

### Overview

#### HPE M-series SN2010M Switch

With an increasing need to access data faster and accommodate growing workloads, rising levels of east-west traffic, and new storage arrays based on flash storage technologies, a high bandwidth, low-latency, zero packet loss network becomes paramount. The HPE SN2010M switches offer a mix of 10/25GbE and 100GbE for the right network bandwidth for your applications with consistent performance for high-performance and storage workloads. Delivering the highest feature set at the right price allows you to get the most out of your Ethernet infrastructure to best support a variety of use cases, including media and entertainment; streaming video, financial services industry, virtualized data centers, and next generation storage, including software-defined storage and NVMe flash.

With HPE M-series switches, you can:

- **Optimize Storage**— modernize your network to eliminate limitations and bottlenecks that can be caused by the addition of flash storage.
- **Enjoy efficient network performance**— avoid packet loss, provide predictable performance with line-rate packet delivery across all ports and all packet sizes
- **Realize breakthrough economics**— make better use of your data center resources with the highest port density per rack unit and the industry's lowest power consumption.
- **Accelerate business innovation**— utilize 1/10/40Gbps Ethernet connectivity for existing workloads and enhance connectivity utilizing built-in 25/50/100Gbps capabilities to respond quickly to business needs and to stay on the leading edge of Ethernet switching technology.

The M-Series SN2020 switch provides a high density, side-by-side 25GbE/100GbE switching solution which scales up to 34 ports per switch with QSFP28 breakout cables for up to 16 additional 10/25Gbps ports in single Rack Unit (1RU) for the growing demands of today's storage, database, and data center environments. The SN2010 carries a unique design to accommodate the highest rack performance. Its design allows side-by-side placement of two switches in a single, 1RU slot of a 19" rack, delivering high availability to the hosts. Available with 18 SFP28/SFP+ slots and 4 QSFP28/QSFP+ slots, each SN2010 carries a switching capacity of 1.7Tb/s with 1.26Bpps processing capacity when running 18 ports at 25GbE and 4 ports at 100GbE, and enables 3.4Tb/s and 2.52Bpps when two units are deployed side-by-side in a 1 RU space.



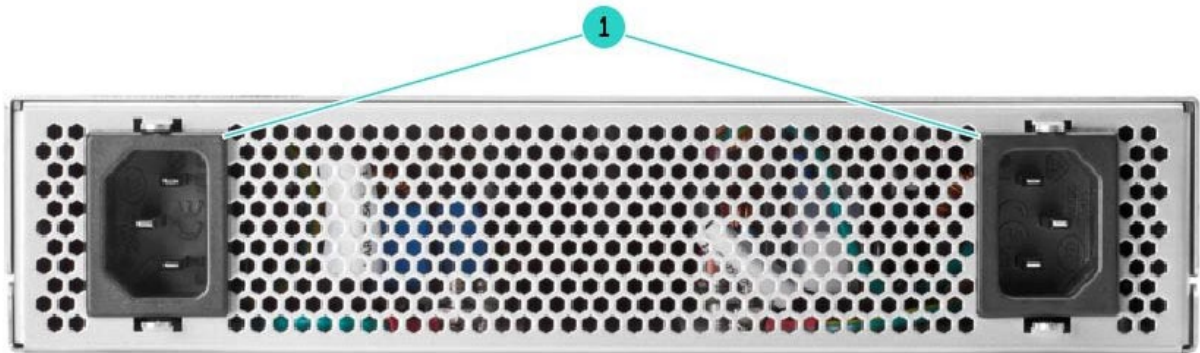
HPE M-Series 2 x SN2010M Ethernet Switch with Rack Mount Kit

## Overview



**HPE M-Series SN2010M (18 x SFP28 + 4 x QSFP28) Front View**

- |   |                                       |
|---|---------------------------------------|
| 1. MGMT0 100Mb/s to 1Gb/s Port            | 5. Inventory Information Pull-out Tab |
| 2. USB Port                               | 6. System Status LEDs                 |
| 3. Serial Console Port (115200 BAUD rate) | 7. QSFP28/QSFP Ports (19-22)          |
| 4. Reset Button                           | 8. SFP28/SFP Ports (1-18)             |



**HPE M-Series SN2010M (18 x SFP28 + 4 x QSFP28) Rear View**

1. Power Supply and Fans (non-replaceable)



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## Overview

### Models

#### Description

#### SKU

#### HPE M-Series SN2010M Ethernet Switch

HPE SN2010M 25GbE 18SFP28 4QSFP28 Power to Connector Airflow Half Width Switch	Q9E63A
HPE SN2010M 25GbE 18SFP28 4QSFP28 Power to Connector Airflow Half Width TAA Switch	R0P77A
HPE SN2010M 25GbE 18SFP28 4QSFP28 Connector to Power Airflow Half Width TAA Switch	R0P78A
HPE SN2100M Rack Installation Kit	Q2F25A

#### Notes:

- Only 1 Rack Mount kit is needed for 2x SN2010M switches within the same rack.
  - HPE ONIE switch SKUs are intended for customer installation of NVIDIA® Cumulus® or another NOS and cannot be converted to ONYX switch SKUs under any circumstances. HPE switch SKUs with factory installed ONYX cannot be converted to HPE ONIE switch SKUS and do not support NVIDIA® Cumulus® or any other NOS.
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## Standard Features

### Key Features and Benefits

- The HPE SN2010M Ethernet switch is a Half-width 10/25GbE and 40/100GbE Ethernet Switch ideal for Primary, Secondary storage and Hyperconverged Infrastructures. The SN2010 switch is the ideal top of rack (ToR) solution packed with 18 ports of 10/25GbE and 4 QSFP28 ports supporting 40/100GbE and which can breakout to 4 10GbE or 25GbE ports.
- SN2010M introduces low latency for 10/25GbE and 40/100GbE switching, features a robust implementation of data, control and management planes, and offers the most compact form factor and lowest power consumption.
- SN2010M switch provides ultra-low latency of under 300ns port-to-port. This is advantageous for flash storage which has moved latency bottlenecks from storage access to the network, as well as for the burst nature of today's software defined and cloud data centers traffic.
- The buffering architecture of the HPE SN2010M switches provides superior micro burst absorption for applications that burst data at random intervals.
- The HPE SN2010M Switch provides a flexible combination of ports, allowing for efficiency, simplifying scale-out environments, and saving on total cost of ownership.
- Optimized port configuration enables high-speed rack connectivity to the server at 1/10GbE or 25GbE speeds with 40/100GbE uplink ports that allow for a variety of blocking ratios that suit specific application requirements.
- SN2010M with its optimization for RoCE, full buffer utilization, and zero packet loss combined into a small form factor with low latency make it the ideal switch for ESF (Ethernet Storage Fabric).
- The HPE SN2010M Switches provide port density in a single rack unit, allowing for higher capacity and efficiency, simplifying scale-out environments and saving on total cost of ownership.
- Its unique half-width form factors and port counts, these Ethernet switches allow for two SN2010 units to be deployed side-by-side allowing for increased density, making it the ideal top-of-rack switch.
- Designed to use less power than competing switches, providing one of the industry's lowest power draws, producing less heat than competing products allowing reduced OpEx cost.
- SN2010 is the best fit with a mix of 10/25GbE and 40/100GbE ports that are all designed for zero packet loss. Distributed storage, hyperconverged, analytic and database solutions require the ability to scale out without compromising performance or high availability.
- High throughput, low latency and active-active network switching capabilities are crucial when deploying clustered servers and storage. SN2010M delivers connectivity to many clients plus 40/100GbE connectivity to selected servers, storage systems or for network uplinks, and all with low latency.

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### M-Series SN2010M

- Unique form factor of half-width allow for redundant units to be placed side-by-side in 1 rack unit saving space and increasing density
- Supporting port speeds of 1, 10, 25, 40, 50 and 100GbE, delivering predictable performance and zero packet loss at line-rate across each port and packet size.
- Ultra-low latency with true cut through performance, Zero packet loss performance with DCBX, PFC, and ECN support

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### User Interfaces: Command Line & Web Interface

- Industry-standard command line interface (CLI). The CLI is accessed through SSH or Telnet sessions, or directly via the console serial port on the power side panel.
  - The CLI can be in one of several modes, and each mode makes available a certain group (or level) of commands for execution.
  - Web interface - WebUI that accepts inputs and provides outputs by generating webpages which can be viewed by the user using a web browser for configuration, monitoring, and troubleshooting.
  - The inventory in the switch system can be accessed through a SNMP MIB browser. These devices are indexed (entPhysicalIndex) using three levels: Module layer, Device layer & Sensor layer.
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## Standard Features

### System Management

#### Management Interface

Management interfaces are used in order to provide access to switch management user interfaces (e.g. CLI, WebUI). HPE Switch Management supports out-of-band (OOB) dedicated interfaces (e.g. mgmt0, mgmt1) and in-band dedicated interfaces. In addition, HPE M-Series Switches feature a standard 115200 baud rate RJ45 serial port that provides access to the CLI.

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#### NTP, Clock & Time Zones

Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over packet-switched, variable-latency data networks. NTP is intended to synchronize all participating computers to within a few milliseconds of Coordinated Universal Time (UTC) and is designed to mitigate the effects of variable network latency.

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#### PTP

IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems (standard number 1588) defines the means to achieve time synchronization in the orders of sub microseconds.

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### Software Management

#### Configuration Management

Onyx's built-in automation infrastructure reduces operational expenses and time to service by minimizing manual operations and eliminating configuration and provisioning errors. Automation tools such as Ansible, SaltStack, ZTP and Puppet enable you to automate fabric configuration and large scale deployments.

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#### Saving, Loading & restore to factory defaults of the Configuration Files

There are two types of configuration files that can be applied on the switch, BIN files (binary) and text-based configuration files. BIN configuration files are not human readable. Additionally, these files are encrypted and contain integrity verification preventing them from being edited and used. Text configuration files are text-based and editable. It is similar in form to the output of the command "show running config expanded". Automated configuration file backup feature can be used to upload the active configuration file on every "configuration write". The switch WEBUI and CLI can be used to load a BIN or text configuration file. By default, or after a system reset, the system loads the default "initial" configuration file. Support is provided to load a different configuration file and make it the active configuration.

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#### Logging

Logging of system events in several severity level over a configurable period of time.

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#### Debugging

Support save sysdmp file collects configuration, status, counters, log files, What-Just-Happened, and WireShark traces for Ethernet modules to enable timely review of problems and facilitate service support. There are 31 per port packet counters and an additional 22 discard packet classification counters to help you identify why there are packet processing problems, should they occur.

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## Standard Features

### What Just Happened (WJH)

As an innovative network telemetry technology, 'What Just Happened' (WJH) monitors and alerts on data plane anomalies to reduce system downtime. With built-in capabilities to inspect packets across all ports at line-rate, multi-terabit speeds, WJH avoids time-consuming data collection and manual searches for network problems. In addition, a streaming WJH telemetry application, supported by other management applications, can be installed as a Docker container.

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### Link Diagnostic Per Port

Enables an insight into the physical layer components - see information such as a cable status (plugged/unplugged), speed mismatch, auto-negotiation failures, signal quality failures, link training failures, forward error code mismatch, etc.

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### Signal Degradation Monitoring

A system can monitor the bit error rate (BER) in order to ensure a quality of the link and take an automatic action to disable offending ports.

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### Telemetry

Sampling (histograms) – a network administrator can enable a sampling of the port buffer occupancy, record occupancy changes over time, and provide information for different levels of buffer occupancy, and amount of time the buffer has been occupied during the observation period.

Thresholds – thresholds may be enabled per port to record the network time when port buffer occupancy crosses the defined threshold and when buffer occupancy drops below it.

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### User Management and Security

- Different user account types with different privileges
  - RADIUS, TACACS+ & LDAP support
  - System Secure Mode - configures the switch system to run secure algorithms in compliance with FIPS 140-2 requirements
  - USA Department of Defense certification – UC APL
  - Storm Control
  - Access Control Lists (ACLs L2-L4 & user defined)
  - 802.1X - Port Based Network Access Control
  - SSH server strict mode – NIST 800-181A
  - CoPP (IP filter)
  - Port isolation
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### Cryptographic (X.509, IPSec) and Encryption

- Configuring, generating and modifying x.509 certificates used in the system.
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### 802.1x Protocol

Authenticate hosts (or supplicants) and to allow connection only to a list of allowed hosts pre-configured on an authentication server

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### Network Management Interfaces SNMP, JSON & XML

#### Puppet Agent

Built-in agent for the open-source "Puppet" configuration change management system

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## Standard Features

### Additional Management & Automation Features

- Zero Touch Provisioning
- Ansible, SALT Stack
- FTP \ TFTP \ SCP
- AAA , RADIUS \ TACACS+ \ LDAP
- JSON & CLI , Enhanced Web UI
- SNMP v1,2,3
- In-band Management
- DHCP, SSHv2, Telnet
- SYSLOG
- Dual ONYX™ Software images
- Events history

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### Linux Docker Containers

Run your applications as a Linux Docker image embedded in the switch flash:

- Full SDK access through the container
- Persistent container & shared storage.

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## Software Components, Standard, Base Models

### Ethernet Switching

#### Interface Isolation

Group interfaces in sets where traffic from each port is isolated from other interfaces in the group.

#### Link Aggregation Group (LAG)

Several same speed links are combined into a single logical entity with the accumulated bandwidth of the originating ports

#### MLAG

Extending the implementation of the LAG to more than a single device provides yet another level of redundancy that extends from the link level to the node level.

#### VLANs

L2 segment of the network which defines a broadcast domain and is identified by a tag added to all Ethernet frames running within the domain

#### Voice VLAN

Provide QoS to voice and data traffic in a scenario where a terminal is connected to an IP phone which is in turn connected to the port on the switch

#### QinQ

Segregate the traffic of different customers in their infrastructure, while still giving the customer a full range of VLANs for their internal use by adding a second 802.1Q VLAN tag to an already tagged frame

#### Spanning Tree

Rapid Spanning Tree Protocol (RSTP) provides for rapid recovery of connectivity following the failure of a bridge/bridge port or a LAN. The following are supported: BPDU Filter, BPDU Guard, Loop Guard, Root Guard, MSTP and RPVST



## Standard Features

### Virtual routing and forwarding functions (VRFs)

Virtual routing and forwarding (VRF) is a technology included in IP (Internet Protocol) network routers that allows multiple instances of a routing table to exist in a router and work simultaneously. This increases functionality by allowing network paths to be segmented without using multiple devices. Because traffic is automatically segregated, VRF also increases network security.. Currently, Onyx™ supports 64 VRF instances.

### OpenFlow - Support for OpenFlow 1.3

OpenFlow is a network protocol that facilitates direct communication between network systems via Ethernet. Software Defined Networks (SDN) allows a centralist management of network equipment. OpenFlow allows the SDN controller to manage SDN equipment. The OpenFlow protocol allows communication between the OpenFlow controller and OpenFlow agent.

### VXLAN

VXLAN (Virtual eXtensible Local Area Network) addresses the requirements of the L2 and L3 data center network infrastructure in the presence of virtual networks in a multi-tenant environment. It runs over the existing networking infrastructure and provides a means to “stretch” a L2 broadcast domain over a layer 3 network.

### IGMP Snooping

Snooping and updating tables based on the IGMP protocol used by hosts and adjacent routers on IP networks to establish multicast group memberships

### Link Layer Discovery Protocol (LLDP)

A vendor-neutral Link Layer protocol in the Internet Protocol Suite used by network devices for advertising their identity, capabilities, and neighbors on a IEEE 802 LAN

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## Quality of Service (QoS)

### QoS Classification, QoS ReWrite, Queuing and Scheduling, RED & ECN are supported

#### Access Control List

An Access Control List (ACL) is a list of permissions attached to an object, to filter or match switches packets. When the pattern is matched at the hardware lookup engine, a specified action (e.g. permit/deny) is applied

#### Other QOS features

- 802.3X Flow Control
- WRED, Fast ECN & PFC
- 802.1Qbb Priority Flow Control
- 802.1Qaz Enhanced Transmission Selection
- DCBX and Application TLV support
- Advanced QoS- qualification, Rewrite, Policers
- 802.1AB Station and Media Access Control Connectivity Discovery
- Advanced and user-mode Shared buffer management

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## Port Mirroring

Port mirroring enables data plane monitoring functionality which allows the user to send an entire traffic stream for testing.

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## sFlow

sFlow (ver. 5) is a procedure used for statistical monitoring of traffic in networks. MLNX-OS supports an sFlow sampling mechanism (agent), which includes collecting traffic samples and data from counters. The sFlow datagrams are then sent to a central collector.

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## Standard Features

### RDMA over Converged Ethernet (RoCE)

Remote Direct Memory Access (RDMA) is the remote memory management capability that allows server to server data movement directly between application memory without any CPU involvement. Simplified RoCEv2 switch configuration automation supported by just one command: `roce {lossy | semi-lossless | lossless}`.

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### Priority Flow Control

Provides an enhancement to the existing pause mechanism in Ethernet. The global Ethernet pause option stops all traffic on a link. PFC creates eight separate virtual links on the physical link and allows any of these links to be paused and restarted independently, enabling the network to create a no-drop class of service for virtual links.

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### Shared Buffers

All successfully received packets by a switch are stored on internal memory from the time they are received until the time they are transmitted. The packet buffer is fully shared between all physical ports and is hence called a shared buffer. Buffer configuration is applied in order to provide lossless services and to ensure fairness between the ports and priorities.

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### Storm Control

Storm Control is a feature which can be enabled on L2 Ethernet ports and port-channels to monitor inbound traffic to prevent disruptions caused by a broadcast, multicast, or unicast traffic storm on the physical interfaces

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### Store-and-Forward

Store-and-Forward is used to describe a functionality where a switch receives a complete packet, stores it, and only then forwards it.

Since the switch makes forwarding decisions based on the destination address which is at the header of the packet, the switch can make the forwarding decision before receiving the complete packet. This process is called cut-through, as the switch forwards part of the packet before receiving the complete packet. Cut-through and store-and-forward modes are configurable as a switch global or per port option.

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## IP Routing

### IP Interfaces

The following 3 types of IP interfaces are supported:

- VLAN interface
- Loopback interface
- Router port interface

### IPv6

IP version 6 (IPv6) is a routing protocol which succeeds IPv4. With the expansion of the Internet and data bases IPv6 addresses consist of 128 bits whose purpose is to allow networks to include a significantly higher number of nodes by increasing the pool of available unique IP addresses. IPv6 packets alleviate overhead and allow for future customizability.

### OSPF

Open Shortest Path First (OSPF) is a link-state routing protocol for IP networks. It uses a link state routing algorithm and falls into the group of interior routing protocols, operating within a single autonomous system (AS).



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## Standard Features

### BGP

Border Gateway Protocol (BGP) is an exterior gateway protocol which is designed to transfer routing information between routers. It maintains and propagates a table of routes which designates network reachability among autonomous systems (ASs).

### BGP unnumbered

This BGP feature enables a user to establish a BGP session through a P2P Layer-3 link (port or port-channel) without specifying what the IP address of the remote neighbor is, nor what the neighbor's ASN number is. This feature is useful when provisioning a big data center fabric. It does not require allocation of an IP subnet on each pair of connected switches and simplifies the massive configuration and enables automation.

### BFD Infrastructure

Many protocols use slow Hello mechanisms and failure detection is usually within seconds after the problem occurs. The BFD goal is to provide low overhead short duration detection of failures between adjacent nodes and single mechanism that can be used for liveness detection over any media. BFD session is established by the application that uses it. There is no discovery mechanism. e.g. in OSPF BFD session is established to neighbors that were discovered by OSPF hello protocol.

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## Policy Rules

### Route Map

Route maps define conditions for redistributing routes between routing protocols. A route map clause is identified by a name, filter type (permit or deny) and a sequence number. Clauses with the same name are components of a single route map; the sequence number determines the order in which the clauses are compared to a route.

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### IP Prefix-List

Prefix-list is a list of entries, each of which can match one or more IP prefixes. A prefix-list is usually used to match a specific IP prefix, mostly in relation to IP route destinations.

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### Multicast (IGMP and PIM)

Protocol independent multicast (PIM) is a collection of protocols that deal with efficient delivery of IP multicast (MC) data. Those protocols are published in the series of RFCs and define different ways and aspects of multicast data distribution. PIM protocol family includes PIM dense mode (PIM-DM), PIM sparse mode (PIM-SM, which is not supported on Mellanox platforms), Bidirectional PIM (PIM-BIDIR) and Bootstrap router (BSR) protocol.

PIM builds and maintains multicast routing tables based on the unicast routing information provided by unicast routing tables that can be maintained statically or dynamically by IP routing protocols like OSPF and BGP.

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### VRRP

The Virtual Router Redundancy Protocol (VRRP) is a computer networking protocol that provides for automatic assignment of available IP routers to participating hosts. This increases the availability and reliability of routing paths via automatic default gateway selections on an IP subnetwork.

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### MAGP

Multi-active gateway protocol (MAGP) is aimed to solve the default gateway problem when a host is connected to a set of switch routers (SRs) via MLAG.

The network functionality in that case requires that each SR is an active default gateway router to the host, thus reducing hops between the SRs and directly forwarding IP traffic to the L3 cloud regardless which SR traffic comes through.

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## Standard Features

### DHCP Relay

Since Dynamic Host Configuration Protocol must work correctly even before DHCP clients have been configured, the DHCP server and DHCP client need to be connected to the same network.

In larger networks, this is not always practical because each network link contains one or more DHCP relay agents. These DHCP-R agents receive messages from DHCP clients and forward them to DHCP servers thus extending the reach of the DHCP beyond the local network.

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## Feature Summary

### Layer 3 Feature Set

- 64 VRFs supported
- IPv4 & IPv6 Routing and Route maps:
- BGP4, MP-BGP, OSPFv2, route maps
- PIM-SM and PIM-SSM (PIM-SM over MLAG)
- User and management VRFs
- BFD (BGP, OSPF, static routes)
- VRRP, Multi Active Gateway Protocol (MAGP)
- DHCPv4/v6 Relay
- Router Port, int Vlan, NULL Interface for Routing
- ECMP, 64-way
- IGMPv2/v3 Snooping Querier
- Consistent/Resilient Hashing

### Network Virtualization

- VXLAN EVPN —L2 stretch use case
- VXLAN Hardware VTEP – L2 Gateway
- L2 stretch use case
- Integration with VMware NSX & OpenStack, etc
- Onyx™ certified NSX scale of 1000 VNIs

### Quality of Service (QoS)

- 802.3X Flow Control
- WRED with Fast ECN
- 802.1Qbb Priority Flow Control
- 802.1Qaz ETS
- DCBX – Application TLV support
- Advanced QoS – Qualification, Rewrite, Policers – 802.1AB
- Simplified (one command) RoCEv2 configuration automation

### Security

- USA Department of Defense certification—UC APL
- System secure mode—FIPS 140-2 compliance
- Storm control
- Access Control Lists (ACLs L2-L4 & user defined)
- 802.1X - Port Based Network Access Control
- Strict Security mode for DoD Apps & NIST 800 181A compliance
- CoPP (IP filter)
- Port Isolation



## Standard Features

### Synchronization

- NTP
- PTP IEEE-1588 (SMPTE profile)

### Docker Container

- Full SDK access through the container
- Persistent container & shared storage
- Container-secured mode of work:
- Limited CPU/memory/SSD usage

### Software Defined Network (SDN)

- OpenFlow 1.3
- Supported controllers: ODL, ONOS, FloodLight, RYU, etc.
- NAT
- True hybrid mode with programmable pipeline

### Layer 2 Feature Set

- Multi Chassis LAG (MLAG), MLAG with STP support
- Jumbo Frames (9216 Bytes)
- IGMP V2/V3, Snooping, Querier
- VLAN 802.1Q (4K)
- 256K forwarding entries that can be flexibly shared across ACL, LPM routes, Host routes, MAC, ECMP and Tunnel applications
- Q-In-Q
- 802.1W Rapid Spanning Tree
- BPDU Filter, Root Guard
- Loop Guard, BPDU Guard
- 802.1s Multiple STP (MSTP)
- Rapid Per VLAN STP+ and PVRST+
- 802.3ad Link Aggregation (LAG) & LACP
- 32 Ports/Channel - 64 Groups Per System
- Port Isolation
- 802.1AB Link Layer Discovery Protocol (LLDP)
- Store & Forward / Cut-through switching modes
- Head of Queue Life Time Limit (HLL)
- 1/10/25/40/50/100GbE

### Monitoring & Telemetry

- High Resolution Streaming Telemetry
- What Just Happened (WHJ) Root Cause Analysis
- sFLOW
- Real Time queue depth histograms & thresholds
- Port mirroring (SPAN & ERSPAN)
- Enhanced Link & phy monitoring
- BER degradation monitoring
- User mode - simplified and advanced shared buffer configuration



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## Standard Features

### Management and Automation

- ZTP
  - Ansible, Puppet, SaltStack
  - FTP/TFTP/SCP
  - AAA, RADIUS / TACACS+ / LDAP
  - JASON & CLI, WEB UI
  - SNMP v1/v2/v3
  - InBand and OOB management
  - DHCP, SSHv2, Telnet
  - SYSLOG
  - USB
  - 10/100/1000 Mb/s Ethernet RJ45 mgmt port
  - RJ45 Serial console mgmt port (115200 BAUD)
  - Dual software images, each in separate flash partitions
  - Events history
  - Open Network Install Environment (ONIE switch models)
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## Service and Support

### Warranty

(3-3-3) Hardware Warranty; 3-year parts; 3-year on-site (standard business hours, next business day response) and 3-year labor.

**Notes:** The hardware warranty covers firmware. For extended hardware support and installation information, please see the “Services and Support” Section.

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### HPE Services

No matter where you are in your transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.

<https://www.hpe.com/services>

### Consulting services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.

<https://www.hpe.com/services/consulting>

### HPE Managed Services

HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

[HPE Managed Services | HPE](#)

### Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.

<https://www.hpe.com/services/operational>

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## Recommended Services

### HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.

<https://www.hpe.com/services/techcare>

### HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

<https://www.hpe.com/services/completechcare>

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## Service and Support

### Other related services from HPE Services

#### HPE Installation and Start-up Service

Provides for the hardware installation and startup of HPE branded M-Series switches with ONYX™, according to the product specifications. The HPE service delivery technician will assist you in bringing your new hardware into operation in a timely and professional manner.

<https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00025816enw>

#### HPE Hardware Installation

Provides for the basic hardware installation of HPE branded M-Series ONIE switches to assist you in bringing your new hardware into operation in a timely and professional manner.

<https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=5981-9356enw>

#### HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

<https://www.hpe.com/services/lifecycle>

- For a list of the most frequently purchased services using service credits, see the [HPE Service Credits Menu](#)

#### HPE Education Services

Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.

<https://www.hpe.com/services/training>

#### Defective Media Retention

An option available with HPE-Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.



## Service and Support

### Parts and Materials

HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

### How to purchase services

Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at <https://ssc.hpe.com/portal/site/ssc/>

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### AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience.

Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.

<https://support.hpe.com/hpesc/public/home/signin>

### Consume IT on your terms

**HPE GreenLake** edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"

<https://www.hpe.com/us/en/contact-hpe.html>

For more information: <http://www.hpe.com/services>

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## Configuration Information

### Step 1 - Base Configuration (Select one Model)

Description	SKU
HPE SN2010M 25GbE 18SFP28 4QSFP28 Power to Connector Airflow Half Width Switch	Q9E63A
HPE SN2010M 25GbE 18SFP28 4QSFP28 Power to Connector Airflow Half Width TAA Switch	R0P77A
HPE SN2010M 25GbE 18SFP28 4QSFP28 Connector to Power Airflow Half Width TAA Switch	R0P78A
<b>Notes:</b> For M-series SN2010M ONIE SKUs, refer to the <a href="#">Transceivers &amp; Cables supported by the NOS used</a> .	
HPE SN2010M 25GbE 18SFP28 4QSFP28 Power to Connector Airflow Half Width Switch	Q9E63A
<ul style="list-style-type: none"> <li>18 x 1/10/25 GbE + 4 x 40/100GbE ports</li> <li>2 x Power cord, 1.83m, C13-C14</li> <li>1 x Serial cable (DB9 to RJ45)</li> <li>1 x HPE Warranty and Installation instructions</li> <li>HPE Quick Start Guide</li> </ul>	
<b>Notes:</b> Requires Rack Installation Kit & optical transceivers listed below.	
HPE SN2100M Rack Installation Kit	Q2F25A
Rack installation kit for SN2010M/SN2100M	
<b>Notes:</b> Only 1 Rack Mount kit is needed for 2x SN2010M switches within the same rack.	

### Step 2 – Options

#### Transceivers – for M-series SN2010M ONYX™ switches

**Notes:** Refer to [HPE M-series SPOCK Connectivity Stream for latest M-series ONYX™ interconnect support matrix](#)

Note #	Description	SKU
	HPE 100GbE QSFP28 500m 1310nm PSM4 Transceiver	Q8J73A
	HPE 10GbE SFP+ SR Multi-mode 300m Transceiver	Q6M30A
	HPE 10Gb SFP+ Short Wave 1-pack Pull Tab Optical Transceiver	Q2P65A
	HPE 100GbE QSFP28 SR4 100m Transceiver	Q2F19A
	HPE 25Gb SFP28 Short Wave Extended Temperature 1-pack Pull Tab Optical Transceiver	Q2P64B
10	HPE 100Gb QSFP28 LC SWDM4 Multi-mode 100m Transceiver	R0R40A
3, 6, 11,12	HPE 10GBASE-T SFP+ RJ45 30m 1-pack Transceiver	R0R41B
3, 6	HPE 25Gb SFP28 SR 30m Transceiver	R0R42A
	HPE BladeSystem c-Class 10Gb SFP+ SR Transceiver	455883-B21
	HPE Networking X110 100M SFP LC LX Transceiver	JD120B
	HPE Networking X120 1G SFP LC SX Transceiver	JD118B
	HPE Networking X120 1G SFP LC LX Transceiver	JD119B
	HPE Networking X120 1G SFP RJ45 T Transceiver	JD089B
7	HPE BladeSystem CClass Virtual Connect 1G SFP RJ45 Transceiver	453154-B21

## Configuration Information

Note #	Description	SKU
	HPE Networking X130 10G SFP+ LC SR Transceiver	JD092B
	HPE Networking X130 10G SFP+ LC LR Transceiver	JD094B
	HPE Aruba Networking 10G SFP+ LC LR 10km SMF Transceiver	J9151E
	HPE Aruba Networking SFP-10GE-ZR 10GBASE-ZR SFP+ 1310nm LC Connector Pluggable 10GbE Transceiver	JW148A
	HPE Networking X130 10G SFP+ LC ER 40km Transceiver	JG234A
1	HPE Networking X130 10G SFP+ LC LH 80km Transceiver	JG915A
	HPE Networking X140 40G QSFP+ CSR4 300m Transceiver	JG709A
	HPE Networking X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver	JG661A
	HPE BladeSystem c-Class 40Gb QSFP+ MPO SR4 100m Transceiver	720187-B21
	HPE Networking X140 40G QSFP+ LC BiDi 100m MM Transceiver	JL251A
	HPE 40Gb QSFP+ Bidirectional Transceiver	841716-B21
	HPE Networking X140 40G QSFP+ LC LR4L 2km SM Transceiver	JL286A
	HPE Networking X190 25G SFP28 LC SR 100m MM Transceiver	JL293A
3	HPE Aruba Networking 25G SFP28 LC LR 10km SMF Transceiver	JL486A
	HPE 100GbE QSFP28 500m 1310nm PSM4 Transceiver	Q8J73A
	HPE Networking X130 10G SFP+ LC SR Transceiver	JD092B
	HPE Networking X140 40G QSFP+ MPO SR4 Transceiver	JG325B
	HPE 25Gb SFP28 SR 100m Transceiver	845398-B21
3	HPE QSFP28 to SFP28 Adapter	845970-B21
	HPE Networking X150 100G QSFP28 LC LR4 10km SM Transceiver	JL275A
	HPE Networking X150 100G QSFP28 CWDM4 2km SM Transceiver	JH673A
10	HPE Networking X150 100G QSFP28 LC SWDM4 100m MM Transceiver	JH419A
9	HPE 100Gb QSFP28 Bidirectional Transceiver	845972-B21
14	HPE 100GbE QSFP28 LC DR1 500m 1-pack Transceiver	R8M61A
	HPE 25/50GbE SFP56 SR 100m 1-pack Transceiver	R8M65A
	HPE Alletra 6000 2x100Gb QSFP28 MPO SR4 100m FIO Transceiver	R7D08A
	HPE Alletra 6000 2x100Gb QSFP28 MPO SR4 100m Transceiver	R7D12A
	HPE Alletra 6000 2x10Gb SFP+ SR FIO Transceiver	R7D05A
	HPE Alletra 6000 2x10Gb SFP+ SR Transceiver	R7D09A
	HPE Alletra 6000 2x25Gb SFP28 SR 100m FIO Transceiver	R7D07A
	HPE Alletra 6000 2x25Gb SFP28 SR 100m Transceiver	R7D11A

### Supported DAC/Copper Cables and Adapters

8	HPE 7.6m/25ft CAT5 RJ45 M/M Ethernet C/O Cable	C7539A
5	HPE Networking X240 10G SFP+ SFP+ 0.65m DAC Cable	JD095C
5	HPE Networking X240 10G SFP+ SFP+ 1.2m DAC Cable	JD096C
5	HPE Networking X240 10G SFP+ SFP+ 3m DAC Cable	JD097C
5	HPE Networking X240 10G SFP+ SFP+ 5m DAC Cable	JG081C
	HPE C-series 3M Passive Copper SFP+ Cable	K2Q21A
	HPE C-series 5M Passive Copper SFP+ Cable	K2Q22A

## Configuration Information

Note #	Description	SKU
5	HPE Aruba Networking 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281D
5	HPE Aruba Networking 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283D
5	HPE Aruba Networking 25G SFP28 to SFP28 0.65m Direct Attach Cable	JL487A
	HPE Networking Comware X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	JG326A
	HPE Networking Comware X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	JG327A
	HPE Networking Comware X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	JG328A
	HPE Networking Comware X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	JG329A
	HPE Networking Comware X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	JG330A
	HPE Networking Comware X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	JG331A
	HPE BladeSystem c-Class 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable	720199-B21
	HPE BladeSystem c-Class 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable	720202-B21
5	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 3m Direct Attach Copper Cable	487655-B21
5	HPE BladeSystem c-Class 10GbE SFP+ to SFP+ 5m Direct Attach Copper Cable	537963-B21
	HPE Networking X242 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable	JH234A
	HPE Networking X242 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable	JH235A
	HPE Networking X242 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable	JH236A
4	HPE Networking X240 QSFP28 4xSFP28 1m Direct Attach Copper Cable	JL282A
4	HPE Networking X240 QSFP28 4xSFP28 3m Direct Attach Copper Cable	JL283A
4	HPE Networking X240 QSFP28 4xSFP28 5m Direct Attach Copper Cable	JL284A
4	HPE 100Gb QSFP28 to 4x25Gb SFP28 3m Direct Attach Copper Cable	845416-B21
	HPE Aruba Networking 100G QSFP28 to QSFP28 5m Direct Attach Copper Cable	ROZ26A
5	HPE 25Gb SFP28 to SFP28 3m Direct Attach Copper Cable	844477-B21
5	HPE 25Gb SFP28 to SFP28 0.5m Direct Attach Copper Cable	R4G18A
5	HPE 25Gb SFP28 to SFP28 1m Direct Attach Copper Cable	R4G19A
	HPE 100Gb QSFP28 to QSFP28 5m Direct Attach Copper Cable	845408-B21
4	HPE 100GbE QSFP28 to 4x25GbE SFP28 1m Direct Attach Copper Cable	Q9S72A
	HPE Networking X240 100G QSFP28 1m DAC Cable	JL271A
	HPE Networking X240 100G QSFP28 3m DAC Cable	JL272A
	HPE Networking X240 100G QSFP28 5m DAC Cable	JL273A
	HPE Aruba Networking 100G QSFP28 to QSFP28 1m Direct Attach Copper Cable	ROZ25A
	HPE Aruba Networking 100G QSFP28 to QSFP28 3m Direct Attach Copper Cable	JL307A
	HPE 100Gb QSFP28 to QSFP28 3m Direct Attach Copper Cable	845406-B21
	HPE 200Gb QSFP56 to QSFP56 0.5m Direct Attach Copper Cable	R5Z76A
	HPE 200Gb QSFP56 to QSFP56 1m Direct Attach Copper Cable	R5Z77A
	HPE 200Gb QSFP56 to QSFP56 2m Direct Attach Copper Cable	R5Z78A
	HPE 200Gb QSFP56 to QSFP56 2.5m Direct Attach Copper Cable	R5Z79A
	HPE Alletra 6000 2x10Gb SFP+ to SFP+ 3m Direct Attach Copper Cable	R7D16A
5	HPE Alletra 6000 2x25Gb SFP28 to SFP28 3m Direct Attach Copper Cable	R7D17A
	HPE Alletra 6000 2x100Gb QSFP28 to QSFP28 3m Direct Attach Copper Cable	R7D18A
5	HPE Aruba Networking 25G SFP28 to SFP28 3m Direct Attach Copper Cable	JL488A
	HPE 200GbE QSFP56 to 2xQSFP56 2m Direct Attach Copper Cable	R8M57A

## Configuration Information

Note #	Description	SKU
	HPE 200GbE QSFP56 to 2xQSFP56 2.5m Direct Attach Copper Cable	R8M58A
	HPE 100Gb QSFP28 to QSFP28 0.5m Direct Attach Copper Cable	R8M59A
13	HPE 200Gb QSFP56 to 4x50/25Gb SFP56 2.5m Direct Attach Copper Cable	R6F27A

### Supported AOC (Optical) Cables and Adapters

HPE 40GbE QSFP+ to 4x10GbE SFP+ 5m Active Optical Cable	Q9S66A
HPE 25GbE SFP28 to SFP28 3m Smart Active Optical Cable	Q9S67A
HPE 25GbE SFP28 to SFP28 5m Smart Active Optical Cable	Q9S68A
HPE 25GbE SFP28 to SFP28 10m Smart Active Optical Cable	Q9S69A
HPE 25GbE SFP28 to SFP28 15m Smart Active Optical Cable	Q9S70A
HPE 100GbE QSFP28 to QSFP28 5m Active Optical Cable	Q9S71A
HPE BladeSystem c-Class QSFP+ to 4x10G SFP+ 15m Active Optical Cable	721076-B21
HPE BladeSystem c-Class 40G QSFP+ to QSFP+ 15m Active Optical Cable	720211-B21
HPE 100Gb QSFP28 to QSFP28 7m Active Optical Cable	845410-B21
HPE 100Gb QSFP28 to QSFP28 15m Active Optical Cable	845414-B21
HPE QSFP28 to 4x25Gb SFP28 7m Active Optical Cable	845420-B21
HPE QSFP28 to 4x25Gb SFP28 15m Active Optical Cable	845424-B21
HPE 25Gb SFP28 to SFP28 7m Active Optical Cable	844483-B21
HPE 25Gb SFP28 to SFP28 15m Active Optical Cable	845396-B21

### Configuration Rules and Notes:

#### Notes:

- 1. JG915A - Storage connectivity support for this transceiver is limited to 40Km
- 2. QSA (QSFP+ to SFP+) adapter (655874-B21) is being phased out of the M-series support. Use HPE QSA28 (QSFP28 to SFP28) adapter (845970-B21) that is compatible with all M-series switches to convert a QSFP+/QSFP28 slot to a single SFP+/SFP28 slot for 1G to 25G operation.
- 3. HPE QSA28 (QSFP28 to SFP28) adapter (845970-B21) is compatible with all M-series switches and is required with this transceiver to convert a QSFP28 slot to a single SFP28 or SFP+ slot for 1G, 10G, or 25G operation with this switch model.
- 4. QSFP (+ or 28) cable end is supported in SN2010M. The SFP (+ or 28) end is not supported in the SN2010M
- 5. The SN2010M 25G DAC connectivity to another M-series switch or 3rd party switch is limited to a 0.5m DAC cable. End device connectivity may use 1m or a 3m (26 gauge) 25G DAC. 10G DAC up to 5m is supported between SN2010M switches.
- 6. This HPE transceiver is compatible and supported for use in the SFP28 slots with this M-series switch model and is not restricted to use only with a QSA28 in QSFP28 slots.
- 7. This HPE transceiver is compatible and supported for use in the SFP28 slots and also the QSFP28 slots with this M-series switch model with the QSA28 (QSFP28 to SFP28) adapter (845970-B21).
- 8. This RJ45 crossover cable is compatible and supported for use when directly connecting the two M-series switch MGMT ports. When configuring MLAG and also utilizing in-band management, the MGMT0 ports of the two switches should be connected.
- 9. The interoperable 845972-B21 and 855817-B21 HPE 100Gb QSFP28 Bidirectional XCVRs do not interoperate with the JH419A and R0R40A transceivers.
- 10. 100Gbe SWDM4 LC transceivers JH419A and R0R40A are interoperable.
- 11. 10Gbase-T SFP+ RJ45 transceiver supports maximum length 30M CAT6a cable. This 10Gbase-T transceiver is not qualified for use at 1GbE and shall be operated only at 10GbE.
- 12. ONYX-3.9.2110 and later revisions are required for support of up to 18 R0R41B transceivers in the SN2010M switch.
- 13. All 4 R6F27A cable ports must be set as NRZ or PAM4. A mix between the two technologies is not supported.
- 14. The R8M61A class 6 power requirements support use in the SN2010M ports 19, 20, 21, 22.



## Configuration Information

### Supported Optical Cables for all M-series switch models

Description	SKU
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 10m Cable	QK729A
HPE Premier Flex MPO/MPO Multi-mode OM4 8 Fiber 50m Cable	QK731A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 Fiber 50m Cable	QK737A
HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A
HPE Premier Flex MPO/MPO OM4 100m Cable	H6Z30A
HPE Multi Fiber Push On to 4 x Lucent Connector 5m Cable	K2Q46A
HPE Multi Fiber Push On to 4 x Lucent Connector 15m Cable	K2Q47A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 1m Cable	Q1H63A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 2m Cable	Q1H64A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 5m Cable	Q1H65A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 15m Cable	Q1H66A
HPE Premier Flex MPO/MPO Multi-mode OM4 12 Fiber 30m Cable	Q1H67A
HPE Premier Flex MPO to 4xLC 30m Cbl	Q1H68A
HPE Premier Flex MPO to 4 x Lucent Connector 50m Cable	Q1H69A
HPE 5m Single-Mode LC/LC Fibre Channel Cable	AK346A
HPE Premier Flex MPO12 to MPO12 APC Single-mode 50m 1-pack Cable	R6F28A
HPE Premier Flex MPO12 to MPO12 APC Single-mode 100m 1-pack Cable	R6F29A
HPE Premier Flex MPO12 to MPO12 APC Single-mode 300m 1-pack Cable	R6F30A
HPE Premier Flex MPO12 to MPO12 APC Single-mode 500m 1-pack Cable	R6F31A

## Technical Specifications

### Family Information

	<b>HPE SN2010M</b>	<b>HPE SN2100M</b>	<b>HPE SN2410M</b>	<b>HPE SN2700M</b>
<b>Description</b>	Ideal ½ width ToR 1/10/25/40/50/100 GbE	Ideal ½ width ToR 10/25/40/50/100GbE	1/10/25GbE ToR 40/50/100GbE	40/50/100GbE spine and aggregation ToR
<b>Ports Speeds</b>	18 x 1/10/25GbE + 4x40/100GbE	16x40/100GbE 64x10/25GbE	48x10/25GbE + 8x40/100GbE	32x40/100GbE 64x10/25GbE
<b>Minimum Configuration</b>	18 + 4 Ports	8 Ports - pay as you grow with 8 additional port option	24x10/25 GbE + 4x100 GbE Ports - pay as you grow 24/4 additional port option	16 Ports - pay as you grow with 16 additional port option
<b>Size</b>	1U ( ½ 19" wide)	1U ( ½ 19" wide)	1U	1U
<b>Switching Capacity</b>	1.7Tb/s	3.2Tb/s	4Tb/s	6.4Tb/s
<b>Processing Capacity</b>	1.26Bpps	2.38Bpps	2.97Bpps	4.76Bpps
<b>Forwarding Technology</b>	Cut Through and Store- and-forward	Cut Through and Store- and-forward	Cut Through and Store- and-forward	Cut Through and Store- and-forward
<b>Latency</b>	300ns	300ns	300ns	300ns
<b>Typical Power Consumption</b>	57W	94W	165W	150W
<b>Energy Efficiency</b>	full load: 91.3% @ 115Vac/60Hz , 92.6% @ 230Vac/50Hz	full load: 91.3% @ 115Vac/60Hz , 92.6% @ 230Vac/50Hz	80 Plus Gold	80 Plus Gold
<b>Supported Operating Systems**</b>	ONYX™ & ONIE	ONYX™ & ONIE	ONYX™ & ONIE	ONYX™ & ONIE
<b>System Memory</b>	8GB	8GB	8GB	8GB
<b>SSD Memory</b>	16GB	16GB	32GB	32GB
<b>Packet Buffer</b>	16MB	16MB	16MB	16MB
<b>1GbE Mgmt Ports</b>	1 RJ45	1 RJ45	2 RJ45	2 RJ45
<b>Serial Ports</b>	1 RJ45	1 RJ45	1 RJ45	1 RJ45
<b>USB Ports</b>	1 Mini USB	1 Mini USB	1	1
<b>Airflow</b>	Power-to-Connector and Connector-to-Power airflow	Power-to-Connector and Connector-to-Power airflow	Power-to-Connector and Connector-to-Power airflow; hot swappable	Power-to-Connector and Connector-to-Power airflow; hot swappable
<b>Power Supplies</b>	2 (1+1 redundant) not replaceable	2 (1+1 redundant) not replaceable	2 (1+1 redundant) hot-swappable	2 (1+1 redundant) hot-swappable



## Technical Specifications

	HPE SN2010M	HPE SN2100M	HPE SN2410M	HPE SN2700M
<b>Fans</b>	2 fans not replaceable	2 fans not replaceable	4 (N+1 redundant) hot-swappable	4 (N+1 redundant) hot-swappable
<b>Power Supplies</b>	Frequency: 50-60Hz Input range: 100-264 AC Input current 4.5-2.9A	Frequency: 50-60Hz Input range: 100-264 AC Input current 4.5-2.9A	Frequency: 50-60Hz Input range: 100-264 AC Input current 4.5-2.9A	Frequency: 50-60Hz Input range: 100-264 AC Input current 4.5-2.9A
<b>Size</b>	1.72" x 7.87" x 20"(43.9mm x 200mm x 508mm)	1.72" x 7.87" x 20"(43.9mm x 200mm x 508mm)	1.72" x 17.24" x 17"(43.9mm x 438mm x 436mm)	1.72" x 16.84" x 27"(43.9mm x 427.8mm x 686mm)
<b>Weight</b>	4.53kg (10Lb)	4.53kg (10Lb)	8.52kg (18.8Lb)	11.1kg (24.5Lb)

**Notes:** \*\*There are separate M-Series SKUs for ONIE and ONYX™ switch models.

### HPE SN2010M 25GbE 18SFP28 4QSFP28 Half Width Switch

<b>Description</b>	Ideal ½ width ToR switch supporting 1/10/25/40/50/100 GbE connectivity
<b>Ports Speeds</b>	18 x 1/10/25 GbE + 4 x 40/100 GbE
<b>Minimum Configuration</b>	18 + 4 ports
<b>Size</b>	1U ( ½ 19" wide)
<b>Switching Capacity</b>	1.7Tb/s
<b>Processing Capacity</b>	1.26Bpps
<b>Forwarding Technology</b>	Cut Through and Store-and -Forward
<b>Latency</b>	300ns
<b>Typical Power Consumption</b>	57W
<b>Supported Operating Systems</b>	ONYX™
<b>System Memory</b>	8GB
<b>SSD Memory</b>	16GB
<b>Packet Buffer</b>	16MB
<b>100/100 Mgmt Ports</b>	1 RJ45
<b>Serial Ports</b>	1 RJ45
<b>USB Ports</b>	1 Mini USB
<b>Airflow</b>	Power-to-Connector <u>and</u> Connector-to-Power
<b>Power Supplies</b>	2 (1+1 redundant); not replaceable
<b>Fans</b>	2 fans not replaceable
<b>Power Supplies</b>	Frequency: 50-60Hz Input range: 100-264 AC Input current 4.5-2.9A
<b>Size</b>	1.72" x 7.87" x 20"(43.9mm x 200mm x 508mm)
<b>Weight</b>	4.53kg (10Lb)

## Technical Specifications

### Environment

- **Operating temperature**  
0°C to 40°C
- **Non-operating temperature**  
-40°C to 70°C
- **Operating relative humidity (operational)**  
5% to 85% noncondensing
- **Operating Altitude** 0 - 3050m  
RoHS compliant

### Electrical characteristics

- Frequency 50/60 Hz
- Voltage 90 - 264 VAC

### Safety

EN 60950-1:2006+A11:2009+A1:2010+A12:2011+AC:2011+A2:2013, IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013 and EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013, UL 60950-1:2007, CAN/CSA C22.2 60950-1:2007+A1:2011+A2:2014, IEC 60950-1 Ed. 2.0 :2005 + Am 1:2009+ Am 2:2013, LV CU TR 004/2011 and EMC CU TR 020/2011 Technical Regulation, DSTU EN 55032:2014 and DSTU EN 60950-1:2014

### EMC

EN 55032:2012 class A, EN 55024:2010, EN 61000-3-2:2014, EN 61000-3-3: 2013, EN 61000-4-2: 2002, EN 61000-4-3: 2006+A1(08)+A2(10), EN 61000-4-4: 2004+A1(10), EN 61000-4-5: 2006, EN 61000-4-6: 2014  
EN 61000-4-11:2004, FCC 47 CFR, Part 15:2017, Sub-part B, Class A, ICES-003, Issue 6: 2016 Class A, VCCI V-3/2015.04 Class A, AZ/NZS CISPR 32:2015 Class A, KN22:2009 class A/ KN24:2009

### Acoustic

High-speed fan: 73.7dB(A)

### Typical power with passive cables (ATIS)

57W

### HPE Power Advisor

To address a need to accurately estimate power requirements and to ensure the appropriate levels of power and cooling and power-related operating costs, HPE created the **HPE Power Advisor utility**. The HPE Power Advisor utility provides accurate and meaningful estimates of the power needs for HPE servers, storage, and switches including M-series Ethernet switches.

### Protocols

#### Standards

- 802.1D Bridging and Spanning Tree
- 802.1p QOS
- 802.1Q VLAN Tagging
- 802.1w Rapid Spanning Tree
- 802.1s Multiple Spanning Tree Protocol
- 802.1AB Link Layer Discovery Protocol
- 802.1Qaz ETS
- 802.1Qbb PFC





## Technical Specifications

- 802.3ad Link Aggregation with LACP
- 802.3ba
- 802.3x Flow Control
- 1000BASE-KX
- 802.3ae 10 Gigabit Ethernet

### SNMP MIBs

- RFC 4001 INET-ADDRESS-MIB
- IANAifType-MIB
- RFC 2863 IF-MIB
- RFC 4318 RSTP-MIB
- LLDP-MIB 802.1AB-2005
- RFC 4363 Q-BRIDGE-MIB
- RFC 4188 BRIDGE-MIB
- RFC 4133 ENTITY-MIB
- RFC 3433 ENTITY-SENSOR-MIB
- RFC 4268 ENTITY-STATE-MIB
- RFC 2572 SNMP-MPD-MIB
- RFC 4293 IP-MIB
- RFC 4022 TCP-MIB
- RFC 4113 UDP-MIB

### SNMP MIBs

- RFC 4292 IP-FORWARD-MIB
  - RFC 2790 HOST-RESOURCES-MIB
  - RFC 1213
  - SNMPV2-CONF
  - RFC 2579 SNMPV2-TC MIB
  - RFC 3417 SNMPV2-TM MIB
  - RFC 3826 SNMP-USM-AES-MIB
  - Mellanox SMI MIB
  - Mellanox IF-VPI-MIB
  - Mellanox enhanced ENTITY-MIB
  - Mellanox Power-Cycle-MIB
  - Mellanox SW-Update-MIB
  - Mellanox Config-MIB
- 



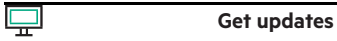
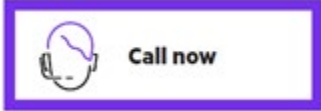
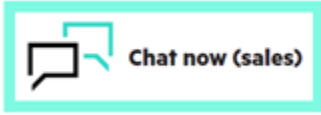
## Summary of Changes

Date	Version History	Action	Description of Change
26-Feb-2024	Version 18	Changed	Networking product names were updated.
13-Nov-2023	Version 17	Changed	HPE Services Rebranding
19-Sep-2022	Version 16	Changed	Standard Features, Configuration Information and Technical Specifications sections were updated
06-Jun-2022	Version 15	Changed	Overview, Standard Features and Service and Support sections were updated
04-Oct-2021	Version 14	Changed	Service and Support section was updated
02-Aug-2021	Version 13	Changed	Service and Support section was updated
19-Apr-2021	Version 12	Changed	Configuration Information Section was updated
15-Feb-2021	Version 11	Changed	Overview, Standard Features and Technical Specifications sections were updated
03-Aug-2020	Version 10	Changed	Overview, Standard Features and Configuration Information sections were updated
06-Jul-2020	Version 9	Changed	QuickSpecs layout was updated and Branding Refresh was applied.
16-Mar-2020	Version 8	Changed	Configuration Information and Technical Specifications sections were updated.
03-Feb-2020	Version 7	Changed	Overview, Service and Support, Family Information and Technical Specifications sections were updated.
07-Oct-2019	Version 6	Changed	ONIE SKU updates; features update; transceivers updated
05-Aug-2019	Version 5	Added	Overview, Service and Support, Family Information and Technical Specifications sections were updated.
02-Apr-2019	Version 4	Changed	Family Information and Technical Specifications sections were updated.
07-Jan-2019	Version 3	Changed	Overview, Models, Service and Support, Family Information, Configuration Information and Technical Specifications sections were updated
15-Oct-2018	Version 2	Changed	Overview section was updated. SKUs descriptions were updated. Obsolete SKUs were removed from Configuration Information section. New SKUs were added in Configuration Information section.
4-Sep-2018	Version 1	New	New QuickSpecs.



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