Economies of scale

Interest grows in blade servers cut deployment, management costs

RLX Technologies' System 600ex Chassis, priced at $2,400, holds up to 10 of the company's server blades, and has high-speed connections and redundant power supplies.

BY J.B. MILES | SPECIAL TO GCN

What's the big deal about blade servers? Think small: in the size of the servers, in the number of cables and wires cluttering up the back of a rack, in the time required for setup and management, and—in some cases at least—in the amount of power consumed.

At the simplest level, blade servers are complete servers on a single card that plug into a rackmount chassis. They're hot-swappable—just slide them into the chassis and they're up and running in seconds. Hundreds of blades can fit into a very small space.

Theirs is a different arrangement from what most of us are used to with servers. A typical six-foot server rack in use today holds up to 42 1U rackmount servers, each 1.75 inches high. Because each server requires its own power cables, Ethernet and Fibre Channel controllers, software management module and keyboard/video/mouse switch, there's quite a bundle of cables, spare network interface cards, power sources and other paraphernalia to manage.

Blade servers promise to correct these problems, but will they deliver the goods?

A couple of new companies such as RLX Technologies Inc. and Egenera Inc., and some well-heeled computer manufacturers such as Dell Computer Corp., Hewlett-Packard Co., IBM Corp. and Sun Microsystems Inc., think they will.

Blade servers are cost-effective because they eliminate many of the complications of rackmount designs and pack a lot of computing power into small spaces. You need less technical expertise than with other servers, and they help eliminate the annoying cable clutter behind server racks.

There are different blade server designs—from dense, low-voltage models to high-performance, low-density versions. There also are a couple of proprietary, rack-optimized designs with some—though not all—of the features of blade servers.

Shared components

The term blade server typically refers to a proprietary chassis that can hold a number of hot-swappable blades that act as independent servers. For example, IBM's eServer BladeCenter is a 7U chassis that can hold up to 14 server blades for a total of up to 84 high-end servers in the rack.

What makes the blade server so efficient is that the chassis generally holds common components such as power supplies, fans, CD drives, Ethernet and Fibre Channel switches and system ports, all of which can be shared by the blades.

The server blades are smaller units that slide into the chassis' blade bay. As miniservers, they typically have one or two processors with associated RAM, one or two disk drives for storage and all the other components of servers—except for the common components built into the chassis.

Option blades, which may or may not come with a particular system, are generally shared by the server blades and provide additional features such as controllers for external I/O, or disk arrays or additional power supplies. Sun Microsystems' Sun Fire SSL Proxy Blade integrates accelerated Secure Sockets Layer encryption and decryption into the Sun Fire Blade platform.

Many processors

Blade servers use a fairly wide range of processors, from low-cost Pentium IIIs to high-performance Intel Xeons running at 2 GHz or faster. You should work closely with the vendor to determine which architecture and processors will be most efficient.

Blades with single, low-end processors can save users money on up-front costs and electrical bills if their workloads don't require lots of horsepower, such as for edge-of-network service like load balancing, firewalls or print and file serving, according to IBM.

For large, enterprise-class workloads, choose blade systems with high-end, dual chip sets—quads aren't yet generally available, though Hewlett-Packard just released the ProLiant BL40p series, too late for inclusion in the accompanying chart on Page 46. Prices for the quad systems range from $8,238 for a 1.5-GHz system to $18,268 for a 2-GHz system.

By most measurements, blade servers stack up well against other server architectures. Consider the following categories.

Scalability. Scaling a typical blade server generally involves little more than sliding a new blade into an open bay on the chassis. Via management software, the system configures it to the network, and boots from its own disk or from a network storage device. You can scale a blade server up or down without touching power, networking, serial or I/O cables.

Versatility. Advanced designs support a mix of blades with different types and speeds of processors. Enterprise workloads can be consolidated in one chassis, without the need for rackmount 1U servers and standalone servers to perform different functions.

High availability. Like conventional rackmount servers, blade servers include plenty of high-availability features such as redundant or hot-swappable components. But they take it a step further because the blades themselves can be hot-swapped. The more advanced servers can be designed so that there is no single point of failure.

Cost. Blade servers share power units, cabling, switches and other key components, resulting in lower initial and ongoing costs than other servers have. They generally use less power per CPU than standard servers, and can be running within minutes, saving technicians' time. They also require about half the floor space of rackmount servers.

Scaling a blade server is usually very simple. You can scale them up or down without touching power, networking, serial or I/O cables.

Industry analysts are optimistic about blade servers' future, but I'd carefully ponder the following points before jumping on board:

- To date, only a handful of manufacturers are shipping blade servers; it's difficult to make honest product comparisons or assess the potential success or failure of the new form factor. Manufacturers also have adopted different nomenclatures and widely different designs for their products.
- Blade servers are proprietary, so you can't just stick one manufacturer's blade into another's chassis and make it work.
- Check on how well a server's management software consolidates information from other network components. ■

J.B. Miles of Pahoa, Hawaii, writes about communications and computers. E-mail him at jbmiles@hawaii.rr.com.

The lowdown

- **What is it?** A blade server is a new type of rack-optimized server that eliminates the complications of rackmount designs. Hot-swappable blades, which are complete servers in themselves, can be inserted into a blade rack chassis in seconds and can share basic components like power supplies, CD-ROM drives, KVM switches, and Ethernet and Fibre Channel links.
- **When do I need one?** They are worth a look if you need to make the most of space, component savings and scaled performance. Blade servers can pack more than five times the servers per rack than 1U systems.
- **When don't I need one?** When you don't need the scalability on demand that blade server technology provides.
- **Must-know info?** This will be a shakeout year for blade server technology. By the end of this year, vendors will have expanded their product lines and blade servers will likely have gained a foothold among enterprise buyers. Keep in mind that blade servers are proprietary and each requires its own management software.

Cutting-edge blade servers can cut costs and power needs

Company	Product	Hardware features	Platforms	Price
Dell Computer Corp. Round Rock, Texas 800-293-3492 **www.dell.com**	**PowerEdge 1655MC Enclosure**	Two hot-swap redundant power supplies, built-in KVM switch, four hot-swap cooling fans, integrated ATI RAGE video controller, two Gigabit Ethernet switches, six internal Ethernet inputs for the blades, NAS or tape backup options	Win 2000 Server and Advanced Server, Red Hat Linux	$2,597
	PowerEdge 1666MC Blades	Dual 1.26-GHz or 1.4-GHz Pentium III processors, 512M RAM, dual 18G hard drives, dual integrated Ethernet, two Peer PCI buses, RAID controller, up to two SCSI drives per blade	Win 2000 Server and Advanced Server, Red Hat Linux	$3,502
Egenera Inc. Marlboro, Mass. 508-858-2600 **www.egenera.com**	**BladeFrame**	Configured system that creates a pool of up to 96 Intel processors deployable entirely through software; chassis has 24 two-way or four-way SMP processing resources, redundant central controllers, redundant integrated switches and redundant high-speed interconnects; processing blades are diskless and contain only processors and memory	Red Hat Linux	$200,000 up
Hewlett-Packard Co. Palo Alto, Calif. 800-727-5472 **www.hp.com**	**ProLiant BL e-Class**	Comes in two models: the 900-MHz BL10e and 800-MHz BL10e, each with 20 server blades per 3U enclosure, up to 1G ECC SDRAM per processor, ServerWorks LELP 3.0 chip set, 5,400-rpm or 4,200-rpm hard drives, two 10/100-Mbps Ethernet NICs, Integrated Administrator; enclosure has redundant hot-swap power and cooling modules	Win 2000 Server, Red Hat Linux, SuSE Linux, Microsoft .Net Server	$1,759
	ProLiant BL p-Class	BL20p, currently available, has two 1.4-GHz Pentium processors, up to 4G RAM, integrated Smart Array 5i controller, hot-swap Wide Ultra3 SCSI drive cage with 18.2G hard drive, 512M of SDRAM, and a maximum 48 blades per 42U rack; BL20p G2, available this spring, will have dual 2.8-GHz Intel Xeon processors and a Fibre Channel storage option; BL40p, also available this spring, will come with four 2-GHz Xeon processors, up to 12G RAM, maximum storage of 584G and up to 12 blades per 42U rack	Win 2000 Server, Red Hat Linux, SuSE Linux, Microsoft .Net Server	$2,336 per blade for the BL20p server; prices for the BL20p G2 and the BL40p to be announced this spring
IBM Corp. Armonk, N.Y. 800-426-4968 **www.ibm.com**	**eServer BladeCenter**	7U rack-optimized chassis, 14 blade server bays for up to 84 servers in the rack, cable reduction of up to 83 percent, XpandonDemand scale-out capability, up to four hot-swap and redundant switch modules supporting Gigabit Ethernet and Fibre Channel, up to four hot-swap and redundant load balancing power supply modules, high-availability ePlane for maximum uptime	Win 2000 Server and Advanced Server, Red Hat Linux, SuSE Linux, Novell NetWare	$2,789 up
	BladeCenter HS20	Optimized for the BladeCenter enclosure, up to two 2-GHz or 2.4-GHz Xeon processors, up to 8G of DDR ECC Chipkill RAM, support for two local IDE and/or two hot-swap SCSI hard drives, integrated dual Broadcom Gigabit Ethernet, two high-availability midplane connections, Predictive Failure Analysis, integrated Systems Management Processor, Light Path Diagnostics self-diagnosis panel	Win 2000 Server and Advanced Server, Red Hat Linux, SuSE Linux, Novell NetWare	$1,879 up
NextCom LLC Nashua, N.H. 603-886-3874 **www.atnextcom.com**	**NextServer 420**	4U rackmount enclosure, two backplanes, one to 10 hot-swap server blades, one hot-swap KVM switch blade, one management blade, two Ethernet feed-through switch blades, four fan trays and four to seven hot-swap power modules; server blades hold up to two 2.4-GHz processors, onboard 2.5-inch ATA100 IDE hard drive, dual Gigabit Ethernet ports, one management LAN port for the dual-processor version and one PCI-X add-on card slot	Win 2000 Server and Advanced Server, XP, Red Hat Linux 7.3, FreeBSD 4.6	$8,000 for chasis and one blade
RLX Technologies Inc. The Woodlands, Texas 866-759-9866 **www.rlx.com**	**System 300ex Chassis**	3U chassis, holds up to 24 server blades and up to 336 server blades per 42U rack, consolidated cabling, integrated management switch, hot-swap power supplies and server blades, network connect cards, network switches; supports the RLX ServerBlades 1200i, 800i, 1000t	Win 2000 Server, Red Hat Linux	$3,160 GSA
	System 100ex Chassis	1U chassis for six server blades (252 server blades per 42U rack), integrated management switch, hot-swappable, redundant power supplies; supports the ServerBlade 800i	Win 2000 Server, Red Hat Linux	$1,915 GSA
	System 324 Chassis	3U chassis, holds up to 24 server blades, up to 336 server blades per 42U rack, consolidated cabling, management hub card, hot-swap power supplies and server blades, network connect cards, network switches; supports any combination of RLX blades	Win 2000 Server, Red Hat Linux	$2,154 up GSA
	System 600ex Chassis	6U enclosure, holds up to 10 server blades, 24 100-Mbps Ethernet port management switch, with two 1-Gbps uplinks, dual 12-port 1-Gbps Ethernet switches, two-plus-one redundant 1500W power supplies, LCD display	Win 2000 Server, Red Hat Linux	$2,400
	ServerBlade 1200i	One 1.2-GHz Pentium III processor, up to 2G DDR RAM modules, one or two 2.5-inch Ultra ATA/66 disk controllers with drives (up to 60G capacity), dual drives support RAID, two integrated 10/100 Ethernet controllers, one integrated 10/100 Ethernet controller dedicated to management network connectivity	Win 2000 Server and Advanced Server, Red Hat Linux 7.2, 7.3, 8.0	$1,529 up
	ServerBlade 800i	One 800-MHz Pentium III processor, up to 1G DDR RAM module, one or two 2.5-inch Ultra ATA/66 disk controllers with drives (up to 60G capacity), dual drives support RAID, two integrated 10/100 Ethernet controllers, one integrated 10/100 Ethernet controller dedicated to management support	Win 2000 Server and Advanced Server, Red Hat Linux 7.2, 7.3, 8.0	$1,388 up GSA
	ServerBlade 2800i	Dual 2.8-GHz or 3.0-GHz Pentium 4 processors, up to 8G DDR RAM, 2.5-inch ATA/100 disk drive (60G or 80G capacity), dual 1Gbps Ethernet NICs, two 100-Mbps Ethernet interfaces dedicated to management support	Win 2000 Server and Advanced Server, Red Hat Linux 7.3	$2,400
Sun Microsystems Inc. Santa Clara, Calif. 650-960-1300 **www.sun.com**	**Sun Fire B1600 Intelligent Shelf**	Front-to-back cooling, passive midplane with dual Gigabit Ethernet fabric, separate management network, service indicator lights, dual power supply unit with independent fans, hot-swap switch, system controllers and power supply units, holds up to 16 blades	Solaris 8 Operating Environment, Linux	$4,795
	Sun Fire B100s Blade Server	UltraSPARC III 650-MHz processor, up to 2G RAM, up to two Gigabit Ethernet interfaces, two RS-232 serial ports, internal 30G 5,400 rpm Ultra ATA drive, single slot 3U self-enclosed blade, fits into 3U Sun Fire Intelligent Shelf	Solaris 8 Operating Environment, Linux	$1,795 to $2,995
Silicon Mechanics Inc. Seattle 866-352-1173 **www.siliconmechanics.com**	**SM-318B**	Rackmountable 3U enclosure, supports up to 18 blade servers per chassis, one 1.26-GHz Pentium III processor, Intel 815E or ServerWorks ServerSet LC-E chip set, up to 1G SDRAM, single 2.5-inch ATA hard drive, KVM/FDD/CD Module (takes two blade slots), system management port, daisy chain port, PS/2 Keyboard/Mouse ports, VGA port, three 10/100 Ethernet and one Broadcom 10/100/1000 Gigabit Ethernet port, 1,200W 4+1 redundant power supply	Optional	$5,640 per chassis, $1,117 per blade