Part No. 060908-00, Rev. A
March 2024

OmniSwitch AOS Release 8 Specifications Guide

8.9R4

Alcatel·Lucent Enterprise

www.al-enterprise.com

This user guide documents AOS Release 8.9R4.

The functionality described in this guide is subject to change without notice.

ALE USA Inc.
2000 Corporate Center Drive
Thousand Oaks, CA 91320
(818) 880-3500

Service & Support Contact Information
North America: 800-995-2696
Latin America: 877-919-9526
EMEA: +800 00200100 (Toll Free) or +1(650)385-2193
Asia Pacific: +65 6240 8484
Web: myportal.al-enterprise.com
Email: ale.welcomecenter@al-enterprise.com

Contents

About This Guide

This *OmniSwitch AOS Release 8 Specifications Guide* provides Specification tables for all the OmniSwitch AOS Release 8 Products.

Supported Platforms

The information in this guide applies only to the following products:

- OmniSwitch 6360 Series
- OmniSwitch 6465 Series
- OmniSwitch 6560 Series
- OmniSwitch 6570M Series
- OmniSwitch 6860 Series
- OmniSwitch 6865 Series
- OmniSwitch 6900 Series
- OmniSwitch 9900 Series

Who Should Read this Manual?

The audience for this user guide are network administrators and IT support personnel who need to configure, maintain, and monitor switches and routers in a live network.

When Should I Read this Manual?

Read this guide as soon as you are ready to integrate your OmniSwitch into your network. You should already be familiar with the basics of managing a single OmniSwitch as described in the *OmniSwitch AOS Release 8 Switch Management Guide*.

The information provided in the Specification tables in this guide assume a basic understanding of OmniSwitch administration commands and procedures.

What is Not in this Manual?

Procedures for switch management methods, such as CLI, web-based (WebView or OmniVista) or SNMP, are outside the scope of this guide.

For information on WebView and SNMP switch management methods consult the *OmniSwitch AOS Release 8 Switch Management Guide.* Information on using WebView and OmniVista can be found in the context-sensitive on-line help available with those network management applications.

This guide is designed to provide feature specification information only and is not intended as a reference for any CLI commands or configuration information. Refer to the Documentation Roadmap for a list of available user guides.

How is the Information Organized?

Each chapter in this guide corresponds to an OmniSwitch software user manual:

- Chapter 1, "Switch Management Specifications," applies to the features described in the *OmniSwitch AOS Release 8 Switch Management Guide*.
- Chapter 2, "Network Configuration Specifications," applies to the features described in the *OmniSwitch AOS Release 8 Network Configuration Guide*.
- Chapter 3, "Advanced Routing Configuration Specifications," applies to the features described in the *OmniSwitch AOS Release 8 Advanced Routing Configuration Guide*.
- Chapter 4, "Data Center Switching Specifications," applies to the features described in the *OmniSwitch AOS Release 8 Data Center Switching Guide*.

Documentation Roadmap

The OmniSwitch user documentation suite was designed to supply you with information at several critical junctures of the configuration process.The following section outlines a roadmap of the manuals that will help you at each stage of the configuration process. Under each stage, we point you to the manual or manuals that will be most helpful to you.

Stage 1: Using the Switch for the First Time

Pertinent Documentation: *OmniSwitch Hardware Users Guide*
Release Notes

This guide provides all the information you need to get your switch up and running the first time. It provides information on unpacking the switch, rack mounting the switch, installing NI modules, unlocking access control, setting the switch's IP address, and setting up a password. It also includes succinct overview information on fundamental aspects of the switch, such as hardware LEDs, the software directory structure, CLI conventions, and web-based management.

At this time you should also familiarize yourself with the Release Notes that accompanied your switch. This document includes important information on feature limitations that are not included in other user guides.

Stage 2: Gaining Familiarity with Basic Switch Functions

Pertinent Documentation: *OmniSwitch Hardware Users Guide*
OmniSwitch AOS Release 8 Switch Management Guide

Once you have your switch up and running, you will want to begin investigating basic aspects of its hardware and software. Information about switch hardware is provided in the *Hardware Guide*. This guide provide specifications, illustrations, and descriptions of all hardware components, such as chassis, power supplies, Chassis Management Modules (CMMs), Network Interface (NI) modules, and cooling fans. It also includes steps for common procedures, such as removing and installing switch components.

The *OmniSwitch AOS Release 8 Switch Management Guide* is the primary users guide for the basic software features on a single switch. This guide contains information on the switch directory structure, basic file and directory utilities, switch access security, SNMP, and web-based management. It is recommended that you read this guide before connecting your switch to the network.

Stage 3: Integrating the Switch Into a Network

Pertinent Documentation: *OmniSwitch AOS Release 8 Network Configuration Guide*
OmniSwitch AOS Release 8 Advanced Routing Configuration Guide
OmniSwitch AOS Release 8 Data Center Switching Guide

When you are ready to connect your switch to the network, you will need to learn how the OmniSwitch implements fundamental software features, such as 802.1Q, VLANs, Spanning Tree, and network routing protocols. The *OmniSwitch AOS Release 8 Network Configuration Guide* contains overview information, procedures, and examples on how standard networking technologies are configured on the OmniSwitch.

The *OmniSwitch AOS Release 8 Advanced Routing Configuration Guide* includes configuration information for networks using advanced routing technologies (OSPF and BGP) and multicast routing protocols (DVMRP and PIM-SM).

The *OmniSwitch AOS Release 8 Data Center Switching Guide* includes configuration information for data center networks using virtualization technologies (SPBM, VXLAN, UNP), Data Center Bridging protocols (PFC, ETC, and DCBX), and FCoE/FC gateway functionality.

Anytime

The *OmniSwitch AOS Release 8 CLI Reference Guide* contains comprehensive information on all CLI commands supported by the switch. This guide includes syntax, default, usage, example, related CLI command, and CLI-to-MIB variable mapping information for all CLI commands supported by the switch. This guide can be consulted anytime during the configuration process to find detailed and specific information on each CLI command.

Related Documentation

The following are the titles and descriptions of all the related OmniSwitch user manuals:

- *OmniSwitch 6360/6465/6560/6570M/6860/6865/6900/9900 Hardware Users Guides*

  Describes the hardware and software procedures for getting an OmniSwitch up and running as well as complete technical specifications and procedures for all OmniSwitch chassis, power supplies, fans, and Network Interface (NI) modules.

- *OmniSwitch AOS Release 8 CLI Reference Guide*

  Complete reference to all CLI commands supported on the OmniSwitch. Includes syntax definitions, default values, examples, usage guidelines and CLI-to-MIB variable mappings.

- *OmniSwitch AOS Release 8 Switch Management Guide*

  Includes procedures for readying an individual switch for integration into a network. Topics include the software directory architecture, image rollback protections, authenticated switch access, managing switch files, system configuration, using SNMP, and using web management software (WebView).

- *OmniSwitch AOS Release 8 Network Configuration Guide*

  Includes network configuration procedures and descriptive information on all the major software features and protocols included in the base software package. Chapters cover Layer 2 information (Ethernet and VLAN configuration), Layer 3 information (routing protocols, such as RIP and IPX), security options (authenticated VLANs), Quality of Service (QoS), link aggregation, and server load balancing.

- *OmniSwitch AOS Release 8 Advanced Routing Configuration Guide*

  Includes network configuration procedures and descriptive information on all the software features and protocols included in the advanced routing software package. Chapters cover multicast routing (DVMRP and PIM-SM), Open Shortest Path First (OSPF), and Border Gateway Protocol (BGP).

- *OmniSwitch AOS Release 8 Data Center Switching Guide*

  Includes and introduction to the OmniSwitch data center switching architecture as well as network configuration procedures and descriptive information on all the software features and protocols that support this architecture. Chapters cover Shortest Path Bridging MAC (SPBM), Data Center Bridging (DCB) protocols, and Virtual Network Profile (vNP).

- *OmniSwitch AOS Release 8 Transceivers Guide*

  Includes SFP and XFP transceiver specifications and product compatibility information.

- *OmniSwitch AOS Release 8 Specifications Guide*

  Includes Specifications table information for the features documented in the Switch Management Guide, Network Configuration Guide, Advanced Routing Guide, and Data Center Switching Guide.

- Technical Tips, Field Notices

  Includes information published by Alcatel-Lucent's Customer Support group.

- *Release Notes*

  Includes critical Open Problem Reports, feature exceptions, and other important information on the features supported in the current release and any limitations to their support.

Technical Support

An Alcatel-Lucent service agreement brings your company the assurance of 7x24 no-excuses technical support. You'll also receive regular software updates to maintain and maximize your Alcatel-Lucent product's features and functionality and on-site hardware replacement through our global network of highly qualified service delivery partners.

With 24-hour access to Alcatel-Lucent's Enterprise Service and Support web page, you'll be able to view and update any case (open or closed) that you have reported to Alcatel-Lucent Enterprise technical support, open a new case or access helpful release notes, technical bulletins, and manuals.

Access additional information on Alcatel-Lucent Enterprise Service Programs:

Web: myportal.al-enterprise.com

Phone: 1-800-995-2696

Email: ale.welcomecenter@al-enterprise.com

1 Switch Management Specifications

This chapter provides Specifications tables for the following switch management applications and procedures that are used for readying an individual OmniSwitch for integration into a network:

- The switch directory structure, basic file and directory utilities, switch access security, SNMP, and web-based management.
- The software directory architecture.
- Image rollback protections.
- Authenticated switch access.
- Managing switch files.
- System configuration.
- Using SNMP.
- Using web management software (WebView).

Note. The maximum limit values provided in the Specifications tables included in this chapter are subject to available system resources.

Note. A Virtual Chassis is a group of switches managed as a single logical chassis. Any maximum limitation values documented apply to the entire Virtual Chassis and not to each individual switch unless stated otherwise.

For information about how to configure switch management applications, refer to the *OmniSwitch AOS Release 8 Switch Management Guide*.

In This Chapter

This chapter contains the following switch management Specifications tables:

Getting Started Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Standalone Configuration Files	N/S	N/S	N/S	N/S	N/S	N/S	N/S	boot.cfg	N/S	N/S	N/S
Virtual Chassis Configuration Files	vcboot.cfg vcsetup.cfg										
Image Files	Nosa.img	Nos.img	Nos.img	Wos.img	Uos.img	Uosn.img	Uos.img	Tos.img	Yos.img	Yos.img	Mhost.img Mos.img Meni.img
Notes:											
N/A											

Login Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Login Methods	Telnet, SSH, HTTP, SNMP										
Number of concurrent Telnet sessions	6										
Number of concurrent SSH sessions	8										
Number of concurrent HTTP (WebView) sessions	4										
Secure Shell public key authentication	Password DSA/RSA/ECSDA Public Key										

RFCs Supported for SSHv2	RFC 4253 - SSH Transport Layer Protocol RFC 4418 - UMAC: Message Authentication Code using Universal Hashing
Notes:	
N/A	

File Management Specifications

	OS6360	**OS6465**	**OS6560**	**OS6570M**	**OS6860**	**OS6860N**	**OS6865**	**OS6900**	**OS6900-V72/C32**	**OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2**	**OS9900**
File Transfer Methods	FTP (v4/v6), SFTP (v4/v6), SCP (v4/v6), TFTP										
Client/Server Support	FTP—Client (IPv4 Only) or Server SFTP—Client or Server SCP—Client or Server TFTP—Client										
Number of concurrent FTP/SFTP sessions	4										
Configuration Recovery	The **flash/certified** directory holds configurations that are certified as the default start-up files for the switch. They will be used in the event of a non-specified reload.										
Default Switch Directory - /**flash**	Contains the **certified**, **working, switch, network,** and user-defined directories.										
File/Directory Name Metrics	255 character maximum. File and directory names are case sensitive. 30 character maximum if being used the RUNNING directory.										
File/Directory Name Characters	Any valid ASCII character except '/'.										
Sub-Directories	Additional user-defined directories created in the /**flash** directory.										
Text Editing	Standard Vi editor										
System Clock	Set local date, time and time zone, Universal Time Coordinate (UTC), Daylight Savings (DST or summertime).										
Notes:											
N/A											

CMM Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RAM Memory	1 GB	1 GB	2 GB	2GB	2 GB	4 GB	2 GB	4 GB (X/T) 8 GB (Q32) 8 GB (X72)	8 GB	8 GB	16 GB
Flash Memory	1 GB	1 GB	1 GB / 2 GB	8 GB	2 GB	16 GB	2 GB	2 GB X72 - 4 GB	32 GB	32 GB* 64 GB (V48C8/ C32E)	2 GB (9907) 32GB (9912)
Maximum Length of File Names (in Characters)	255										
Maximum Length of Directory Names (in Characters)	255 30 (maximum if being used as RUNNING directory).										
Maximum Length of System Name (in Characters)	64										
Notes:											
*Size of physical memory. Partitioned to 16GB flash memory.											

USB Flash Drive Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
USB Flash Drive Support	Alcatel-Lucent Enterprise Certified USB Flash Drive										
Automatic Software Upgrade	Supported								N/S	N/S	N/S
Disaster Recovery	**Narescue.img** file required	**Nrescue.img** file required	**Nrescue.img** file required	**Wrescue.img** file required	**Urescue.img** file required	**Urescue.img** file required	**Urescue.img** file required	**Trescue.img** file required	**Trescue.img** file required	**Trescue.img** file required	**Mrescue.img** file required
Notes:											
• The format of the Alcatel-Lucent certified USB Flash Drive must be FAT32. To avoid file corruption issues, the USB Drive should be stopped before removing from a PC. • Directory names are case sensitive and must be lower case.											

CLI Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Configuration Methods	• Online configuration via real-time sessions using CLI commands. • Offline configuration using text file containing CLI commands.										
Command Capture Feature	Snapshot feature captures switch configurations in a text file.										
User Service Features	• Command Line Editing • Command Prefix Recognition • CLI Prompt Option • Command Help • Keyword Completion • Command Abbreviation • Command History • Command Logging • Syntax Error Display • More Command										

Notes:
N/A

Configuration File Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Methods for Creating Configuration Files	• Create a text file on a word processor and upload it to the switch. • Invoke the switch's snapshot feature to create a text file. • Create a text file using the switch's text editor.										
Timer Functions	Files can be applied immediately or by setting a timer on the switch.										
Command Capture Feature	Snapshot feature captures switch configurations in a text file.										
Error Reporting	Snapshot feature includes error reporting in the text file.										
Text Editing on the Switch	Vi standard editor.										
Default Error File Limit	1										
Notes:											
N/A											

User Database Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum number of alphanumeric characters in a username	63										
Maximum number of alphanumeric characters in a user password	30										
Maximum number of local user accounts	50										
Notes:											
N/A											

WebView Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
WebView Versions	WebView 2.0										
Notes:											
N/A											

SNMP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported for SNMPv2	1902 through 1907 - SNMPv2c Management Framework 1908 - Coexistence and transitions relating to SNMPv1 and SNMPv2c										
RFCs Supported for SNMPv3	2570—Version 3 of the Internet Standard Network Management Framework 2571—Architecture for Describing SNMP Management Frameworks 2572—Message Processing and Dispatching for SNMP 2573—SNMPv3 Applications 2574/3414—User-based Security Model (USM) for version 3 SNMP 2575—View-based Access Control Model (VACM) for SNMP 2576—Coexistence between SNMP versions 3586—The Advanced Encryption Standard (AES) Cipher Algorithm in the SNMP User-based Security Model										
SNMPv1, SNMPv2, SNMPv3	The SNMPv3 protocol is ascending compatible with SNMPv1 and v2 and supports all the SNMPv1 and SNMPv2 PDUs										
SNMPv1 and SNMPv2 Authentication	Community Strings										
SNMPv1, SNMPv2 Encryption	None										
SNMPv1 and SNMPv2 Security requests accepted by the switch	Sets and Gets										
SNMPv3 Authentication	SHA, MD5										
SNMPv3 Encryption	DES, AES										
SNMPv3 Security requests accepted by the switch	Non-authenticated Sets, Non-authenticated Gets and Get-Nexts, Authenticated Sets, Authenticated Gets and Get-Nexts, Encrypted Sets, Encrypted Gets and Get-Nexts										
SNMP traps	For a list and description of system MIBs and Traps refer to Appendix B, “SNMP Trap Information,” in the *OmniSwitch AOS Release 8 Switch Management Guide*.										
Notes:											
N/A											

Web Services Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Configuration Methods	• HTTP/HTTPS • Python API										
Response Formats	• Extensible Markup language (XML) • JavaScript Object Notation (JSON)										
Maximum Web Services Sessions	4										
Alcatel-Lucent Example Python Library	consumer.py (Python version 2.X/3.X compatible) This file is available on the Service & Support Website. It is being provided as an example application to help with Web Services familiarization but is not an officially supported part of the Web Services solution.										
Embedded Python /Event based CLI Scripting	Python 3										
AOS Micro Services (AMS)	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Notes:											
N/A											

OpenFlow Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Modes Supported	N/S	N/S	N/S	N/S	Normal Hybrid (API)	N/S	N/S	Normal Hybrid (API)	N/S	N/S	N/S
Versions Supported	N/S	N/S	N/S	N/S	1.0/ 1.3.1	N/S	N/S	1.0/ 1.3.1	N/S	N/S	N/S
Maximum number of logical switches	N/S	N/S	N/S	N/S	3	N/S	N/S	3	N/S	N/S	N/S
Maximum number of controllers per logical switch	N/S	N/S	N/S	N/S	3	N/S	N/S	3	N/S	N/S	N/S
Maximum number of logical switches in Hybrid mode	N/S	N/S	N/S	N/S	1	N/S	N/S	1	N/S	N/S	N/S
Support for Virtual Chassis	N/S	N/S	N/S	N/S	Supported	N/S	N/S	Supported	N/S	N/S	N/S
OpenFlow 1.0/1.3.1 TCP port.	N/S	N/S	N/S	N/S	6633	N/S	N/S	6633	N/S	N/S	N/S
Flow Matching Table	N/S	N/S	N/S	N/S	1535	N/S	N/S	Q32 - 1279 X72 - 1279 other - 511	N/S	N/S	N/S
MAC Table	N/S	N/S	N/S	N/S	48K	N/S	N/S	Q32 - 224K X72 - 224K other - 128K	N/S	N/S	N/S
Notes:											
N/A											

Virtual Chassis Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E V48C8, C32E, X/T24C2	OS9900
Maximum number of physical switches in a Virtual Chassis	8 (all 24/48 port models) 4 (10 port models)	4	8	8	8	8	8	6	6	6	2 (OS9907)
Valid chassis identifier	1-8 (24/48) 1-4 (10)	1-4	1–8	1-8	1–8	1–8	1–8	1–6	1–6	1–6	1 or 2
Valid chassis group identifier	0-255	0-255	0-255	0-255	0–255	0–255	0-255	0–255	0–255	0–255	0-255
Valid chassis priority	0-255	0-255	0-255	0-255	0–255	0–255	0-255	0–255	0–255	0–255	0-255
Maximum number of Virtual Fabric Link peers per chassis	2	2	2	2	2	2	2	5	5	5	1
Maximum number of member ports per Virtual Fabric Link	2	8	8	8	8	8	8	16	16	16	8
Valid Virtual Fabric Link identifier	0 or 1	0 or 1	0 or 1	0 or 1	0 or 1	0-1	0 or 1	0–4	0–4	0–4	0
VFL Supported Port Types	10G SFP+ SFP (10/P10 Only)	SFP/SFP+	Dedicated VFL ports, 10G SFP+	10G SFP+	Dedicated VFL ports, 10G SFP+	Dedicated VFL ports, 40G QSFP+ 100G QSFP28	10G SFP+	10G SFP+ 25G SFP28 40G QSFP+ 100G QSFP28	10G SFP+ 25G SFP28 40G QSFP+ 100G QSFP28	10G SFP+ 25G SFP28 40G QSFP+ 100G QSFP28	10G SFP+ 40G QSFP+ 100G QSFP28
Valid control VLAN	2-4094										
Valid Virtual Chassis protocol hello interval	1-65535										
Remote Chassis Detection (RCD)	N/S	N/S	N/S	N/S	Supported	Supported	N/S	Supported	N/S	Supported	Supported
Notes:											

- The OS9912 chassis does not support a VC configuration.
- OS6900-X20/X40/T20/T40/Q32/X72 models can be mixed in a VC of up to 6 elements.
- OS6900-V72/C32(E)/X48C6/T48C6/V48C8/X24C2/T24C2 models can be mixed in a VC of up to 6 elements.
- OS6900-X48C4E can be mixed with OS6900-X48C6/T48C6/V48C8/C32E/T24C2/X24C2 when they are configured in mixed VFL mode.
- MAC Learning Mode is not supported on OS6900 Virtual Chassis.
- OS6860 and OS6865 models can be mixed in Virtual Chassis.
- OS6465-P6/P12, OS6465-P28 and 6465T models can be mixed in Virtual Chassis using the 1G SFP ports.
- OS6860N and OS686x models should not be mixed in a Virtual Chassis.
- OS6360 10-port models support a VC of up to 4 elements using SFP ports.
- 10G and 25G VFLs supported on fixed ports only, not supported on 4X10G or 4X25G splitter ports.

Automatic Remote Configuration Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
DHCP Specifications	DHCP Server required DHCP Client on: - VLAN 1 - Tagged VLAN 127 - LLDP Management VLAN - Automatic LACP (tagged VLAN 127, untagged VLAN 1)										
File Servers	TFTP FTP/SFTP										
Clients supported	TFTP FTP/SFTP										
Instruction file	Maximum length of: • Pathname: 255 characters • Filename: 63 characters										
Maximum length of username for FTP/SFTP file server.	15 characters										
Maximum DHCP lease tries	6										
Unsupported Features	• ISSU and IPv6 are not supported. • Upgrade of uboot, miniboot, or FPGA files is not supported.										
OK LED	Flashing amber during Automatic Remote Configuration process										
Notes:											
N/A											

Automatic Fabric Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Ports Supported	Any switch port that is not already configured in such a way as to prevent the port from participating in the Automatic Fabric discovery and configuration process.										
IP Protocols Supported for Automatic IP Configuration	OSPFv2, OSPFv3, IS-IS IPv4, IS-IS IPv6										
Notes:											
Advanced routing protocols not supported on the OS6465 or OS6560. Not supported on OS6900-V72/C32(E)/X48C6/T48C6./X48C4E/V48C8/X24C2/T24C2. Not supported on OS6860N.											

NTP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs supported	5905–Network Time Protocol v4										
NTP Key File Location	/flash/network										
Maximum number of NTP servers per client	12										
Maximum number of associations	512										
Notes:											
N/A											

2 Network Configuration Specifications

This chapter provides Specifications tables for the following OmniSwitch network configuration applications and procedures that are used for readying a switch for integration into a live network environment:

- Layer 2 features (Ethernet, source learning, and VLAN configuration).
- Layer 3 features (routing protocols, such as IP and RIP)
- Security options (MAC and 802.1x authentication)
- Quality of Service (QoS)
- Link aggregation
- Server load balancing.

Note. The maximum limit values provided in the Specifications tables included in this chapter are subject to available system resources.

Note. A Virtual Chassis is a group of switches managed as a single logical chassis. Any maximum limitation values documented apply to the entire Virtual Chassis and not to each individual switch unless stated otherwise.

For information about how to implement the fundamental software features and protocols for network configuration, refer to the *OmniSwitch AOS Release 8 Network Configuration Guide*.

In This Chapter

This chapter contains the following network configuration Specifications tables:

Ethernet Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Standards Supported	802.3 Carrier Sense Multiple Access with Collision Detection (CSMA/CD) 802.3u (100BaseTX) 802.3ab (1000BaseT) 802.3z (1000Base-X) 802.3ae (10GBase-X) 802.3ba (40GBase-X) 802.3az (Energy Efficient Ethernet)										
Ports Supported	Ethernet (10 Mbps) Fast Ethernet (100 Mbps) Gigabit Ethernet (1 Gbps) 10/40/100 Gigabit Ethernet (10/40/100 Gbps)										
802.1Q Hardware Tagging	Supported										
Jumbo Frame Configuration	1/10/40/100 Gigabit Ethernet ports										
Maximum Frame Size	1553 bytes (10/100 Mbps) 9216 bytes (1/10/40/100 Gbps)										
MACsec	N/S	Supported	Supported	N/S	Supported	Supported	N/S	N/S	N/S	X48C4E	Supported
PoE	Supported	Supported	Supported	N/S	Supported	Supported	Supported	N/S	N/S	N/S	Supported
Fast/ Perpetual PoE	Supported	N/S	N/S	N/S	Supported	Supported	Supported	N/S	N/S	N/S	N/S
1588v2 End-to-End	N/S	Supported	Supported[1]	N/S	Supported	Supported[2]	Supported	X72/Q32	N/S	Supported[3]	N/S
1588v2 Peer-to-Peer	N/S	Supported	Supported[1]	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S

Notes:

- Supported port speeds are chassis and module dependent.
- OS6860/6865 does not support 10/100 half-duplex (CSMA/CD).
- MACsec site license required.
- Refer to the latest release notes for a detailed list of MACsec platform and module support.
- 1588v2 is supported on a VC-of-1 only.

1. Supported on OS6560-48X4/P48X4/P48Z16 1G and 10G ports only. Not supported 2.5G ports. Requires proper FPGA, see release notes.
2. OS6860N-P48Z – Not supported on 2.5G, 5G, 25G interfaces. OS6860N-U28 – Not supported on 25G interfaces.
3. OS6900-V48C8 – Not supported on 25G or 100G interfaces.

UDLD Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Number of UDLD ports per system	128	128	128	128	128	128	128	128	N/S	128 (X48C4E Only)	N/S
Number of UDLD neighbors per port	32	32	32	32	32	32	32	32	N/S	32 (X48C4E Only)	N/S
Notes:											
N/A											

Source Learning Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	2674—Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering and Virtual LAN Extensions										
Maximum number of learned MAC addresses when centralized MAC source learning mode is enabled	16K	16K	16K	16K	48K	64K (SM) 16K (RM)	48K	X20 - 128K X40 - 128K T20 - 128K T40 - 128K Q32 - 228K X72 - 228K (SM) X72 - 32K (RM)	V72 - 104K (SM) V72 - 8K (RM) C32 - 104K (SM) C32 - 8K (RM)	228K (SM) X/T24C2 - 64K (SM) 32K (RM) X/T24C2 - 16K (RM)	128K
Notes:											
SM = Switch Mode RM = Router Mode (Router Mode values are indicative maximum values based on hardware specifications. They are subject to change per use case or IP Routing configurations)											

VLAN Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	2674 - Definitions of Managed Objects for Bridges with Traffic Classes, Multicast Filtering and Virtual LAN Extensions 5517 - Private VLAN										
IEEE Standards Supported	802.1Q - Virtual Bridged Local Area Networks 802.1D - Media Access Control Bridges										
Maximum VLANs per VC	4094	4094	4094	4094	4094	4094	4094	4094	4094	4094	4094
Maximum Tagged VLANs per Port	4093	4093	4093	4093	4093	4093	4093	4093	4093	4093	4093
Maximum Untagged VLANs per Port	One untagged VLAN (default VLAN) per port.										
Maximum number of ports or link aggregates per PVLAN supported	N/S	N/S	N/S	N/S	1	1	1	1	1	1	N/S
Maximum Number of Secondary VLANs with a Primary VLAN that can co-exist on a port	N/S	N/S	N/S	N/S	1	1	1	1	1	1	N/S
Maximum number of IPCL and EPCL rules per VLAN	N/S	N/S	N/S	N/S	256	256	256	256	256	256	N/S
Maximum number of PVLAN per promiscuous port	N/S	N/S	N/S	N/S	1	1	1	1	1	1	N/S
Notes:											
N/A											

High Availability VLANs Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum high availability VLANs per VC	N/S	N/S	N/S	N/S	16	16	32	16	16	16	N/S
Notes:											
N/A											

Spanning Tree Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Standards supported	802.1d—Media Access Control (MAC) Bridges 802.1s—Multiple Spanning Trees 802.1w—Rapid Spanning Tree Protocol										
Spanning Tree operating modes supported	Flat mode—one spanning tree instance per VC Per-VLAN mode—one spanning tree instance per VLAN										
Spanning Tree port eligibility	Fixed ports 802.1Q tagged ports Link aggregate of ports										
Maximum VLAN Spanning Tree instances per VC	100	100	100	100	100	100	100	128	128	128	128
Maximum flat mode Multiple Spanning Tree Instances (MSTI) per VC	16 MSTI, in addition to the Common and Internal Spanning Tree instance (also referred to as MSTI 0).										
Notes:											
Maximum VLAN Spanning Tree instances per VC—values based on per-VLAN mode.											

Shortest Path Bridging Specifications

The following Specifications table contains information for the OmniSwitch implementation of Shortest Path Bridging (SPB). Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Standards Supported	802.1aq/D3.6: Draft February 10, 2011—*Virtual Bridged Local Area Networks-Amendment 9: Shortest Path Bridging* 802.1ah/D4.2: DRAFT March 26, 2008— *Virtual Bridged Local Area Networks–Amendment 6: Provider Backbone Bridging*										
IETF Internet-Drafts Supported	draft-ietf-isis-ieee-aq-05.txt—*ISIS Extensions Supporting IEEE 802.1aq Shortest Path Bridging* IETF draft—*IP/IPVPN services with IEEE 802.1aq SPBB networks* IETF draft—*IP/IPVPN services with IEEE 802.1aq SPB networks*										
SPB mode supported	N/S	N/S	N/S	N/S	SPBM (MAC-in-MAC)						
IP over SPBM	N/S	N/S	N/S	N/S	IPv4 (VPN-Lite and L3 VPN) VRF-to-ISID mapping (one-to-one, one-to-many)						
Maximum number of ISIS-SPB instances per VC.	N/S	N/S	N/S	N/S	1						
Maximum number of BVLANs per VC	N/S	N/S	N/S	N/S	16						
Maximum number of IS-IS adjacencies	N/S	N/S	N/S	N/S	70	128	70	70	128	128	128
Maximum number of IS-IS interfaces	N/S	N/S	N/S	N/S	70	128	70	70	128	128	128
Number of equal cost tree (ECT) algorithm IDs supported.	N/S	N/S	N/S	N/S	16 (Can select any ID between 1 and 16 to assign to a BVLAN)						
Maximum number of service instance identifiers (I-SIDs) per VC	N/S	N/S	N/S	N/S	2K	2K	2K	1K Q32 - 8K X72 - 8K	8K	8K X/T24C2 - 2K	1K
Maximum number of VLANs or SVLANs per I-SID	N/S	N/S	N/S	N/S	2K	2K	2K	4K	4K	4K X/T24C2 - 2K	4K

Maximum number of SAPs	N/S	N/S	N/S	N/S	2K	2K	2K	X20 - 4K X40 - 4K T20 - 8K T40 - 8K Q32 - 8K X72 - 8K	8K	8K X/T24C2 - 2K	8K
Maximum Transmission Unit (MTU) size for SPB services.	N/S	N/S	N/S	N/S	9K (not configurable at this time)						
Maximum number of Remote Fault Propagation (RFP) domains.	N/S	N/S	N/S	N/S	8 (or less if there are other Ethernet OAM domains already configured)	N/S	8 (or less if there are other Ethernet OAM domains already configured)	8 (or less if there are other Ethernet OAM domains already configured)	N/S	N/S	N/S
Inline Routing	N/S	N/S	N/S	N/S	N/S	Supported	N/S	N/S	N/S	Supported	Supported
Inline Routing (front panel)	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	Supported	N/S	N/S
External Loopback Routing	N/S	N/S	N/S	N/S	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Notes:											
In a VC with OS6900-X20/X40 models, the maximum number of SAPs is 4K.											

Loopback Detection Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Edge (Bridge)	Supported	Supported	Supported	Supported	Supported	Supported	Supported	N/S	Supported	Supported	Supported
SAP (Access)	N/S	N/S	N/S	N/S	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Transmission Timer	5–600 seconds										
Auto-recovery Timer	30–86400 seconds										
Notes:											
N/A											

Static Link Aggregation Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum number of link aggregation groups	32	32	32	32	128	128	128	128	128	128	253
Maximum number of ports per link aggregate group	8	8	8	8	16	16	16	16	16	16	16
Notes:											
On an OS9900 linkagg IDs 0, 126, and 127 are reserved											

Dynamic Link Aggregation Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Specifications Supported	802.1ax/802.3ad—Aggregation of Multiple Link Segments										
Maximum number of link aggregation groups	32	32	32	32	128	128	128	128	128	128	253
Maximum number of ports per link aggregate group	8	8	8	8	16	16	16	16	16	16	16
Notes:											
On an OS9900 linkagg IDs 0, 126, and 127 are reserved.											

Dual-Home Link Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
DHL sessions supported	1	1	1	1	1	1	1	N/S	N/S	1	N/S
Notes:											
N/A											

ERP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
ITU-T G.8032 03/2010	Ethernet Ring Protection version 2 (Multi Rings and Ladder networks supported) (Hold off timer, Lockout, Signal degrade SD, RPL Replacement, Forced Switch, Manual Switch, Clear for Manual/Forced Switch, Dual end blocking not supported)										
ITU-T Y.1731/IEEE 802.1ag	ERP packet compliant with OAM PDU format for CCM										
Maximum number of rings per node	64										
Maximum number of nodes per ring	16 (recommended)										
Maximum number of VLANs per port	4094										
Range for ring ID	1–2147483647										
Range for remote MEPID	1–8191										
Range for wait-to-restore timer	1–12 minutes										
Range for guard timer	1–200 centi-seconds										
Notes:											
N/A											

MVRP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Standards Supported	IEEE 802.1ak-2007 Amendment 7: Multiple Registration Protocol IEEE 802.1Q-2005 Corrigendum 2008										
Maximum MVRP VLANs	256	256	512	512	512	512	512	512	512	512	512
Notes:											
N/A											

802.1AB Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Specification	IEEE 802.1AB-2005 Station and Media Access Control Connectivity Discovery										
Maximum number of network policies that can be associated with a port	8	8	8	8	8	8	8	8	8	8	8
Maximum number of network policies that can be configured on a VC	8	8	32	32	32	32	32	32	32	32	32
Nearest Edge MAC Address	01:20:da:02:01:73										
Nearest Bridge MAC Address	01:80:c2:00:00:0e										
Nearest Customer MAC Address	01:80:C2:00:00:00										
Non-TPMR Address	01:80:C2:00:00:03										

Notes:
N/A

SIP Snooping Specifications

	OS6860
RFCs Supported	3261–SIP session initiation protocol 6337–SIP USAGE of offer/answer model 4566–SDP session description Protocol 3551–RTP profile for audio and video conferences with minimal control 3311–The Session Initiation Protocol (SIP) UPDATE Method 3262–Reliability of Provisional Responses in SIP
Notes:	
Supported on OS6860 only.	

IP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	791–Internet Protocol 792–Internet Control Message Protocol 826–An Ethernet Address Resolution Protocol 2784–Generic Routing Encapsulation (GRE) 2890–Key and Sequence Number Extensions to GRE (extensions defined are not supported) 1701–Generic Routing Encapsulation (GRE) 1702–Generic Routing Encapsulation over IPV4 Networks 2003-IP Encapsulation within IP 4292 - IP Forwarding Table MIB 4293 - Management Information Base for the Internet Protocol (IP)										
Maximum router interfaces per system	32	24	128	128 4K*	4K	4K	4K	4K	4K	4K	4K
Maximum router interfaces per VLAN	8	8	8	8 16*	16	16	16	16	16	16	16
Maximum HW routes	64	32	2048	256 16K*	12K	12K (SM) 144K (RM)	12K	X20 - 16K X40 - 16K T20 - 16K T40 - 16K Q32 - 12K X72 - 12K (SM) X72 - 128K (RM)	V72 - 12K (SM) V72 - 128K (RM) C32 - 12K (SM) C32 - 128K (RM)	32K (SM) X/T24C2 - 12K (SM) 384K (RM) X/T24C2 - 144K (RM)	128K
Maximum HW ARP entries	256	256	2048	2048 8K*	16K	24K (SM) 16K (RM)	16K	X20 - 8K X40 - 8K T20 - 16K T40 - 16K Q32 - 48K (SM) Q32 - 16K (RM) X72 - 48K (SM) X72 - 16K (RM)	V72 - 32K (SM) V72 - 8K (RM) C32 - 32K (SM) C32 - 8K (RM)	64K (SM) X/T24C2 - 24K (SM) 16K (RM) X/T24C2 - 16K (RM)	24K

Maximum HW ARP entries in VC of OS6900s	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Equal to capacity of module with lowest number of supported ARPs.	Equal to capacity of module with lowest number of supported ARPs.	Equal to capacity of module with lowest number of supported ARPs.	N/A
Maximum number of GRE tunnel interfaces per VC	N/S	N/S	N/S	127*	127	127	127	127	127	127	N/S
Maximum number of IPIP tunnel interfaces per VC	N/S	N/S	N/S	127*	127	127	127	127	127	127	N/S
Maximum ECMP gateways	4	4	4	4 16*	16	16	16	16	16	16	16
Maximum Static Routes (Including Black Hole Routes)	256	256	256	256 4K*	4094	4094	4094	4094	4094	4094	4094
Notes:											
SM - Switch mode RM - Router mode (Router Mode values are indicative maximum values based on hardware specifications. They are subject to change per use case or IP Routing configurations) * With Advanced Routing License The OmniSwitch can support a higher number of routes than what is documented in the hardware routing limits. This is done by moving older unused routes into software and more recent active routes into hardware. The total number of routes supported is dependent upon the switch configuration and the total amount of memory available. Exceeding the maximum hardware routes will result in some traffic being routed in software.											

VRF Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum number of MAX profile VRF instances per VC (no LOW profiles)	N/S	1	1	8	64	64	64	64	64	64	64
Maximum number of LOW profile VRF instances per VC (no MAX profiles)	N/S	N/S	N/S	16	128	128	128	128	128	128	300
Maximum VRF instances per VLAN	N/S	N/S	N/S	1	1	1	1	1	1	1	1
Maximum OSPFv2/v3 VRF routing instances per VC	N/S	N/S	1	8	16	16	16	16	16	16	16
Maximum RIPv2/ng VRF routing instances per VC	N/S	1	1	8	16	16	16	16	16	16	16
Maximum BGP VRF routing instances per VC	N/S	N/S	N/S	N/S	32	32	32	32	32	32	32

Notes:

- OS6570M requires Advanced Routing license.
- Refer to the Configuring Multiple VRF chapter for information on VRF aware applications.

IPv6 Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	1981—Path MTU Discovery for IP version 6 2375—IPv6 Multicast Address Assignments 2460—Internet Protocol, Version 6 (IPv6) Specification 2464—Transmission of IPv6 Packets over Ethernet Networks 2465—Management Information Base for IP Version 6: Textual Conventions and General Group 2466—Management Information Base for IP Version 6: ICMPv6 Group 2711—IPv6 Router Alert Option 3056—Connection of IPv6 Domains via IPv4 Clouds 3484—Default Address Selection for Internet Protocol version 6 (IPv6) 3493—Basic Socket Interface Extensions for IPv6 3542—Advanced Sockets Application Program Interface (API) for IPv6 3587—IPv6 Global Unicast Address Format 3595—Textual Conventions for IPv6 Flow Label 3596— DNS Extensions to Support IP Version 6 4007—IPv6 Scoped Address Architecture 4022—Management Information Base for the Transmission Control Protocol (TCP) 4113—Management Information Base for the User Datagram Protocol (UDP) 4193—Unique Local IPv6 Unicast Addresses 4213—Basic Transition Mechanisms for IPv6 Hosts and Routers 4291—IP Version 6 Addressing Architecture 4294—IPv6 Node Requirements 4443—Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification 4861—Neighbor Discovery for IP version 6 (IPv6) 4862—IPv6 Stateless Address Autoconfiguration 5095—Deprecation of Type 0 Routing Headers in IPv6 5453—Reserved IPv6 Interface Identifiers 5722—Handling of Overlapping IPv6 Fragments										
Maximum IPv6 interfaces	4	4	64	16 4K*	4096	4096	4096	4096	4096	4096	4096
Maximum 6to4 tunnels	N/S	N/S	N/S	1*	1	1	1	1	1	1	1
Maximum Configured tunnels	N/S	N/S	N/S	255*	255	255	255	255	255	255	255

Maximum IPv6 Hosts (Neighbor Discovery)	64	64	128	128 3K*	3K	12K (SM) 8K (RM)	3K	X20 - 4K X40 - 4K T20 - 4K T40 - 4K Q32 - 40K (SM) Q32 - 8K (RM) X72 - 40K (SM) X72 - 8K (RM)	V72 - 16K (SM) V72 - 4K (RM) C32(E) - 16K (SM) C32(E) - 4K (RM)	32K (SM) X/T24C2 - 12K (SM) 8K (RM) X/T24C2 - 8K (RM)	24K
Maximum IPv6 global unicast or anycast addresses	4	4	16	16 4K*	10K	10K	10K	10K	10K	10K	10K
Maximum IPv6 global unicast addresses per IPv6 interface	1	1	1	1 50*	50	50	50	50	50	50	50
Maximum IPv6 hardware routes when there are no IPv4 routes present (includes dynamic, static, black hole routes)	32	32	1024	128 8K*	1K (128-bit) 6K (64-bit)	1K (128-bit SM) 6K (64-bit SM) 48K (128-bit RM) 72K (64-bit RM)	1K (128-bit) 6K (64-bit)	256 (128-bit) X20/X40 - 8K (64-bit) T20/T40 - 8K (64-bit) Q32/X72 - 6K (64-bit SM) Q32/X72 - 64K (64-bit RM) Q32/X72 - 1K (128-bit SM) Q32/X72 - 64K (128-bit RM)	6K (64-bit SM) 64K (64-bit RM) - 1K (128-bit SM) 64K (128-bit RM)	1K (128-bit SM) 16K (64-bit SM) X/T24C2 - 1K (128-bit SM) 6K (64-bit SM) 128K (128-bit RM) 192K (64-bit RM) X/T24C2 - 48K (128-bit RM) 72K (64-bit RM)	32K
Maximum IPv6 static routes (Including black hole routes)	4	16	128	128 512*	512	512	512	512	512	512	512
Maximum number of RIPng Peers	N/S	4	10	10 20*	20	20	20	20	20	20	20
Maximum number of RIPng Interfaces	N/S	4	10	10 20*	20	20	20	20	20	20	20

Maximum number of RIPng Routes	N/S	40	128	128 5K*	5K	5K	5K	5K	5K	5K	5K
Maximum ECMP gateways	4	4	4	4 16*	16	16	16	16	16	16	16
Notes:											
SM - Switch mode RM - Router mode (Router Mode values are indicative maximum values based on hardware specifications. They are subject to change per use case or IP Routing configurations) * With Advanced Routing license. Exceeding the maximum IPv6 hardware routes or having IPv4 routes will result in some traffic being routed in software.											

IPsec Specifications

	OS6360	**OS6465**	**OS6560**	**OS6570M**	**OS6860**	**OS6860N**	**OS6865**	**OS6900**	**OS6900-V72/C32**	**OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2**	**OS9900**
IP Version Supported	N/S	N/S	N/S	N/S	IPv4, IPv6						
RFCs Supported	N/S	N/S	N/S	N/S	4301—Security Architecture for the Internet Protocol 4302—IP Authentication Header (AH) 4303—IP Encapsulating Security Payload (ESP) 4305—Cryptographic Algorithm Implementation Requirements for ESP and AH 4308—Cryptographic Suites for IPsec						
Encryption Algorithms Supported for ESP	N/S	N/S	N/S	N/S	NULL, 3DES-CBC, and AES-CBC						
Key lengths supported for Encryption Algorithms	N/S	N/S	N/S	N/S	3DES-CBC - 192 bits AES-CBC - 128, 192, or 256 bits						
Authentication Algorithms Supported for AH	N/S	N/S	N/S	N/S	HMAC-SHA1-96, HMAC-MD5-96, and AES-XCBC-MAC-96, HMAC-SHA256, HMAC-SHA384, HMAC-SHA512						
Key lengths supported for Authentication Algorithms	N/S	N/S	N/S	N/S	HMAC-MD5 - 128 bits HMAC-SHA1 - 160 bits AES-XCBC-MAC - 128 bits						
Master Security Key formats	N/S	N/S	N/S	N/S	Hexadecimal (16 bytes) or String (16 characters)						
Priority value range for IPsec Policy	N/S	N/S	N/S	N/S	1–1000 (1=highest priority, 1000=lowest priority)						

Index value range for IPsec Policy Rule	N/S	N/S	N/S	N/S	1–10
SPI Range	N/S	N/S	N/S	N/S	256–999999999
Modes Supported	N/S	N/S	N/S	N/S	Transport
Notes:					
N/A					

RIP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 1058–RIP v1 RFC 2453–RIP v2 RFC 1722–RIP v2 Protocol Applicability Statement RFC 1724–RIP v2 MIB Extension RFC 2080–RIPng for IPv6 RFC 2082–RIP-2 MD5 Authentication										
Maximum Number of Interfaces	N/S	8	10	10	10	10	10	10	10	10	16
Maximum Number of Peers	N/S	8	8	8 100*	100	100	100	100	100	100	16
Maximum Number of Routes	N/S	128	256 (1024#)	256 (1024#) 10K*	10K	10K	10K	10K	10K	10K	10K
Notes											
* With Advanced Routing license. # With ECMP Maximum number of routes includes routes redistributed into RIP.											

BFD Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	N/S	N/S	N/S	N/S	5880—Bidirectional Forwarding Detection 5881—Bidirectional Forwarding Detection for IPv4 and IPv6 (Single Hop) 5882—Generic Application of Bidirectional Forwarding Detection						
Maximum Number of BFD Sessions	N/S	N/S	N/S	N/S	Chassis - 32 VC - 100	Chassis - 32 VC - 100	Chassis - 32 VC - 100 -	Chassis - 32 VC - 100	Chassis - 32 VC - 100	Chassis - 32 VC - 100	Chassis - 32 VC - 100
Protocols Supported	N/S	N/S	N/S	N/S	BGP, OSPF, VRRP Remote Address Tracking only, and Static Routes. IPv6 protocols not supported.						
Modes Supported	N/S	N/S	N/S	N/S	Asynchronous Echo (Demand Mode not supported)						
Notes:											
N/A											

DHCP Relay / Snooping Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	0951–Bootstrap Protocol 1534–Interoperation between DHCP and BOOTP 1541–Dynamic Host Configuration Protocol 1542–Clarifications and Extensions for the Bootstrap Protocol 2132–DHCP Options and BOOTP Vendor Extensions 3046–DHCP Relay Agent Information Option, 2001										
DHCP Relay Implementation	Global DHCP Per-VLAN DHCP										
DHCP Relay Service	BOOTP/DHCP (Bootstrap Protocol/Dynamic Host Configuration Protocol)										
UDP Port Numbers	67 for Request 68 for Response										
IP addresses supported for each Relay Service	256	256	256	256	1536	1536	1536	1536	1536	1536	1536
IP addresses supported for the Per-interface mode	256	256	256	256	1536	1536	1536	1536	1536	1536	1536
Maximum number of UDP relay services allowed per VC	12	30	30	30	30	30	30	30	30	30	30
Maximum number of VLANs to which forwarded UDP service port traffic is allowed	256	256	256	256	256	256	256	256	256	256	256

Maximum VLAN level IP source filtering entries*	15 VLANs with 93 clients	16 VLANs with 31 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 160 clients 16 VLANs with 208 clients 8 VLANs with 232 clients 4 VLANs with 244 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 160 clients 16 VLANs with 208 clients 8 VLANs with 232 clients 4 VLANs with 244 clients	32 VLANs with 160 clients 16 VLANs with 208 clients 8 VLANs with 232 clients 4 VLANs with 244 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients
Maximum port level IP source filtering entries	107 clients	46 clients	254 clients	254 clients	253 clients	254 clients	253 clients	253 clients	254 clients	254 clients	254 clients
Notes:											
*Maximum VLAN-based entries for a VC is equal to the documented values multiplied by the number of VC elements. *OS6465 - For a linkagg there is one binding entry per member port(s) of the linkagg. *Other platforms - For a linkagg, there is one binding entry per NI on which there are member port(s) of the linkagg.											

DHCPv6 Relay / Snooping Specifications

	OS6360	**OS6465**	**OS6560**	**OS6570M**	**OS6860**	**OS6860N**	**OS6865**	**OS6900**	**OS6900-V72/C32**	**OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2**	**OS9900**
RFCs Supported	RFC 3315 - Dynamic Host Configuration Protocol for IPv6 (DHCPv6)										
DHCP Relay Implementation	Per-VLAN DHCP										
UDP Destination Port Numbers	547 - DHCPv6 messages to a DHCPv6 Server or Relay Agent 546 - DHCPv6 messages to a Client										
Maximum Relay Destinations per DHCPv6 Relay Interface	5										
Maximum DHCPv6 snooping VLANs (per VLAN mode)	64	64	64	64	64	64	64	64	64	64	64

Maximum VLAN snooping / source filtering entries*	8 VLANs with 30 clients.	N/S	16 VLANs with 64 clients 8 VLANs with 72 clients 4 VLANs with 76 clients 1 VLANs with 79 clients	16 VLANs with 64 clients 8 VLANs with 72 clients 4 VLANs with 76 clients 1 VLANs with 79 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	32 VLANs with 223 clients 16 VLANs with 239 clients 8 VLANs with 247 clients 4 VLANs with 251 clients	X/T24C2 - 32 VLANs with 223 clients 4 VLANs with 251 clients	16 VLANs with 64 clients 8 VLANs with 72 clients 4 VLANs with 76 clients 1 VLANs with 79 clients
Maximum port level IP source filtering entries	37 clients	N/S	79 clients	79 clients	254 clients	254 clients	254 clients	254 clients	254 clients	254 clients	79 clients
Maximum DHCPv6 Guard VLANs	64	64	64	64	64	64	64	64	64	X/T24C2 - 64	N/S
Maximum IPv6 Generic UDP Relay Services	4	4	8	8	8	8	8	8	8	8	8
Maximum IPv6 UDP Relay Ports	4	4	8	8	8	8	8	8	8	8	8
Maximum IPv6 UDP Destinations per Port	8	8	8	8	8	8	8	8	8	8	8
Notes:											
*Maximum VLAN-based entries for a VC is equal to the documented values multiplied by the number of VC elements. Platform specific specifications in other areas may have an impact on these values.											

DHCP Server Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 2131—Dynamic Host Configuration Protocol RFC 3315—Dynamic Host Configuration Protocol for IPv6 RFC 950—Internet Standard Subnetting Procedure RFC 868—Time Protocol RFC 1035—Domain Implementation and Specification RFC 1191—Path MTU Discovery										
DHCP Server Implementation	BOOTP/DHCP										
UDP Port Numbers	67 for Request and Response (IPv4) 547 for Request (IPv6) 546 for Response (IPv6)										
IP address lease allocation mechanisms	**Static BootP:** IP address is allocated using the BootP configuration when the MAC address of the client is defined. Static DHCP: The network administrator assigns an IP address to the client. DHCP conveys the address assigned by the DHCP server to the client. **Dynamic DHCP:** The DHCP server assigns an IP address to a client for a limited period of time or until the client explicitly releases the address.										
OmniSwitch IPv4 Configuration Files	dhcpd.conf dhcpd.pcy dhcpsrv.db										
OmniSwitch IPv6 Configuration Files	dhcpdv6.conf dhcpdv6.pcy dhcpv6srv.db										
Maximum number of leases	8000										
Maximum lease information file size	375K										
Notes:											
N/A											

VRRP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 3768 - Virtual Router Redundancy Protocol RFC 2787 - Definitions of Managed Objects for the Virtual Router Redundancy Protocol RFC 5798 - Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6 RFC 6527 - Definitions of Managed Objects for VRRP Version 3 (VRRPv3) IPv6										
Maximum number of VRRPv2 and VRRPv3 virtual routers	255	255	255	255	255	255	255	255	255	255	255
Maximum number of IP addresses per instance	16	16	16	16	16	16	16	16	16	16	16
Notes:											
N/A											

Server Load Balancing Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum number of clusters	N/S	N/S	N/S	N/S	32	32	32	32	N/S	32	N/S
Max. number of physical servers per cluster	N/S	N/S	N/S	N/S	32	32	32	32	N/S	32	N/S
Layer-3 classification	Destination IP address QoS policy condition										
Layer-2 classification	QoS policy condition										
Server health checking	Ping, link checks										
High availability support	Hardware-based failover, VRRP, Chassis Management Module (CMM) redundancy										
Networking protocols supported	Virtual IP (VIP) addresses										
Notes:											
N/A											

IPMS Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 1112—Host Extensions for IP Multicasting RFC 2236—Internet Group Management Protocol, Version 2 RFC 2710—Multicast Listener Discovery (MLD) for IPv6 RFC 2933—Internet Group Management Protocol MIB RFC 3019—IP Version 6 Management Information Base for The Multicast Listener Discovery Protocol RFC 3376—Internet Group Management Protocol, Version 3 RFC 3810—Multicast Listener Discovery Version 2 (MLDv2) for IPv6 RFC 4541—Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches RFC 4604—Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast										
IGMP Versions Supported	IGMPv1, IGMPv2, IGMPv3										
Maximum number of IPv4 multicast flows (switched)	1K	1K	1K	1K	12K	40K	12K	X20 - 4K X40 - 4K T20 - 8K T40 - 8K Q32 - 40K X72 - 40K	20K	40K	128K
Maximum number of IPv4 multicast flows (*,G routed)	N/S	N/S	N/S	1K	12K	12K	12K	X20 - 4K X40 - 4K T20 - 8K T40 - 8K Q32 - 40K X72 - 40K	20K	40K X/T24C2 - 12K	16K
Maximum number of IPv4 multicast flows (S,G routed)	N/S	N/S	N/S	1K	12K	12K	12K	X20 - 4K X40 - 4K T20 - 8K T40 - 8K Q32 - 40K X72 - 40K	20K	40K X/T24C2 - 12K	16K
Notes:											
N/A											

IPMSv6 Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 2710—Multicast Listener Discovery for IPv6 RFC 3019—IPv6 MIB for Multicast Listener Discovery Protocol RFC 3306—Unicast-Prefix-based IPv6 Multicast Addresses RFC 3810—Multicast Listener Discovery Version 2 for IPv6 RFC 4541—Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches RFC 4604—Using Internet Group Management Protocol Version 3 (IGMPv3) and Multicast Listener Discovery Protocol Version 2 (MLDv2) for Source-Specific Multicast										
MLD Versions Supported	MLDv1, MLDv2										
MLD Query Interval	1–65535 in seconds										
MLD Router Timeout	1–65535 in seconds										
MLD Source Timeout	1–65535 in seconds										
MLD Query Response Interval	1–65535 in milliseconds										
MLD Last Member Query Interval	1–65535 in milliseconds										
Maximum number of IPv6 multicast flows (switched)	1K	1K	1K	1K	6K	20K	6K	X20 - 2K X40 - 2K T20 - 4K T40 - 4K Q32 - 20K X72 - 20K	10K	20K	128K
Maximum number of IPv6 multicast flows (*,G routed)	N/S	N/S	N/S	1K	6K	6K	6K	X20 - 2K X40 - 2K T20 - 4K T40 - 4K Q32 - 20K X72 - 20K	10K	20K X/T24C2 - 6K	16K
Maximum number of IPv6 multicast flows (S,G routed)	N/S	N/S	N/S	1K	6K	6K	6K	X20 - 2K X40 - 2K T20 - 4K T40 - 4K Q32 - 20K X72 - 20K	10K	20K X/T24C2 - 6K	16K
Notes:											

N/A

QoS Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum number of policy rules hardware	128	128	384	384	3072	3072	3072	1024 Q32 - 2560 X72 - 2560	4K	4K X/T24C2 - 3072	1024
Max. number of policy conditions hardware	128	128	384	384	3072	3072	3072	1024	4K	4K X/T24C2 - 3072	1024
Maximum number of policy actions hardware	128	128	384	384	3072	3072	3072	1024	4K	4K X/T24C2 - 3072	1024
Maximum number of groups (network, MAC, service, port)	2047	2047	2047	2047	1024	1024	1023	2047	2047	2047 X/T24C2 - 1024	2047
Maximum number of group entries	128	128	384 per group (256 per service group)	384 per group (256 per service group)	1024 per group (256 per service group)	1024 per group (256 per service group)	1024 per group (256 per service group)	1024 per group (256 per service group)	1024 per group	1024 per group	1024 per group (256 per service group)
Maximum number of Class of Service (CoS) queues per port.	8	8	8	8	8	8	8	8	8	8	8
Queue Set Profiles (QSP)	2	2	2	2	4	4	4	4	4	4	4
Weighted Random Early Detection profiles (WRED)	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Maximum number of QoS policy lists	32 (does not include the default list)										
Maximum number of QoS policy lists per Universal Network Profile (UNP)	1										
Notes:											
N/A											

LDAP Policy Server Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 2251–Lightweight Directory Access Protocol (v3) RFC 3060–Policy Core Information Model—Version 1 Specification										
Maximum number of policy servers (supported on a VC)	5										
Maximum number of policy servers (supported by PolicyView)	1										
Notes:											
N/A											

Authentication Server Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RADIUS RFCs Supported	RFC 2865–Remote Authentication Dial In User Service (RADIUS) RFC 2866–RADIUS Accounting RFC 2867–RADIUS Accounting Modifications for Tunnel Protocol Support RFC 2868–RADIUS Attributes for Tunnel Protocol Support RFC 2809–Implementation of L2TP Compulsory Tunneling through RADIUS RFC 2869–RADIUS Extensions RFC 2548–Microsoft Vendor-specific RADIUS Attributes RFC 2882–Network Access Servers Requirements: Extended RADIUS Practices										
TACACS+ RFCs Supported	RFC 1492–An Access Control Protocol										
LDAP RFCs Supported	RFC 1789–Connectionless Lightweight X.5000 Directory Access Protocol RFC 2247–Using Domains in LDAP/X.500 Distinguished Names RFC 2251–Lightweight Directory Access Protocol (v3) RFC 2252–Lightweight Directory Access Protocol (v3): Attribute Syntax Definitions RFC 2253–Lightweight Directory Access Protocol (v3): UTF-8 String Representation of Distinguished Names RFC 2254–The String Representation of LDAP Search Filters RFC 2256–A Summary of the X.500(96) User Schema for Use with LDAPv3										
Other RFCs	RFC 2574–User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3) RFC 2924–Accounting Attributes and Record Formats RFC 2975–Introduction to Accounting Management RFC 2989–Criteria for Evaluating AAA Protocols for Network Access										
Maximum number of authentication servers in single authority mode	4	8									
Maximum number of authentication servers in multiple authority mode	4	8									
Maximum number of servers per Authenticated Switch Access type	4	8									
Notes:											
N/A											

UNP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Number of UNPs per VC	4K	4K	4K	4K	4K	4K	4K	4K	4K	4K	2K
Number of UNP users per chassis	128	80	256	256	2K	2K	2K	2K	2K	2K	1K
Number of UNP users per VC	512	320	2K	2K	2K	2K	2K	2K	2K	2K	2K
Authentication type	MAC and 802.1x authentication										
Profile type	VLAN				VLAN and SPB service			VLAN, SPB and VXLAN service			VLAN, SPB
UNP port type	Bridge				Bridge, Access						Bridge, Access
Number of QoS policy lists per VC	32 (includes the default list)										
Number of QoS policy lists per UNP	1										
Notes:											
• Number of UNPs per VC includes static and dynamic profiles. • The maximum entries may be lower depending on any LPS or QoS configuration.											

Access Guardian Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC 2284–PPP Extensible Authentication Protocol (EAP) RFC 2865–Remote Authentication Dial In User Service (RADIUS) RFC 2866–RADIUS Accounting RFC 2867–RADIUS Accounting Modifications for Tunnel Protocol Support RFC 2868–RADIUS Attributes for Tunnel Protocol Support RFC 2869–RADIUS Extensions RFC 3576--Change of Authorization-Request (COA) and Disconnect request (DM) for BYOD. RFC support is limited to ClearPass solution. RFC 3579–RADIUS Support for EAP										
IEEE Standards Supported	IEEE 802.1X-2001–Standard for Port-based Network Access Control 802.1X RADIUS Usage Guidelines										
Authentication methods supported	802.1X, MAC address, Captive Portal										
Maximum number of Access Guardian users (system)	512	320	1K	1K	1K	1K	1K	1K	1K	1K	1K
Maximum number of users quarantined by QMR	N/S	N/S	256	256	1K	1K	1K	1K	1K	1K	N/S
Average number of users allowed to login to Captive portal Web pages at any given time	40										
Maximum number of Captive Portal profiles	8										
Maximum number of AAA profiles	8										
Maximum number of authentication servers	4 per authentication type (MAC, 802.1X, Captive Portal)										
Maximum number of accounting servers	4 per authentication type (MAC, 802.1X, Captive Portal)										
BYOD Solution Server	ClearPass Policy Manager (CPPM) / UPAM										
mDNS GRE Tunnel Supported Protocol	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4

SSDP GRE Tunnel Supported Protocol	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPv4	IPV4
Maximum L2 GRE Access Tunnels	N/S	N/S	8	8	1	1	1	1	1	1	1
Maximum L2 GRE Aggregation Tunnels	N/S	N/S	N/S	N/S	2K	2K	2K	Q32/X72 - 1K	8K	8K 2K (X/T24C2)	1K
Notes:											
N/A											

AppMon Specifications

	OS6360	**OS6465**	**OS6560**	**OS6570M**	**OS6860**	**OS6860N**	**OS6865**	**OS6900**	**OS6900-V72/C32**	**OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2**	**OS9900**
Packet types sampled	N/S	N/S	N/S	N/S	TCP and UDP	TCP and UDP	N/S	N/S	N/S	N/S	N/S
Notes:											
AppMon is supported in a virtual chassis of OmniSwitch 6860 and OmniSwitch 6860E platforms where at least one OmniSwitch 6860E is mandatory for the feature to work.											

Application Fingerprinting Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Packet sampling rate	N/S	N/S	N/S	N/S	N/S	N/S	N/S	50Kpackets-per-second on each module.	N/S	N/S	N/S
Packet types sampled	N/S	N/S	N/S	N/S	N/S	N/S	N/S	IPv4 and IPv6 (no fragmented, encrypted, control, or protocol packets. For example, ICMP, LLDP, BPDU packets not scanned).	N/S	N/S	N/S
Notes:											
AFP is supported on the OS6900 only.											

Port Mapping Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Port Mapping Sessions	8										
Notes:											
N/A											

Learned Port Security Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Ports eligible for Learned Port Security	Fixed and 802.1Q tagged										
Ports not eligible for Learned Port Security	Link aggregate ports. 802.1Q (trunked) link aggregate ports.										
Maximum number of learned MAC addresses allowed per LPS port	1000										
Maximum number of filtered MAC addresses allowed per LPS port	100										
Maximum number of configurable MAC address ranges per LPS port	8										
Notes:											
N/A											

Port Mirroring Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Mirroring Sessions Supported	2	7	7	7	4	4	4	4	4	4	7
Combined Mirroring/ Monitoring Sessions per Chassis	2	7	7	7	4	4	4	4	4	4	7
N-to-1 Mirroring Supported	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1	128 to 1
Maximum No. of mirroring destinations per session supported	1	1	1	1	2	2	2	2	2	2	128
Number of RPMIR VLANs per session	1	1	1	1	1	1	1	1	1	1	1
Notes:											

Port Monitoring Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Monitoring Sessions Supported	1	1	1	1	1	1	1	1	1	1	1
Combined Mirroring/ Monitoring Sessions per Chassis	2	7	7	7	2	2	2	2	2	2	7
File Type Supported	ENC file format (Network General Sniffer Network Analyzer Format)										

Notes:
N/A

sFlow Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	3176—sFlow Management Information Base										
Receiver/Sampler/Polling Instances	2										
Sampling	length of packet type of frame source and destination MACs source and destination VLANs source and destination priorities source and destination IP addresses source and destination ports tcp flags and tos										
Polling	In octets Out octets Number of Rx Unicast packets Number of Tx Unicast packets Number of Rx Multicast packets Number of Tx Multicast packets Number of Rx Broadcast packets Number of Tx Broadcast packets In Errors Out Errors										
Notes:											
N/A											

RMON Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	2819 - Remote Network Monitoring Management Information Base										N/S
RMON Functionality Supported	Basic RMON 4 group implementation –Ethernet Statistics group –History (Control and Statistics) group –Alarms group –Events group										N/S
RMON Functionality Not Supported	RMON 10 group* RMON2* –Host group –HostTopN group –Matrix group –Filter group –Packet Capture group (*An external RMON probe that includes RMON 10 group and RMON2 be used where full RMON probe functionality is required.)										N/S
Flavor (Probe Type)	Ethernet/History/Alarm										N/S
Status	Active/Creating/Inactive										N/S
History Control Interval (seconds)	1–3600										N/S
History Sample Index Range	1–65535										N/S
Alarm Interval (seconds)	1–2147483647										N/S
Alarm Startup Alarm	Rising Alarm/Falling Alarm/ RisingOrFalling Alarm										N/S
Alarm Sample Type	Delta Value/Absolute										N/S
RMON Traps Supported	RisingAlarm/FallingAlarm These traps are generated whenever an Alarm entry crosses either its Rising Threshold or its Falling Threshold and generates an event configured for sending SNMP traps.										N/S
Notes:											
Not supported on the OS9900.											

Switch Health Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Health Functionality Supported	–Switch level CPU Utilization Statistics (percentage); –Switch/module/port level Input Utilization Statistics (percentage); –Switch/module/port level Input/Output Utilization Statistics (percentage); –Switch level Memory Utilization Statistics (percentage); –Device level (for example, Chassis/CMM) Temperature Statistics (Celsius).										
Monitored Resource Utilization Levels	–Most recent utilization level; –Average utilization level during last minute; –Average utilization level during last hour; –Maximum utilization level during last hour.										
Resource Utilization Raw Sample Values	Saved for previous 60 seconds.										
Resource Utilization Current Sample Values	Stored.										
Resource Utilization Maximum Utilization Value	Calculated for previous 60 seconds and stored.										
Utilization Value = 0	Indicates that none of the resources were measured for the period.										
Utilization Value = 1	Indicates that a non-zero amount of the resource (less than 2%) was measured for the period.										
Percentage Utilization Values	Calculated based on Resource Measured During Period/Total Capacity.										
Resource Threshold Levels	Apply automatically across all levels of switch (switch/module/port).										
Rising Threshold Crossing	A Resource Threshold was exceeded by its corresponding utilization value in the current cycle.										
Falling Threshold Crossing	A Resource Threshold was exceeded by its corresponding utilization value in the previous cycle, but is not exceeded in the current cycle.										
Threshold Crossing Traps Supported	Device, module, port-level threshold crossings.										
Notes:											
N/A											

VLAN Stacking Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
IEEE Standards supported	IEEE 802.1Q, 2003 Edition, IEEE Standards for Local and Metropolitan Area Networks—Virtual Bridged Local Area Networks P802.1ad/D6.0 (C/LM) Standard for Local and Metropolitan Area Networks—Virtual Bridged Local Area Networks–Amendment 4: Provider Bridges										
Maximum number of services	N/S	4	4	4	4	4	4	4	4	4	N/S
Maximum number of SVLANs	N/S	4K	4K	4K	4K	4K	4K	4K	4K	4K	N/S
Maximum number of SAPs	N/S	8K	8K	8K	8K	8K	8K	8K	8K	8K	N/S
Maximum number of SAP profiles	N/S	8K	8K	8K	8K	8K	8K	8K (1K if profiles assign priority or bandwidth)	8K (1K if profiles assign priority or bandwidth)	8K (1K if profiles assign priority or bandwidth)	N/S
Maximum number of SAP profile VLAN translation or double tagging rules	N/S	-	-	-	-	-	-	8K	8K	8K	N/S
Maximum number of customer VLANs (CVLANs) associated with a SAP	N/S	4K	4K	4K	4K	3.5K	4K	4K	4K	4K	N/S
Maximum number of customer VLANs (CVLANs) per VC.	N/S	-	-	-	-	-	-	8192	8192	8192	-
Maximum number of service-to-SAP associations	N/S	1K	1K	1K	1K	1K	1K	-	-	-	N/S
Maximum supported SAP-UNI-CVLAN	N/S	127	127	127	4K	480	4K	512	512	3072 X24C2/ T24C2 - 512	N/S
Notes:											
N/A											

Switch Logging Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	RFC-5424 Syslog Protocol										
Functionality Supported	High-level event logging mechanism that forwards requests from applications to enabled logging devices.										
Number of Syslog Servers Supported	12										
Logging Devices	Flash Memory/Console/IP Address										
Severity Levels/Types Supported	2 (Alarm - highest severity), 3 (Error), 4 (Alert), 5 (Warning) 6 (Info - default), 7 (Debug 1), 8 (Debug 2), 9 (Debug 3 - lowest severity)										
Notes:											
N/A											

Ethernet OAM Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Standards Supported	N/S	IEEE 802.1ag Version 8.1–*Connectivity Fault Management* IEEE 802.1D–*Media Access Control (MAC) Bridges* IEEE 802.1Q–*Virtual Bridged Local Area Networks* ITU-T Y.1731–*OAM Functions and Mechanisms for Ethernet-Based Networks*									N/S
Maximum Maintenance Domains (MD) per Bridge	N/S	8									N/S
Maximum Maintenance Associations (MA) per Bridge	N/S	128									N/S
Maximum Maintenance End Points (MEP) per Bridge	N/S	256									N/S

Maximum MEP CMM Database Size	N/S	1K	N/S
Minimum CCM interval	N/S	100ms	N/S
Notes:			
Ethernet OAM is not supported on the OS6360 or OS9900.			

Link OAM Specifications

	OS6360	**OS6465**	**OS6560**	**OS6570M**	**OS6860**	**OS6860N**	**OS6865**	**OS6900**	**OS6900-V72/C32**	**OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2**	**OS9900**
IEEE Standards Supported	IEEE 802.3ah–*EFM LINK OAM* RFC 4878 - *Definitions and Managed Objects for Operations, Administration, and Maintenance (OAM) functions on Ethernet-Like Interfaces.*										
Platforms Supported	N/S	Supported	Supported	Supported	Supported	Supported	Supported	N/S	N/S	N/S	N/S
Maximum LINK OAM instances per VC	N/S	-									
Maximum loopback sessions	N/S	-									
Maximum event logs	N/S	-									
Mirroring ports	LINK OAM is not supported on mirroring ports.										
Notes:											
N/A											

CPE Testhead Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Test Supported	N/S	Unidirectional and bidirectional ingress test	Unidirectional and bidirectional ingress test	Unidirectional and bidirectional ingress test	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Maximum number of test ID per switch	N/S	32	32	32	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Number of active tests allowed per switch	N/S	1	1	1	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Supported test roles	N/S	Generator or Analyzer or Loopback	Generator or Analyzer or Loopback	Generator or Analyzer or Loopback	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Test mode supported	N/S	Ingress UNI	Ingress UNI	Ingress UNI	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Test traffic direction supported	N/S	Unidirectional and bidirectional	Unidirectional and bidirectional	Unidirectional and bidirectional	N/S	N/S	N/S	N/S	N/S	N/S	N/S
Notes:											
N/A											

PPPoE-IA Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Maximum number of options supported for Circuit-Identifier	N/S	5	5	5	N/S	N/S	5	N/S	N/S	N/S	N/S
Maximum Circuit-Identifier length supported	N/S	63 Bytes	63 Bytes	63 Bytes	N/S	N/S	63 Bytes	N/S	N/S	N/S	N/S
Maximum Remote-Identifier length supported	N/S	63 Bytes	63 Bytes	63 Bytes	N/S	N/S	63 Bytes	N/S	N/S	N/S	N/S
Notes:											
N/A											

SAA Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Platforms Supported	Supported	Supported	N/S	N/S	Supported	Supported	Supported	Supported	Supported	Supported	N/S
Maximum number of SAAs	128	128	N/S	N/S	128	128	128	128	128	128	N/S
Maximum SAA SPB sessions	N/S	N/S	N/S	N/S	128 (per BVLAN)	128 (per BVLAN)	128 (per BVLAN)	128 (per BVLAN)	128 (per BVLAN)	128 (per BVLAN)	320 (per BVLAN)
Notes:											
N/A											

MRP Specifications

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
Platforms Supported	N/S	Supported	N/S	N/S	N/S	N/S	Supported	N/S	N/S	N/S	N/S
IEEE Standards Supported	IEC 62439-2:2016 Media Redundancy Protocol										
Maximum Number of rings	N/S	3	N/S	N/S	N/S	N/S	3	N/S	N/S	N/S	N/S
Maximum Nodes in Ring	N/S	50	N/S	N/S	N/S	N/S	50	N/S	N/S	N/S	N/S
Maximum Reconfig Time	N/S	200Ms and 500Ms	N/S	N/S	N/S	N/S	200Ms and 500Ms	N/S	N/S	N/S	N/S
Notes:											
N/A											

3 Advanced Routing Configuration Specifications

This chapter provides Specifications tables for the following OmniSwitch features that are used to set up and monitor advanced routing protocols for operation in a live network environment:

- Routing technologies.
  - Open Shortest Path First (OSPF), version 2 and version 3.
  - Intermediate System-to-Intermediate System (IS-IS).
  - Border Gateway Protocol (BGP).
- Multicast routing protocols.
  - Multicast boundaries that are used to confine scoped multicast addresses to a specific domain.
  - Distance Vector Multicast Routing Protocol (DVMRP)
  - Protocol-Independent Multicast (PIM)
  - Multicast Border Router (MBR) functionality as defined in the PIM-SM specification (RFC 4601)

Note. The OmniSwitch can support a higher number of routes than what is documented in the protocol routing tables. The values documented are based on typical scenarios and validated during the AOS test phase. The total number of routes supported is dependent upon the switch configuration and the total amount of memory available.

Note. A Virtual Chassis is a group of switches managed as a single logical chassis. Any maximum limitation values documented apply to the entire Virtual Chassis and not to each individual switch unless stated otherwise.

For information about how to configure advanced routing protocols, refer to the *OmniSwitch AOS Release 8 Advanced Routing Configuration Guide*.

In This Chapter

This chapter contains the following Advanced Routing Specifications tables:

OSPF Specifications

The following Specifications table contains information for the OmniSwitch implementation of Open Shortest Path First (OSPF) routing protocol. Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs supported	1370 - Applicability Statement for OSPF 4750 - OSPF Version 2 Management Information Base 2328 - OSPF Version 2 5250 - The OSPF Opaque LSA Option 3101 - The OSPF Not-So-Stubby Area (NSSA) Option 3623 - Graceful OSPF Restart 5709 - OSPFv2 HMAC-SHA Cryptographic Authentication										
Maximum number of areas	N/S	N/S	2	8	4	10	4	10	10	10	15
Maximum number of interfaces	N/S	N/S	8	128	128	200	128	128	128	128	200
Maximum number of passive interfaces	N/S	N/S	8	200	200	200	200	200	200	200	200
Maximum number of Link State Database entries	N/S	N/S	1K	20K	20K	100K	20K	100K	100K	100K	100K
Maximum number of neighbors	N/S	N/S	8	128	128	254	128	254	254	254	200
Maximum number of routes	N/S	N/S	512	32K	32K	32K	32K	32K	32K	32K	64K
Maximum number of ECMP next hop entries	N/S	N/S	16	16	16	16	16	16	16	16	16
Notes:											
• The maximum number of routes value may vary depending on the number of interfaces/neighbors. • OS6570M requires Advanced Routing license.											

OSPFv3 Specifications

The following Specifications table contains information for the OmniSwitch implementation of Open Shortest Path First version 3 (OSPFv3) routing protocol. Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs supported	RFC 1826—IP Authentication Header RFC 1827—IP Encapsulating Security Payload RFC 2553—Basic Socket Interface Extensions for IPv6 RFC 2373—IPv6 Addressing Architecture RFC 2374—An IPv6 Aggregatable Global Unicast Address Format RFC 2460—IPv6 base specification RFC 2740—OSPF for IPv6 RFC 5643—Management Information Base for OSPFv3										
Maximum number of areas	N/S	N/S	2	5	4	5	4	5	5	5	5
Maximum number of interfaces	N/S	N/S	8	128	128	128	128	128	128	128	128
Maximum number of Link State Database entries	N/S	N/S	-	20K	20K	20K	20K	20K	20K	20K	20K
Maximum number of neighbors	N/S	N/S	8	128	128	128	128	128	128	128	128
Maximum number of routes	N/S	N/S	256	32K	32K	32K	32K	10K	10K	10K	10K
Maximum number of ECMP next hop entries	N/S	N/S	16	16	16	16	16	16	16	16	16
Notes:											
The maximum number of routes may vary depending on the number of interfaces/neighbors. OS6570M requires Advanced Routing license.											

IS-IS Specifications

The following Specifications table contains information for the OmniSwitch implementation of the Intermediate System-to-Intermediate System (IS-IS) routing protocol. Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	1142-OSI IS-IS Intra-domain Routing Protocol 1195-OSI IS-IS for Routing in TCP/IP and Dual Environments 3373-Three-Way Handshake for Intermediate System to Intermediate System (IS-IS) Point- to-Point Adjacencies 3567-Intermediate System to Intermediate System (IS-IS) Cryptographic Authentication 2966-Prefix Distribution with two-level IS-IS (Route Leaking) support 2763-Dynamic Host name exchange support 3719-Recommendations for Interoperable Networks using IS-IS 3787-Recommendations for Interoperable IP Networks using IS-IS 5308-IS-IS support for IPv6 (Routing IPv6 with IS-IS)										
IETF Internet-Drafts Supported	draft-ietf-isis-igp-p2p-over-lan-05.txt-Point-to-point operation over LAN in link-state routing protocols										
Maximum number of areas	N/S	N/S	N/S	3	3	3	3	3	3	3	3
Maximum number of L1 adjacencies per interface	N/S	N/S	N/S	70	70	70	70	70	70	70	70
Maximum number of L2 adjacencies per interface	N/S	N/S	N/S	70	70	70	70	70	70	70	70
Maximum number of IS-IS interfaces	N/S	N/S	N/S	70	70	70	70	70	70	70	70
Maximum number of Link State Packet entries (per adjacency)	N/S	N/S	N/S	255	255	255	255	255	255	255	255
Maximum number of IS-IS routes	N/S	N/S	N/S	24K	24K	24K	24K	24K	24K	24K	24K
Maximum number of IS-IS L1 routes	N/S	N/S	N/S	12K	12K	12K	12K	12K	12K	12K	12K
Maximum number of IS-IS L2 routes	N/S	N/S	N/S	12K	12K	12K	12K	12K	12K	12K	12K
Notes:											
- OS6570M requires Advanced Routing license.											

BGP Specifications

The following Specifications table contains information for the OmniSwitch implementation of the Border Gateway Protocol (BGP) routing protocol. Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	1771/4271–A Border Gateway Protocol 4 (BGP-4) 2439–BGP Route Flap Damping 3392/5492–Capabilities Advertisement with BGP-4 2385–Protection of BGP Sessions via the TCP MD5 Signature Option 1997–BGP Communities Attribute 4456–BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP) 3065–Autonomous System Confederations for BGP 4273–Definitions of Managed Objects for BGP-4 4486–Subcodes for BGP Cease Notification 4760–Multiprotocol Extensions for BGP-4 2545–Use of BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing 2918 - Route Refresh Capability for BGP-4 4724 - Graceful Restart Mechanism for BGP 6793 - BGP 4-octet ASN 5668 - 4-Octet AS Specific BGP Extended Community 2042 - Registering New BGP Attribute Types 5396 -Textual Representation of Autonomous System (AS) Numbers										
BGP Attributes Supported	Origin, AS Path, Next Hop (IPv4), MED, Local Preference, Atomic Aggregate, Aggregator (IPv4), Community, Originator ID, Cluster List, Multiprotocol Reachable NLRI (IPv6), Multiprotocol Unreachable NLRI (IPv6), AS4 Path, AS4 Aggregator (IPv4), and AS Specific Extended Community.										
Maximum number of peers (32 peers per VRF)	N/S	N/S	N/S	N/S	512	512	512	512	512	512	512
Maximum number of networks	N/S	N/S	N/S	N/S	4K	4K	4K	4K	4K	4K	4K
Maximum number of aggregation addresses	N/S	N/S	N/S	N/S	2K	2K	2K	2K	2K	2K	2K
Maximum number of routes	N/S	N/S	N/S	N/S	128K	128K	128K	128K	128K	128K	256K
Maximum number of policies	N/S	N/S	N/S	N/S	1K	1K	1K	1K	1K	1K	1K
Notes:											
N/A											

Multicast Boundary Specifications

The following Specifications table contains information for the OmniSwitch implementation of multicast address boundary functionality. Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	N/S	N/S	N/S	N/S	2365—Administratively Scoped IP Multicast 5132 - IP Multicast MIB						
Valid Scoped Address Range	N/S	N/S	N/S	N/S	239.0.0.0 to 239.255.255.255						
Valid extended Multicast route boundary Address Range	N/S	N/S	N/S	N/S	224.0.0.0 to 239.255.255.255						
Notes:											
• If software routing is used, the number of total flows supported is variable, depending on the number of flows and the number of routes per flow. • Multicast boundary is not supported on the OS6360, OS6465, OS6560 or OS6570M.											

DVMRP Specifications

The following Specifications table contains information for the OmniSwitch implementation of the Distance Vector Multicast Routing Protocol (DVMRP). Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	N/S	N/S	N/S	N/S	1075—Distance Vector Multicast Routing Protocol, Version1 4087—IP Tunnel MIB 2715—Interoperability Rules for Multicast Routing Protocols						N/S
IETF Internet-Drafts Supported	N/S	N/S	N/S	N/S	draft-ietf-idmr-dvmrp-v3-09.txt - Distance Vector Multicast Routing Protocol, Version 3						N/S
DVMRP version supported	N/S	N/S	N/S	N/S	DVMRPv3.255						N/S
DVMRP attributes supported	N/S	N/S	N/S	N/S	Reverse Path Multicasting, Neighbor Discovery, Multicast Source Location, Route Report Messages, Distance metrics, Dependent Downstream Routers, Poison Reverse, Pruning, Grafting, DVMRP Tunnels						N/S
DVMRP timers supported	N/S	N/S	N/S	N/S	Flash update interval, Graft retransmissions, Neighbor probe interval, Neighbor timeout, Prune lifetime, Prune retransmission, Route report interval, Route hold-down, Route expiration timeout						N/S
Maximum number of interfaces	N/S	N/S	N/S	N/S	384 (Maximum 384 combined Multicast Interfaces between PIMv4, PIMv6 and DVMRP.)						N/S
Multicast protocols per interface	N/S	N/S	N/S	N/S	1 (PIM and DVMRP cannot be enabled on the same interface.)						N/S
Notes:											
DVMRP is not supported on the OS6360, OS6465, OS6560, OS6570M or OS9900.											

PIM Specifications

The following Specifications table contains information for the OmniSwitch implementation of the Protocol-Independent Multicast (PIM) routing protocol. Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	OS6465	OS6560	OS6570M	OS6860	OS6860N	OS6865	OS6900	OS6900-V72/C32	OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2	OS9900
RFCs Supported	N/S	N/S	N/S	2365—Administratively Scoped IP Multicast 4601—Protocol Independent Multicast-Sparse Mode (PIM-SM) Protocol Specification 4007—IPv6 Scoped IP Multicast 5060—Protocol Independent Multicast MIB 5132—IP Multicast MIB 3569—An Overview of Source-Specific Multicast (SSM) 3973—Protocol Independent Multicast-Dense Mode (PIM-DM) 5015 - Bidirectional Protocol Indpendent Multicast (BIDIR-PIM) 5059—Bootstrap Router (BSR) Mechanism for PIM 5240—Protocol Independent Multicast (PIM) Bootstrap Router MIB 2715—Interoperability Rules for Multicast Routing Protocols									
PIM-SM version supported	N/S	N/S	N/S	PIM-SMv2							
PIM attributes supported	N/S	N/S	N/S	Shared trees (also referred to as RP trees) Designated Routers (DRs) Designated Forwarders (DFs) Bootstrap Routers (BSRs) Candidate Bootstrap Routers (C-BSRs) Rendezvous Points (RPs) (applicable only for PIM-SM) and BIDIR-PIM Candidate Rendezvous Points (C-RPs)							
PIM timers supported	N/S	N/S	N/S	C-RP expiry, C-RP holdtime, C-RP advertisement, Join/Prune, Probe, Register suppression, Hello, Expiry, Assert, Neighbor liveness, DF Election Timer							
Maximum PIM interfaces	N/S	N/S	N/S	384 **(**Maximum 384 combined Multicast Interfaces between PIMv4, PIMv6 and DVMRP.)							
Maximum Rendezvous Point (RP)	N/S	N/S	N/S	100							
Maximum Bootstrap Routers (BSRs)	N/S	N/S	N/S	1							
Multicast Protocols per Interface	N/S	N/S	N/S	1 (PIM and DVMRP cannot be enabled on the same IP interface)							
Reserved SSM IPv4 Address Ranges	N/S	N/S	N/S	232.0.0.0 to 232.255.255.255							

Reserved SSM IPv6 Address Ranges	N/S	N/S	N/S	FF3x::/32
Maximum Anycast RP Routers	N/S	N/S	N/S	8
Notes:				
- PIM is not supported on the OS6360, OS6465 or OS6560. - OS6570M requires Advanced Routing license.				

MBR Specifications

The following Specifications table contains information for the OmniSwitch implementation of the multicast border router (MBR) functionality defined in the PIM-SM specification (RFC 4601). Note that any maximum limits provided in the table are subject to available system resources.

	OS6360	**OS6465**	**OS6560**	**OS6570M**	**OS6860**	**OS6860N**	**OS6865**	**OS6900**	**OS6900-V72/C32**	**OS6900-X/T48C6, X48C4E, V48C8, C32E, X/T24C2**	**OS9900**
RFCs Supported	N/S	N/S	N/S	N/S	4601—Protocol Independent Multicast-Sparse Mode (PIM-SM) Protocol Specification 3973—Protocol Independent Multicast-Dense Mode (PIM-DM) 2715—Interoperability Rules for Multicast Routing Protocols						
IETF Internet-Drafts Supported	N/S	N/S	N/S	N/S	draft-ietf-idmr-dvmrp-v3-09.txt - Distance Vector Multicast Routing Protocol, Version 3						
MBR Interoperability	N/S	N/S	N/S	N/S	DVMRP interoperability with IPv4 PIM (PIM-SM and PIM-DM only).						
Notes:											
MBR is not supported on the OS6360, OS6465, OS6560 or OS6570M.											

4 Data Center Switching Specifications

The OmniSwitch implementation of data center switching capabilities helps enterprises address the challenges and ongoing transformation of data center networks. This chapter provides Specifications tables for the following OmniSwitch data center switching applications:

- Data Center Bridging (DCB) protocols to convert Ethernet into a lossless transport to support a reliable storage area network fabric within the data center mesh.
- Shortest Path Bridging MAC (SPBM), including SPBM support of Provider Backbone Bridging (PBB) encapsulation and services.
- Virtual eXtensible Local Area Network (VXLAN) to transparently extend Layer 2 networks over a Layer 3 infrastructure.
- VXLAN Snooping to detect and identify VXLAN traffic on the network.
- Fibre Channel over Ethernet (FCoE) Initialization Protocol (FIP) snooping to ensure the security of an FCoE network.
- FCoE/FC gateway functionality to converge FC over Ethernet and FC-to-FC over Ethernet through an OmniSwitch gateway..

Note. The maximum limit values provided in the Specifications tables included in this chapter are subject to available system resources.

Note. A Virtual Chassis is a group of switches managed as a single logical chassis. Any maximum limitation values documented apply to the entire Virtual Chassis and not to each individual switch unless stated otherwise.

For information about how to configure data center switching applications, refer to the *OmniSwitch AOS Release 8 Data Center Switching Guide*.

In This Chapter

This chapter contains the following data center Specifications tables:

Data Center Bridging Specifications

The following Specifications table contains information for the OmniSwitch implementation of Data Center Bridging (DCB). Note that any maximum limits provided in the table are subject to available system resources.

	OS6900
OmniSwitch Software License	Data Center
IEEE Standards Supported	802.1Qbb—*Priority-based Flow Control* 802.1Qaz D2.5—*Enhanced Transmission Selection* 802.1Qaz D2.5—*Data Center Bridging Exchange Converged Enhanced Ethernet DCBX v.1.01* 802.1Q-REV/D1.5—*Media Access Control (MAC) Bridges and Virtual Bridged Local Area Networks*
Maximum number of DCB profiles	128 profiles: • Profiles 1–11 are predefined, with profile 8 serving as the default profile for all ports. • Profiles 12–128 are reserved for user-defined (custom) profiles.
Maximum number of lossless queues (priorities)	110
DCB TLVs supported	ETS Configuration ETS Recommendation PFC Configuration Application Priority
Notes:	
DCB is only supported on the OS6900-X20/X40/T20/T40/X72/Q32.	

VXLAN Specifications

The following Specifications table contains information for the OmniSwitch implementation of the Virtual eXtensible LAN (VXLAN) feature. Note that any maximum limits provided in the table are subject to available system resources.

	OS6860N/OS6900
RFCs Supported	7348—*VXLAN: A Framework for Overlaying Layer 2 Virtualized Networks over Layer 3 Networks.*
VXLAN segments (L2 overlay networks)	16 million
VXLAN service instances	8K
VXLAN Tunnel End Points in a VXLAN network.	500
VXLAN UDP destination ports	8 (including the default UDP port number, which is 4789).
VXLAN Service Access Points (SAPs)	8K (per device or per Virtual Chassis)
VXLAN SAPs with a VLAN ID range	8 SAPs per service access port
Service access ports with SAPs that contain a VLAN ID range	255
VXLAN Network IDs (VNIs)	4K
Multicast Groups	500
Multicast protocol supported	Bidirectional PIM (BIDIR-PIM)
Notes:	
VXLAN is supported on the OmniSwitch 6900-Q32/X72/V72/C32/X48C6/T48C6/X48C4E/V48C8/ C32E/X24C2/T24C2,OS6860N.	

VXLAN Snooping Specifications

The following Specifications table contains information for the OmniSwitch implementation of VXLAN Snooping. Note that any maximum limits provided in the table are subject to available system resources.

	OS6900
RFCs Supported	7348—*VXLAN: A Framework for Overlaying Layer 2 Virtualized Networks over Layer 3 Networks.*
Packet sampling rate	1K packets-per-second on each module.
Notes:	
VXLAN Snooping is only supported on the OS6900-X20/X40/T20/T40/Q32/X72.	

FIP Snooping Specifications

The following Specifications table contains information for the OmniSwitch implementation of FIP Snooping and FCoE. Note that any maximum limits provided in the table are subject to available system resources.

	OS6900
OmniSwitch Software License	Data Center
INCITS Standards Supported	• T11 Fibre Channel Backbone - 5 (FC-BB-5) Rev 2.00 June 4, 2009 • FC-BB-5 Annex C: Increasing FC-BB_E Robustness Using Access Control Lists • T11 Switch Fabric - 5 (FC-SW-5) Rev 8.5 June 3, 2009
Maximum number of FIP Snooping Sessions	128 Maximum number of FIP Snooping Sessions
Required port types	10G or faster Ethernet with DCB profile and DCBx enabled with PFC/ ETS active (ports and link aggregates)
Notes:	
FIP Snooping is only supported on the OS6900-X20/X40/T20/T40/X72/Q32.	

FCoE/FC Gateway Specifications

The following Specifications table contains information for the OmniSwitch FCoE/FC Gateway. Note that any maximum limits provided in the table are subject to available system resources.

	OS6900
OmniSwitch Software License	Data Center
INCITS Standards Supported	• FC-PI-4 Fibre Channel T11/08-138v1 • FC-PI-5 Fibre Channel T11 2118-D/Rev 6.10 • FC-BB-5 Backbone 5 T11/1871-D • FC-BB-6 Backbone 6 T11/2159-D (CNA switching only)
Fibre Channel functionality supported	• FCoE transit bridge - FCoE tunneling of encapsulated FC frames - FCoE initialization protocol (FIP) snooping • FCoE/FC gateway switch - N_Port proxy (NPIV) - F_Port proxy (Reverse-NPIV) - E_Port proxy (E2E-tunnel)
Supported port types	• Fibre Channel for FCoE/FC gateway—OS-XNI-U12E module with SFP-FC-SR transceiver • Ethernet for FCoE/FIP snooping—10G or faster with DCB profile, DCBx enabled with PFC/ETS active (ports and link aggregates)
OmniSwitch 64-bit World Wide Node Name (WWNN)	10:00:xx:xx:xx:xx:xx:xx (where xx = next available increment of the switch base MAC address)
OmniSwitch 64-bit World Wide Port Name (WWPN) for each Fibre Channel port	10:00:xx:xx:xx:xx:xx:xx (where xx = port MAC address)
VSAN–FC port associations	Multiple FC port assignments per VSAN allowed. Only one VSAN assignment per FC port allowed.
VSAN–FCoE VLAN mapping	One-to-one
VSAN scalability	Based on the number of FC ports (for example, if switch has 12 FC ports, then 12 VSANs; one for each FC port). Note that an FC port configured as an E2E tunnel endpoint does not use up a VSAN assignment.
Maximum number of VSANs per network	4094
E2E tunnel scalability	One tunnel termination per FC port up to the number of available FC ports on the switch or virtual chassis.
Maximum frame size supported	2180
Load Balancing	NP_Port load balancing only: • Dynamic • Dynamic-reorder • ENode-based • Static
Notes:	

- Only an OmniSwitch 6900 with the supported port types can serve as an FCoE/FC Gateway switch.
- Not supported on OS6900-V72/C32(E) and X/T48C6 models.

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