



IBM Power Systems offers Mellanox sourced switches and features for integrated big data and storage solution offerings

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At a glance

The **EDR 324-port InfiniBand (IB) Director Switch, sourced from Mellanox** (8828-ED1) for IBM[®] Power Systems[™] servers, is designed to provide high-capacity and low latency InfiniBand network backbone switching, enabling large-scale computing clusters to operate efficiently.

The switch offers:

- Performance
 - 324 EDR (100 Gb/s) ports in a 16U switch
 - Up to 64 Tb/s switching capacity
 - Ultra-low latency
- Optimized design
 - IBTA Specification 1.3 and 1.2.1 compliant
 - Quality of service enforcement
 - N+N power supplies
- Management
 - Integrated EDR management module
 - Integrated with three EDR Leaf Modules

The **Networking TOR Ethernet Switch SX1410**, based on Mellanox's SwitchX-2 silicon and advanced hardware design, is now available for use in IBM Elastic Storage[™] Server and IBM Data Engine for Analytics solution.

IBM Data Engine for Hadoop and Spark integrated solution now offers two specially priced feature bundles of processor, memory, and disk.

The **IBM Elastic Storage Server** offers 1.6 TB solid-state drive (SSD) options and 1.8 TB SAS drives for certain models and additional new capabilities and capacity.

Overview

EDR 324-port IB Director Switch

IBM offers the new EDR 324-port IB Director Switch Sourced from Mellanox, with a high-performing fabric solution in a 16U form factor by delivering up to 64 Tb/s of full bidirectional bandwidth with as low as sub 0.5us port latency.

The integrated InfiniBand routing function enables design and deployment of larger-scale InfiniBand fabrics. Its low latency enables fast communications within and across the data center. InfiniBand routing also enables fabric isolation between different cluster segments (compute/network and storage).

The EDR IB Director Switch (8828-ED1) is not orderable or supported in the following countries: Algeria, Bahrain, Comoros, Djibouti, Dubai, Ghana, Iraq, Kuwait, Lebanon, Libya, Moldova, Morocco, Mozambique, Namibia, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates (which includes Abu Dhabi), and Yemen.

Networking TOR Ethernet Switch SX1410

The Networking TOR Ethernet Switch SX1410 packs 48 SFP+ and 12 QSFP interfaces in an ultra-dense, 1U form factor. It is available for use with the IBM Elastic Storage Server and IBM Data Engine for Analytics. It is interoperable with components supporting the Ethernet industry standards.

The switch becomes an integral part of an optimized, end-to-end networking solution when combined with other Mellanox Ethernet products, including the ConnectX family of 10GbE NICs, acceleration, and management software and cables. These solutions deliver industry-leading performance, scalability, reliability, and power usage for optimal data center efficiency and application performance across a wide range of industry applications in financial services, Web 2.0, database, cloud, and HPC environments.

Networking TOR Ethernet Switch SX1410 (8831-S48) performance:

- High density
 - Nonblocking TOR supporting 48 x 10 GbE and 12 x 40 GbE ports
 - Up to sixty-four 10 GbE ports (using 40 GbE ports as 10 GbE ports)
- Low latency
 - 220 ns for 40 GbE
 - 270 ns for 10 GbE
- Low power
- Control plane resiliency
 - Dual core x86 CPU
 - 16 GB SSD
 - 4 GB DIMM
- VM user applications

IBM Data Engine for Hadoop and Spark

Two new feature bundles are now available for IBM Data Engine for Hadoop and Spark. They provide a special price for standard quantities of processor, memory, and disk.

- Solution Edition for Hadoop Bundle (#EHLH) includes one 2.92 GHz 10C, 16 x 8 GB memory, 12 x 6 TB HDD when selected for each Hadoop data node server. This is a configuration suitable for typical Hadoop based workloads.
- Solution Edition for Spark Bundle (#EHLK) includes one 2.92 GHz 10C, 16 x 16 GB memory, 10 x 6 TB HDD, 2 x 960 GB SSDs when selected for each Spark worked node server. This is a configuration suitable for typical Spark based workloads.

The New EN0V adapter is now also available in this solution: PCIe2 LP 4-port (10 Gb + 1 GbE) Copper SFP+RJ45 Adapter.

Elastic Storage Server

IBM is adding new capability and capacity to the Elastic Storage Server:

- 1.6 TB SSD options to the GS1, GS2, and GS4 models
- 1.8 TB SAS drives in our GS2, GS4, and GS6 models
- 100 Gb/s Enhanced Data Rate (EDR) InfiniBand adapter
- HDFS transparency support
- FIPS Compliant end-to-end encryption support
- Data compression support with new capability available in Spectrum Scale 4.2

The Mellanox SX1410 Ethernet Switch is available as an option in the Elastic System Server:

- 48 ports of 10GbE
- 12 ports of 40GbE

Key prerequisites

None.

Planned availability date

- April 29, 2016, for features 4651, 4652, 4653, 4654, 4655, 4656, 4657, 4658, 4659, 4660, 4661, 4662, 4663, 4664, 4665, 4666, EGSA, EGSB, ER2R, and ER36
- May 27, 2016, for EDR IB Director Switch (8828-ED1), Networking TOR Ethernet Switch SX1410 (8831-S48) (available for use with IBM Elastic Storage Server and IBM Data Engine for Analytics), and features EGTB, EGTC, EGTD, EGTE, EGTF, EGTG, EHJQ, EHLH, EHLK, ELFU, and EN0V

The EDR IB Director Switch is not orderable or supported in the following countries: Algeria, Bahrain, Comoros, Djibouti, Dubai, Ghana, Iraq, Kuwait, Lebanon, Libya, Moldova, Morocco, Mozambique, Namibia, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates (which includes Abu Dhabi), and Yemen.

Description

EDR 324-port IB Director Switch (8828-ED1)

The 324-port switch is contained in a 16U chassis. Networks built with the 324-port switch can carry converged traffic with the combination of assured bandwidth and granular quality of service.

The switch ships in a minimum base configuration plus additional modules, depending on the chosen configuration. Optional modules are:

- Additional CS75XX EDR Management Module (#ESWL)
- Additional CS75XX EDR Leaf Module (#ESWM)

The 8828-ED1 platform comes standard with six power supplies. Each power supply provides 48 V dc 2500 W output power.

The EDR 324-port IB Director Switch is sourced from Mellanox for IBM. For product details, go to the [Mellanox](#) website.

The latest Mellanox Switch-IB InfiniBand switch device provides up to 100 Gb/s full bidirectional bandwidth per port with ultra-low latency as low as <0.5us per port.

IBM offers cables for your convenience and to help ensure that quality cables are used that can be supported by IBM.

Description	Feature number
0.5 m EDR IB / 100GbE Copper Cable QSFP	EB50
1.0 m EDR IB / 100GbE Copper Cable QSFP	EB51
1.5 m EDR IB / 100GbE Copper Cable QSFP	EB54
2.0 m EDR IB / 100GbE Copper Cable QSFP	EB52

Description	Feature number
3 m EDR IB / 100GbE Optical Cable QSFP	EB5A
5 m EDR IB / 100GbE Optical Cable QSFP	EB5B
10 m EDR IB / 100GbE Optical Cable QSFP	EB5C
15 m EDR IB / 100GbE Optical Cable QSFP	EB5D
20 m EDR IB / 100GbE Optical Cable QSFP	EB5E
30 m EDR IB/ 100GbE Optical Cable QSFP	EB5F
50 m EDR IB / 100GbE Optical Cable QSFP	EB5G
100 m EDR IB / 100GbE Optical Cable QSFP	EB5H

These cables include the transceivers that plug into the switch and the adapter or device.

Networking TOR Ethernet Switch Mellanox SX1410 (8831-S48), available for use with IBM Elastic Storage Server and IBM Data Engine for Analytics

The SX1410 switch comes with 12 QSFP and can be divided to allow a higher number of 10GbE ports on a nonblocking ToR for 40GbE ports and up to as much as sixty-four 10GbE ports on a single switch. Redundant power supplies and fans provide high availability for both Enterprise Data Center and high-performance computing environments. The SX1410 switch carries a high-capacity, dual core x86 processor.

Network management

- 100/1000 management port
- In-band management
- Serial console port

For product details, go to the [Mellanox](#) website.

IBM Data Engine for Hadoop and Spark

Two new feature bundles are now available for IBM Data Engine for Hadoop and Spark. They provide a special price for standard quantities of processor, memory, and disk.

- Solution Edition for Hadoop Bundle (#EHLH) includes one 2.92 GHz 10C, 16 x 8 GB memory, 12 x 6 TB HDD when selected for each Hadoop data node server. This is a configuration suitable for typical Hadoop based workloads.
- Solution Edition for Spark Bundle (#EHLK) includes one 2.92 GHz 10C, 16 x 16 GB memory, 10 x 6 TB HDD, 2 x 960 GB SSDs when selected for each Spark worked node server. This is a configuration suitable for typical Spark based workloads.

The New EN0V adapter is now also available in this solution: PCIe2 LP 4-port (10 Gb + 1 GbE) Copper SFP+RJ45 Adapter.

IBM Elastic Storage Server

Elastic Storage Server has expanded capability and capacity:

- The size of all-flash configurations is doubled with the addition of 1.6 TB SSD options for the GS1, GS2, and GS4 models.
- The size of SAS drive configurations is increased 50% with the additions of 1.8 TB SAS Drives in the GS2, GS4, and GS6 models.

In addition, to help drive data-centric designs even faster, IBM offers the 100 Gb/s Enhanced Data Rate (EDR) InfiniBand adapter. Each Elastic Storage Server can support up to 12 EDR connections, giving unprecedented connection speed and capability.

With the new compression capability available in Spectrum Scale 4.2, the Elastic Storage Server now supports data compression for clients who want to optimize their data storage. ESS will compress appropriate stored data based upon client priorities and provide significant cost savings.

For the support of HDFS and MapReduce workloads, the Elastic Storage Server now supports HDFS transparency. This allows ESS to accelerate MapReduce workloads by providing a single Data Lake capability, with data that can be accessed with NFS, SMB, Posix, Object, and HDFS access. By using the HDFS Transparency capability, analytics users are freed from triple copies of data, saving footprint, energy, and cost. By using this capability, clients can accelerate the performance of their MapReduce servers, accomplishing deeper analytics at a much lower cost.

Because data security is of critical importance, especially when dealing with health-care workloads, Elastic Storage Server now supports FIPS compliant end-to-end encryption, protecting the data not only at rest, but while in motion to the Spectrum Scale clients.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be found on the [IBM Accessibility](#) website.

Product number

The following are newly announced features on the specific models of the IBM Power Systems 8828 machine type:

Description	Machine type	Model	Feature number
EDR 324-port IB Director Switch Sourced from Mellanox	8828	ED1	

The following are features already announced for the IBM Power Systems 8828 machine type:

Description	Machine type	Model	Feature number
Power Cord (4.3 M), To wall (250V/15A)	8828	ED1	1452
Power Cord (2.5 M), To wall, (208V/15A)	8828	ED1	3733
Power Cord (2.5 M), To wall, (200-240V)	8828	ED1	4549
Power Cord (2.5 M), To wall (220-240V)	8828	ED1	4550
Power cord (2.5 M), To wall, (220-240V)	8828	ED1	4551
Power Cord (2.5 M), To wall, (220-240V)	8828	ED1	4552
Power Cord (2.5 M), To wall (220-240V)	8828	ED1	4553

Power Cord (2.5 M), To wall (220-240V)	8828	ED1	4554
Power Cord (2.5 M), To wall (220-240V)	8828	ED1	4555
Power Cord (2.5 M), To wall, (230V/16A)	8828	ED1	4556
Power Cord (2.5 M), To wall, (220-240V)	8828	ED1	4557
Power Cord To PDU/UPS, (100-240V/16A)	8828	ED1	4558
Power cord (4.3 M), To wall, (208V/16A)	8828	ED1	4560
Power Cord (4.3 M), To wall, (230V/16A)	8828	ED1	4561
Power Cord (4.3 M), To wall, (230V/16A)	8828	ED1	4562
Power Cord (4.3 M), To wall, (230V/13A)	8828	ED1	4563
Power Cord (4.3 M), To wall, (230V/16A)	8828	ED1	4564
Power Cord (4.3 M), To wall, (230V/16A)	8828	ED1	4565
Power Cord (4.3 M), To wall, (230V/16A)	8828	ED1	4566
Power Cord (4.3 M), To wall, (220V/16A)	8828	ED1	4567
Power Cable (4.3 M), To wall, (240V/16A)	8828	ED1	4568
Power Cord (4.3 M), To wall, (220V/16A)	8828	ED1	4570
Power Cord (4.3 M), To wall, (230V/15A)	8828	ED1	4571
Power Cord (4.3 M), To wall, (125V/16A)	8828	ED1	4572
Power Cord (4.3 M), To wall, (250V/16A)	8828	ED1	4573
Power Cable (4.3 M), To wall, (250V/15A)	8828	ED1	4574
Power Cord (4.3 M), To wall, (200V/15A)	8828	ED1	4576
Power Cord (2.5 M), To wall, (120V/15A)	8828	ED1	4578

One and only one rack indicator feature is required on all orders (#4650 to #4666).

Rack Indicator- Not Factory Integrated	8828	ED1	4650
Power Cord (2.5 M), To wall, (200V/15A)	8828	ED1	5812
Power Cord (2.5 M), To wall, (220V/16A)	8828	ED1	5814
Power Cord (2.5 M), To wall, (220V/15A)	8828	ED1	5815
Power Cord (2.5M), To wall, (250V/16A)	8828	ED1	5817
Power Cord (4.3 M), To wall, (250V/16A)	8828	ED1	5818
Power Cord (2.5 M), To wall, (220V/16A)	8828	ED1	5820
Power Cord (2.5 M), To wall, (230V/16A)	8828	ED1	5821
Power Cord (4.3 M), To wall, (230V/16A)	8828	ED1	5822
Month Indicator	8828	ED1	9461
Day Indicator	8828	ED1	9462
Hour Indicator	8828	ED1	9463
Minute Indicator	8828	ED1	9464
Qty Indicator	8828	ED1	9465
Countable Member Indicator	8828	ED1	9466
0.5M EDR IB / 100GbE Copper Cable QSFP	8828	ED1	EB50
1.0M EDR IB / 100GbE Copper Cable QSFP	8828	ED1	EB51
2.0M EDR IB / 100GbE Copper Cable QSFP	8828	ED1	EB52
1.5M EDR IB / 100GbE Copper Cable QSFP	8828	ED1	EB54
3M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5A
5M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5B
10M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5C
15M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5D
20M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5E
30M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5F
50M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5G
100M EDR IB / 100GbE Optical Cable QSFP	8828	ED1	EB5H
Custom Service Specify, Mexico	8828	ED1	ECSM
Additional CS75XX EDR Management Module	8828	ED1	ESWL
Additional CS75XX EDR Leaf Module	8828	ED1	ESWM
Order Placed Indicator	8828	ED1	EU29

The following are newly announced features on the specific models of the IBM Power Systems 8831 machine type:

Description	Machine type	Model	Feature number
Networking TOR Ethernet Switch SX1410	8831	S48	
3m, Blue Cat5e Cable	8831	S48	1111
10m, Blue Cat5e Cable	8831	S48	1112
25m, Blue Cat5e Cable	8831	S48	1113
CAT5E Ethernet Cable, 3M GREEN	8831	S48	1115
CAT5E Ethernet Cable, 10M GREEN	8831	S48	1116
3m, Yellow Cat5e Cable	8831	S48	1118
10m, Yellow Cat5e Cable	8831	S48	1119
Power Cable - Drawer to IBM PDU, 200-240V/10A	8831	S48	6577
QSFP+ 40GBase-SR Transceiver	8831	S48	EB27

SFP+ Transceiver	8831	S48	EB28
10m (30.3-ft), IBM Passive QSFP+ MTP Optical Cable	8831	S48	EB2J
30m (90.3-ft), IBM Passive QSFP+ MTP Optical Cable	8831	S48	EB2K
5m (16.4-ft), IBM LC-LC Fiber Cable	8831	S48	ECBD
25m (82.5-ft), IBM LC-LC Fiber Cable	8831	S48	ECBE
1U Air duct for S48	8831	S48	EDT6
IBM Data Engine for Hadoop Solution Specify	8831	S48	EHLA
1m (3.3-ft), 10GbE'Net Cable SFP+ Act Twinax Copper	8831	S48	EN01
3m (9.8-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	8831	S48	EN02
5m (16.4-ft), 10Gb E'Net Cable SFP+ Act Twinax Copper	8831	S48	EN03

The following are features already announced for the IBM Power Systems 8831 machine type:

Description	Machine type	Model	Feature number
One and only one rack indicator feature is required on all orders (#4650 to #4666).			
Rack Indicator- Not Factory Integrated	8831	S48	4650
Rack Indicator, Rack #1	8831	S48	4651
Rack Indicator, Rack #2	8831	S48	4652
Rack Indicator, Rack #3	8831	S48	4653
Rack Indicator, Rack #4	8831	S48	4654
Rack Indicator, Rack #5	8831	S48	4655
Rack Indicator, Rack #6	8831	S48	4656
Rack Indicator, Rack #7	8831	S48	4657
Rack Indicator, Rack #8	8831	S48	4658
Rack Indicator, Rack #9	8831	S48	4659
Rack Indicator, Rack #10	8831	S48	4660
Rack Indicator, Rack #11	8831	S48	4661
Rack Indicator, Rack #12	8831	S48	4662
Rack Indicator, Rack #13	8831	S48	4663
Rack Indicator, Rack #14	8831	S48	4664
Rack Indicator, Rack #15	8831	S48	4665
Rack Indicator, Rack #16	8831	S48	4666
Power Cord 4.3m (14-ft), Drawer to Wall/IBM PDU (250V/10A)	8831	S48	6458
Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (250V/15A) U. S.	8831	S48	6469
Power Cord 1.8m (6-ft), Drawer to Wall (125V/15A)	8831	S48	6470
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (125V/15A)	8831	S48	6471
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/16A)	8831	S48	6472
Power Cord 2.7m (9-ft), Drawer to Wall/OEM PDU (250V/10A)	8831	S48	6473
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/13A)	8831	S48	6474
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	8831	S48	6475
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	8831	S48	6476
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/16A)	8831	S48	6477
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (125V/15A or 250V/10A)	8831	S48	6488
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	8831	S48	6493
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	8831	S48	6494
Power Cord 4.3m (14-ft), Drawer to Wall/OEM PDU (125V/15A)	8831	S48	6660
Power Cord 2.8m (9.2-ft), Drawer to wall/IBM PDU, (250V/10A)	8831	S48	6665
Power Cord 2.7m (9-ft), Drawer to wall/OEM PDU, (250V/10A)	8831	S48	6680
Month Indicator	8831	S48	9461

Day Indicator	8831	S48	9462
Hour Indicator	8831	S48	9463
Minute Indicator	8831	S48	9464
Qty Indicator	8831	S48	9465
Countable Member Indicator	8831	S48	9466
1m (3.3-ft), Passive QSFP+ Break-out Cable	8831	S48	EB24
3m (9.8-ft), Passive QSFP+ Break-out Cable	8831	S48	EB25
5m (16.4-ft), Passive QSFP+ Break-out Cable	8831	S48	EB26
3m (9.8-ft), IBM Passive QSFP+ to QSFP+ Cable (DAC)	8831	S48	EB2H
0.5M FDR IB / 40GbE Copper Cable QSFP	8831	S48	EB40
1M FDR IB / 40GbE Copper Cable QSFP	8831	S48	EB41
2M FDR IB / 40GbE Copper Cable QSFP	8831	S48	EB42
3M FDR IB / 40GbE Optical Cable SFP	8831	S48	EB4A
5M FDR IB / 40GbE Optical Cable QSFP	8831	S48	EB4B
10M FDR IB / 40GbE Optical Cable QSFP	8831	S48	EB4C
15M FDR IB / 40GbE Optical Cable QSFP	8831	S48	EB4D
20M FDR IB / 40GbE Optical Cable QSFP	8831	S48	EB4E
30M FDR IB / 40GbE Optical Cable QSFP	8831	S48	EB4F
50M FDR IB / 40GbE Optical Cable QSFP	8831	S48	EB4G
Custom Service Specify, Mexico	8831	S48	ECSM
IDEA Solution Specify	8831	S48	EGSA
SOLUTION SPECIFY	8831	S48	EGSB
Order Placed Indicator	8831	S48	EU29

The following are newly announced features on the specific models of the IBM Power Systems 5146, 7014, 8247, 8348, and 8828 machine type:

New features available April 29, 2016

Description	Machine type	Model	Feature number
Rack Indicator, Rack #1	8828	E36	4651
Rack Indicator, Rack #2	8828	E36	4652
Rack Indicator, Rack #3	8828	E36	4653
Rack Indicator, Rack #4	8828	E36	4654
Rack Indicator, Rack #5	8828	E36	4655
Rack Indicator, Rack #6	8828	E36	4656
Rack Indicator, Rack #7	8828	E36	4657
Rack Indicator, Rack #8	8828	E36	4658
Rack Indicator, Rack #9	8828	E36	4659
Rack Indicator, Rack #10	8828	E36	4660
Rack Indicator, Rack #11	8828	E36	4661
Rack Indicator, Rack #12	8828	E36	4662
Rack Indicator, Rack #13	8828	E36	4663
Rack Indicator, Rack #14	8828	E36	4664
Rack Indicator, Rack #15	8828	E36	4665
Rack Indicator, Rack #16	8828	E36	4666
IDEA Solution Specify	8828	E36	EGSA
SOLUTION SPECIFY	8828	E36	EGSB
Rack Content Specify: 8831-S48 1EIA	7014	T42	ER2R
Rack Content Specify: 8828-E36 1EIA	7014	T42	ER36

The following are newly announced features on the specific models of the IBM Power Systems 5146, 7014, 8247, 8348, and 8828 machine type:

New features available May 27, 2016

Description	Machine type	Model	Feature number
GS1 (6U) SOLUTION SPECIFY (WITH 1.6TB SSD + EXP24S)	5146	GS1	EGTB
	7014	T42	
	8247	22L	
GS2 (8U) SOLUTION SPECIFY (WITH 1.6TB SSD + EXP24S)	5146	GS2	EGTC
	7014	T42	
	8247	22L	

GS4 (12U) SOLUTION SPECIFY (WITH 1.6TB SSD + EXP24S)	5146 7014 8247	GS4 T42 22L	EGTD
GS2 (8U) SOLUTION SPECIFY (WITH 1.8TB HDD + EXP24S)	5146 7014 8247	GS2 T42 22L	EGTE
GS2 (12U) SOLUTION SPECIFY (WITH 1.8TB HDD + EXP24S)	5146 7014 8247	GS4 T42 22L	EGTF
GS2 (16U) SOLUTION SPECIFY (WITH 1.8TB HDD + EXP24S)	5146 7014 8247	GS6 T42 22L	EGTG
EHJQ FEATURE ON 8348-21C IS RESTRICTED FOR USE ONLY ON IBM DATA ENGINE FOR HADOOP AND SPARK. IBM BigInsights ^(R) Enterprise Management and IBM Open Platform with Apache Hadoop Indicator			
	8348	21C	EHJQ
EHLH FEATURE ON 8348-21C IS RESTRICTED FOR USE ONLY ON IBM DATA ENGINE FOR HADOOP AND SPARK. Solution Edition for Hadoop Bundle - 2.92Ghz 10 C, 16x 8 GB MEM, 12x 6 TB HDD			
	8348	21C	EHLH
EHLK FEATURE ON 8348-21C IS RESTRICTED FOR USE ONLY ON IBM DATA ENGINE FOR HADOOP AND SPARK. Solution Edition for Spark Bundle - 2.92Ghz 10C, 16x 16 GB MEM, 10x 6 TB HDD, 2x 960 GB SSD			
	8348	21C	EHLK
ELFU FEATURE IS RESTRICTED FOR USE ONLY ON ESS. 1.8TB 10K RPM SAS SFF-2 Disk Drive 4K Block - 4096			
	8247	22L	ELFU
PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter			
	8348	21C	EN0V

Publications

No publications are shipped with the announced products.

To access the IBM Publications Center Portal, go to the [IBM Publications Center](#) website.

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. A large number of publications are available online in various file formats, which can currently be downloaded.

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an on-demand business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or go to the <http://www.ibm.com/services/> website.

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or go to the [Resiliency Services](#) website.

Details on education offerings related to specific products can be found on the [IBM authorized training](#) website.

Technical information

Specified operating environment

Physical specifications

EDR 324-port IB Director Switch Sourced from Mellanox:

- 16U modular chassis
- Thirty-six QSFP28 EDR 100 Gb/s InfiniBand ports per dual IC leaf blade

Physical characteristics

- Width: 448.05 mm (17.64 in.)
- Depth: 769.62 mm (30.3 in.)
- Height: 711.2 mm (28 in.)
- Weight: Fully populated 275 kg (606 lb)

Power supply

- Hot swappable with N+N redundancy
- Input range: 180 to 265 V ac
- Frequency: 47 - 63 Hz, single-phase ac

Cooling

- Hot-swappable fan trays
- Front-to-rear air flow
- Auto-heat-sensing fans

Power consumption

- Typical power consumption (fully populated):
 - Passive cable: 4939 W
 - Active cable: 6543 W

Operating conditions

- Operating: 0°C to 45°C (32° to 113°F)
- Nonoperating: -40° to 70°C (-40 to 158°F)
- Humidity: 5% to 95%
- Altitude - mean sea level (MSL): Operating -60 to 2000 m

For product details, go to the [Mellanox](#) website.

Networking TOR Ethernet Switch SX1410 for IBM Data Engine for Hadoop and Spark solution only

- Networking TOR Ethernet Switch SX1410 for IBM Data Engine for Hadoop and Spark - Power Systems Edition

Physical characteristics

- Width: 428 mm (16.85 in.)
- Depth: 428.9 mm (16.8 in.)
- Height: 43.6 mm (1.716 in.)
- Weight: Fully populated 8.80 kg (19.40 lb)

Power specifications

- Typical power consumption (ATIS): 83.3 W
- Maximum power consumption (passive cables): 208 W
- Maximum power consumption (optical cables): 300 W
- Input voltage range: 100 - 240 V ac

Supported modules and cables

- QSFP, SFP+ short-range and long-range optics
- QSA - QSFP to SFP+ adapter
- QSFP to SFP+ DAC cable
- QSFP to QSFP DAC cable
- QSFP breakout cables 40 GbE to 4x10 GbE
- DAC, Optical
- QSFP AOC

Power consumption

- Typical (ATIS score under "snake" topology) with passive cables: 83
- 3 Maximum with passive cables: 208 W
- Maximum with active (optical) cables (assuming QSFP at 2.0W SFP at 1.0 W) = 300 W

Operating conditions

- Operating: 0°C to 45°C (32° to 113°F)
- Nonoperating: -40° to 70°C (-40° to 158°F)
- Humidity:
 - Operational: 10% - 85% noncondensing
 - Non-Operational: 10% - 90% noncondensing
- Altitude - mean sea level (MSL): Operating 3050 m

For product details, go to the [Mellanox](#) website.

Planning information

Customer responsibilities

Upgrades

- Upgrade firmware using serial or TFTP.
- Dual software images.

These switches are designated as customer setup (CSU). CSU allowance is one day.

Cable orders

No cables are required.

Security, auditability, and control

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Global Technology Services

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, and/or integration of this product.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, go to the [IBM Electronic Support](#) website.

Terms and conditions

Volume orders

Contact your IBM representative.

Products - terms and conditions

Warranty period

One year.

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM. An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

This product is provided with a one-year standard warranty. For your convenience, IBM has provided two additional years of extended warranty services. Consult with your advisors about the appropriate financial treatment for this offering. See your sales representative for other available service options.

Warranty services

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information.

CRU Service

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request. CRUs are designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU.

Tier 1 (mandatory) CRU

Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

Tier 2 (optional) CRU

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs will be shipped for next-business-day (NBD) delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU. You may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRUs:

- 1 - System
- 1 - Rail Kit
- 1 - Power cable for each power supply unit - Type C13-C14
- 1 - Harness: HAR000028 - Harness RS232 2M cable - DB9 to RF-451
- Quick start guide
- Management module
- EDR leaf
- Fan unit
- External cables
- Port adapter

CRU and On-site Service

At IBM's discretion, you will receive specified CRU service, or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Service level is:

- IBM On-site Repair Limited, Next-Business-Day Onsite Response Time, Latest Call Registration 15:00, 9 hours per day, Monday through Friday, excluding public or national holidays.

Warranty services

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

Warranty service upgrades

During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. Service levels are response-time objectives and are not guaranteed. See the **Warranty services** section above for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts.

- IBM On-site Repair, Same Business Day Onsite Response Time, Latest Call Registration 12:00, 9 hours per day, Monday through Friday, excluding public or national holidays
- IBM On-site Repair, Same Business Day Onsite Response Time, Latest Call Registration 18:00, 18 hours per day, Monday through Saturday, excluding public or national holidays
- IBM On-site Repair, Same Business Day 6 hours average Onsite Response Time, 24 hours per day, Monday through Sunday, 365 days a year

Maintenance service options

CRU and On-site Service

At IBM's discretion you will receive CRU service or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose. The following on-site response-time objectives are available as warranty service upgrades for your machine. Available offerings are:

- IBM On-site Repair Limited, Next-Business-Day Onsite Response Time, Latest Call Registration 15:00, 9 hours per day, Monday through Friday, excluding public or national holidays.
- IBM Onsite Repair, Next-Business-Day Onsite Response Time, 9 hours per day, Latest Call Registration 15:00, Monday through Friday, excluding public or national holidays.
- IBM On-site Repair, Same-Business-Day Onsite Response Time, Latest Call Registration 12:00, 9 hours per day, Monday through Friday, excluding public or national holidays.
- IBM On-site Repair, Same Business Day 6 hours average Onsite Response Time, 24 hours per day, Monday through Sunday, 365 days a year.
 - ESA and SSU customers: 2-hour coverage extension at no additional charge.

Customer Replaceable Units (CRUs) may be provided as part of the machine's standard warranty CRU Service except that you may install a CRU yourself or

request IBM installation, at no additional charge, under the CRU and On-site Service level specified above. For additional information on the CRU Service, see the warranty information.

Maintenance services

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. Service levels are response-time objectives and are not guaranteed. The specified level of maintenance service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information. The following service selections are available as maintenance options for your machine type.

On-site Service

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Service levels are:

- IBM On-site Repair Limited, Next Business Day Onsite Response Time, Latest Call Registration 15:00, 9 hours per day, Monday through Friday, excluding public or national holidays.
- IBM Onsite Repair, Next Business Day Onsite Response Time, 9 hours per day, Latest Call Registration 15:00, Monday through Friday, excluding public or national holidays.
- IBM On-site Repair, Same Business Day Onsite Response Time, Latest Call Registration 12:00, 9 hours per day, Monday through Friday, excluding public or national holidays.
- IBM On-site Repair, Same Business Day 6 hours average Onsite Response Time, 24 hours per day, Monday through Sunday, 365 days a year.
 - ESA and SSU customers: 2-hour coverage extension at no additional charge.

Customer Replaceable Unit (CRU) Service

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

Based upon availability, CRUs will be shipped for next business day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement.

CRUs are designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU.

Tier 1 (mandatory) CRUs: Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

For machines with On-site Same-day Response Service, IBM will replace a Tier 1 CRU part at your request, at no additional charge.

Tier 2 (optional) CRUs: You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

The following parts and features have been designated as Tier 1 CRUs:

- 1- System
- 1 - Rail kit
- 1 - Power cable for each power supply unit - Type C13-C14
- 1 - Harness: HAR000028 - Harness RS232 2M cable - DB9 to RF-451
- Quick Start Guide

Feature codes or models for which there is a maintenance charge:

Type/Model
8831-S48
8828-ED1

Non-IBM parts service

Under certain conditions, IBM provides services for selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

This service includes hardware problem determination (PD) on the non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installed within IBM machines and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

Usage plan machine

Yes

Average usage plan provisions apply

No

IBM hourly service rate classification

Two

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

Maintenance service offerings

These machines are eligible under terms and conditions of IBM ServiceElite, the IBM Enterprise Service Agreement (ESA), or the IBM Maintenance Agreement. Consult your IBM representative for details.

General terms and conditions

Field-installable features

Yes

Model conversions

Yes

Machine installation

Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated program license charges apply

No

Licensed Machine Code

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement by contacting your IBM representative. It can also be found on the [License Agreement for Machine Code and Licensed Internal Code](#)

Access to Machine Code updates is conditioned on entitlement and license validation in accordance with IBM policy and practice. IBM may verify entitlement through customer number, serial number, electronic restrictions, or any other means or methods employed by IBM in its discretion.

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

Machine Code License Acceptance Requirement

C.) Acceptance-By-Use Machine: No, the LIC license requires signed acceptance by the machine's end user directly with IBM, applicable to orders for a new machine, machine type conversion MES, and to machines transferred to another user.

Prices

For all local charges, contact your local IBM representative.

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Corrections

(Corrected on July 19, 2016)

The Product number section was revised.

(Corrected on July 7, 2016)

The Overview, Description, and Product number sections were revised.