QuickSpecs

Overview

HPE Composable Fabric FM 2072 Switch

The HPE Composable Fabric FM 2072 is a top-of-rack (TOR) connectivity module that delivers the next generation of innovative networking solutions designed to meet the growing needs of today's virtual and highly dynamic data center and cloud environments. Specifically designed to support scale-out applications with high performance east/west traffic needs, Composable Fabric provides an easily scalable and automated network solution for diverse application workloads.

HPE Composable Fabric FM 2072 provides a cost effective 1U solution for intensive Big Data or Agile IT workload environments. The FM 2072's industry standard architecture uses the Ethernet switching to create a high performance, resilient, low latency and scalable data center network fabric. Composable Fabric connectivity modules are deployed as a single tier, eliminating cost and complexity while vastly reducing operational overhead while creating true fabric agility to support dynamic workload needs. In conjunction with Composable Fabric Manager; a centralized management, visualization and control platform, the solution streamlines operations and dynamically aligns network resources to the demanding workload and data requirements of the modern data center.

HPE Composable Fabric FM 2072

Key Features

- 1 RU form factor
- 48xSFP+ (1GbE or 10GbE), 6xQSFP+ (4x10)
- 240 Gbps of fabric capacity using 24x10 Gbps paths
- 1.44 Tbps switching capacity
- Simplified cabling with FM 1006 or Leaf-Spine cabling
- Redundant/hot-swappable power and fans
- Controller based architecture using Composable Fabric Manager

Services

- HPE Pointnext full suite of support offerings (Proactive Care and Datacenter Care).

NOTE: For the best support experience, HPE Pointnext Installation Services is required and 24x7x365 support is recommended.

Standard Features

Features and Benefits

The Fabric Advantage
Each HPE Composable Fabric FM 2072 features six QSFP optical interfaces delivering up to 240 Gbps full-duplex bandwidth creating programmable scalable meshed networks.

HPE Composable Fabric FM 2072 uses QSFP optics which when combined with an optical passive interconnect FM 1006 create a mesh between rack connectivity modules that is completely controllable by software through Composable Fabric Manager. Module-to-Module cabling is greatly simplified with two connections per rack connectivity module.

Multi-Layered Network Architecture
The full potential of optical switching is unleashed by Composable Fabric's multi-layered network architecture that delivers efficient layer 1, layer 2 and layer 3 network topologies to critical application workloads. HPE Composable Fabric FM 2072 provide layer 2 and layer 3 network topologies as part of the Composable Fabric network architecture. The optical interfaces create a highly meshed, multipath network fabric with multiple direct and indirect paths between modules. HPE Composable Fabric Manager software, which understands the physical and logical network topology, as well as the application and data workload requirements, establishes a network, where individual workloads receive their own portion of the network at each network layer.

Dynamic Topologies
In conjunction with the centralized HPE Composable Fabric Manager platform, the HPE Composable Fabric provides intelligent and adaptive technology that ensures workloads always have access to the most optimal network paths. HPE Composable Fabric Manager provides both the integration platform, as well as a set of HPE-developed API level integrations that automate workflows based on the included sensors, actions and triggers for 3rd party orchestration systems.

HPE Composable Fabric connectivity modules intelligently select the best network paths for workloads that have resource requirements or explicit constraints defined by the integrations.

Less sensitive workloads without explicitly defined constraints are efficiently forwarded across the available direct and indirect paths created by the network fabric. Based on HPE residual fit algorithms, HPE Composable Fabric Manager dynamically fits non-affinitized traffic. Unlike typical multipath networks, which might utilize a maximum of 16 or 32 IP based equal cost paths between switch ports, HPE Composable Fabric Manager can intelligently select from hundreds of non-interfering, nonequal paths across the highly diverse HPE Composable Fabric at layer 1, 2 or 3. As a result, HPE creates unprecedented efficiency, delivering higher performance with greater flexibility than traditional access/aggregation/core hierarchical networking solutions.

Scale Out, Not Up
HPE Composable Fabric FM 2072 physically interconnect using its QSFP ports to create a very dense, full or partial mesh between connectivity modules. This creates a more cost effective and power efficient network architecture than traditional tree or leaf-and-spine hierarchical networks can achieve. The mesh architecture enables linear scaling, with each additional switch adding fabric capacity, resiliency and multi-path options. HPE Composable Fabric connectivity modules create network fabrics ranging from a few server racks in size to a large capacity cloud data center. The linear build-out offers predictable economics and capacity growth in true scale-out fashion. With an out of the box default access to fabric oversubscription ratio of 2:1, the FM 2072 provides cost-effective performance for up to 48 10GbE server and storage connections.

Latest Switching Technology
HPE Composable Fabric FM 2072 are based on the latest available commercial switching technology providing line rate forwarding. It provides up to 288,000 L2 and up to 112,000 L3 IPv4 host entries, 550ns latency, full Data Center Bridging support and increased packet buffer allocation capabilities leading to improved congestion performance. This leading-edge silicon technology also provides full support for VXLAN and NVGRE overlay networks, with the ability to perform overlay to traditional network gateway functions, as well as optimized packet distribution algorithms based on VXLAN and NVGRE packet formats.
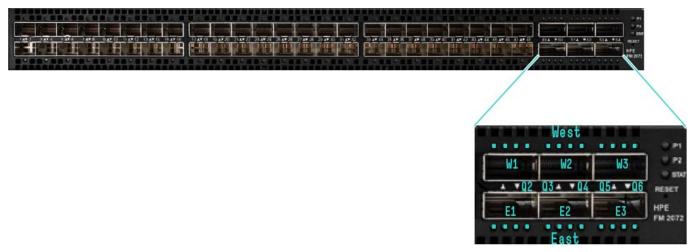
Standard Features

Network Deployments
HPE Composable Fabric FM 2072 network deployments involve the six QSFP ports that are located at the right side of I/O end of the module. These ports connect to an FM 1006 interconnect or to QSFP ports on another FM 2072 for a direct connect network:

- Direct Connect for six FM 2072 modules or less.
    - Directly connect FM 2072 modules together using a QSFP-to-QSFP cable such as a Direct Attach Cable (DAC) or Active Optical Cable (AOC). Avoid directly connecting FM 2072 modules in a network if the deployment is expected to grow beyond seven switches.
- Optical-based FM 1006 passive solution for six FM 2072 rack connectivity modules or more.
    - Connect all FM 2072 modules to an FM 1006 passive interconnect module. Plug each FM 2072 into the FM 1006 using the HPE-supplied cable. The passive FM 1006 device creates the mesh structure of an HPE Composable Fabric.

QSFP Port Diagram
In the diagram, the QSFP ports include a label indicating direction (W1 through W3 and E1 through E3). These labels are for informational purpose and are not found on the HPE Composable Fabric FM 2072 chassis.

FM 2072 - QSFP Port Diagram

HPE Composable Fabric FM 1006
Network of six FM 2072 rack connectivity modules or more (four minimum) requires connecting the modules to an FM 1006 passive interconnect.

The FM 1006 device is a passive optical module that uses HPE Composable Fabric optical interfaces to connect HPE Composable Fabric into a meshed network.

HPE Composable Fabric FM 1006

Service and Support

Services for customers purchasing from Hewlett Packard Enterprise or an enterprise reseller are quoted using Hewlett Packard Enterprise order configuration tools.

Technology Services for increased uptime, productivity and ROI
At HPE, our priority is to maximize your workload uptime, avoiding problems before they occur. As the experts for the HPE Composable Fabric, HPE Pointnext support will be your 24x7x 365 single point-of-contact for all of your support needs with HPE Pointnext Proactive Care Support. This means you can spend more time developing apps and adding value to the business rather than maintaining your infrastructure.

If there is a potential risk in your infrastructure, our remote support technology will proactively notify HPE and initiate the resolution process. If you are experiencing any issue with your solution, HPE Pointnext Proactive Care will provide you immediate access to our team of solution experts, whose first priority is to ensure your workloads are up and running, and then immediately start diagnosing the failure.

HPE Pointnext offers its full portfolio of support services. This includes Foundation Care, Proactive Care, Proactive Care Advanced and Datacenter Care. Flexible Capacity and Operational Support Services are also available.

HPE Composable Fabric is supported by the power of HPE, in 30+ different languages, with local presence across 140 countries.

Please consult your HPE Sales Representative for any additional questions and support options.

Installation and Startup Services
HPE Pointnext provides a full set of installation and startup services to meet your unique requirements.

Warranty
1-year Warranty: **http://www.hpe.com/networking/warrantysummary** for warranty and support information included with your product purchase.

Software releases to find software for your product, refer to **http://www.hpe.com/networking/support**; for details on the software releases available with our product purchase, refer to **http://www.hpe.com/networking/warrantysummary**.

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.

Configuration Information

HPE Composable Fabric FM 2072

HPE Composable Fabric FM 2072 6-port QSFP 48-port SFP+ Front-to-Back Module   R0Y48A
HPE Composable Fabric FM 2072 6-port QSFP 48-port SFP+ Back-to-Front Module   R0Y49A

HPE Composable Fabric Manager

HPE Composable Fabric FM 2xxx 32-port 10GbE E-LTU   R1C62AAE
HPE Composable Fabric FM 2xxx 72-port 10GbE E-LTU   R1C63AAE
HPE Composable Fabric 8-port 10GbE Upgrade E-LTU   R1C64AAE

Related Options

HPE Composable Fabric Accessories

HPE Composable Fabric FM 1006 1RU Passive Module	R1N31A
HPE 100GbE 24 Fiber MPO Single-mode 0.25 Phm Cable	R1N92A
HPE 25GbE 24 Fiber MPO Single-mode 0.25 Phm Cable	R1N96A
HPE 24 Fiber MPO Single-mode 0.25m Cable	R1N44A
HPE 24 Fiber MPO Single-mode 1m Cable	R1N78A
HPE 24 Fiber MPO Single-mode 3m Cable	R1N54A
HPE 24 Fiber MPO Single-mode 5m Cable	R1N53A
HPE 24 Fiber MPO Single-mode 10m Cable	R1N52A
HPE 24 Fiber MPO Single-mode 20m Cable	R1N73A
HPE 24 Fiber MPO Single-mode 100m Cable	R1N80A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 1m Cable	R1N87A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 3m Cable	R1N42A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 5m Cable	R1N56A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 10m Cable	R1N88A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 15m Cable	R1N89A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 20m Cable	R1N93A
HPE 40Gb QSFP+ to QSFP+ 0.35m Direct Attach Copper Cable	R0Y58A
HPE 40Gb QSFP+ to QSFP+ 1m Direct Attach Copper Cable	R0Y56A
HPE 40Gb QSFP+ to QSFP+ 3m Direct Attach Copper Cable	R0Y57A
HPE 40Gb QSFP+ to QSFP+ 5m Direct Attach Copper Cable	R0Y59A
HPE 40Gb QSFP+ to QSFP+ 7m Active Optical Cable	R1N39A
HPE 40Gb QSFP+ to QSFP+ 15m Active Optical Cable	R1N40A
HPE 10Gb SFP+ to SFP+ 1m Direct Attach Copper Cable	R0Y52A
HPE 10Gb SFP+ to SFP+ 3m Direct Attach Copper Cable	R0Y53A
HPE 10Gb SFP+ to SFP+ 5m Direct Attach Copper Cable	R0Y54A
HPE 10Gb SFP+ to SFP+ 5m Active Optical Cable	R1N79A
HPE 10Gb SFP+ to SFP+ 7m Active Optical Cable	R1N81A
HPE 1GBASE-TX SFP RJ45 100m Transceiver	R0Y63A
HPE 1Gb SFP LC SX Multi-mode 550m Transceiver	R1N95A
HPE 10GBASE-T SFP+ RJ45 30m Transceiver	R0Y65A
HPE 10Gb SFP+ LC LR 10km Transceiver	R0Y61A
HPE 10Gb SFP+ LC SR 300m Transceiver	R0Y62A
HPE 40Gb QSFP+ MPO IR4P 2km Transceiver	R1N55A
HPE 40Gb QSFP+ MPO SR4 100m Transceiver	R1N49A
HPE 40Gb QSFP+ LC LR 10km Transceiver	R1N48A
HPE QSFP28 to SFP28 Adapter	R1P15A

Technical Specifications

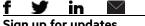|	
Chassis	1RU Form Factor Redundant Hot Swappable Power Supplies Hot swappable fans Console, RJ45
Fabric Interfaces	6 x QSFP (40GbE)
Access Interfaces	48 x SFP+ (1GbE or 10GbE)
Switching Capacity	1.44 Tpbs Up to 1 billion packets per second Line rate L2 and L3 forwarding L2/L3 Latency from 550ns
Platform Software	Linux ONIE
Power and Cooling	1+1 redundant, hot swap PSUs 100 - 240VAC auto-ranging, 47-63Hz auto input 3+1 redundant fans, front to back and back to front system cooling
Power Consumption	Maximum Power Draw 300W Typical Power Draw 246W
Dimensions	Height: 43.8 mm (1.73") 1 EIA unit Width: 442 mm (17.3") Depth: 442 mm (20.5")
Weight	22.4 lbs. (10.2 Kg)
Altitude	-60 to 3000m
Temperature	32°F to 104°F (0°C to 40°C)
Humidity	10% to 90% non-condensing
Approvals	**EMC:** CN(GB9254-2008), EU(EN55022, EN55024), FCC, VCCI, CCC **Safety:** IEC60950-1, GB4943, UL/CSA, CB, CCC
Other	ROHS-6
Memoryand processor	Intel Atom C3538 quad-core x86 processor @ 2.4 GHz, 16 GB DDR3 SDRAM 128 GB NAND flash
Performance	**Throughput** up to 500 Mpps **Routing/Switching capacity** 720 Gbps, 12M Byte Buffer **Routing table** size 229376 entries (IPv4), 114688 entries (IPv6) **Mac address table size** 32K min/288K max
Management	HPE Composable Fabric Manager; Command-line interface; Out-of-band management; Telnet; FTP
Services	Refer to the Hewlett Packard Enterprise website at **http://www.hpe.com/networking/services** for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

Summary of Changes

Date	Version History	Action	Description of Change
17-Feb-2020	Version 7	Changed	Overview, Configuration Information and Related Options sections were updated.
04-Nov-2019	Version 6	Changed	Overview, Configuration Information, Service and Support, and Technical Specifications sections were updated.
		Added	SKUs added in Configuration Information.
23-Sep-2019	Version 5	Changed	Configuration Information section was updated.
		Added	SKUs added in Configuration Information section: R1N93A, R1N79A, R1N95A
06-May-2019	Version 4	Changed	Configuration Information section was updated.
		Added	SKUs added in Configuration Information section: R1N44A, R1N73A, R1N87A, R1N42A, R1N88A, R1N89A, R0Y58A, R1N39A, R1N40A.
04-Mar-2019	Version 3	Changed	Configuration Information section was updated.
04-Feb-2019	Version 2	Changed	Overview, Standard Features, and Technical Specifications sections were updated.
		Added	SKUs added in Configuration Information section: R1N54A, R1N53A, R1N52A, R1N56A, R1N55A, R0Y65A.
03-Dec-2018	Version 1	New	QuickSpecs created.

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