IBM @server xSeries 440

Innovative technologies such as Active™ PCI-X, Active Memory™, Chipkill™ memory, Light Path Diagnostics™ and Predictive Failure Analysis® help provide the superior performance and reliability required to respond quickly to data center demands. These technologies are designed to let you scale, diagnose and repair with minimal disruption— protecting you from costly downtime.

XpandOnDemand scalability

The ability of the x440 to expand to changing needs helps IT administrators do more with less:

- *Scale quickly to greater SMP for better performance*
- *Get outstanding scalability from 2-way to 4-way SMP*
- *Achieve higher availability through more efficient partitioning and clustering*
- *Consolidate servers to lower costs and improve utilization.*

Highlights

- **■ *Award-winning[1] industry-standard server with outstanding up to 16-way performance***

- **■ *Enterprise X-Architecture™ technology delivers balanced processor, memory and I/O performance***

- **■ *XpandOnDemand™ scalability lets you pay as you grow***

- **■ *Enhanced high availability with three levels of memory protection***

Enterprise X-Architecture innovation

The IBM @server™ xSeries™ 440 is built with mainframe-inspired IBM Enterprise X-Architecture technologies that help balance high availability with high performance. The x440 is designed for maximum scalability and manageability.

Start with a base 4-way configuration and add incremental 4-way capacity as your needs grow—e-business on demand. This innovative, modular server architecture delivers investment protection without the upfront costs of expensive switch-based alternatives.

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XpandOnDemand provides a simple route to high performance using industry-standard hardware. Each x440 can scale from 2-way to 8-way in a single chassis (expanding beyond 4-way requires that all processors be the Intel Xeon Processor MP). Grow to 16-way simply by connecting two 8-way chassis. This capability enables you to add processing, memory and I/O capacity as your needs change.

The optional RXE-100 Remote Expansion Enclosure provides up to 12 additional Active PCI-X slots for added bandwidth without the expense of a full system upgrade.

XpandOnDemand provides outstanding flexibility because it allows the x440 to scale both UP and OUT.

- *Scaling UP is simple, because the x440 is an extremely rack-dense 16-way configuration. You benefit because the x440 you use today can continue to scale with your needs into the future.*
- *Scaling OUT is made easy for server consolidation using VMware™ ESX Server™, which can enable up to 64 virtual servers on one 16-processor configuration. Server capacity can be increased dynamically without all the costs normally associated.*

With exceptional expandability, the x440 is designed to match the changing requirements of high-intensity, high-volume, business-critical transaction workloads like customer relationship management (CRM), enterprise resource planning (ERP) and business intelligence.

High-octane performance
More than two dozen leadership benchmarks achieved in 2002 provide testament to this server's performance.[2] It is the first industry-standard server to introduce Level 4 cache, which can increase overall system performance. With 32MB of

XceL4 cache per 4-way, the x440 is able to exploit up to 128MB of Level 4 cache per 16-way SMP configuration—for a substantial leap in processing power.

The memory capacity of the x440 is impressive with up to 64GB per 16-way. Sufficient memory means that processors rarely need to exchange data beyond cache and main memory, resulting in fast execution. Consequently, you may be able to load entire databases into main memory for extremely fast transaction processing.

XpandOnDemand powers x440 16-way scalability.

Award-winning systems management

The x440 delivers OnForever™ avail-
ability features with a memory sub-
system that provides a remarkable
defense against downtime. Active
Memory offers industry-leading avail-
ability with features such as:

- *Chipkill memory allows multiple
  single-bit errors to be corrected
  using off-the-shelf memory–
  protecting your data and budget.*
- *Memory ProteXion keeps the server
  running smoothly by rerouting data
  in the event of an on-DIMM chip
  failure–enhancing the effectiveness
  of Chipkill technology.*
- *Memory mirroring protects data by
  writing simultaneously to inde-
  pendent memory cards–helping
  minimize downtime and lost
  productivity.*

Other self-healing and autonomic
capabilities help enable uptime with
minimal IT interaction. These include
IBM Director systems management
software, the award-winning suite of
proactive server tools[2], and the inte-
grated Remote Supervisor Adapter
(RSA), the computer within the x440
that monitors system health and
provides remote management.

When combined, these capabilities
power virtual 24/7 operations with
Predictive Failure Analysis to monitor
critical components and trigger alerts
before problems arise. Light Path
Diagnostics expedites repairs by pin-
pointing faulty components.

Enterprise operating systems

The IBM Datacenter Solution Program
offers you a wide array of services
and support for running Microsoft
Windows® Datacenter Server for
16-way SMP. Cost-effective
IBM @**server** xSeries Linux® solu-
tions provide reliable, enterprise
ready platforms that support the con-
stant uptime required for e-business
on demand.

Next generation today

The x440 changes the dynamics of
the industry-standard server market
by changing the way you view your
data center. Take advantage of the
revolution that is Enterprise
X-Architecture. Take advantage of all
that is the x440.

For more information:

World Wide Web

U.S.	**ibm.com**/pc/us/eserver/xseries/x440.html
Canada	**ibm.com**/pc/ca/eserver/xseries/x440/more_about.shtml

Reseller locator

U.S.	1 800 426-7777
Canada	1 800 426-7777

xSeries 440 at a glance

Form Factor	Rack/4U per chassis
Processor	Intel Xeon Processor MP up to 2.0GHz or Intel Xeon Processor up to 2.4GHz
Number of processors (min/max)	2/16 with Intel Xeon Processor MP 2/4 with Intel Xeon Processor
Cache (max)	2MB L3, 32MB XceL4™ Server Accelerator Cache/4-way for Intel Xeon Processor MP or 512MB L2, 32MB XceL4 Server Accelerator Cache/2-way for Intel Xeon processor
Memory (max)	64GB Chipkill™ for Intel Xeon Processor MP or 32GB Chipkill for Intel Xeon Processor
Expansion Slots	6/6 Active PCI-X, with optional Remote I/O
Disk bays (total/hot-swap)	2/2
Maximum internal storage	146.8GB[3]
Network	Integrated 10/100/1000 Ethernet
Power supply (std/max)	1050W 2/2 hot-swap
Hot-swap components	Power supplies, cooling fans, hard disk drives and PCI-X adapters
RAID support	Optional
Systems management	IBM Director, Remote Supervisor Adapter standard
Operating systems supported	Windows 2000® Server Family Edition, Linux® (Red Hat, SuSE), Novell Netware 6.0, Microsoft® Windows NT® 4.0 Enterprise Edition, VMware™ ESX Server™[4], Windows 2003 Server Family[5]
Limited warranty[6]	1-year onsite limited warranty

[1] "Award for Technical Excellence," in the Network and Enterprise Hardware category, PC Magazine, 12/24/2002, page 102.

[2] Denotes benchmarks that were achieved during 2002. Benchmark status often changes. For most recent benchmark data, visit **ibm.com**/pc/ww/eserver/xseries/benchmark/index.html

[3] PC Magazine Editor's Choice Award, October 2002.

[4] When referring to storage capacity, GB means 1,000,000,000 and TB means 1,000,000,000,000. Accessible capacity is less.

[5] IBM makes no warranties, express or implied, regarding non-IBM products and services that are ServerProven, including but not limited to the implied warranties of merchantability and fitness for particular purpose. These products are offered and warranted solely by third parties.

[6] Some software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply.

[7] For a copy of the IBM Statement of Limited Warranty, call 1 800 772-2227. Telephone support may be subject to additional charges. For onsite service, IBM sends a technician after attempting to diagnose and resolve the problem remotely.

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