

• Family 1417+01 IBM eServer Cluster 1350

IBM United States Sales Manual
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Product Life Cycle Dates

Type Model	Announced	Available	Marketing Withdrawn	Service Discontinued
1417-11X	2004/07/06	2004/07/31	-	2011/12/31

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Abstract

The IBM 1417 is part of the latest enhancement to the Cluster 1350 which combines industry-leading hardware, clustering software, and services.

Model Abstract 1417-11X

The IBM 1417 Model 11X is an 11U NetBAY Rack.

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Highlights

- The IBM eServer Cluster 1350 is built on:
 - Rack-optimized and blade-based servers from IBM
 - Industry-leading interconnects
 - Robust cluster-management software
 - IBM service options -- Three-year on-site(1) limited warranty(2)
- Easy-to-order, robust factory-built configurations are supported by IBM.
- With the smaller 11U racks, the IBM eServer Cluster 1350 is better positioned to meet the specific requirements of departmental and small or medium business application environments.
- If you purchase this offering with IBM eServer Cluster 1350 options you will receive component-level warranty service.

Note: (1) You may be asked certain diagnostic questions before a technician is sent.

Note: (2) For information on IBM's Statement of Limited Warranty, contact your IBM representative or reseller.

Copies are available upon request.

Note: For the latest information on safe and effective computing, visit:

www.ibm.com/pc/safecomputing

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Description

Hardware

- BladeCenter HS20 2-way blade server:
 - Support for two 2.8, 3.0, 3.2, 3.4, or 3.6 GHz processor, 800 MHz front-side-bus 1 MB L2 cache
 - 64-bit extensions
- BladeCenter JS20 64-bit PowerPC** processor-based two-way blade server: Supports two 2.2 GHz 64-bit PowerPC 970 processors
- xSeries 346 rack server:
 - Support for two 2.8, 3.0, 3.2, 3.4, or 3.6 GHz Xeon processors
 - Extended Memory 64 Technology (EM64T): 64-bit memory addressing
- xSeries 336 rack server:
 - Support for two 2.8, 3.0, 3.2, 3.4, or 3.6 GHz Xeon processors
 - EM64T: 64-bit memory addressing
- IBM eServer 326 -- AMD Opteron, SMP-capable server:
 - AMD Opteron Processor Model 246 at 2.0 GHz, 248 at 2.2 GHz, or 250 at 2.4 GHz
 - Support for 32-and 64-bit applications using a 64-bit operating system
 - ECC double data rate (DDR) SDRAM RDIMM memory; addressable up to 16 GB
- IBM TotalStorage DS4100, single channel DS300, and DS400
- Force 10 E600 (WS-x6704-10GE)
- SMC 8648T 48 Port Managed Switch
- Topspin 270 96 Port InfiniBand Switch (99-00053-04)
- Voltaire 9024 24 Port InfiniBand Switch (511S30021)
- 10 GE Cisco options
- 4 MB Myricom Options for Blades and PCI-X

The Cluster 1350 offering scales up to 1,024 total servers. Higher scaling is available by special bid.

Computing applications or environments often have more requirements than an individual computer or server can address. These requirements may be best addressed by several computers working together. A cluster is a group of interconnected individual computers, working together on a single problem or consolidating workloads from multiple servers. Although these computers can operate individually, they are managed from a single point of control using cluster management software.

The Cluster 1350 offering, a high-performance, scalable cluster is built on Intel Xeon-based, PowerPC 970 and AMD Opteron-based, rack-optimized and blade-based servers.

The Cluster 1350 supports SLES 9 (32-and 64-bit) and Red Hat Enterprise Linux 3.0 (32-and 64-bit). All hardware components are configured and installed into the racks in the factory. You must obtain the prerequisite version of the Linux operating system and device drivers as specified by IBM.

- Either you or a qualified Business Partner can install the required software.
- You can use the optional installation services to have IBM install the operating system, device drivers, and CSM software.

IBM provides a single point of contact for service of all the cluster hardware components and IBM software during the applicable warranty period. This warranty support does not include support for the Linux operating systems. Support for Linux is available through an optional IBM SupportLine service.

Additional enhancements

For a list of hardware components, refer to the Overview.

Software

- Linux Cluster Install Tool (LCIT) V3.3

Optional

- General Parallel File System (GPFS) for Linux V2.3
- Cluster Systems Management (CSM) for Linux V1.4
- Red Hat Enterprise Linux 3.0 (32-and 64-bit) (preload available)

These components are combined with a terminal server, monitor, cabling, power supplies, power distribution units, racks, and others. When you obtain the prerequisite or preloaded versions of the Linux operating system and device drivers, the 1350 offers an integrated cluster solution.

Supported operating systems include Red Hat Enterprise Linux 3 QU3 and SLES 9 (32-and 64-bit) for Opteron, Power and Intel servers. Additional Linux operating systems may be available via special bid.

IBM offers optional fee-based services to install all supported Linux distributions, required device drivers, and CSM onto the Cluster 1350. Also, IBM offers optional Support Line for Linux Clusters for an enhanced level of integration and maintenance support.

Linux Cluster Installation Tool (LCIT)

LCIT as an installation utility, customer utility, and diagnostic tool

The IBM eServer Cluster 1350 offering includes LCIT, an application used in the deployment and management of Linux clusters. LCIT is a utility that assists with the initial setup and information gathering of the cluster. Additionally, LCIT is used during the life of the cluster for ongoing customer and diagnostic tasks.

Installation utility

LCIT can reduce the possibility of errors during installation by automating the part of the installation process involving the low-level configuration of the cluster (node detection, IP addresses, subnet masks, MAC addresses, and service processors). The result is faster initial installation time. This prepares the cluster for the eventual loading of the Linux operating system and the CSM or xCAT management program.

During manufacturing, a disk partition is created on the management node known as LCIT. This partition contains configuration information generated during the manufacture of the cluster using the LCIT utility. Configuration information includes the tab files needed for CSM and xCat utilities and the cluster topology file. This information can be used to verify the cluster configuration at installation. Additionally, the LCIT partition contains the LCIT utility program. This partition is accessible to IBM service representatives, IBM installation teams, and to you.

Customer utility

LCIT can assist in ongoing maintenance and administration tasks. The systems administrator can realize significant time savings as well as efficiencies in setup and management.

Diagnostic tool

LCIT can provide verification of hardware. Personnel and administrators can diagnose issues at a cluster level instead of the traditional node-level diagnostics.

For example, during site installation service personnel can validate the cluster by comparing the configuration files generated during the manufacturing phase. During the operational phase the system administrator can take a quick snapshot of the cluster configuration and analyze the topology for future configurations.

LCIT features

- Automatic generation of configuration tab files
- Immediate node and RSA verification
- Cluster topology gathering
- Support for multiple Linux operating systems
- Complementary function in CSM and xCAT
- Dynamic allocation of IP addresses
- Ability to flash multiple nodes: BIOS, CMOS maps, and firmware
- Cluster inventory management functions
- Verification of network and RSA connections
- Remote power on/off
- Automatic discovery of nodes and MAC addresses
- RSA, BMC, ISMP, BladeCenter management module support
- Shorter repair time
- Higher level of fix confidence
- Update of nodes to cluster level BIOS quickly

- Warranty validation with use of configuration files generated by IBM at time of manufacture
- Potentially reduced downtime

All IBM eServer Cluster 1350 orders are shipped with an LCIT CD. IBM service representatives and other field personnel can order a CD (ZK3T-9168-03) via the PUBORDER process.

Cluster racks

11U NetBAY Rack (1417-11X)

This 11U rack addresses the requirements of small departmental and small and medium business cluster configurations.

The rack is shipped from the factory with Cluster 1350 components such as power units, nodes, switches, cables, and consoles mounted in position and with intrarack cabling installed according to applicable Cluster 1350 racking rules. In addition, the rack meets the EMC compliance regulations in all markets in which it is offered.

This rack is designed to be installed by you or IBM through a service contract. Coupled with the factory integration services or optional on-site hardware and software installation and software verification services the cluster 1350 is a ready-to-run cluster system. The cost of software installation by IBM or a qualified Business Partner is not included.

Warranty for all racks

These racks include a three-year warranty, which extends to all currently offered rack hardware options. IBM offers warranty support for the IBM and non-IBM products and options included in the 1350 offering. For example, with this warranty, a failure of a switch component is serviced by IBM, and replacement parts are maintained by IBM. IBM machine types supported as part of the Cluster 1350 solution carry their own warranty terms.

Factory integration -- product customization services

The Cluster 1350 features several hardware validation and test services collectively referred to as product customization services. These services include the integration of hardware and software on IBM eServer, pSeries and xSeries servers in state-of-the-art manufacturing facilities. You can deploy systems in almost any IT environment. This means your IT resources can be better used elsewhere.

This statement is especially true for Linux cluster solutions. Given the complexity of a Linux cluster, you want the confidence that the solution arrives properly configured and ready to integrate in your datacenter. These options are integrated into the servers. xSeries also offers a Blade Integration Service, which, for a flat fee, includes installation of:

- Hardware options on the blades
- Options in the BladeCenter chassis
- Blades in the chassis

IBM can install the chassis in an enterprise rack and have it shipped to you. Performing the same services on-site would take hours or even days.

In addition, xSeries offers specific services for the Cluster 1350 called Cluster Systems Validation and Test to confirm that all system settings are enabled and tested to enable smooth on-site deployment:

- Enable BIOS management
- Configure BIOS on each node
- Provide ASM and RSA setup
- Create disk partitioning
- Configure (network, firewall, language, and time zone)
- Configure services
- Set up storage
- Install terminal server
- Set up DNS
- Test, debug, and confirm that cluster is ready for operation

IBM has the skills and technology to offer this type of service. xSeries product customization portfolio offers a tremendous value, especially for customers interested in complex offerings such as Linux cluster.

Services

Installation and deployment services

The Cluster 1350 solution deployed in the 1417-11X rack enclosure is designed for customer installation. Additional optional on-site software installation and customization services include:

- Linux and CSM for Linux customization and skills transfer for system administration personnel
- Installation and configuration of GPFS for Linux

Growth possibilities

You can extend the capabilities of the Cluster 1350 by adding optional storage and compute nodes. The xSeries 346 server acts as storage nodes; up to 64 storage nodes are supported. DS4000 storage can be optionally integrated in the offering. The Cluster 1350 now supports the DS300, DS400, DS4000 EXP100 expansion unit, DS4100 (SATA) and the DS4300 Turbo. These storage expansion units are offered in addition to the previously available DS4300, DS4400, and DS4500 storage controllers and DS4000 EXP700 and EXP400 storage expansion units.

Use backup shared disk servers to enable applications to continue to operate without interruption in the event of server or adapter failure.

Support of Fibre Channel, SCSI, and SATA disks is available for up to 32 nodes. SAN support is available by special bid.

The Cluster 1350 scales up to 1,024 nodes with larger scale systems are available from IBM by special bid.

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Product Positioning

The Cluster 1350 is positioned within the IBM eServer family of offerings as the platform of choice for high-value and high-performance scalable Linux cluster solutions.

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Models

Model Summary Matrix

Models	Type
11X	11U NetBAY Rack

Customer Setup (CSU)

No.

Devices Supported

The IBM Cluster 1350 offering is designed to maintain compatibility with the following IBM part numbers. As a part of the ServerProven program, xSeries server compatibility listings are updated on the World Wide Web. Detailed information relative to IBM and non-IBM vendor devices, adapters, software and network operating systems supported with xSeries servers can be accessed via the Web by entering URL:

<http://www.ibm.com/pc/us/compat>

Hardware options

e1350 Cluster Setup

Part

Number

Description

42D1363 IBM Cyclades RJ-45 to DB9 Serial Cable Adapter for BladeCenter

Hardware options for 1417-11X

Part Number	Description
eServer 326	
8848-61Y	Opteron 2.2 GHz, 2x512MB PC3200 Memory, 411W, U320 SCSI, Open Bay
8848-62Y	Opteron 2.2 GHz, 2x512MB PC3200 Memory, 411W, 80GB Fixed SATA IDE
8848-71Y	Opteron 2.4 GHz, 2x512MB PC3200 Memory, 411W, U320 SCSI, Open Bay
8848-72Y	Opteron 2.4 GHz, 2x512MB PC3200 Memory, 411W, 80GB Fixed SATA IDE
8848-81U	Opteron 2.6 GHz, 2x512MB PC3200 Memory, 411W, U320 SCSI, Open Bay
8848-82U	Opteron 2.6 GHz, 2x512MB PC3200 Memory, 411W, Fixed SATA
8848-45U	1.8 GHz Dual Core/800MHz/1MB L2 per core/2x512MB/CD-ROM/SCSI hot-swap open bay
8848-46U	1.8 GHz Dual Core/800MHz/1MB L2 per core/2x512MB/CD-ROM/80.0 GB SATA
8848-55U	2.0 GHz Dual Core/800MHz/1MB L2 per core/2x512MB/CD-ROM/SCSI hot-swap open bay
8848-56U	2.0 GHz Dual Core/800MHz/1MB L2 per core/2x512MB/CD-ROM/80.0 GB

Processor Upgrades (System Dependent)

13N0706 Opteron** Processor Model 248, 2.2 GHz.
 13N0702 Opteron** Processor Model 250, 2.4 GHz.
 13N0703 Opteron** Processor Model 252, 2.6 GHz.
 25R8959 Opteron Dual Core Processor Model 275, 2.2 Ghz
 25R8960 Opteron Dual Core Processor Model 270, 2.0 Ghz
 25R8961 Opteron Dual Core Processor Model 265, 1.8 Ghz

Memory Kit Options per Node

39M5800 1GB Kit (2x512MB) PC3200 CL3 ECC DDR SDRAM RDIMM
 39M5803 2GB Kit PC3200 CL3 ECC DDR SDRAM RDIMM

Single Memory DIMM Options per Node

73P2269 2GB PC2700 CL2.5 ECC DDR SDRAM RDIMM (Single RDIMM Need 2)

SCSI HDD Options

40K1023 73.4GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
 40K1024 146.4GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
 40K1025 300GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
 90P1318 36.4GB 15K rpm Ultra320 SCSI Hot-Swap SSL HDD
 90P1319 73.4GB 15K rpm Ultra320 SCSI Hot-Swap SSL HDD

SATA HDD Options

25R6902 80GB HDD 7.2k RPM SATA Option
 25R6903 160GB HDD 7.2k RPM SATA Option

Storage Adapter Cards

26K7754 QLogic 2-Gbps 4-port Fibre Channel to PCI-X HBA
 24P0960 IBM TotalStorage FC2-133 Host Bus Adapter

SCSI/RAID Adapters

32P0033 IBM ServerAID-6M Ultra320 SCSI Controller (128MB Cache)
 02R0988 IBM ServerAID-6M Ultra320 SCSI Controller (256MB Cache)
 71P8648 IBM ServerAID 7t SATA Controller

Communication Adapters

73P4001 NetXtreme 1000 SX+ Ethernet Adapter
 73P4101 NetXtreme 1000T+ Ethernet Adapter
 73P4201 NetXtreme 1000 T+ Dual Port Ethernet Adapter

High Speed InterConnect

02R2118 Myrinet 333MHz Dual Fibre/PCI-X "E" Card w/2MB Memory
26K7752 Myrinet 333MHz Single Fiber/PCI-X "F" Card w/2MB Memory
73P3984 Topspin 10 Gbps Host Channel PCI-X Adapter
26K7512 Voltaire 10 Gbps Host Channel PCI-X Adapter

Part

Number Description

xSeries 336

8837-15U	3.0GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	2x3.5"
	SCSI, DVD	
8837-16U	3.0GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	2x3.5"
	SATA, DVD	
8837-1VU	3.0GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	4x2.5"
	SCSI	
8837-25U	3.2GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	2x3.5"
	SCSI, DVD	
8837-35U	3.4GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	2x3.5
	SCSI, DVD	
8837-36U	3.4GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	2x3.5
	SATA, DVD	
8837-3VU	3.4GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	4x2.5"
	SCSI	
8837-45U	3.6GHz/800MHz/2MB L2, 1GB Memory, HS 585W, Open Bay	2x3.5
	SCSI, DVD	

Processor Upgrades (System Dependent)

25R8904 xSeries 3.0GHz 800MHz 2MB L2 cache upgrade with Xeon processor and EM64T
25R8905 xSeries 3.2GHz 800MHz 2MB L2 cache upgrade with Xeon processor and EM64T
13N0666 xSeries 3.4GHz 800MHz 2MB L2 cache upgrade with Xeon processor and EM64T
13N0667 xSeries 3.6GHz 800MHz 2MB L2 cache upgrade with Xeon processor and EM64T

Memory Kit Options per Node

39M5821 1GB Kit (2x512MB) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM (256MB)
39M5809 2GB Kit (2x1GB) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM (512MB)
39M5815 4GB Kit (2 x 2GB) PC2-3200 DDR2 SDRAM RDIMM
39M5818 1GB Kit (2x512MB) PC2-3200 CL3 ECC DDR2 Non Chipkill SDRAM RDIMM (x8 512MB)
73P3523 512MB Kit (2x256MB) PC2-3200 CL3 ECC DDR2 Non Chipkill SDRAM RDIMM (x8 256MB)

SATA HDD Options

40K6864 80GB 7200-rpm Simple-swap SATA HDD
40K6868 160GB 7200-rpm Simple-swap SATA HDD
40K6872 250GB 7200-rpm Simple-swap SATA HDD

SCSI HDD Options

40K1023 73.4GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
40K1024 146.4GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
40K1025 300GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
90P1318 36.4GB 15K rpm Ultra320 SCSI Hot-Swap SSL HDD
90P1319 73.4GB 15K rpm Ultra320 SCSI Hot-Swap SSL HDD
40K1035 36.4GB 10K rpm Ultra320 SFF SCSI Hot-Swap SSL HDD
40K1036 73.4GB 10K rpm Ultra320 SFF SCSI Hot-Swap SSL HDD

Storage Adapter Cards

24P0960 IBM TotalStorage FC2-133 Host Bus Adapter
26K7754 QLogic 2-Gbps 4-port Fibre Channel to PCI-X HBA

SCSI/RAID Adapters

32P0033 IBM ServerAID-6M Ultra320 SCSI Controller (128MB Cache)
02R0988 IBM ServerAID-6M Ultra320 SCSI Controller (256MB Cache)
71P8648 IBM ServerAID 7t SATA Controller

Communication Adapters

31P9601 PRO/1000 MT Server Ethernet Adapter by Intel
73P2701 PRO/1000 MT Dual Port Server Adapter by Intel
73P4001 NetXtreme 1000 SX+ Ethernet Adapter
73P4101 NetXtreme 1000T+ Ethernet Adapter
73P4201 NetXtreme 1000 T+ Dual Port Ethernet Adapter

High Speed InterConnect

02R2118 Myrinet 333MHz Dual Fibre/PCI-X "E" Card w/2MB Memory
26K7752 Myrinet 333MHz Single Fiber/PCI-X "F" Card w/2MB Memory
73P3984 Topspin 10 Gbps Host Channel PCI-X Adapter
26K7608 Topspin 10 Gbps Host Channel PCI Express Adapter
26K7512 Voltaire 10 Gbps Host Channel PCI-X Adapter
26K7607 Voltaire 10 Gbps Host Channel PCI Express Adapter

Power Supply Option

90P5280 IBM eServer xSeries 585W Redundant Power Supply Option

PCI Express Riser Option

24R9293 PCI Express Adapter Riser Card

Optical Drives

73P3294 Ultrabay Slim Rambo 2.5 Multi-Burner Drive

Part

Number Description

xSeries 346

8840-15U 3.0GHz., 2 x 256MB DDR2, Open Bay
8840-25U 3.2GHz., 2 x 256MB DDR2, Open Bay
8840-35U 3.4GHz., 2 x 256MB DDR2, Open Bay
8840-45U 3.6GHz., 2 x 256MB DDR2, Open Bay

Processor Upgrades (System Dependent)

25R8902 xSeries 3.0 GHz / 800 Mhz 2MB L2 Cache Xeon Processor
25R8903 xSeries 3.2 GHz / 800 Mhz 2MB L2 Cache Xeon Processor
13N0686 xSeries 3.4 GHz / 800 Mhz 2MB L2 Cache Xeon Processor
13N0687 xSeries 3.6 GHz / 800 Mhz 2MB L2 Cache Xeon Processor

Memory Kit Options per Node

39M5821 1GB Kit (2x512MB) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM (256MB)
39M5809 2GB Kit (2x1GB) PC2-3200 CL3 ECC DDR2 SDRAM RDIMM (512MB)
39M5815 4GB Kit (2 x 2GB) PC2-3200 DDR2 SDRAM RDIMM
39M5818 1GB Kit (2x512MB) PC2-3200 CL3 ECC DDR2 Non Chipkill SDRAM
RDIMM (x8 512MB)
73P3523 512MB Kit (2x256MB) PC2-3200 CL3 ECC DDR2 Non Chipkill SDRAM
RDIMM (x8 256MB)

SCSI HDD Options

40K1023 73.4GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
40K1024 146.4GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
40K1025 300GB 10K rpm Ultra320 SCSI Hot-Swap SSL HDD
90P1318 36.4GB 15K rpm Ultra320 SCSI Hot-Swap SSL HDD
90P1319 73.4GB 15K rpm Ultra320 SCSI Hot-Swap SSL HDD

Storage Adapter Cards

24P0960 IBM TotalStorage FC2-133 Host Bus Adapter
26K7754 QLogic 2-Gbps 4-port Fibre Channel to PCI-X HBA

SCSI/RAID Adapters

32P0033 IBM ServerAID-6M Ultra320 SCSI Controller (128MB Cache)
02R0988 IBM ServerAID-6M Ultra320 SCSI Controller (256MB Cache)
71P8642 IBM ServerAID-7K

Communication Adapters

73P2701 PRO/1000 MT Dual Port Server Adapter by Intel
31P9601 PRO/1000 MT Server Ethernet Adapter by Intel
73P3601 IBM iSCSI Server Adapter
73P4001 NetXtreme 1000 SX+ Ethernet Adapter
73P4201 NetXtreme 1000 T+ Dual Port Ethernet Adapter

High Speed InterConnect

02R2118 Myrinet 333MHz Dual Fibre/PCI-X "E" Card w/2MB Memory
26K7752 Myrinet 333MHz Single Fiber/PCI-X "F" Card w/2MB Memory
73P3984 Topspin 10 Gbps Host Channel PCI-X Adapter
26K7608 Topspin 10 Gbps Host Channel PCI Express Adapter
26K7512 Voltaire 10 Gbps Host Channel PCI-X Adapter
26K7607 Voltaire 10 Gbps Host Channel PCI Express Adapter

PCI Express Riser Option

13M8182 PCI Express Adapter Riser Card

Power Supply Option

26K5098 IBM eServer xSeries 625W Hot-Swap Red.Power Supply Option
(WW)
26K5097 IBM eServer xSeries 625W Hot-Swap Red Power Supply Option
(North America)

Part

Number Description

OEM Components

Terminal Servers

02R2238 MRV LX - 32 port Terminal Server Switch

1U GB Switches

02R2152 SMC 8624T 24 port SMC 1Gigabit Managed Switch
02R2154 SMC SMCBGSCLX1 mini-GBIC
4668-001 SMC Tigerswitch Standalone 48-port 10/100/1000Mbps Layer 2
Managed Switch with 4 associated mini-GBIC ports for uplinks
26K7659 SMC 8748M Tiger IV - 48-port Switch with 10GB uplinks
26K7660 SMC 8748M Tiger IV 10GB Xenpack Receiver Tray
73P3993 Cisco Catalyst 3750 24 10/100/1000T Standard Multilayer
Image
4667-005 Force10 1U 48 port 10/100/1000 stackable Switch with 2x 10GB
Uplinks
26K7652 Force10 10GB Uplink kit
26K7604 Force10 Qualified 10GE XFP SR Optics Module

10GB Switch

4668-002 SMC 8708L2 Tiger IV - 8-port 10GB Switch

InfiniBand

73P3984 Topspin 10 Gbps Host Channel PCI-X Adapter
26K7608 Topspin 10 Gbps Host Channel PCI Express Adapter

26K7512 Voltaire 10 Gbps Host Channel PCI-X Adapter
 26K7607 Voltaire 10 Gbps Host Channel PCI Express Adapter
 73P3981 Topspin TS120 1U InfiniBand Switch w/ 24 10Gbps connectivity
 4669-001 Voltaire 9024 1U Switch

Racks

1417-11U Rack

141711X IBM eServer Cluster 1417-11U Rack

KVM Switches

09N4291 NetBAY 2x8 Console Switch
 1735L04 NetBAY 4 Port Local Console Manager

Rack Options

25R5559 IBM 1U Quick Install Filler Panel Set
 25R5560 IBM 3U Quick Install Filler Panel Set
 24P8228 DS4500 FlashCopy / VolumeCopy Activation
 24P7218 Common 1U Rack Mount Kit

Rack PDU's

32P1736 DPI Universal Rack PDU w/Nema L5-20P & L6-20P U.S. Line Cord
 32P1737 DPI Universal Rack PDU with CEE7-VII (Europe line cord)
 32P1738 DPI Universal Rack PDU with IEC 309 2-pin and ground
 (Denmark line cord)
 32P1739 DPI Universal Rack PDU with SI32 (Israel line cord)
 32P1740 DPI Universal Rack PDU with CEI 23-16 (Italy line cord)
 32P1741 DPI Universal Rack PDU with SABS 164 (South Africa line
 cord)
 32P1742 DPI Universal Rack PDU with BS 1363/A (UK line cord)
 32P1743 DPI Universal Rack PDU with 3112 (Australia/New Zealand
 line cord)
 32P1744 DPI Universal Rack PDU with GB 2099.1 (China line cord)
 32P1745 DPI Universal Rack PDU with NBR 6147 (Brazil line cord)
 32P1746 DPI Universal Rack PDU with IS 6538 (India line cord)
 32P1747 DPI Universal Rack PDU with IRAM 2073 (Argentina line cord)
 32P1761 DPI 100-127v Nema Rack PDU w/fixed Nema L5-15P Line Cord

Front End PDUs

32P1751 DPI 30amp/125V Front-end PDU with NEMA L5-30P (AmericasLine
 Cord)
 32P1752 DPI 32amp/250V Front-end PDU with IEC 309 2-pin and ground
 line cord (International)
 32P1766 DPI 30amp/250V Front-end PDU with NEMA L6-30P (208v) Line
 Cord

Sandpiper 3 PDUs

26K4241 PDU C13 32A 1P w/25R2553 LC
 26K4242 PDU C13 60A 1P w/25R2556 LC
 26K4243 PDU C13 63A 1P w/25R2554 LC
 26K4244 PDU C13 60A 3P w/attached LC
 26K4245 PDU C13 32A 3P w/25R2552 LC
 26K4246 PDU C13 30A 1P w/25R2555 LC
 26K4256 PDU C19 60A 1P w/25R2556 LC
 26K4257 PDU C19 63A 1P w/25R2554 LC
 26K4258 PDU C19 60A 3P w/attached LC
 26K4259 PDU C19 32A 3P w/25R2552 LC

Line Cords

39Y7938 Power Jumper Cord IEC c13 TO c20 2.8m
 39Y7937 Universal Jumper Cord - 1.5 m (Power)

Extension Cords

24P7864 Power Cord Extension NEMA L6-30P
24P7887 Power Cord Extension IEC 309 2P + G
24P7888 Power Cord Extension IEC 309 3P + N + G

Keyboards

73P3144 Travel Keyboard (US English)
73P3152 Travel Keyboard (Canadian French)
73P3160 Travel Keyboard (LA Spanish)
73P3146 Travel Keyboard (UK Belgium)
73P3150 Travel Keyboard (Dutch)
73P3151 Travel Keyboard (French)
73P3153 Travel Keyboard (German)
73P3157 Travel Keyboard (Italian)
73P3161 Travel Keyboard (Norwegian)
73P3163 Travel Keyboard (Portuguese)
73P3164 Travel Keyboard (Russian Cyrillic)
73P3166 Travel Keyboard (Spanish)
73P3167 Travel Keyboard (Swedish/Finnish)
73P3168 Travel Keyboard (UK English)
73P3171 Travel Keyboard (US Euro)
73P3147 Travel Keyboard (Chinese)
73P3159 Travel Keyboard (Korean)
73P3158 Travel Keyboard (Japanese)

Rate Card Services

02R2148 11U Enterprise Rack Prep Fee
26K7476 Cluster System Validation and Test 11U Rack

Cables

Copper-Based Ethernet

02R2271 Rate Card Service - Colored CAT5E Cables

Serial Cables for the Port Servers

24P7966 Serial Cable, RJ45 to DB9, iTouch Port Server, 7'
24P7959 Harness, RJ45 to DB9, iTouch, 10 Cables, Upper Nodes

Monitor/C2T Cables

32P1636 250mm KVM Conversion Option
32P1652 1.5m KVM Conversion Option
09N4293 NetBAY Console Cable - 7ft
73P5832 NetBAY 1.5m USB Conversion Option (Long UCO)

InfiniBand Cables

26R0813 IBM 3 Meter InfiniBand Cable (4x to 4x)

Miscellaneous

09P3701 Mouse - Business Black with Keyboard Attachment Cable
31R1438 SLES 9 1-2 CPUs HPC (1 Year Maintenance)
31R1440 SLES 9 1-2 CPUs HPC (3 Year Maintenance)
31R1442 SLES 9 HPC Media Kit

Software

Scali Software

90P3635 MPI Connect for TCP/IP -- (Commercial)
90P3636 MPI Connect for Myrinet -- (Commercial)
90P3637 MPI Connect for TCP/IP -- (Academic)
90P3638 MPI Connect for Myrinet -- (Academic)
90P3639 Software Package, CD-ROM, and documentation

90P3640 1 year additional maintenance -- TCP/IP
90P3641 1 year additional maintenance -- Myrinet

Management Node Media Kits

25K7967 RHEL 3.0 AS x86, No support, 1 yr RHN
32P9578 RHEL 3.0 AS x86, No support, 3 yrs RHN
25K7970 RHEL 3.0 AS AMD64, No support, 1 yr RHN
32P9580 RHEL 3.0 AS AMD64, No support, 3 yrs RHN

Compute Node Media Kits

31R1106 RHEL 3.0 WS x86
31R1109 RHEL 3.0 WS AMD64/EM64T

Compute Node HPC Reg Cards

31R1112 RHEL 3.0 WS x86 HPC, 1 yr entitlement - RHN only
31R1115 RHEL 3.0 WS AMD/64T HPC 32Bit, 1 yr entitlement - RHN only
31R1118 RHEL 3.0 WS x86 HPC, 3 yrs entitlement - RHN only
31R1121 RHEL 3.0 WS AMD/64T HPC 32Bit, 3 yrs entitlement - RHN only

CSM:

D51ZQLL CSM for Linux Processor LIC/SW MAINT 2 ANNIV
E00LYLL CSM for Linux Processor SW MAINT RNWL 1 ANNIV
D51ZRLL CSM for Linux Processor SW MAINT AFT LIC 1 ANNIV

GPFS

BH00SIE GPFS for Linux on xSeries Media Package English
D53GZLL GPFS for Linux + Processor LIC+SW MAINT 12 MO
BH00SIE GPFS for Linux on xSeries Media Package English

Model Conversions

None.

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Technical Description

- | | | |
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| ↓ Physical Specifications | ↓ Operating Environment | ↓ Limitations |
| ↓ Hardware Requirements | ↓ Software Requirements | |

The Cluster Racks

11U NetBay Rack (1417-11X)

This 11U has been introduced into the 1350 Cluster offering to entertain very small Department cluster configurations.

This 11U Rack is enable shipment from the factory with Cluster 1350 components such as power units, nodes, switches, cables, and consoles mounted in position and with intrarack cabling installed according to applicable Cluster 1350 racking rules. In addition, the rack meets the EMC compliance regulations in all markets in which it is offered.

The 1417-11X Rack is designated to be Customer installed. This designation, coupled with the factory integration services and optional on-site hardware installation and verification of software, results in a ready-to-run cluster system. A Service Pack is available which reflects the cost of the hardware installation. The cost of software installation by IBM or a qualified Business Partner is not included in the price of the rack.

The 1417-11X Rack includes a three-year warranty, which extends to all currently offered rack hardware options. IBM offers warranty support for the IBM and non-IBM products and options provided in the 1350 offering. For

example, with this warranty, a failure of a switch component is serviced by IBM, and replacement parts are maintained by IBM. IBM machine types supported as part of the Cluster 1350 solution carry their own warranty terms.

Physical Specifications

- 1417-11X Primary or expansion rack:
 - Width: 520.0 mm (20.5 in)
 - Depth: 874.0 mm (34.4 in)
 - Height: 612.0 mm (24.0 in)
 - Weight - Empty: 37.0 kg (75 lb)
 - Weight - Maximum configuration: 215.9 kg (475 lb)

Operating Environment

- Temperature: 16 to 32 degrees C (60.8 to 89.6 degrees F)
- Relative humidity: 8% to 80%
- Maximum wet bulb: 23 degrees C
- Sound power: 7.5 Bels LwAd (operating), Category 1A (with four BladeCenters and an acoustics module):
 - If Option M/T 4667-001 is selected the Sound Power is 8.7 Bels.
 - If Option M/T 4671-001 is selected the Sound Power is 8.3 Bels.
- Sound pressure: No operator position
- Maximum altitude: 2133.6 meters (7000 ft)

Power requirements (per rack)

- Operating voltage: 200 to 240 V at 50/60 Hz
- Electrical output: 36 kW (maximum)
- Power source loading: 22 kVA (maximum)
- Thermal output: 20.9 kJ/s (71,400 Btu/hr) (maximum configuration)

Note: See the Cluster 1350 Preinstallation Planning Guide for power information on a specific configuration.

Limitations

Operating system and CSM

- Different versions of Linux cannot be mixed in a cluster.
- Different levels of CSM cannot be mixed in a system.
- Different distributions of Linux cannot be mixed in a cluster.
- Some components supported on the Cluster 1350 are supported only by CSM on particular Linux distributions. Refer to the CSM material for a matrix of components and supported distributions.

Hardware

- Use of the 1417-11X Linux Cluster Rack outside of the Cluster 1350 offering is prohibited.

Hardware Requirements

A Cluster 1350 offering consists of the following:

- 1417-11X rack assembly with power distribution units (PDUs)
- xSeries 346 or IBM eServer 326 management node
- At least two compute nodes using IBM eServer 326, xSeries 336 or xSeries 346 servers or BladeCenter JS20 or HS20 blades
- At least two compute nodes using IBM eServer 326, xSeries 336,
- KVM switch
- Port server (not applicable for BladeCenter)
- Ethernet VLAN

Software Requirements

- IBM eServer 326:
 - SLES 9 (32-and 64-bit)
 - Red Hat Enterprise Linux 3 (32-and 64-bit)
- xSeries 336, 346 servers, BladeCenter HS20 blades:
 - SLES 9 (32-and 64-bit)
 - Red Hat Enterprise Linux 3 (32-and 64-bit)

- IBM eServer BladeCenter JS20 blades:
 - SLES 9 (64-bit)
 - Red Hat Enterprise Linux 3 (64-bit)
 Other Linux distributions may be supported by special bid.
- CSM for Linux V1.4
- GPFS for Linux V2.3

Note: Service is required for both GPFS and CSM and is available from:

<http://techsupport.services.ibm.com/server/cluster>

Software Compatibility

The following software products have been tested by IBM and software publishers in the latest available versions, and where appropriate, are or will soon be certified by the publisher to be compatible with the e1350.

- IBM:
 - CSM for Linux V1.3 Media Pack (BH00JIE)
 - CSM Cryptographic for Linux V1.3 Media Pack (BH00KIE)
 - CSM for Linux Processor LIC/SW MAINT 1 ANNIV (D51ZPLL)
 - CSM for Linux Processor LIC/SW MAINT 2 ANNIV (D51ZQLL)
 - CSM for Linux Processor SW MAINT RNWL 1 ANNIV (E00LYLL)
 - CSM for Linux Processor SW MAINT AFT LIC 1 ANNIV (D51ZRLL)
 - GPFS for Linux on xSeries,
 - GPFS for Linux on xSeries Media Package English (BH00SIE)
 - GPFS for Linux + Processor LIC+SW MAINT 12 MO (D53GZLL)
 - GPFS for Linux on xSeries Media Package English (BH00SIE)
 - GPFS for Linux on xSeries Media Package English (BH00SIE)
- Linux:
 - SLES 9 (32-and 64-bit)
 - Red Hat Enterprise Linux 3 (32-and 64-bit)
- Scali:
 - MPI Connect for TCP/IP - (Commercial)(90P3635)
 - MPI Connect for Myrinet - (Commercial) (90P3636)
 - MPI Connect for TCP/IP - (Academic) (90P3637)
 - MPI Connect for Myrinet - (Academic) (90P3638)
 - Software Package, CD-ROM and doc. (90P3639)
 - 1-Year additional Maintenance - TCP/IP (90P3640)
 - 1-Year additional Maintenance - Myrinet (90P3641)
- Management Node Media Kits:
 - RHEL 3.0 AS x86, No support, 1 yr RHN preload (25K7967)
 - RHEL 3.0 AS x86, No support, 3 yrs RHN preload (32P9578)
 - RHEL 3.0 AS AMD64, No support, 1 yr RHN preload (25K7970)
 - RHEL 3.0 AS AMD64, No support, 3 yrs RHN preload (32P9580)
- Compute Node Media Kits:
 - RHEL 3.0 WS x86 (31R1106)
 - RHEL 3.0 WS AMD64/EM64T (31R1109)
- Compute Node Reg. Cards (RHN only):
 - RHEL 3.0 WS x86 HPC, 1 yr entitlement (31R1112)
 - RHEL 3.0 WS AMD/64T HPC 32Bit, 1 yr entitlement (31R1115)
 - RHEL 3.0 WS x86 HPC, 3 yrs entitlement (31R1118)
 - RHEL 3.0 WS AMD/64T HPC, 32Bit 3 yrs entitlement (31R1121)

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Publications

None.

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Features

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↓ [Features - Chargeable](#)

↓ [Feature Exchanges](#)

↓ [Feature Descriptions](#)

Features - No Charge

None.

Features - Chargeable

Note: The following options are only available on the IBM eServer Cluster 1350.

Description	Machine	Models	Number
-----	-----	-----	-----
SMC 8648T	4668	001	4668001
Cisco 10GE 4-Port Line Card	4670	001	4670001
Force 10 E600 Sw. Chassis Bundle	4667	001	4667001
Force 10 E600 48-Port GE Line Card	4667	002	4667002
Force 10 E600 4-Port 10GE Line Card	4667	003	4667003
Topspin 270 96 Port IB Switch	4671	001	4671001
Topspin 24-Port 4X IB Expansion Kit	4671	002	4671002
Voltaire 9024 1U Switch	4669	001	4669001

Description	Option Part Number
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Cisco XENPAK-10GB-SR	26K7510
Myricom 4MB DC for Blades	26K7605
Myricom 'D' Card 4MB PCI-X	26K7606
Myricom Ethernet Line Card	26K7515
Force 10 E600 10 GE XENPAK SR-Fiber	26K7604
Topspin 10Gbps Host Channel PCI-Express Adapt.	26K7608
Voltaire 10Gbps HostChannel PCI-X Adapt.	26K7512
Voltaire 10Gbps Host Channel PCI-Express Adapt.	26K7607

Additional part numbers announced previously are also supported by the Cluster 1350. They are listed in the Hardware Options section. These parts, along with the newly announced parts, are the only part numbers supported with the Cluster 1350 and are not validated or supported in other configurations.

Feature Exchanges

Not available.

Feature Descriptions

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Accessories

None.

Customer Replacement Parts

None.

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Machine Elements

None.

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Supplies

None.

Supplemental Media

None.

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