IBM Intelligent Cluster

*Take the complexity out of complex solutions*

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**Complex solutions—made simple by IBM**

Deploying solutions for Technical Computing, High Performance Computing (HPC), Analytics and Cloud environments can place a significant burden on IT. Intelligent Cluster leverages decades of IBM experience to reduce the complexity of deployment with pre-integrated, delivered, and fully-supported solutions that match best-in-industry components with optimized solution design. With IBM Intelligent Cluster, clients can focus their efforts on maximizing business value, instead of consuming valuable resources to design, optimize, install and support the infrastructure required to meet business demands.

**Best-of-industry technology, optimized solution design**

Intelligent Cluster solutions feature industry-leading IBM® System x® servers, storage, software and third-party components that allow for a wide choice of technology within an integrated, delivered solution. IBM thoroughly tests and optimizes each solution for reliability, interoperability and maximum performance, so clients can quickly deploy the system and get to work achieving their business goals.

**Increase results through automation and built-in intelligence**

Clients are expanding the use of Technical Computing and HPC to solve complex problems at a smaller scale, and smaller organizations typically lack the dedicated resources needed to deploy and manage cluster systems effectively. As an integral part of the IBM Intelligent Cluster portfolio, the IBM Platform HPC comprehensive management solution lets clients quickly put the system to work with minimal effort and skill. Platform HPC optimizes resources automatically to maximize utilization, and the easy-to-use web-based tools make application deployment and ongoing management simple.
The IBM Intelligent Cluster provides industry-leading technology in an integrated solution that is easy to deploy and manage.

End-to-end solutions with end-to-end support by IBM

Intelligent Cluster solutions are built, tested, delivered and installed by IBM, and supported as a single solution instead of being treated as hundreds of individual components. IBM provides single point-of-contact, solution-level support that includes both IBM and third-party components to deliver maximum system availability throughout the life of the system, so clients can spend less time maintaining systems and more time delivering results.

New offerings for Intelligent Cluster portfolio

- **IBM NeXtScale System™**—Introducing the new IBM NeXtScale System and solutions, optimized for compute- and data-intensive workloads, simplified for easy adoption and yet powerful enough to quickly scale computing resources up or down in accordance with business requirements. This new class of systems features an industry-standard 1/2 wide form factor. Basic building blocks include a dense 6U chassis which contains 12 1/2 wide compute nodes. Other building blocks include GPU/Intel MIC Node, storage node, and 4U 1/2 wide hot-swap storage enclosure with up to 24 hot-swap drives.

- **iDataPlex**—Enhanced with Intel Xeon E5-2600 v2 processors and 1866 MHz memory DIMMs.

- **IBM Flex System™**—An upgrade to the x240 compute node to the next generation of Intel processors (Xeon E5-2600 v2) provides more cores, 1866 MHz memory DIMMs, new I/O modules and network daughter cards.

- **IBM BladeCenter®**—The HS23 blade server is available with the new higher-performing Intel processor (Xeon E5-2600 v2), providing continued growth capability for customers with a blade infrastructure.

- **IBM rack-mounted servers**—The x3550 M4 and x3650 M4 systems are also upgraded with Intel’s newest processor (Xeon E5-2600 v2) and up to 1866 MHz memory speed.

- **x3650 M4 HD**—Features a high spindle count for increased throughput and transactions, and it addresses big data and data management requirements. The x3650 M4 HD supports the latest Intel Xeon E5-2600 v2 processor (up to 12 cores per processor), up to 1866 MHz memory speed, and optimized 12 Gbps RAID.

- **IBM Storwize® V3700**—Easy-to-use, affordable storage offering. Features dual controllers with up to 180 TB of capacity and 8 GB of cache packaged in a compact, 2U 19-inch rack-mount enclosure.

- **IBM Platform Computing**—LSF 9.1.2 and PE v1.2+

- **Mellanox ConnectX-3 EN Single-port SFP+ 10 GbE Adapter**—A low-cost entry offering for a 10 GbE infrastructure.

- **EdgeCore**—Two new low-cost switch offerings—a 1 GbE and a 10 GbE switch available for either enterprise rack or iDataPlex rack solutions.

- **Chelsio**—Three networking adapters are being introduced: a dual-port 10 GbE adapter, a quad-port 10 GbE adapter and a dual-port 40 GbE adapter.

- **400 GB DDN 6 Gbps SLC SSD Module for SS7K**—Introducing a low-power, high-performance SSD expansion option for DDN’s Storage Scaler 7000.
### IBM Intelligent Cluster Summary at a glance

**Systems**
- IBM NeXtScale System: nx360 M4
- IBM Flex System: x220, x240, x440 compute nodes
- Blade servers: HX5, HS23
- Enterprise servers: x3850 X5, x3690 X5
- iDataPlex servers: dx360 M4
- Rack servers: x3550 M4, x3630 M4, x3650 M4, x3750 M4, x3650 M4 HD

**Interconnects**
- Ethernet Switches: IBM System Networking, Brocade, Cisco, Mellanox, Edgecore
- Ethernet Adapters: Chelsio, Mellanox, Emulex, Intel
- InfiniBand Switches and Adapters: Mellanox, Intel
- Fibre Channel: Brocade, Emulex, Intel

**External storage**
- **Storage systems**
  - System Storage® DS5020, DS5100, DS3950, DS3500, DS3512, DS3524, IBM Storwize V3700
- **Storage expansion**
  - EXP5000 Storage Expansion Unit; EXP 2512 Storage Expansion Unit; EXP 2524 Storage Expansion Unit; EXP 520 Storage Expansion Unit; EXP 395 Storage Expansion Unit
- **OEM storage solution**
  - DDN SFA 12000 InfiniBand (60 and 84 drive enclosures)
- **Rackmount Flash storage products**
  - IBM FlashSystem RamSan 720 and 820
- **System x storage solution**
  - IBM GPFS Storage Server: GSS24 and GSS26
- **Graphic Processing Units (GPUs)**
  - NVIDIA: Quadro 5000, Tesla K10, Tesla M2070Q, Tesla M2090, Tesla K20, Tesla K20X
- **Co-processors**
  - Intel Xeon Phi 5110P
- **Operating systems**
  - Red Hat Enterprise Linux (RHEL); SUSE Linux Enterprise Server (SLES)
- **Cluster management software**
  - IBM Platform HPC; IBM Platform Cluster Manager; xCAT (Extreme Cloud Administration Toolkit); Moab Adaptive HPC Suite; Moab Adaptive Computing Suite; IBM General Parallel File System (GPFS) for Linux; IBM LoadLeveler; IBM Parallel Environment

### Rack cabinets
- **5000 42U Rack Cabinet**
  - 79.5" H x 25.2" W x 43.3" D (2020 mm x 640 mm x 1100 mm); 574.2 lbs (261 kg)*
- **5000 25U Rack Cabinet**
  - 49.0" H x 23.8" W x 39.4" D (1244 mm x 605 mm x 1001 mm); 221 lbs (100.2 kg)*
- **iDataPlex 100U Rack Cabinet**
  - 82.4" H x 48.6" W x 33.2" D (2093 mm x 1235 mm x 844 mm); 385 lbs (174.6 kg)

**Power and cooling**
- Calibrated Vectored Cooling™, energy-efficient power supplies, low-voltage processors, IBM Power Configurator, Thermal Diagnostics

**Scalability**
- One management node is required and one redundant management node for failover is optional. A minimum of two and a maximum of 1,024 managed nodes are supported (optional software may limit supported nodes). This total can include up to 64 storage nodes. The maximum configuration is 1,026 nodes including compute, storage and management nodes. Larger configurations are available through a special bid process

**Services**
- Intelligent Cluster hardware installation is included at no charge on 100U, 42U and 25U racks
- HPC cluster software services and SupportLine for Linux and Windows Clusters are available as optional fee-based services
- Cluster Installation Support Services are available through the Cluster Enablement Team (CET) as optional fee-based services

**Warranty**
- 3-year parts, customer replaceable unit (CRU) or on-site labor, limited warranty, with individual nodes retaining the warranty and service upgrade offerings for that IBM machine type; optional warranty service upgrades
For more information
To learn more about the IBM Intelligent Cluster, visit:
ibm.com/systems/x/hardware/highdensity/cluster/index.html or contact your IBM representative or IBM Business Partner.
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This equipment is subject to FCC rules. It will comply with the appropriate FCC rules before final delivery to the buyer.

* Weight is dependent on the nodes added and will vary when disks, adapters and peripherals are added.