LAN and EVP-LAN)	C/PC/NC

2.2.OS6465T-P12

The switch must support the following characteristics:

2.2.1.	Non-blocking architecture	C/PC/NC
2.2.2.	Operate with out fan up to 45°C ambient temperature	C/PC/NC
2.2.3.	Maximum height of 4.4 cm (1.73 in)	C/PC/NC
2.2.4.	Maximum width of 21.7 cm (8.55 in)	C/PC/NC
2.2.5.	Maximum depth (without power supplies) of 28 cm (11.05 in)	C/PC/NC
2.2.6.	Maximum weight (without power supplies) of 2 Kg (3.8 lbs)	C/PC/NC
2.2.7.	Minimum of 10 ports 10/100/1000 Base T RJ45	C/PC/NC
2.2.8.	Minimum of 8 ports 10/100/1000 Base T RJ45 PoE+ 115W	C/PC/NC
2.2.9.	Minimum of 2 100/1000 SFP ports (could be combo with 10/100/1000 Base-T RJ45 ports)	C/PC/NC
2.2.10.	Minimum of 2 1000Base-X SFP ports (1 Gbps)	C/PC/NC
2.2.11.	Support of MACsec on all ports	C/PC/NC
2.2.12.	Support of IEEE 1588v2 on all ports	C/PC/NC
2.2.13.	Minimum PoE budget of 115W	C/PC/NC
2.2.14.	Minimum switching capacity (Gbps): 24 Gbps	C/PC/NC
2.2.15.	Minimum Processing Capacity (Mpps): 17.9 Mpps	C/PC/NC
2.2.16.	Operating Temperature: -10°C to 60°C (-14ºF to 140ºF)	C/PC/NC
2.2.17.	Maximum system power consumption (idle) of 8.5W (at 120V AC)	C/PC/NC
2.2.18.	Maximum system power consumption (full load) of 19W (does not include PoE power consumption)	C/PC/NC
2.2.19.	Minimum MTBF of 1,298,328	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.	Remote Virtual Chassis connection	C/PC/NC
3.5.	Split Virtual Chassis protection: Autodetection and recovery of Virtual Chassis splitting due to one or more VFL or stack element failures	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.	Dual-home link support for sub-second link protection, without STP	C/PC/NC
3.11.	ITU-T G.8032/Y1344 2010: Ethernet Ring Protection	
3.12.	Virtual Router Redundancy Protocol (VRRP) with tracking capabilities	C/PC/NC
3.13.	IEEE protocol auto-discovery	C/PC/NC
3.14.	Built-in CPU protection against malicious attacks	C/PC/NC

4. Layer-3 IPv4 routing protocols and features

The switch must support the following:

4.1.	Static routing	C/PC/NC
4.2.	Routing Information Protocol (RIP) v1 and v2	C/PC/NC
4.3.	Virtual Router Redundancy Protocol (VRRPv2)	C/PC/NC
4.4.	DHCP relay (including generic UDP relay)	C/PC/NC
4.5.	Address Resolution Protocol (ARP)	C/PC/NC
4.6.	Policy-based routing and server load balancing	C/PC/NC

4.7.	DHCP V4 server	C/PC/NC
4.8.	RIPv1 & RIPv2	C/PC/NC

5. Layer-3 IPv6 routing protocols and features

The switch must support the following:

5.1.	Internet Control Message Protocol version 6 (ICMPv6)	C/PC/NC
5.2.	Static routing	C/PC/NC
5.3.	Virtual Router Redundancy Protocol version 3 (VRRPv3)	C/PC/NC
5.4.	Policy-based routing and server load balancing	C/PC/NC
5.5.	DHCPv6 server	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

7. Layer-2 switching and services

The switch must support the following:

7.1.	Up to 16k MAC addresses	C/PC/NC
7.2.	Total number of IPv4 routes: 128	C/PC/NC
7.3.	Number of VLANs: 4,000	C/PC/NC
7.4.	Jumbo frame size: 9216 bytes (for 1 Gb/s)	C/PC/NC
7.5.	Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking)	C/PC/NC
7.6.	Ethernet OAM (802.1ag): Connectivity Fault Management (L2 ping & Link trace)	C/PC/NC

7.7.	Ethernet in First mile: Link OAM (802.3ah)	C/PC/NC
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.	VLAN translation and mapping including CVLAN to SVLAN	C/PC/NC
7.12.	Port Mapping controlling communication between peer users	C/PC/NC
7.13.	DHCP Option 82: Configurable relay agent information	C/PC/NC
7.14.	Multiple VLAN Registration Protocol (MVRP)	C/PC/NC
7.15.	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
7.16.	Bridge Protocol Data Unit (BPDU) blocking	C/PC/NC
7.17.	STP Root Guard	C/PC/NC
7.18.	Customer Provider Edge (CPE) test head traffic generator and analyzer tool	C/PC/NC
7.19.	TR-101 Point-to-Point Protocol over Ethernet (PPPoE) Intermediate Agent allowing for the PPPoE network access method	C/PC/NC
7.20.	Service Assurance Agent (SAA) for proactively measuring network, health, reliability, and performance.	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.	Centralized RADIUS for device authentication and network access control authorization	C/PC/NC
8.9.	Learned Port Security (LPS) or MAC address lockdown	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 Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection	C/PC/NC
8.12.	ARP poisoning detection	C/PC/NC
8.13.	IP Source Filtering as a protective and effective mechanism against ARP attacks	C/PC/NC
8.14.	LLDP security mechanism for rogue device detection and restriction	C/PC/NC
8.15.	The minimum password size range is 1-30 characters.	C/PC/NC
8.16.	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 congestion avoidance	C/PC/NC
9.8.	EEE 802.3x Flow Control (FC)	C/PC/NC
9.9.	IEEE 802.1Qbb Priority-based Flow Control (PFC)	C/PC/NC
9.10.	Auto QoS for Generic Object-Oriented Substation Events (GOOSE) messages	C/PC/NC

10. Manageability and configuration features

The switch must support the following:

10.1.	Intuitive CLI in a scriptable Python & BASH environment via console, Telnet or Secure Shell (SSH) v2 over IPv4/IPv6	C/PC/NC
10.2.	Powerful WebView Graphical Web Interface via HTTP and HTTPS over IPv4/IPv6	C/PC/NC
10.3.	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
10.4.	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
10.5.	Fully programmable RESTful web services interface with XML and JSON support. API enables access to CLI and individual MIB objects	C/PC/NC
10.6.	Full configuration and reporting using SNMPv1/2/3 to facilitate third party network management over IPv4/IPv6	C/PC/NC
10.7.	File upload using USB, TFTP, FTP, SFTP or SCP using IPv4/IPv6	C/PC/NC
10.8.	Human-readable ASCII-based configuration files for off-line editing, bulk configuration and out-of-the-box auto-provisioning	C/PC/NC
10.9.	Non-volatile memory for start-up configuration	C/PC/NC
10.10.	Multiple microcode image support with fallback recovery	C/PC/NC
10.11.	Dynamic Host Configuration Protocol (DHCP) relay for IPv4/IPv6	C/PC/NC
10.12.	IEEE 802.1AB Link Layer Discover Protocol (LLDP) with Media Endpoint Discover (MED) extensions	C/PC/NC
10.13.	Network Time Protocol (NTP)	C/PC/NC
10.14.	Boot from USB and/or external flash	C/PC/NC
10.15.	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
10.16.	Must support hitless upgrade of IP services	C/PC/NC

11. Monitoring and troubleshooting features

The switch must support the following

11.1.	Local (on the flash) and remote server logging (Syslog): event and command logging	C/PC/NC
11.2.	IP tools: ping and trace route	C/PC/NC
11.3.	Dying Gasp support via SNMP and syslog messages	C/PC/NC
11.4.	Loopback IP address support for management per service	C/PC/NC
11.5.	Policy- and port-based mirroring	C/PC/NC
11.6.	Remote port mirroring	C/PC/NC
11.7.	sFlow v5 and Remote Monitoring (RMON)	C/PC/NC
11.8.	Unidirectional Link Detection (UDLD), Digital Diagnostic Monitoring (DDM)	C/PC/NC

12. Compliance and certifications

12.1. Industrial environmental:

12.2. Commercial EMI/EMC

The switch must support the following

12.2.1.	47 CRF FCC Part 15: 2015 Subpart B (Class A)VCCI (Class A, with UTP Cables)	C/PC/NC
12.2.2.	ICES-003:2012 Issue 5, Class A	C/PC/NC
12.2.3.	AS/NZS 3548 (Class A) – C-Tick	C/PC/NC
12.2.4.	CE marking for European countries (Class A)	C/PC/NC

12.3. CE Emission

The switch must support the following

12.3.1.	EN50581 (RoHS Recast)	C/PC/NC
12.3.2.	EN 55032 (EMI & EMC requirement)	C/PC/NC
12.3.3.	EN 55024 (Immunity Characteristics)	C/PC/NC
12.3.4.	EN 61000-3-2(Harmonic Current emissions)	C/PC/NC
12.3.5.	EN 61000-3-3	C/PC/NC

12.3.6.	EN 61000-4-2	C/PC/NC
12.3.7.	EN 61000-4-3	C/PC/NC
12.3.8.	EN 61000-4-4	C/PC/NC
12.3.9.	EN 61000-4-5 (Surge Immunity, Class 4)	C/PC/NC
12.3.10.	EN 61000-4-6	C/PC/NC
12.3.11.	EN 61000-4-8	C/PC/NC
12.3.12.	EN 61000-4-11	C/PC/NC
12.3.13.	IEEE802.3: Hi-pot Test (2.25 KV DC on all Ethernet Ports)	C/PC/NC

12.4. Commercial safety

The switch must support the following

12.4.1.	IEC 62368-1	C/PC/NC
12.4.2.	UL 60950-1, 2nd Ed	C/PC/NC
12.4.3.	UL62368-1	C/PC/NC
12.4.4.	UL 2043 (plenum rated)	C/PC/NC
12.4.5.	IEC 60950-1; all national deviations and amendments	C/PC/NC
12.4.6.	IEC 62368-1; all national deviations	C/PC/NC
12.4.7.	EN 60950-1; all deviations	C/PC/NC
12.4.8.	CAN/CSA-C22.2 No. 60950-1-03	C/PC/NC
12.4.9.	CAN/CSA-C22.2 No. 62368-1	C/PC/NC
12.4.10.	NOM-019 SCFI, Mexico	C/PC/NC
12.4.11.	AS/NZ TS-001 and 60950:2000, Australia	C/PC/NC
12.4.12.	UL-AR, Argentina	C/PC/NC
12.4.13.	UL-GS Mark, Germany	C/PC/NC
12.4.14.	CU, EAC, Russia	C/PC/NC
12.4.15.	ANATEL, Brazil	C/PC/NC
12.4.16.	CCC, China	C/PC/NC
12.4.17.	KCC Korea	C/PC/NC
12.4.18.	BSMI, Taiwan	C/PC/NC
12.4.19.	C Mark, Morocco	C/PC/NC
12.4.20.	EN 60825-1 Laser	C/PC/NC

12.4.21.	EN 60825-2 Laser	C/PC/NC
12.4.22.	CDRH Laser	C/PC/NC
12.4.23.	RoHS & WEEE directives compliant	C/PC/NC
12.4.24.	REACH directive	C/PC/NC

12.5. Security features

The switch must support the following:

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

13. Video surveillance

The switch must support the following:

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