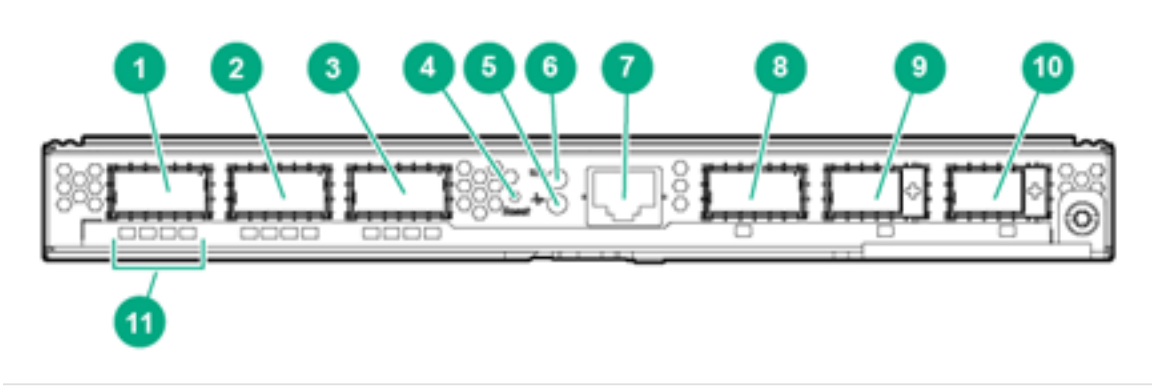
## Overview

### HPE Apollo Ethernet Switches

Today's complex data centers require a demanding networking infrastructure. It all starts at the edge and that's where the HPE Apollo Ethernet Switch excels. The HPE Apollo Ethernet Switches are designed to support HPE Apollo k6000 System in HPC environments with exceptional bandwidth of 10Gb to each HPE ProLiant XL230k Gen10 server, while providing a mixture of uplinks to the core network.




**HPE Apollo Ethernet 10/40/100GbE Switch**

| | | | |
|---|---|---|---|
| 1. | QSFP+ port (100G/40G, supports breakout cable for 4x25G or 4x10G) | 7. | Console port |
| 2. | QSFP+ port (40G, supports breakout cable for 4x10G) | 8. | QSFP+ port LED (100G/40G or 25G/10G, does not support breakout cable) |
| 3. | QSFP+ port (40G, supports breakout cable for 4x10G) | 9. | SFP+ port (10G, or 1GBaseT with adapter) |
| 4. | Reset Button | 10. | SFP+ port (10G, or 1GBaseT with adapter) |
| 5. | Health LED | 11 | Port LEDs |
| 6. | UID LED | | |

## Overview

**Models**

| | |
|---|---|
| HPE Apollo Ethernet 10/40/100Gb Switch | 874061-B21 |
| HPE Apollo Ethernet 10/40Gb Switch | 846633-B21 |
| HPE Apollo Ethernet 10/40Gb TAA-compliant Switch | 846633-B22 |

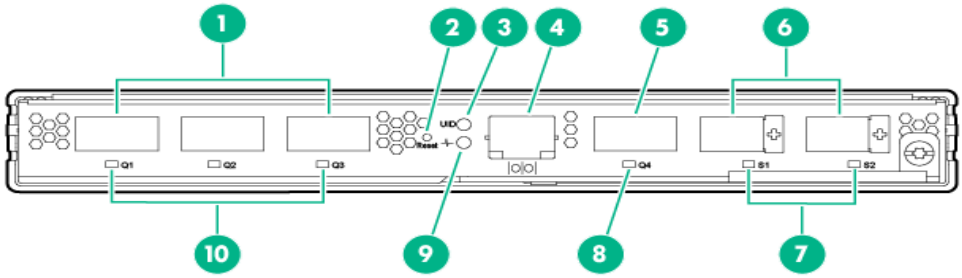
**Compatibility**

**HPE ProLiant Servers**

HPE ProLiant XL230k Gen10 Server

**Supported Chassis**

HPE Apollo k6000 Gen10 System




**HPE Apollo Ethernet 10/40GbE Switch**

1. QSFP+ ports (40G, supports breakout cable for 4x10G)
2. Reset Button
3. UID LED
4. Console port
5. QSFP+ port
6. SFP+ ports (10G, or 1GBaseT with adapter)
7. SFP+ port LEDs
8. QSFP+ port LED
9. Health LED
10. QSFP+ port LEDs

## Standard Features

**Performance**

**10/40/100GbE Switch**

- 300Gb uplink bandwidth / 480Gb available server side bandwidth
- Wire-speed switching and IPv4/IPv6 routing on all ports
- Support up to 2 switches into a single Apollo k6000 Chassis
- 50 Gb internal crosslink between 2 switches to support MLAG
- 4 QSFP+ ports: Ports 1 & 8 (see illustration) support 100G/40G; Ports 2 & 3 (see illustration) support 40G. Ports 1, 2, & 3 support breakout cable for 4x25G, or 40x10G, respectively; Port 8 does not support breakout cable.
- 2 SFP+ ports support either 10Gb or 1Gb (transceiver SFP to RJ45 required) depending on module inserted
- Cut-through switching
- Hardware-based wire-speed access control lists (ACLs)
- Data Center Bridging (DCBX)
- Support for VXLAN (RFC 7348)

**10/40GbE Switch**

- 180Gb uplink bandwidth / 240Gb available server side bandwidth
- Wire-speed switching and IPv4/IPv6 routing on all ports
- Support up to 2 switches into a single Apollo k6000 Chassis
- 40 Gb internal crosslink between 2 switches to support IRF
- 4 QSFP+ ports, each support 1x40Gb or 4x10Gb ports (with optional breakout cable)
- 2 SFP+ ports support either 10Gb or 1Gb (transceiver SFP to RJ45 required) depending on
- module inserted
- Any uplink or cross connect port can be used for IRF connections
- Cut-through switching
- Hardware-based wire-speed access control lists (ACLs)
- Data Center Bridging (DCBX)
- Support for VXLAN (RFC 7348)

**Management**

- Remote configuration (thru HPE APM) and management CLI
- Standards-based SNMP management via SNMPv1, v2c and v3
- Out of band management thru the Chassis controller management (iLO) network
- SDN with OpenFlow 1.3
- RJ45 console port
- Web based management
- sFlow
- Manager and operator privilege levels
- Command authorization via RADIUS
- Complete session logging for problem resolution
- LLDP Discovery protocol
- IPv6 management
- Backup firmware image
- Multiple configuration files
- Syslog
- Network Time Protocol (NTP)
- JSON API
- Zero-touch Provisioning (ZTP)
- Control Plain Policing or Policies (CoPP)
- BER Degradation Monitor

- Remote configuration (thru HPE APM) and management CLI
- Standards-based SNMP management via SNMPv1, v2c and v3
- Out of band management thru the Chassis controller management (iLO) network
- HPE IMC Virtual Application Networking Fabric Manager
- Virtual Application Network (VAN)
- SDN with OpenFlow 1.3
- RJ45 console port
- HTTPS Web based management
- sFlow
- Manager and operator privilege levels
- Command authorization via RADIUS
- Complete session logging for problem resolution
- LLDP Discovery protocol
- IPv6 management
- Backup firmware image
- Multiple configuration files
- Syslog
- Network Time Protocol (NTP)

## Standard Features

### Security

**10/40/100Gb Switch**

- IEEE 802.1X user authentication
- MAC-based authentication with RADIUS server
- Access Control Lists (ACLs)
- Secure FTP
- STP Root Guard
- DHCP Protection from unauthorized DHCP servers
- IP Source Guard
- RADIUS/TACACS+
- Secure management via SSHv2 and SNMPv3

**10/40Gb Switch**

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- Access Control Lists (ACLs)
- Secure FTP
- STP Root Guard
- DHCP Protection from unauthorized DHCP servers
- IP Source Guard
- Dynamic ARP protection to prevent eavesdropping
- Endpoint Admission Defense (EAD)
- RADIUS/TACACS+
- Secure management via SSHv2 and SNMPv3
- Unicast Reverse Path Forwarding (URPF)
- Monitor link and Smart link
- IPsec
- IKE (Internet Key Exchange)
- Disable password recovery

### Layer 2 Switching

- 256K MAC addresses
- 4094 VLANs
- IEEE 802.1ad QinQ VLANs
- Per VLAN Spanning Tree (PVST+)
- Jumbo frame support (9k bytes)
- IEEE 802.3ad Link Aggregation (LAG) & ALCP
- 32 Ports/Channel – 64 Groups per system
- Store & Forward / Cut-through mode of work
- Spanning Tree Protocol, MSTP, RSTP, STP Root Guard
- IP Multicast Snooping and data-driven IGMP
- Link Layer Discovery Protocol (LLDP)

- 288K MAC addresses
- 4094 VLANs
- IEEE 802.1ad QinQ VLANs
- Per VLAN Spanning Tree (PVST+)
- Private VLANs (PVLAN)
- Multicast VLAN Registration Protocol (MVRP)
- Jumbo frame support
- Port Aggregation
- Spanning Tree Protocol, MSTP, RSTP, STP Root Guard
- IP Multicast Snooping and data-driven IGMP
- Transparent Interconnect of Lots of Links (TRILL)
- Shortest Path Bridging (SPB)
- Multiple Label Switching (MPLS)
- Virtual Private LAN Service (VPLS)

### Layer 3 Routing

- IPv4 routing protocols - BFD (static routes, OSPFv2 and BGP4)
- IPv6 tunneling
- IP Multicast - PIM-SSM, PIM-SM
- Equal-Cost Multipath (ECMP 64-way)
- Policy-based routing
- IPv4 & IPv6 Routing (Route maps: BGP4, OSPFv2)
- DHCPv4 and DHCPv6 Relay
- VRRP (64)
- Virtual Routing and Forwarding (VRF)
- Router Port, intVlan, NULL Interface for Routing
- IGMPv2/v3 Snooping Querier

- IPv4 routing protocols - static routes, RIP, OSPF and BGP
- IPv6 routing protocols - static routes, RIPng, OSPFv3 and BGP+
- IPv6 tunneling
- IP Multicast - PIM-SSM, PIM-DM, PIM-SM, IGMP for IPv4 and IPv6
- Equal-Cost Multipath (ECMP)
- Policy-based routing
- DHCP and DHCPv6 client
- VRRP
- VXLAN

## Standard Features

### Quality of Service (QoS)

- Advanced classifier-based QoS (with eight queues) - classifies traffic using multiple match criteria based on Layer 2, 3 and 4 information and applies QoS policies such as priority level and rate limit to selected traffic on a per-port or per-VLAN basis
- Traffic policing - supports Committed Access Rate (CAR) and line rate
- Powerful QoS feature - creates traffic classes based on access control lists (ACL), IEEE 802.1p precedence, IP, DSCP or Type of Service (ToS) precedence; supports filter, redirect, mirror or remark; supports the following congestion actions: strict priority (SP) queuing, weighted round robin (WRR), weighted fair queuing (WFQ), and weighted random early discard (WRED)
- Storm restraint - allows limitation of broadcast, multicast, and unknown unicast traffic rate to cut down on unwanted broadcast traffic on the network
- WRED, Fast ECN & PFC
- Congestion Control (DCQCN)


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### Resiliency and High Availability

- IMLAG 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. Servers or switches can be attached using standard LACP for automatic load balancing, resiliency and high availability; Simplifies network operation by eliminating Spanning Tree, ECMP and VRRP.
- Virtual Router Redundancy Protocol (VRRP)


- Intelligent Resilient Framework (IRF) - Creates virtual resilient switching fabrics, up to eight switches acting as a single Layer 2/3 switch; Switches do not have to be co-located and can be part of a disaster recovery system; Servers or switches can be attached using standard LACP for automatic load balancing and high availability; Simplifies network operation by eliminating Spanning Tree, ECMP and VRRP.
- Device Link Detection Protocol (DLDP) - Monitors Link connectivity and shuts down ports at both ends if unidirectional traffic is detected
- Virtual Router Redundancy Protocol (VRRP)


### Monitoring and Diagnostics

- 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.
- Mirroring - Port mirroring enables traffic on a port to be simultaneously sent to a network analyzer for monitoring; Flow-based mirroring
- Link Diagnostic per Port - The Diagnostic commands enables an insight into the physical layer components where the user is able to see information such as a cable status (plugged/unplugged) or if Auto-Negotiation has failed.
- Digital Diagnostic Monitoring Interface for QSFP/SFP Optical Transceivers


- OAM (802.3ah) - Detects data link layer problems in the "last mile"; monitors link status between two devices
- CFD (802.1ag) - Connectivity Fault Detection (CFD) provides L2 link OAM mechanism used for link connectivity detection and fault location
- Mirroring - Port mirroring enables traffic on a port to be simultaneously sent to a network analyzer for monitoring; Flow-based mirroring

## Service and Support

**Warranty**

This product is covered by a global limited warranty and supported by Hewlett Packard Enterprise Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners (may vary by region). Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HPE Pointnext operational services or customized service agreements. Hard drives have either a one year or three year warranty.

**NOTE:** Server Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
**http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/**

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It is recommended to have the same attached support level for Intel Omni-Path Switches as the Server and chassis.

**Service and Support**

**Protect your business beyond warranty with HPE Support Services**

HPE Pointnext provides a comprehensive portfolio including Advisory and Transformational, Professional, and Operational Services to help accelerate your digital transformation. From the onset of your transformation journey, Advisory and Transformational Services focus on designing the transformation and creating a solution roadmap. Professional Services specializes in creative configurations with flawless and on-time implementation, and on-budget execution. Finally, operational services provides innovative new approaches like Flexible Capacity and Datacenter Care, to keep your business at peak performance. HPE is ready to bring together all the pieces of the puzzle for you, with an eye on the future, and make the complex simple.

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**Optimized Recommendation**

**Recommended Services**

HPE Proactive Care* with 24x7 coverage, three year Support Service

HPE Proactive Care gives customers an enhanced call experience. When your products are connected to HPE, Proactive Care helps prevent problems and maintains IT stability by utilizing personalized proactive reports with recommendations and advice This Service combines three years proactive reporting and advice with our 24x7 coverage, four hour hardware response time when there is a problem. This service also includes collaborative software support for Independent Software Vendors (ISVs), (Red Hat, VMWare, Microsoft, etc.) running on your HPE servers.
**https://www.hpe.com/h20195/v2/GetPDF.aspx/4AA3-8855ENW.pdf**

**NOTE:** *HPE Proactive Care and HPE Proactive Care Advanced require that the customer connect their devices to make the most of these services and receive all the deliverables.

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**Standard Recommendation**

**HPE Foundation Care 24x7, three-year Support Service**

HPE Foundation Care 24x7 gives you access to HPE 24 hours a day, seven days a week for assistance on resolving issues. This service includes need based Hardware onsite response within four hours. In addition, collaborative software support is included in this service that provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make HPE your first call to help resolve hardware or software problems.
**https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en**

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## Service and Support

**Basic Recommendation**

**HPE Foundation Care NBD, three-year Support Service**

HPE Foundation Care Next Business Day connects you to HPE during business hours for assistance on resolving issues – This service features need based next business day hardware onsite response and software call back within two hours. In addition, Collaborative software support and provides troubleshooting assistance on industry leading software running on your HPE server. Simplify your support experience and make HPE your first call to help resolve hardware or software problems.

**https://www.hpe.com/h20195/V2/GetDocument.aspx?docname=4AA4-8876ENW&cc=us&lc=en**

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**Parts and Materials**

Hewlett Packard Enterprise 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 quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

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**HPE Factory Express for Servers and storage**

HPE Factory Express offers configuration, customization, integration and deployment services for HPE servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HPE products supported through Factory Express include a wide array of servers and storage: HPE Integrity, HPE ProLiant, HPE Apollo, HPE ProLiant Server Blades, HPE BladeSystem, HPE 9000 servers as well as the MSAxxxx3PAR suite, XP, rackable tape libraries and configurable network switches.

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**HPE Technology Services Support Credits**

Offer flexible services and technical skills to meet your changing IT demands. With a menu of service that is tailored to suit your needs, you get additional resources and specialist skills to help you maintain peak performance of your IT. Offered as annual credits, you can plan your budgets while proactively responding to your dynamic business.

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**HPE Datacenter Care service**

HPE Datacenter Care helps improve IT stability and security, increase the value of IT, and enable agility and innovation. It is a structured framework of repeatable, tested, and globally available services "building blocks." You can deploy, operate, and evolve your datacenter wherever you are on your IT journey. With HPE Datacenter Care, you benefit from a personalized relationship with HPE via a single point of accountability for HPE and others' products.

For more information, visit **http://www.hpe.com/services/datacentercare**

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**HPE Flexible Capacity**

With Flexible Capacity, you get the speed, scalability, and economics of the public cloud in the privacy of your data center. Gain the advantages of the public cloud—consumption-based payment, rapid scalability without worrying about capacity constraints. Reduce the "heavy lifting" needed to operate a data center. And retain the advantages that IT provides the business (i.e., control, security). Deliver the right user experience, choose the right technology for the business, manage privacy and compliance, and manage the cost of IT. And, you have the option to use the public cloud when needed.

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## Service and Support

**DC for Hyperscale**
Datacenter Care for Hyperscale is available for Service Providers and HPC customers who use a scale out approach to computing with a high volume homogenous infrastructure and resilient architecture can take advantage of this environment support tailored to their operating model.

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**HPE Education Services**
Keep your IT staff trained making sure they have the right skills to deliver on your business outcomes. Book on a class today and learn how to get the most from your technology investment. **http://www.hpe.com/ww/learn**

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**HPE Support Center**
The HPE Support Center is a personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers.
Learn more **http://www.hpe.com/support/hpesc**
HPE's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now you can get access to personalized IT support anywhere, anytime. HPE Insight Remote Support and HPE Support Center are available at no additional cost with a HPE warranty, HPE Support Service or HPE contractual support agreement.
**NOTE:** *HPE Support Center Mobile App is subject to local availability

**For More Information**
**http://www.hpe.com/services**

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## Technical Specifications

| SFP Options | | | |
|---|---|---|---|
| **Description** | **Part Number** | **10/40/100GbE Switch** | **10/40GbE Switch** |
| HPE X120 1G SFP LC SX Transceiver | JD118B | √ | √ |
| HPE X120 1G SFP LC LX Transceiver | JD119B | √ | √ |
| HPE BladeSystem c-Class Virtual Connect 1G SFP RJ-45 Transceiver | 453154-B21 | √ | |
| HPE X125 1G SFP LC LH40 1310nm Transceiver | JD061A | | √ |
| HPE X120 1G SFP LC LH40 1550nm Transceiver | JD062A | | √ |
| HPE X125 1G SFP LC LH70 Transceiver | JD063B | | √ |
| HPE X120 1G SFP RJ45 T Transceiver | JD089B | √ | √ |
| **SFP+ Options** | | | |
| HPE X130 10G SFP+ LC SR Transceiver | JD092B | √ | √ |
| HPE X130 10G SFP+ LC LR Transceiver | JD094B | √ | √ |
| HPE X2A0 10G SFP+ to SFP+ 10m Active Optical Cable | JL291A | √ | √ |
| HPE X2A0 10G SFP+ to SFP+ 20m Active Optical Cable | JL292A | √ | √ |
| HPE QSFP/SFP+ Adapter Kit | 655874-B21 | | √ |
| **QSFP+ Options** | | | |
| HPE X140 40G QSFP+ LC LR4 SM 10km 1310nm Transceiver | JG661A | √ | √ |
| HPE X140 40G QSFP+ MPO SR4 Transceiver | JG325B | √ | √ |
| HPE X140 40G QSFP+ MPO MM 850nm CSR4 300m Transceiver | JG709A | √ | √ |
| HPE X140 40G QSFP+ LC BiDi 100m MM Transceiver | JL251A | √ | √ |
| HPE X2A0 40G QSFP+ to QSFP+ 7m Active Optical Cable | JL287A | √ | |
| **Direct Attach Cables** | | | |
| HPE FlexNetwork X240 10G SFP+ to SFP+ 0.65m Direct Attach Copper Cable | JD095C | √ | √ |
| HPE FlexNetwork X240 10G SFP+ to SFP+ 1.2m Direct Attach Copper Cable | JD096C | √ | √ |
| HPE FlexNetwork X240 10G SFP+ to SFP+ 3m Direct Attach Copper Cable | JD097C | √ | √ |
| HPE FlexNetwork X240 10G SFP+ to SFP+ 5m Direct Attach Copper Cable | JG081C | √ | √ |
| HPE FlexNetwork X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable | JG326A | √ | √ |
| HPE FlexNetwork X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable | JG327A | √ | √ |
| HPE FlexNetwork X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable | JG328A | √ | √ |
| HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable | JG329A | √ | √ |
| HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable | JG330A | √ | √ |
| HPE FlexNetwork X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable | JG331A | √ | √ |
| **100GbE Transceiver and cables** | | | |
| HPE 100Gb QSFP28 MPO SR4 100m Transceiver | 845966-B21 | √ | |
| HPE 100Gb QSFP28 to QSFP28 3m Direct Attach Copper Cable | 845406-B21 | √ | |
| HPE 100Gb QSFP28 to QSFP28 5m Direct Attach Copper Cable | 845408-B21 | √ | |
| HPE 100Gb QSFP28 to 4x25Gb SFP28 3m Direct Attach Copper Cable | 845416-B21 | √ | |

## Technical Specifications

| | | | |
|---|---|---|---|
| **Service and Support Offerings** | | | |
| **Installation & start up services** | | | |
| HPE Installation Apollo 6000 Gen10 Chassis Service | H2GA8E | √ | √ |
| HPE Apollo 6000 Generation 10 Installation and Startup Service | H6SV1E | √ | √ |
| **Support Services** | | | |
| HPE 3 Year Proactive Care 24x7 Apollo 10/40/100GbE Switch Service | H2GL5E | √ | √ |
| HPE 3 Year Proactive Care 24x7 with CDMR Apollo 10/40/100GbE Switch Service | H2GL6E | √ | √ |
| HPE 3 Year Foundation Care 24x7 Apollo 10/40/100GbE Switch Service | H2GL3E | √ | √ |
| HPE 3 Year Foundation Care 24x7 with CDMR Apollo 10/40/100GbE Switch Service | H2GL4E | √ | √ |
| HPE 3 Year Foundation Care Next Business Day Apollo 10/40/100GbE Switch Service | H2GK7E | √ | √ |
| HPE 3 Year Foundation Care Next Business Day with CDMR Apollo 10/40/100GbE Switch Service | H2GK8E | √ | √ |

## Technical Specifications

| | | 10/40/100GbE Switch | 10/40GbE Switch |
|---|---|---|---|
| **Shipping Dimensions** | **Length** | 18.50 in (47.0 cm) | 18.50 in (47.0 cm) |
| | **Width** | 12.2 in (31.0 cm) | 13.39 in (34.0 cm) |
| | **Height** | 2.75 in (7 cm) | 5.16 in (13.1 cm) |
| | **Shipping Weight** | 2.23 kg (7lbs) | 2.55 kg (5.62 lbs) |
| **Product Specifications Hardware** | | | |
| **Performance** | | 1.2Tbps throughput<br>2x10Gb and 4x40Gb uplink ports | 1.2Tbps throughput<br>2x10Gb and 4x40Gb uplink ports |
| | | 24x20Gb downlink (server) ports | 24x20Gb downlink (server) ports |
| | | 4 x10Gbps cross-link ports | 4 x10Gbps cross-link ports |
| | **Forwarding rate** | 14.8 million pps per 10 Gig port | 14.8 million pps per 10 Gig port |
| | | 59.2 million pps per 40 Gig port | 59.2 million pps per 40 Gig port |
| | | Non-blocking, full-wire speed for all connections Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support. | |
| | **Forwarding Mode** | Store and forward/Cut Through | Store and forward/Cut Through |
| | **Latency** | 300ns | 1.3 us (store and forward mode) |
| | **MAC Addresses** | Supports 256K MAC addresses per switch in an Apollo k6000 Chassis | Supports 128K MAC addresses per switch in an Apollo k6000 Chassis |
| | **Forwarding Table Age Time (Maximum age)** | 10 to 1,000,000 seconds (default: 300 seconds) | 10 to 1,000,000 seconds (default: 300 seconds) |
| | **VLAN IDs** | 4094 | 4094 |
| | **Jumbo Frame** | 10K Bytes | 10K Bytes |
| | **IGMP Groups** | 1024 | 1024 |
| | **Memory** | 2 GB Main, 512MB flash and 9MB packet buffer | 2 GB Main, 512MB flash and 9MB packet buffer |
| **Connectors and Cabling** | **Connector** | 4 QSFP+ | 4 QSFP+ (40Gb/4 x10Gb/IRF) |
| | | 2 SFP+/SFP (1Gb/10Gb/IRF) | 8 SFP+/SFP (1Gb/10Gb/IRF) |
| | | 1 RJ45 Management | 1 RJ45 Management |
| | **Cable Support** | FCC Class A | FCC Class A |
| | | ICES-003 Class A | ICES-003 Class A |
| | | AS/NZS 3548 Class A | AS/NZS 3548 Class A |
| | | VCCI Class A | VCCI Class A |
| **LED Indicators** | | Module health, amber/green | Module health, amber/green |
| | | Module locator (UID), blue | Module locator (UID), blue |
| | | QSFP+ port link/activity, green | QSFP+ port link/activity, green |
| | | SFP+ port link/activity, green | SFP+ port link/activity, green |
| **Dimensions** | **Length** | 12.2 in (310 mm) | 11.89 in (302 mm) |
| | **Width** | 16.93 in (430 mm) | 8.62 in (219 mm) |
| | **Height** | 2.3 in (58.4 mm) | 0.95 in (24.1 mm) |
| | **Weight** | 2.52 kg (5.56 lbs) | 1.73 kg (3.81 lbs) |
| **Environmental Ranges** | **Temperature Range** | | |
| | **Operating** | 50° to 95° F (10° to 35° C) | 50° to 95° F (10° to 35° C) |
| | **Non-operating** | -22° to 140° F (-30° to 60° C) | -22° to 140° F (-30° to 60° C) |
| | **Relative Humidity (non-condensing)** | Operating 10% to 90% | Operating 10% to 90% |
| **Power Specification** | **Power Requirements** | 160.2 W | 112 W |

## Technical Specifications

**Standards Support**
General protocols
IEEE 802.1ag Service Layer OAM
IEEE 802.1D MAC Bridges
IEEE 802.1p Priority
IEEE 802.1Q VLANs
IEEE 802.1Qbg Virtual Edge Bridging
IEEE 802.1s (MSTP)
IEEE 802.1v VLAN classification by Protocol and Port
IEEE 802.1w Rapid Reconfiguration of Spanning Tree
IEEE 802.1X PAE
IEEE 802.1AX / 802.3ad Link Aggregation Control Protocol (LACP)
IEEE 802.3ae 10 Gigabit Ethernet
RFC 768 UDP
RFC 792 ICMP
RFC 793 TCP
RFC 826 ARP
RFC 854 TELNET
RFC 925 Multi-LAN Address Resolution
RFC 951 BOOTP
RFC 1058 RIPv1
RFC 1350 TFTP Protocol (revision 2)
RFC 1519 CIDR
RFC 1542 BOOTP Extensions
RFC 2131 DHCP
RFC 2453 RIPv2
RFC 3768 VRRP
RFC 4675 RADIUS VLAN & Priority
RFC 7348 VXLAN

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802.1r GARP Proprietary Attribute Registration Protocol (GPRP)
802.1Qaz DCBx
802.1Qaz ETS
802.1Qbb PFC
NPV Mode

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**IP Multicast**
RFC 2934 Protocol Independent Multicast MIB for IPv4
RFC 3376 IGMPv3 (host joins only)
RFC 3618 Multicast Source Discovery Protocol (MSDP)
RFC 3973 Draft 2 PIM Dense Mode
RFC 4601 PIM Sparse Mode

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**IPv6**
RFC 4443 ICMPv6
RFC 4541 IGMP & MLD Snooping Switch
RFC 4861 IPv6 Neighbor Discovery
RFC 4862 IPv6 Stateless Address Auto-configuration

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## Technical Specifications

**Layer 3**
Static routes
RIP / RIPng
OSPF / OSPFv3
BGP / BGP+
IPv6 tunneling
PIM-SM
PIM-SSM
PIM-DM
IGMP
ECMP
Policy-based routing
DHCP and DHCPv6 client

**MIBs**
IEEE 8021ag CFM-MIB
IEEE 8021Q CFM-MIBv2
IEEE 8021AB LLDP-MIB
IEEE 8021AB LLDP-EXT-DOT1-MIB
IEEE 8021AB LLDP-EXT-DOT3-MIB
ANSI/TAA 1057 LLDP-EXT-MED-MIB
IEEE 8023 LAG-MIB
RFC 1213 MIB
RFC 1493 BRIDGE-MIB
RFC 2096 IP-FORWARD-MIB
RFC 2233 IF-MIB
RFC 2273 SNMP-NOTIFICATION-MIB
RFC 2571 SNMP-FRAMEWORK-MIB
RFC 2572 SNMP-MPD-MIB
RFC 2573 SNMP-TARGET-MIB
RFC 2674 P-BRIDGE-MIB
RFC 2674 Q-BRIDGE-MIB
RFC 3414 SNMP-USER-BASED-SM-MIB
RFC 3415 SNMP-VIEW-BASED-ACM-MIB
RFC 3417 SNMPv2-TM-MIB
RFC 3418 SNMPv2-MIB
RFC 3826 SNMP-USM-AES-MIB
RFC 4022 TCP-MIB
RFC 4113 UDP-MIB
RFC 4133 ENTITY-MIB
RFC 4273 BGP4-MIB
RFC 4750 OSPF-MIB
RFC 4750 OSPF-TRAP-MIB
SFLOW-MIB (V5)

**Environment-friendly Products and Approach - End-of-life Management and Recycling**
Hewlett Packard Enterprise offers end-of-life product return, trade-in, and recycling programs, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.
The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site: **http://www.hpe.com/RECYCLE.** These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

## Summary of Changes

| Date | Version History | Action | Description of Change |
|---|---|---|---|
| 13-May-2019 | Version 5 | Changed | QS Name was corrected, SKU was added in Platform Information section under Models.<br>Obsolete SKUs were removed. |
| 07-Jan-2019 | Version 4 | Changed | Overview, Platform Information, Standard Features, Related Options and Technical Specifications sections were updated |
| 23-Oct-2017 | Version 3 | Changed | Care Pack naming and Service and Support- Parts and Materials updated. |
| 25-Sep- 2017 | Version 2 | Updated | Updates throughout the QuickSpecs |
| 11-Jul-2017 | Version 1 | Created | Create QuickSpecs for HPE Apollo Ethernet 10/40GbE Switch |

**Sign up for updates**



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