

# SPARKING A SERVER REFRESH



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The last few years have seen tremendous advances in the computer market in general. And this is especially true in the area of servers.

Multi-core CPUs allow faster processing and multiple tasks to be performed simultaneously. More efficient chip manufacturing has produced smaller CPU cores, which use less energy and generate less heat while working faster at lower clock speeds.

Better power management and more efficient power supplies mean greener devices that cost less to operate. And typically new machines offer the opportunity for greater cost control for maintenance and repair.

Today's servers are more affordable, powerful and reliable than they were just a few years ago. And they do more: New technologies such as virtualization allow a single piece of hardware to handle workloads that previously required five, 10 or more servers.

In today's purchase-averse times, it can be tempting to delay a hardware refresh another few months or another year. But even if your current servers are working well, and aren't overloaded, accelerating rather than delaying your company's server refresh can prove advantageous.

### Reasons to Refresh

With all this power now available, small businesses should ask themselves whether they might benefit from upgrading their servers. As advanced as the technology is, the big question is, what does this mean for my business?

Buying new machines can actually save on IT budget, with the initial expenditures recouped in 24, 12 or even six months. And a new server environment can improve a company's ability to do business and enhance competitive position, which can be far more valuable than IT dollar savings or the cost of a server refresh.

"Whether you're the CEO of a Fortune 100 company or of a four-person firm, you don't wake up and think, 'I'm going to buy a server today, what can I use it for?'" says Greg Schulz, senior analyst of StorageIO. "You buy a server in response to some issue, some pain point."

There are a slew of reasons why companies refresh their servers. And within the past year or two, new reasons have surfaced for making a move sooner rather than later.

The traditional server refresh cycle has been between three and five years. Still, some businesses will retain servers for six and even seven years. And some will keep them until they "die."

Regardless, the speed of improvement in server technology — new generations roughly every two years — and increases in utility costs are providing additional reasons to shorten these cycles. Here's a look at some of the leading reasons that businesses do a server refresh.

In 2010, the number of virtual servers will surpass physical ones, according to IDC. In an April survey, 42% of respondents reported that they would move to virtual servers to lower their IT costs.

### New CPUs

One of the biggest changes in computing over the past couple of years has been the ability to put two, four or more processing cores onto a single chip. Multiple cores means that instead of splitting power between two or more applications, several processes can run at the same time.

And they can be threaded so that processes run at the same time on separate cores. These cores can be stacked together in the CPU, making even more power available while using only a single motherboard socket.

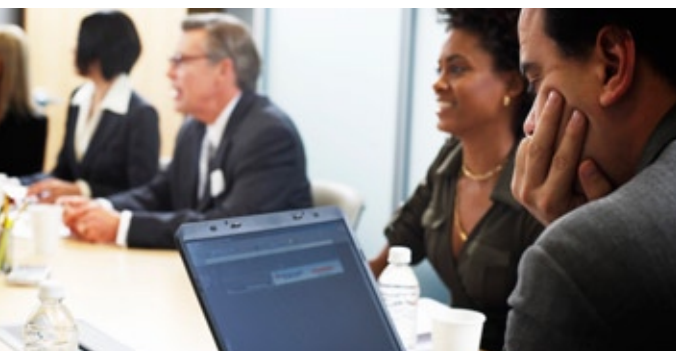
Although by now, most computer users are familiar with multi-core CPUs in their desktop computers, both AMD and Intel have introduced separate lines of multi-core CPUs for servers — the AMD Opteron and Intel Xeon. According to the respective manufacturers, the processors are designed to deliver performance, scalability, energy efficiency, manageability and longevity.

Both manufacturers designed their chips for incredibly fast throughput, advanced power management and optimized business functions. The idea is to dramatically set them apart from chips intended for desktop computers.

For example, the Intel Xeon Processor 5600 series, available with either four or six cores, uses intelligent monitoring to adjust power consumption and server performance on the fly, ratcheting up during periods of high demand and powering down unneeded resources when demand drops. This allows chips at the lower end of the model line to run on as little as 40 watts of power — about what it takes to run a refrigerator light bulb.

Intel has also added hardware-based encryption acceleration to help speed secure transactions and its Trusted Execution Technology to help prevent malicious software from executing on servers. With clock speeds from 1.86 gigahertz to 3.46GHz per core, one Intel Xeon 5600 processor can do the work of up to 15 single-core servers.

AMD's latest server line provides a burst of power as well. The eight- and 12-core Opteron 6000 Series offers plenty of capacity for high-demand applications such as e-commerce or virtualization. Optimized for dual- and quad-CPU systems, each CPU includes an integrated memory controller with AMD's Direct Connect Architecture, allowing processors to access the memory of the other CPUs when needed to support demanding processing tasks.



For almost any business task, servers running either an Opteron 6000 or Xeon 5600 offer a dramatic increase in capability over comparable CPUs from a few years ago. "Just about anyone running an older server will see a quantum leap in performance when they look at new servers today," says Krista Satterthwaite, manager of ProLiant product marketing at HP, whose ProLiant server line includes models using both of these CPUs.

Given these chipsets drastically reduce energy consumption and increase processing power, one Opteron or Xeon server

can replace a whole rack of older servers, while maintaining an environmental footprint smaller than just one. "It could actually be costing companies to stay with the older technology," Satterthwaite points out.

### Real Benefits

For many small companies, an upgrade can lead to significant — and fast — cost savings, even given the initial capital expenditure. Why? Because they will gain the ability to consolidate applications onto a single device, manage everything through a single interface and reduce energy costs.

"We've got HP ProLiant servers now that can give a two- or three-month ROI compared to the servers we were shipping just a few years ago," Satterthwaite says. Plus, declining manufacturing costs combined with cooler-running, lower-energy CPUs, that require small power supplies and inexpensive cooling equipment, has resulted in a steep drop in pricing for the newest servers.

For example, Lenovo's ThinkServer line for small businesses starts at around \$400 for the base-model TS200v — about the price of a high-end netbook. And, even low-end new servers can outperform only slightly out-of-date units. "The TS200v is about two-and-a-half times faster than a two-year-old single socket server," says Kumar Majeti, Lenovo, director of ThinkServer marketing."

It is hard to overstate the difference in energy costs between older servers and new models. "Today's servers are more energy efficient than ever," says Charles King, principal analyst for Pund-IT Research. "It's not unusual to find servers that can deliver magnitudes better performance on a fraction of the energy of a machine four or five years ago." Savings of \$100 or more a year per machine in energy costs alone are not uncommon, King notes.

What's more, given the current pro-sustainability business environment, IT will find it easier to justify moving to more efficient equipment. "There's money on the table," Schulz says. "You may well be eligible to go to your energy provider and get a rebate, a refund or an incentive check for becoming more energy efficient."

The energy savings are compounded when a company leverages all its computing power to implement virtualization. This allows it to consolidate the work done by several separate machines onto a single server.

Especially in a small business, it's common for an application to use only a fraction of a server's potential. But on older machines, the server runs full-tilt whether it's using 10 percent or 90 percent of its capacity.

By consolidating various services on a new machine, "You have a more cohesive set of tools," says HP's Satterthwaite. "You can see and manage everything through the same console, using tools that are optimized to work together."

Multi-core processors are ideal for virtualization, which means applications can run side-by-side on one machine with a processor core all to itself. A six-core processor can easily do the work of six single-socket servers from a few years ago.

"Virtualization today is common currency across businesses of every size," King says. "It's easier to deploy than ever before. On some of these new Xeons, we've heard of companies stacking up to a dozen applications on a single machine."

Fewer machines means more efficient use of office space. What would have taken a rack of servers a few years ago can now be done on a single tower using virtualization. And what would have required a full data center can today be done with a handful of rack-mounted servers.

### Server Refresh Strategy

Although big enterprises often set refresh cycles to replace their servers after a three- to four-year timeframe, small businesses are more likely to take a situational approach to server upgrades. They tend to seek improved performance when they outgrow existing equipment — not before.

The result: a horribly inefficient way to address growth and future-proof the infrastructure. “Just throwing money at problems as they arise isn’t possible anymore,” King warns. “It’s important for small businesses to realize that coming up with a plan, figuring out what kind of applications you’re operating, and knowing what the management and support is costing you is a really important thing for small businesses to do.”

This is crucial if a small business wants to avoid outgrowing its equipment too often, forcing it to buy new servers. At the same time, it can help protect against over-buying as well, installing far more capacity than a business can effectively use.

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Finally, knowing what you need now and what you expect to need in the future can save the hassle of trying to manage a hodge-podge of machines accumulated on a catch-as-catch-can basis. Solving issues as they arise can be an inefficient approach to IT refresh.

In the end, choosing whether and when to upgrade boils down to having the right information, says StorageIO’s Schulz: “Have an understanding of your needs and requirements, know what you want to accomplish, know what resources you have available, and be an informed shopper.” ■

## Your First Server

In the early days of a business, the technology infrastructure can be the last thing anyone wants to worry about or spend money on. Small companies with a handful of workers often make do with discount consumer-grade equipment and second-hand gear, using machines for tasks they were never designed to handle.

At some point though, the years-old desktop computer repurposed as a file and print server or the database running in the background on the receptionist’s desktop becomes more of a liability than a cost-saving measure. Although desktop systems can be pushed beyond their intended operating limits to a degree, they simply aren’t meant for heavy use and 24x7 uptime.

Today’s servers are often in the same price range as a decent desktop, and in the tower form factor even look like any other desktop. But with faster memory and error-correcting, redundant power supplies and cooling systems, and Redundant Array of Independent Disks (RAID), they can handle a heavier workload. These tools help prevent downtime and protect data if problems do occur.

There’s no one-size-fits-all answer to the question of when a business should consider getting its first server. It is not a simple matter of how many computers are on your network, how many people work for you, or how many customers you serve. Different businesses have different needs, growth rates and kinds of data that need protection.

“Data becomes complex enough that you can no longer easily manage it,” says IBM’s Bob Galush, vice president, IBM System x High Volume Servers and Options. “At that time you ought to start looking at a server.” Galush offers a simple rule of thumb: “When the loss of data would create an event large enough that your business is at risk, you need a server to protect your data.”

When your monthly orders become too unwieldy to photocopy by hand, when your contacts database changes too rapidly to back up effectively, when an hour’s downtime starts costing thousands or even tens of thousands of dollars in lost business and employee productivity, it’s time to retire the dusty old machine under the administrative assistant’s desk and invest in a server.

Basically, it’s a matter of growing with your business. “Small businesses are interested in taking care of their customers and clients,” Galush says. “They don’t have a tremendous amount of time to worry about IT. That’s understandable, but there comes a time when they have to protect the enterprise.”