Intel Omni-Path Architecture OPA 100 Series Host Fabric Adapters

Product Guide

Intel Omni-Path Architecture (OPA) is a family of PCIe adapters, switches, cables, and management software that provides high-performance connectivity between servers. It is designed for high performance computing (HPC) workloads and has the ability to scale to thousands of nodes.

The PCIe adapters, known as Omni-Path Host Fabric Adapters (HFAs) use an advanced connectionless "on-load" design that uses the processing capacity of Intel Xeon processors in the server to automatically scale fabric performance as server processor core counts increase.

The following figure shows the Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA.

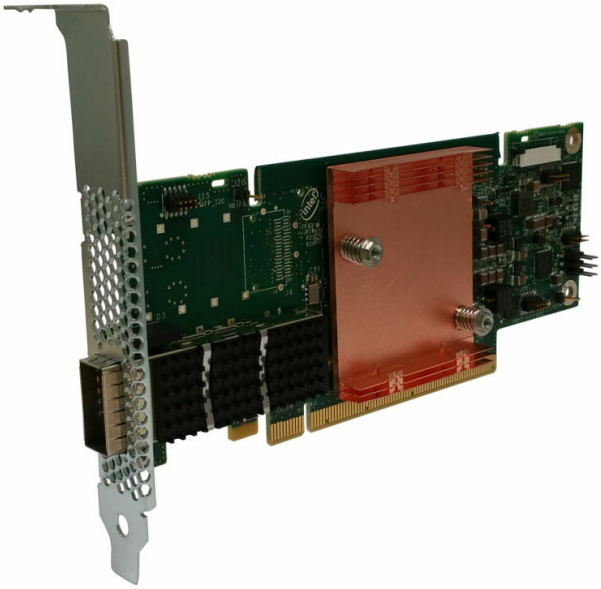

Figure 1. Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA

Did you know?

Omni-Path Architecture is a new networking topology that was designed specifically to scale cost-effectively from entry level HPC clusters to larger clusters with 10,000 nodes or more. The Intel OPA adapters, in conjunction with a switching fabric, help enable the progression towards Exascale computing while cost-effectively supporting clusters of all sizes with optimization for HPC applications at both the host and fabric levels.

Part number information

The following table shows the part numbers and feature codes for the Omni-Path 100 Series adapters.

CTO orders: For configure-to-order builds, these adapters are only available when you select one of the HPC & AI modes in the DCSC configurator. Not available in General Purpose mode of DCSC.

Table 1. Ordering information Omni-Path 100 Series adapters.

Part number	Feature code	Description
00WE023	AU0A	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA
00WE027	AU0B	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA
None*	B21S	ThinkSystem SD650 DWC Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA

* CTO only

The part numbers include the following:

- One adapter with a full-height (3U) bracket attached
- Additional low-profile (2U) bracket included in the box
- Installation and warranty information

Supported cables

The Intel Omni-Path host fabric adapters support the copper and fiber optic cables listed in the following table.

Table 2. Supported copper and fiber optic cables

Part number	Feature code	Description
Passive DAC cables		
00WE031	AU0E	0.5m Intel OPA 100 Series Passive Copper QSFP28 Cable
00WE035	AU0F	0.75m Intel OPA Passive Copper QSFP28 Cable
00WE039	AU0G	1m Intel OPA 100 Series Passive Copper QSFP28 Cable
00WE043	AU0H	1.25m Intel OPA 100 Series Passive Copper QSFP28 Cable
00WE047	AU0J	1.5m Intel OPA 100 Series Passive Copper QSFP28 Cable
00WE051	AU0K	2m Intel OPA 100 Series Passive Copper QSFP28 Cable
Optical cables		
4X97A11034	B22J	5m Intel OPA 100 Series Active Optical QSFP28 Low Power Cable
4X97A11035	B22K	10m Intel OPA 100 Series Active Optical QSFP28 Low Power Cable
4X97A11036	B22L	15m Intel OPA 100 Series Active Optical QSFP28 Low Power Cable
4X97A11037	B22M	20m, Intel OPA 100 Series Active Optical QSFP28 Low Power Cable
00WE059	AU0M	5m Intel OPA 100 Series Active Optical QSFP28 Cable
00WE067	AU0P	15m Intel OPA 100 Series Active Optical QSFP28 Cable
00WE071	AU0Q	20m Intel OPA 100 Series Active Optical QSFP28 Cable

Features

The Omni-Fabric Architecture 100 Series adapters have the following features:

- Available in PCIe x8 and PCI x16 host interfaces

  The PCIe 3.0 x16 adapter supports the full 100 Gb/s link speed, whereas the PCIe 3.0 x8 adapter operates at a lower speed (~58 Gb/s) due to the reduced host interface. The choice of two adapters lets system designers select the best adapter for available slots and cost constraints.

- Advanced data transfer and Quality of Service (QoS)

  With OPA, data is segmented into 65-bit Flow Control Digits (FLITs) which are assembled into larger Link Transfer Packets (LTPs) for efficient wire transfer. By managing traffic at the FLIT level, OPA edge and director switches can more effectively optimize latency, throughput and resiliency for all types of traffic.

- Scalable performance

  The on-load architecture provides investment protection by allowing fabric performance to scale along with the increased performance of Intel Xeon processors and Intel Xeon Phi coprocessor adapters.

- Open Fabrics Alliance software

  The OPA adapters are compatible with software from the Open Fabrics Alliance (OFA) which means that many existing HPC applications will be able to operate over an OPA fabric.

- Enhanced reliability

  The advanced design in these adapter means there is no need for data path firmware or external memory, which enhances reliability. The Intel OPA adapters have ECC protection on all internal SRAMs and parity checking on all internal buses. Equally important, the stateless design is inherently more resilient to adapter and fabric failures as it minimizes its reliance on the connection state. Passive heat sinks eliminate the risk of fan failures.

Technical specifications

- Single Intel Omni-Path 4X port with QSFP28 connector, delivers up to 100 Gbps (4 x 25 Gbps) in each direction
- PCIe 3.0 host interface - maximum data rate:
  - PCIe 3.0 x16 adapter: 100 Gb/s (Gigabits per second)
  - PCIe 3.0 x8 adapter: ~58 Gb/s
- Total network bandwidth:
  - PCIe 3.0 x16 adapter: 25 GB/s (Gigabytes per second) (100Gb link speed)
  - PCIe 3.0 x8 adapter: 15 GB/s (100Gb link speed)
- Multi-core scaling with support for up to 160 contexts
- Large MTU support (4 KB, 8 KB, and 10KB) for reduced per-packet processing overheads. Improved packet-level interfaces to improve utilization of on-chip resources.
- 16 Send DMA engines (M2IO usage)
- Receive DMA engine arrival notification
- Advanced interrupts
  - MSI-X
  - INTx
- ASIC: Single Intel OPA ASIC
  - Up to 160M messages/second
  - Up to 300M bidirectional messages/second

- Virtual lanes: configurable from 1 to 8 VLs plus 1 management VL
- Dimensions: 2.7 inches x 6.6 inches (low-profile PCIe adapter)
- Weight: 240 g
- Typical power consumption:
    - PCIe 3.0 x16 adapter:
        - Copper cable: 7.4 W typical, 11.7 W maximum
        - Fiber optic cable (Class 4 Optics, 3W maximum): 10.6 W typical, 14.9 W maximum
    - PCIe 3.0 x8 adapter:
        - Copper cable: 6.3 W typical, 8.3 W maximum
        - Fiber optic cable: 9.5 W typical, 11.5 W maximum

Server support - ThinkSystem

The following tables list the ThinkSystem servers that are compatible.

Table 3. ThinkSystem server support (Part 1)

Part number	Description	Intel 2S								AMD			
		ST550 (7X09/7X10)	SR530 (7X07/7X08)	SR550 (7X03/7X04)	SR570 (7Y02/7Y03)	SR590 (7X98/7X99)	SR630 (7X01/7X02)	SR650 (7X05/7X06)	SR670 (7Y36/37/38)	SR635 (7Y98/7Y99)	SR655 (7Y00/7Z01)	SR645 (7D2Y/7D2X)	SR665 (7D2W/7D2V)
00WE023	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	N	N	N	N	N	N	Y	N	N	N	N	N
00WE027	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	Y	Y	N	N	N	Y	Y	N	N	N	N
B21S	ThinkSystem SD650 DWC Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	N	N	N	N	N	N	N	N	N	N	N

Table 4. ThinkSystem server support (Part 2)

Part number	Description	E	1S Intel				4S Intel				Dense/ Blade			
		SE350 (7Z46/7D1X)	ST50 (7Y48/7Y50)	ST250 (7Y45/7Y46)	SR150 (7Y54)	SR250 (7Y51/7Y52)	SR850 (7X18/7X19)	SR850P (7D2F/2D2G)	SR860 (7X69/7X70)	SR950 (7X11/12/13)	SD530 (7X21)	SD650 (7X58)	SN550 (7X16)	SN850 (7X15)
00WE023	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N
00WE027	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	N	N	N	N	Y	Y	Y	Y	N	Y	N	N
B21S	ThinkSystem SD650 DWC Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	N	N	N	N	N	N	N	N	N	Y	N	N

Server support - System x

The following tables list the System x servers that are compatible.

Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Table 5. Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Part number	Description	x3250 M6 (3943)	x3250 M6 (3633)	x3550 M5 (8869)	x3650 M5 (8871)	x3850 X6/x3950 X6 (6241, E7 v4)	nx360 M5 (5465, E5-2600 v4)	sd350 (5493)
00WE023	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	N	N	Y	Y	Y	Y	Y
00WE027	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	N	Y	Y	Y	Y	Y

Support for System x and dense servers with Intel Xeon v3 processors

Table 6. Support for servers with Intel Xeon v3 processors

Part number	Description	x3100 M5 (5457)	x3250 M5 (5458)	x3500 M5 (5464)	x3550 M5 (5463)	x3650 M5 (5462)	x3850 X6/x3950 X6 (6241, E7 v3)	nx360 M5 (5465)
00WE023	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	N	N	N	Y	Y	Y	Y
00WE027	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	N	N	Y	Y	Y	Y

Support for servers with Intel Xeon v2 processors

Table 7. Support for servers with Intel Xeon v2 processors

Part number	Description	x3300 M4 (7382)	x3500 M4 (7383, E5-2600 v2)	x3550 M4 (7914, E5-2600 v2)	x3630 M4 (7158, E5-2400 v2)	x3650 M4 (7915, E5-2600 v2)	x3650 M4 BD (5466)	x3750 M4 (8753)	x3850 X6/x3950 X6 (6241, E7 v2)
00WE023	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	N	N	N	N	N	N	N	Y
00WE027	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	N	N	N	N	N	N	N	Y

Operating system support

The adapters support the following operating systems:

- Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA, 00WE023
- Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA, 00WE027

Tip: These tables are automatically generated based on data from Lenovo ServerProven.

Table 8. Operating system support for Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA, 00WE023

Operating systems	SD530 (Gen 2)	SR630 (Gen 2)	SR650 (Gen 2)	SR850 (Gen 2)	SR850P	SR860 (Gen 2)	SR950 (Gen 2)	SD530 (Gen 1)	SR630 (Gen 1)	SR650 (Gen 1)	SR850 (Gen 1)	SR860 (Gen 1)	SR950 (Gen 1)	x3850/3950 X6 (6241, E7 v4)	sd350 (5493)	nx360 M5 (5465)	x3550 M5 (5463)	x3550 M5 (8869)	x3650 M5 (5462)	x3650 M5 (8871)
Red Hat Enterprise Linux 6.9	N	N	N	N	N	N	N	Y	N	N	Y	Y	N	N	Y	N	N	N	N	N
Red Hat Enterprise Linux 7.3	N	N	N	N	N	N	N	Y	Y	Y	Y	N	Y	Y [1]	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.4	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y [1]	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.5	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y [1]	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.6	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y [1]	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.7	N	N	N	N	Y	N	N	N	N	N	Y	N	N	Y [1]	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y [1]	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
Red Hat Enterprise Linux 8.1	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
SUSE Linux Enterprise Server 12 SP2	N	N	N	N	N	N	N	Y	Y	Y	Y	N	Y	Y [1]	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP2 with Xen	N	N	N	N	N	N	N	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP3	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y [1]	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP3 with Xen	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y [1]	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	N
SUSE Linux Enterprise Server 15 SP1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	N
SUSE Linux Enterprise Server 15 SP1 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	N
SUSE Linux Enterprise Server 15 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	N

[1] Bug97685 [PA_2017A_SDV_Lenovo_Draco_Storage] Can not get Intel OPA device in Network in UEFI when enable secure boot in Red Draco.

Table 9. Operating system support for Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA, 00WE027 (Part 1 of 2)

Operating systems	SD530 (Gen 2)	SR530 (Gen 2)	SR550 (Gen 2)	SR630 (Gen 2)	SR650 (Gen 2)	SR670 (Gen 2)	SR850 (Gen 2)	SR850P	SR860 (Gen 2)	SR950 (Gen 2)	SD530 (Gen 1)	SR530 (Gen 1)	SR550 (Gen 1)	SR630 (Gen 1)	SR650 (Gen 1)	SR670 (Gen 1)	SR850 (Gen 1)	SR860 (Gen 1)	SR950 (Gen 1)	x3850/3950 X6 (6241, E7 v4)
Red Hat Enterprise Linux 6.9	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y	Y	N	N
Red Hat Enterprise Linux 7.3	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y	N	Y	Y [1]
Red Hat Enterprise Linux 7.4	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y [1]
Red Hat Enterprise Linux 7.5	N	N	N	N	N	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y [1]
Red Hat Enterprise Linux 7.6	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y [1]
Red Hat Enterprise Linux 7.7	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	Y	N	N	Y [1]
Red Hat Enterprise Linux 7.8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y [1]
Red Hat Enterprise Linux 8.0	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Red Hat Enterprise Linux 8.1	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N
SUSE Linux Enterprise Server 11 SP4	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y	Y	N	N
SUSE Linux Enterprise Server 11 SP4 with Xen	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	Y	Y	N	N
SUSE Linux Enterprise Server 12 SP2	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y	N	Y	Y [1]
SUSE Linux Enterprise Server 12 SP2 with Xen	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y	N	Y	Y
SUSE Linux Enterprise Server 12 SP3	N	N	N	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y [1]
SUSE Linux Enterprise Server 12 SP3 with Xen	N	N	N	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y [1]
SUSE Linux Enterprise Server 12 SP4 with Xen	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 with Xen	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y

[1] Bug97685 [PA_2017A_SDV_Lenovo_Draco_Storage] Can not get Intel OPA device in Network in UEFI when enable secure boot in Red Draco.

Table 10. Operating system support for Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA, 00WE027 (Part 2 of 2)

Operating systems	sd350 (5493)	nx360 M5 (5465)	x3550 M5 (5463)	x3550 M5 (8869)	x3650 M5 (5462)	x3650 M5 (8871)
Red Hat Enterprise Linux 6.9	Y	N	N	N	N	N
Red Hat Enterprise Linux 7.3	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.4	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.5	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.6	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.7	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.8	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.0	N	N	N	N	N	N
Red Hat Enterprise Linux 8.1	N	N	N	N	N	N
SUSE Linux Enterprise Server 11 SP4	N	N	N	N	N	N
SUSE Linux Enterprise Server 11 SP4 with Xen	N	N	N	N	N	N
SUSE Linux Enterprise Server 12 SP2	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP2 with Xen	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP3	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP3 with Xen	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4 with Xen	N	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	N	N	N	Y	N	N
SUSE Linux Enterprise Server 15 SP1	N	N	N	Y	N	N
SUSE Linux Enterprise Server 15 SP1 with Xen	N	N	N	Y	N	N
SUSE Linux Enterprise Server 15 with Xen	N	N	N	Y	N	N

Regulatory approvals

The adapters are compliant with the following regulations:

- FCC Part 15, Subpart B, Class A
- CAN ICES-3 (A)
- CISPR22
- CISPR32/EN55032
- EN55024
- EN61000-3-2
- EN61000-3-3
- VCCI, Class A
- AS/NZS CISPR 22, Class A
- RRA/KC (KN22, KN24), Class A
- BSMI (CNS 13438), Class A
- GOST R IEC 60950-1
- GOST R 51318.22
- GOST 30804.24
- GOST R 51317.3.2 (Section 6, 7)
- GOST R 51317.33
- TUV NRTL: 60950-1, CSA 22.1.No. 60950-1
- TUV SUD EN60950-1
- CB Scheme: IEC 60950-1
- RoHS II Directive 2011/65/EU
- REACH 1907/2006

Operating environment

- Temperature:
    - Operating 0 to 40° C
    - Storage -40 to 70° C
- Humidity:
    - Operating: 5% to 85% non-condensing
    - Storage: 5% to 95% non-condensing
- Altitude:
    - Operating: 0 to 10,000 ft (derate 1° C for every 575 m about 3000 ft)
    - Storage: 0 to 40,000 ft
- Airflow requirement:
    - 200 LFM at 55° C local ambient

Warranty

One year limited warranty. When installed in a supported Lenovo server, these cards assume the server base warranty and any warranty upgrades.

Edge switch support

The adapters support connectivity to the following edge switches available from Lenovo.

Table 11. Omni-Path Architecture edge switches

Part number	Feature code	Description
044911X	0449-HCP fc AU06	Intel OPA 100 Series 24-port Unmanaged Edge Switch (Port-Side Exhaust)
044912X	0449-HCQ fc AU07	Intel OPA 100 Series 24-port Unmanaged Edge Switch (Opposite Port-Side Exhaust)
044913X	0449-HCR fc AU08	Intel OPA 100 Series 48-port Unmanaged Edge Switch (Port-Side Exhaust)
044914X	0449-HCS fc AU09	Intel OPA 100 Series 48-port Unmanaged Edge Switch (Opposite Port-Side Exhaust)

Related publications

For more information, refer to these documents and web pages:

- Networking Options for ThinkSystem Servers
  https://lenovopress.com/lp0765-networking-options-for-thinksystem-servers
- Intel Omni-Path Fabric home page:
  http://www.intel.com/content/www/us/en/high-performance-computing-fabrics/omni-path-architecture-fabric-overview.html
- Lenovo Scalable Infrastructure home page:
  https://www3.lenovo.com/us/en/data-center/servers/high-density/Lenovo-Scalable-Infrastructure/p/WMD00000276

Related product families

Product families related to this document are the following:

- InfiniBand & Omni-Path Adapters

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