Overview

HPE Composable Fabric FM 1006 Switch

HPE Composable Fabric rack connectivity modules deliver 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. Users can scale Composable Fabric by directly connecting up to 6 rack connectivity modules using the fabric ports. Users can support even larger (>6 racks) fabric configurations by using the HPE passive optical interconnect module. This module serves as an extender module for configuring large Composable Fabric configurations.

HPE Composable Fabric FM 1006 is a passive optical interconnect module that uses the fabric and extender interfaces to connect the Composable Fabric rack connectivity modules into a meshed network while maintaining all the photonic switching capabilities of the traditional Composable Fabric solution.

The FM 1006 provides 12 fabric module port connections that are used to interconnect up to 6 HPE rack connectivity modules, along with 6 extender ports used to interconnect multiple FM 1006 together to build out larger fabrics.
The fibers that terminate at a rack connectivity module are wired to the module's fabric ports. Two 24-strand MPO cables are used to connect the FM1006 module to each rack connectivity module and its associated fabric ports. The bypass links are implemented within the FM 1006. The internal FM 1006 wiring implements intra-pod connectivity.

HPE Composable Fabric FM 1006

Key Features

- A 1 RU passive optical interconnect module.
- Twelve fabric module port connections and six extender ports.
- Simplified cabling with direct or Leaf-Spine topologies.
- Completely passive design, no power or cooling needed.
- Supports controller based architecture using HPE 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.

Overview

The Fabric Advantage

HPE Composable Fabric FM 1006 is a passive optical interconnect module that creates an optical mesh architecture which enables linear scaling, with each additional switch adding fabric capacity, resiliency and multi-path options. Maintains all the photonic switching capabilities of the traditional Composable Fabric solution to ease troubleshooting. HPE Composable Fabric rack connectivity module QSFP optics combined with the FM 1006 to create an optical mesh that is completely controllable by software through HPE Composable Fabric Manager. Module-to-module cabling is greatly simplified with two connections per switch.

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. Optical interfaces create a highly meshed, multipath network fabric with multiple direct and indirect paths between modules. HPE Composable Fabric Manager software understands the physical and logical network topology as well as the application and data workload requirements. It 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 1006 physically interconnect using optical ports to create a very dense, full or partial mesh between rack 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.

Standard Features

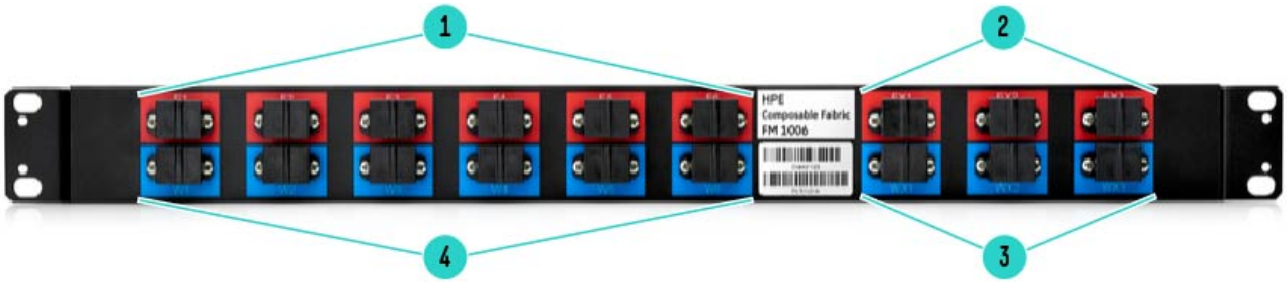
Network Deployments

HPE Composable Fabric enables several highly flexible deployment models. Composable Fabric's Network deployments involve QSFP ports whose location and the amount varies per rack connectivity module's flavor. These ports connect to QSFP ports on another connectivity module for a direct connect network, alternatively leaf and spine configuration can be created where FM 3032Q acts as a spine module. For simplified cabling and where there are more than 6 connectivity modules involved, FM 1006 is used.

- Direct Connect for six rack connectivity modules or less, for example:
  - Directly connect FM 2072 modules together using a QSFP-to-QSFP cable such as a Direct Attach Cable (DAC) or Active Optical Cable (AOC).
- Leaf and Spine configuration with FM 3032Q acting as a spine module:
  - Directly connect FM 3032Q to the QSFP ports of other rack connectivity modules (e.g. FM 3180/3032Q/2072 etc.). Use a QSFP-to-QSFP cable such as a Direct Attach Cable (DAC) or Active Optical Cable (AOC).
- Optical-based FM 1006 passive interconnect solution with simplified cabling for six rack connectivity modules or more, for example:
  - Connect FM 2072 modules to an FM 1006 interconnect passive device. 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.

The FM 1006 creates a meshed network between the HPE Composable Fabric rack connectivity modules, which is used by HPE Composable Fabric Manager to create forwarding topologies based on Affinities. All the values of the Composable Fabric solution are preserved in this deployment. As a passive device, the FM 1006 consumes no power and as such has failure behaviors that are similar to, or better than, fiber patch panels. FM 1006s can be connected together to create larger networks.

With 3 simple MPO cables, FM 1006 can be extended to provide a single implementation of a meshed network for the attached rack connectivity modules. In increments of 6 rack connectivity modules, any sized Composable Fabric network can be created.



HPE Composable Fabric FM 1006 - Port Names

1. East Fabric Ports (From 1 to 6)
2. East Extender Ports (From 1 to 3)
3. West Extender Ports (From 1 to 3)
4 West Fabric Ports (From 1 to 6)

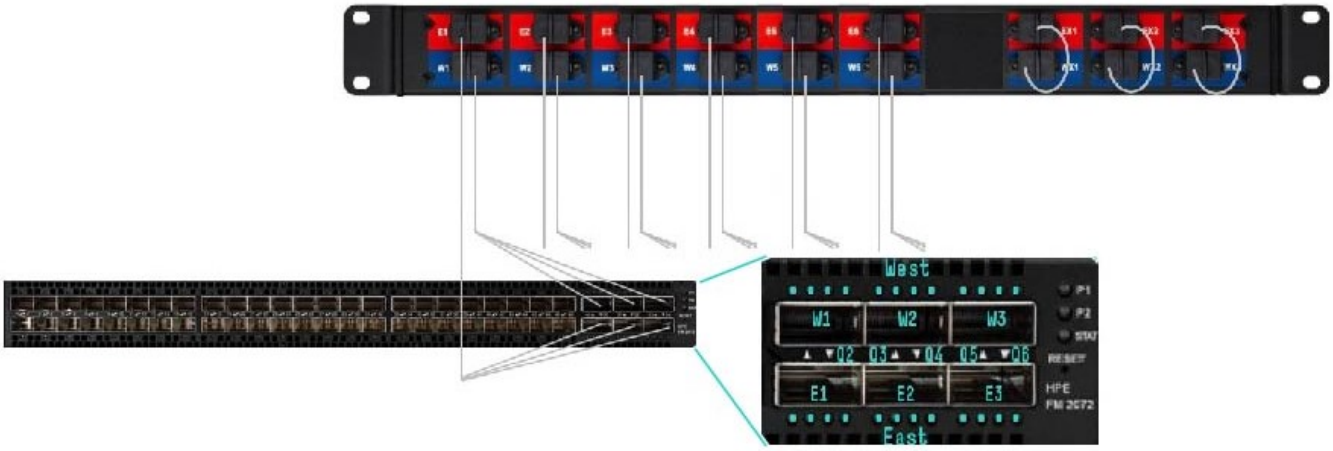
HPE Composable Fabric Rack Connectivity Module – Access Ports

1. West Access Ports
2. East Access Ports

Standard Features

Fabric Ports

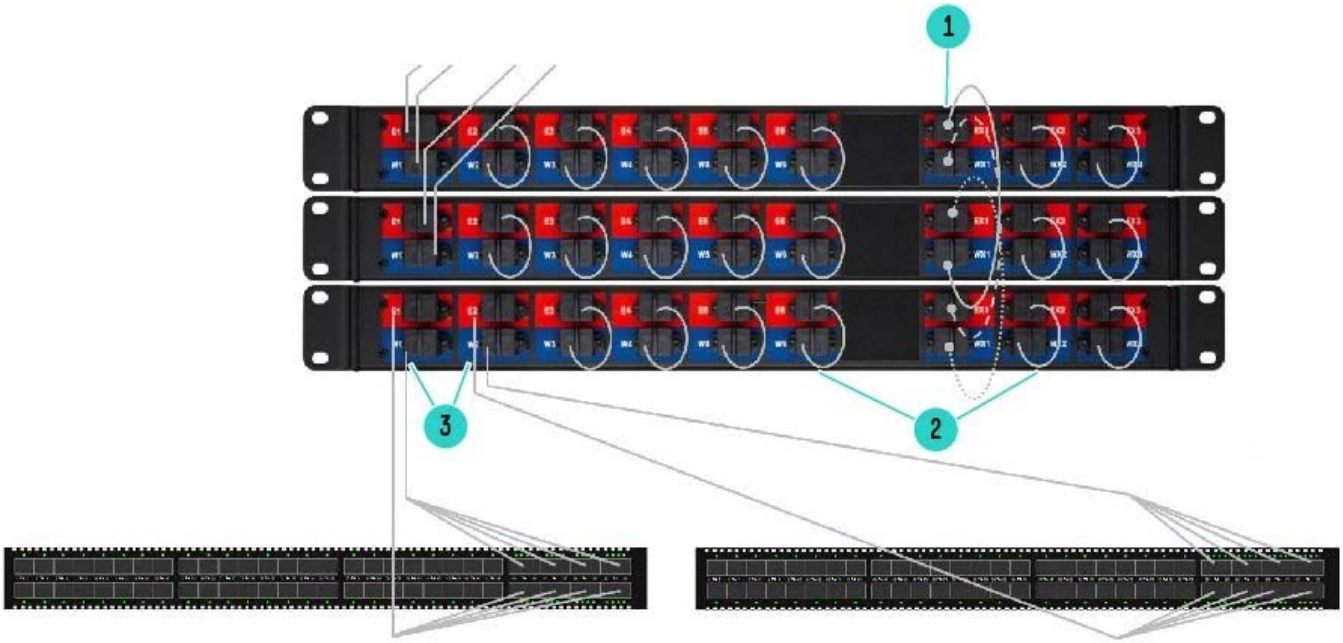
The HPE Composable Fabric FM 1006 passive interconnect module provides 12 fabric connectors for 6 HPE Composable Fabric rack connectivity modules.



HPE Composable Fabric FM 2072 – QSFP Port Diagram

Extender Ports

Multiple (unlimited) FM 1006 devices can be interconnected to form a mesh larger than six rack connectivity modules using the three 24-fiber MPO connectors. The extender ports provide the ability to extend the optical 'spine' to multiple FM 1006 modules, creating 10s of Tbit/sec optical capacity. To use all the available backbone bandwidth in a single pod deployment, the east extender interfaces have to be connected with west extender interfaces of the same FM 1006.



Optical Cables

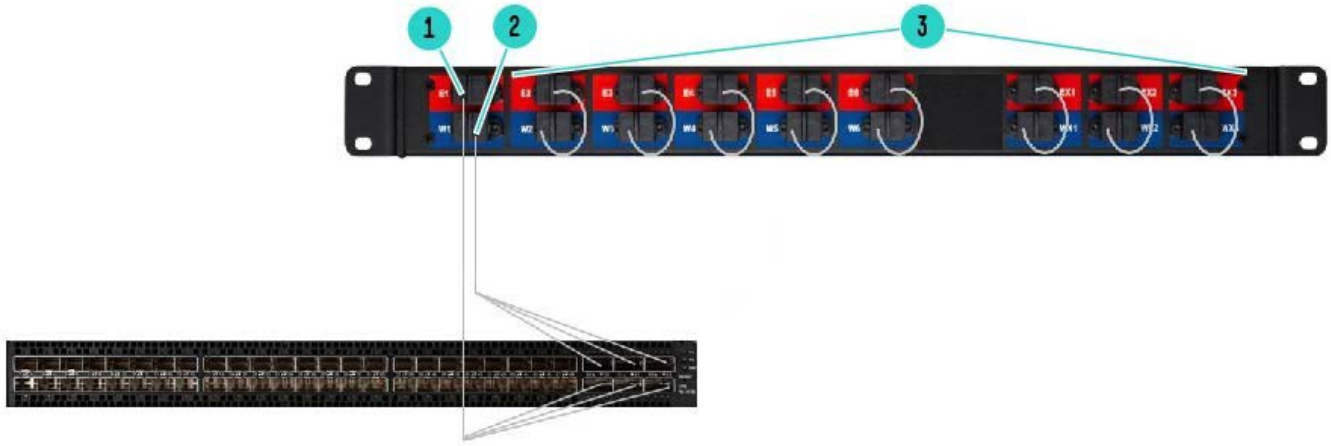
1. HPE 24 Fiber MPO
2. HPE 24 Fiber MPO 0.25M Cables
3. HPE 100Gb QSFP25 LC CWDM4 2km Transceiver

NOTE: HPE Composable Fabric mesh connectivity is provided from the "last" connectivity module on FM 1006 1 to the first through fourth connectivity module on FM 1006 2, and so on.

Standard Features

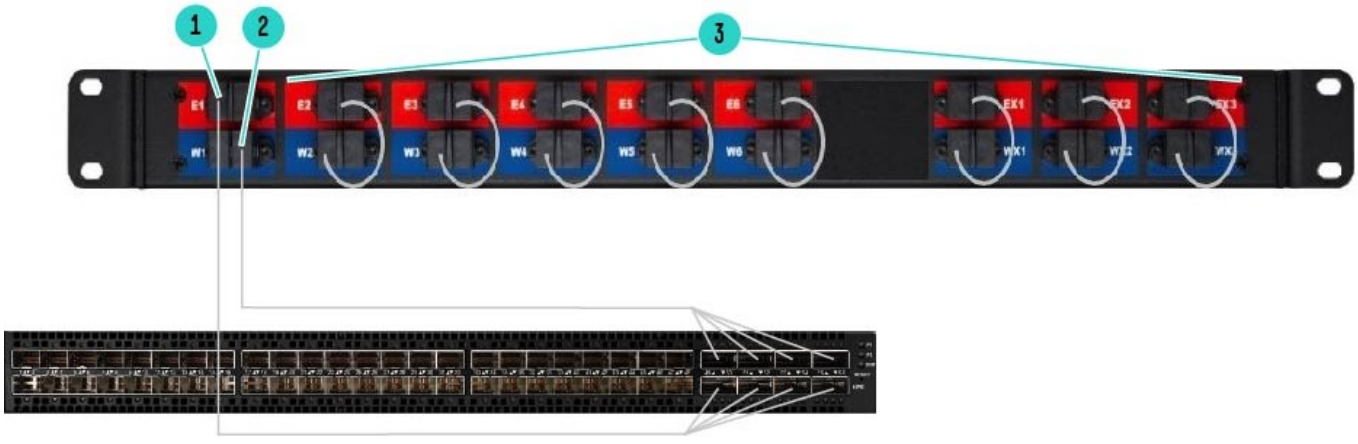
Cabling examples

- Rack connectivity module to FM 1006 cabling examples
- There are no embedded transceivers in the FM 1006 patch panels
- FM 1006 maps individual fiber pairs to other rack connectivity modules
- FM 1006 leverages 3 into 1 optical cable - 3 uplinks to 1 MPO (24 fiber)
- It is possible to daisy chain multiple FM 1006 units
- For unused ports, MPO loopback cable needs to be used



3 x QSFP Deployment – Optical Cables

1. 4 x 10G HPE 40Gb QSFP + MPO IR4P 2km Transceiver or 4 x 25 HPE 100Gb QSFP28 PSM4 2km Transceiver
2. HPE 24 F MPO to 3 x 12 F MPO
3. HPE 24 Fiber MPO 0.25M Cables



4 x QSFP28 Deployment – Optical Cables

1. HPE 100Gb QSFP28 LC CWDM4 2km Transceiver
2. HPE 24Fiber MPO to 4xLC Single-mode
3. HPE 24 Fiber MPO 0.25M Cables

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 your 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 1006

HPE Composable Fabric FM 1006 1RU Passive Module R1N31A

Related Options

HPE Composable Fabric Accessories

HPE 100GbE 24 Fiber MPO SM 0.25m Phantom Cable	R1N92A
HPE 25GbE 24 Fiber MPO SM 0.25m Phantom Cable	R1N96A
HPE 24 Fiber MPO Single-mode 0.25m Cable	R1N44A
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 to 3x12 Fiber MPO Single-mode 3m Cable	R1N42A
HPE 24 Fiber MPO to 3x12 Fiber MPO Single-mode 5m Cable	R1N56A

Technical Specifications

Chassis	1RU Form Factor Passive Optical
Fabric Interfaces	6x2 24-fiber MPO connectors – fabric 3x2 24-fiber MPO connectors – extender ports
Power Consumption	No Power
Dimensions	17.3”W x 21.6”D x 1.73”H
Altitude	-60 to 3000m
Temperature	32°F to 104°F (0°C to 40°C)
Humidity	10% to 90% non-condensing
Weight	4.3 lbs. (1.95 Kg)
Other	ROHS-6
Management	Non-Managed
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 3	Changed	Overview and Configuration Information sections were updated.
03-Feb-2020	Version 2	Changed	Standard Features and Configuration Information sections were updated.
04-Feb-2019	Version 1	New	New QuickSpecs.

Sign up for updates

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