IBM Flex System Storage Expansion Node increases the capability of a standard-width Flex System Compute Node for clients who need additional local storage

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At a glance

The IBM Flex System Storage Expansion Node provides alternative dedicated high-capacity storage to an IBM Flex System Compute Node, which expands the Compute Node's capability.

IBM Flex System is a new category of computing that integrates multiple server architectures, networking, storage, and system management capability into a single system.

Overview

Dedicated, flexible, scalable storage expansion for maximum local storage.

The IBM Flex System Storage Expansion Node (SEN) provides alternative dedicated high-capacity storage to an IBM Flex System Compute Node, expanding the Compute Node's capability. The Flex System SEN fits into one standard-width Flex System Enterprise Chassis node and offers:

- Support for up to 12 SAS/SATA or SSD storage devices
- Multiple RAID functions with up to 1 GB cache
- Hot-swappable drives
- Feature on Demand upgrades
- Front-panel and drive-bay LED indicators

Refer to the IBM® ServerProven® web page for a list of supported adapters and operating systems.

http://www-03.ibm.com/systems/info/x86servers/serverproven/compat/us/flex.html

The Flex System Storage Expansion Node is ideal for a variety of application environments, including:

- Dedicated storage solution for unstructured data analytics within a distributed database environment
- Foundation for low-cost Network Attached Storage infrastructure solutions
The IBM Flex System Storage Expansion Node is part of IBM Flex System, a new category of computing that integrates multiple server architectures, networking, storage, and system management capability into a single system that is easy to deploy and manage. IBM Flex System has full built-in virtualization support of servers, storage, and networking to speed provisioning and increase resiliency. In addition, it supports open industry standards such as operating systems, networking and storage fabrics, virtualization, and system management protocols, to easily fit within existing and future datacenter environments. IBM Flex System is scalable and extendable with multigeneration investments.

The most forward-thinking companies will completely rethink the way they deploy and manage their IT environments by evolving to a more open, agile, and integrated computing system that is dynamically managed from a single vantage point to simultaneously maximize efficiency and innovation.

By doing this, companies can:

- Improve efficiency and utilization through integration
- Optimize heterogeneous environments, providing the right architecture
- Increase speed and dexterity at the enterprise level
- Improve control through simplicity, automation, compliance, and security
- Improve economics with faster time-to-value through real-time scalability
- Deliver insights faster to gain a competitive advantage

**Key prerequisites**

- x86 standard-wide compute node
- IBM Flex System Enterprise Chassis
- IBM network switch
- Appropriate PDUs and main power distribution
- Monitor, keyboard, and mouse for setup

**Planned availability date**

December 3, 2012 -- All except:

December 21, 2012

IBM Flex System Storage Expansion Node 68Y8588

**Description**

**IBM Flex System Storage Expansion Node (SEN)**

- Dedicated storage expansion for x86 standard-wide compute nodes
- Support for 12 x 2.5-inch hot-swap SSDs or HDDs using common Gen-2 drive tray
- Support for mixed HDD / SSD configurations
- Support for SAS and SATA connected drives
- RAID 0, 1, 10, 5, and 6 support
- 512 MB and 1 GB cache with cache-to-flash SuperCap offload
- RAID, SAS expander and disk drive updates performed in-band via the operating system on compute node
- Easy access to drives for hot-swap replacement
• Management function using the management controller on the compute node through the interposer cable/connector port

IBM Flex System Fabric EN4093R 10 Gb Scalable Switch - 95Y3309

This 10 Gb scalable switch offers uncompromised scalability, throughput, and performance. This switch can help clients migrate to 10 Gb infrastructure and offers virtualization features like Virtual Fabric and VMready®. Clients should consider this switch if they:

• Are building a 10 Gb Ethernet Infrastructure or migrating from 1 Gb to 10 Gb (mixed environment)
• Are deploying virtualization
• Want investment protection to upgrade to more ports and bandwidth (40 GbE)

Some of the key features of this switch are:

• This is a triple-density switch with the ability to scale based on your needs.
• It offers a total 64 ports with up to 42 internal 10 Gb ports and 22 external 10 Gb ports.
• The base switch provides 14 internal 10 Gb ports and 10 external SFP+ 10 Gb ports.
• Optional Upgrade 1 provides 14 additional internal 10 Gb ports and enables two external 40 Gb QSFP+ ports that can be used as four 10 Gb ports or one 40 GbE port.
• Optional Upgrade 2 offers 14 additional internal 10 Gb ports and enables 4 external SFP+ 10 Gb ports.
• Upgrade 1 is required to apply Upgrade 2.
• 10 Gb SFP+ ports can function at 1 GBE or 10 GBE.
• 40 Gb QSFP+ ports can function at 10 GBE or 40 GBE.
• The switch provides full Layer 2/3 Ethernet function.
• The switch offers Virtual Fabric support and management.

IBM Flex System Fabric CN4093 10 Gb Converged Scalable Switch - 00D5823

This 10 Gb converged scalable switch offers uncompromised scalability, throughput, and performance. This switch can help clients save cost and reduce complexity by combining 10 GBE, 8 Gb native Fibre Channel and/or 40 GbE ports in a high-performance platform. Clients should consider this switch if they:

• Are looking for full fabric FCF including end-to-end FCoE
• Are looking to reduce cost and integrate into their existing networking SAN
• Want investment protection to upgrade to FCoE or expand with more ports and/or bandwidth (40 GbE)

Some of the key features of this switch are:

• This is a triple-density switch with the ability to scale based on your needs.
• It offers a total 64 ports with up to 42 internal 10 Gb ports and 2 external 10 Gb SFP+ ports, up to 12 Omni ports (10 GBE or 8 Gb native FC) and 2 40 Gb QSFP+ ports.
• The base switch provides 14 internal 10 Gb ports, 2 external SFP+ 10 Gb ports, and 6 Omni ports.
• Optional Upgrade 1 provides 14 additional internal 10 Gb ports and two external 40 Gb QSFP+ ports that can also be used as four 10 Gb ports.
• Optional Upgrade 2 offers 14 additional internal 10 Gb ports and 6 additional Omni ports.
• Upgrade 1 or Upgrade 2 or both can be applied. (Upgrade 1 is not required to apply Upgrade 2.)
• 10 Gb SFP+ ports can function at 1 GBE or 10 GBE.
• Omni ports can function at 10 GbE, 4 Gb FC or 8 Gb FC.
• 40 Gb QSFP+ ports can function at 10 GbE or 40 GbE.
• The switch provides full Layer 2/3 Ethernet function.
• The switch offers Virtual Fabric support and management.

IBM Flex System Fabric CN4093 10 Gb Converged Scalable Switch (Upgrade 1) - 00D5845

This switch upgrade can be applied when you require additional uplink support for 2 ports of 40 Gb (or 8 ports of 10 Gb with optional break-out cables). The upgrade will enable 14 additional internal 10 Gb ports, one to each compute node, and two 40 Gb uplinks. These 40 Gb uplinks are QSFP+ connectors but can be converted to four 10 Gb uplinks using an optional break-out cable.

IBM Flex System Fabric CN4093 10Gb Converged Scalable Switch (Upgrade 2) - 00D5847

This switch upgrade can be applied independent of Upgrade 1 or on top of Upgrade 1 when you want to support 6 additional external Omni ports or if you just want more uplink bandwidth on the base switch. This upgrade will also enable 14 additional internal 10 Gb ports, one to each compute node.

IBM Flex System FC5022 8/16 Gb SAN Scalable Switch Upgrade Keys

88Y6382 - IBM Flex System F5022 16 Gb SAN Scalable Switch (Upgrade 1) License key to activate additional 12 ports on the base 12-port FC switch (prerequisite for key 88Y6386).

88Y6386 - IBM Flex System F5022 16 Gb SAN Scalable Switch (Upgrade 2) License key to activate additional 24 ports on all bases. 12-port base (88Y6374) requires key 88Y6382 first.

00Y3320 - IBM Flex System FC5022 16 Gb Fabric Watch Upgrade License key to activate Fabric Watch License on the 12-port and 24-port base switches (non-ESB).

00Y3322 - IBM Flex System FC5022 16 Gb ISL Trunking Upgrade License key to activate ISL Trunking License on the 12-port and 24-port base switches (non-ESB).

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at


Product positioning

IBM Flex System suits multiple delivery models, from highly customizable hardware platforms to a fully integrated and optimized system.

• IBM Flex System hardware 'building blocks' are made up of individual components that can be mixed and matched, and are fully customizable with optional management.
• IBM Flex System solutions are made up of a chassis with an integrated management appliance, IBM networking, and storage standard.
• IBM Flex System optimized offerings are made up of preconfigured, highly customized systems - focused on selected workloads or single-purpose such as PureFlex™ or CloudBurst®.
# Product number

## Options

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<thead>
<tr>
<th>Option part number</th>
<th>Description</th>
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<tbody>
<tr>
<td>68Y8588</td>
<td>IBM Flex System Storage Expansion Node</td>
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<tr>
<td>47C7633</td>
<td>IBM Flex System Enterprise Chassis 2100W Power Module</td>
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<td>88Y6386</td>
<td>IBM Flex System FC5022 16Gb SAN Scalable Switch (Upgrade 1)</td>
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<td>IBM Flex System Fabric CN4093 10Gb Converged Scalable Switch</td>
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<td>IBM Flex System FC5022 16Gb ISL/Trunking Upgrade</td>
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<tr>
<td>95Y3309</td>
<td>IBM Flex System Fabric EN4093R 10Gb Scalable Switch</td>
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## Pseudo part numbers

**Note:** The following Pseudo part numbers cannot be ordered as stand-alone parts and can only be ordered via configurator.

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<tr>
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<td>IBM Flex System Enterprise Chassis 2100W Power Module Standard</td>
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<tr>
<td>90Y9280</td>
<td>IBM Flex System Compute Node WW packaging-Standard+Storage Expansion</td>
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<tr>
<td>47C7710</td>
<td>Indicator for Smart Cloud Entry on x86 compute node</td>
</tr>
<tr>
<td>90Y4098</td>
<td>IBM Flex System Manager™ Service Fabric Provisioning</td>
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## Publications


https://www-304.ibm.com/systems/support/


IBM Systems Information Centers provide you with a single site where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems information Centers are at


Multilingual support is provided for many of the IBM Flex System Storage Expansion Node components in the following languages:

- Brazilian Portuguese
- Chinese (Simplified and Traditional)
- English (US and UK)
- French
- German
- Italian
- Japanese
- Korean
- Spanish
The multilingual support includes national language keyboard support, multilingual nomenclature, and translated documentation as required by the individual countries.

**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 visit

http://www.ibm.com/services/

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit


Select your country, and then select the product as the category.

**Technical information**

**Specified operating environment**

**Physical specifications**

**Dimensions - IBM Flex System Storage Expansion Node**

- Height: 55.5 mm (2.19 in)
- Depth: 503.5 mm (19.82 in)
- Width: 229.1 mm (9.00 in)
- Maximum weight: 5.9 kg (13 lb)

**Electrical**

IBM Flex System Storage Expansion Node: 12.2 (nominal) V dc

**Note:** All weights and measurements are approximate.

**Standards**

**Equipment approvals and safety**

- IEC 60950-1, GOST R 51318.22, GOST R 51318.249, GOST R 51317.3.2, GOST R 51317.3.3
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
Operating environment

The IBM Flex System Storage Expansion Node complies with ASHRAE Class A3 specifications.

- **Power on**:
  - Temperature: 5° - 40°C (41° - 104°F)
  - Humidity, noncondensing: -12°C dew point (10.4°F) and 8% - 85% relative humidity
  - Maximum dew point: 24°C (75°F)
  - Maximum altitude: 3048 m (10,000 ft)
  - Maximum rate of temperature change: 5°C/hr (41°F/hr)

- **Power off**:
  - Temperature: 5°C - 45°C (41°F - 113°F)
  - Relative humidity: 8% - 85%
  - Maximum dew point: 27°C (80.6°F)

- **Storage (nonoperating)**:
  - Temperature: 1°C to 60°C (33.8°F - 140°F)
  - Altitude: 3050 m (10,006 ft)
  - Relative humidity: 5% - 80%
  - Maximum dew point: 29°C (84.2°F)

- **Shipment (non-operating)**:
  - Temperature: -40°C to 60°C (-40°F - 140°F)
  - Altitude: 10,700 m (35,105 ft)
  - Relative humidity: 5% - 100%
  - Maximum dew point: 29°C (84.2°F)
  - Particulate contamination

**Note:** Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. This IBM system is available with an optional acoustical door feature that can help reduce the sound emitted from this system. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature; and employees' location in relation to the equipment. Further, compliance with such government regulations also depends upon a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. IBM recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

Compatibility

Contact your IBM representative or IBM Business Partner, or refer to the IBM Sales Manual for information on the compatibility of hardware and software for System x servers. The Sales Manual is updated periodically as new features and options are announced that support these servers.

Limitations

Regarding the use of solid-state disk drives, solid-state memory cells have an intrinsic, finite number of write cycles that each cell can incur. As a result, each solid-state device has a maximum amount of write cycles to which it can be subjected, documented as TBW (Total Bytes Written). IBM is not responsible for replacement of hardware that has reached the maximum guaranteed number of write cycles. This limit may be revealed as the device failing to respond to
system-generated commands or becoming incapable of being written to. Additional information is available at

http://www-03.ibm.com/systems/x/options/storage/solidstate/index.html

Planning information

Customer responsibilities
The IBM Flex System Storage Expansion Node is designated as customer setup. Customer setup instructions are shipped with each system.

Cable orders
All cables are supplied with the IBM Flex System Storage Expansion Node. Depending on the applications, the cables may be fully installed, partially installed (plugged at one end and packaged for shipping), or included as part of a shipment group.

Packaging
Ship group
The system carton contains the system unit and a ship-group kit containing the following documents and CDs:

• Important Notices booklet
• IBM Warranty Information booklet
• Product Documentation CD that includes the following documents:
  – Installation and Service Guide
  – IBM Safety Information
  – Product machine code license and other licenses and notices
• Environmental Notice and User Guide Documentation CD

The Installation and Service Guide on the Product Documentation CD contains the installation, use, and troubleshooting information necessary to use and service the product.

Supplies
None

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.

Terms and conditions

Field installable feature
Yes
**Warranty period**

One year

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. 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 effective on its date of installation. 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.

The following has been designated as consumables or supply items and is, therefore, not covered by this warranty:

- None

The following part has been designated as a Tier 1 CRU:

- SEN

**Customer setup**

Yes

**Machine code**

No

All other terms and conditions are the same as those applicable to the IBM machine type in which the feature is installed.

**Pricing**

For all local charges, contact your IBM representative.

**Announcement countries**

All European, Middle Eastern, and African countries.

**Trademarks**

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