

5 ways to future-proof your infrastructure

Growth is good. Outgrowing your infrastructure isn't. Here are five proven techniques for staying a step ahead of escalating demands on your data center.

BY RICH FREEMAN

Illustration by Keith Negley

Little is certain in the IT world, except perhaps this: However great the demands on your infrastructure today, they'll be greater 12 months from now. Not convinced? Consider the following:

■ **Businesses and consumers worldwide will collectively generate a staggering 988 billion GB of electronic information annually by 2010, according to Framingham, Mass.-based analyst firm IDC. That's about 18 million times the data in every book ever written. No wonder IDC says demand for storage capacity is growing at a rate of almost 60 percent a year.**

■ **Worldwide traffic on the Internet is growing 50 percent to 60 percent annually, according to the Minnesota Internet Traffic Studies, a research project sponsored by the University of Minnesota.**

■ **JupiterResearch, of New York, expects the global number of Internet users to reach 1.5 billion, or 22 percent of the world's population, by 2011.**

In short, the volume of data and users impacting corporate networks is growing explosively. Too bad the same isn't true of the average organization's IT budget. Staying on top of growth without breaking the bank is a challenge affecting companies of every size and in every industry. Fortunately, though, you can "future-proof" your infrastructure cost-effectively with the help of proven strategies such as these:

1. Virtualize Your Resources

Virtualization loosens the traditional one-to-one relationship between a server's hardware and operating system, enabling a single physical device to host multiple "virtual machines." Among other benefits, that enables several applications to share space on fewer, more powerful servers, empowering your infrastructure to do more work with less hardware. In addition, while procuring, configuring, and deploying a physical server can take days or even months, rolling out new virtual machines takes just minutes. "A couple of clicks, and you've got a server up and running," observes Mark Bowker, a data center transformation specialist at analyst firm Enterprise Strategy Group, of Milford, Mass. That makes virtual machines the ideal answer to rapid jumps in network traffic.

But don't just virtualize your operating systems. Virtualization technology can help you build scalability into other parts of your infrastructure, too. For example, Application Delivery Networking wares such as F5's BIG-IP products essentially virtualize your web and application servers, Internet links, and distributed data centers. BIG-IP Local Traffic Manager (LTM) functions as a single "virtual interface" to multiple back-end servers—even those hosting many virtual machines—enabling the network to distribute incoming and outbound traffic efficiently within your data center infrastructure. The upshot is an infrastructure that can handle heavier workloads with existing resources. The same principle is true if you have multiple links or data centers. BIG-IP Global Traffic Manager and BIG-IP Link Controller provide a single "virtual interface" for multiple data centers and links, respectively, making those resources look like one to users and applications. This capability enables an organization to direct traffic efficiently based on data center and link availability, performance, and the capacity of those resources. Similarly, file virtualization technologies such as those in the F5 Acopia ARX series of products uncouple a file's apparent location, as users experience it, from its actual location on your network. As a result, you can move files from expensive, Tier 1

storage devices onto less costly, long-term storage repositories any time you choose, without employees ever knowing the difference. Or you can get optimized use from your storage infrastructure by load balancing file storage across an entire pool of storage resources.

2. Consolidate Your Infrastructure

Virtualization is but one element of a broader push among businesses to consolidate their servers on bigger hardware. Consolidated infrastructures require less power, space, cooling, and management. Even better, they're more scalable. For example, F5's VIPRION Application Delivery Controller does the work of multiple devices, and its modular architecture makes adding capacity as easy as plugging in another processing blade. "You don't have to re-architect your network every time you need to grow it," observes Mike Krasnow, a product marketing manager at F5. "You can literally add capacity on demand."

3. Conserve Bandwidth

A 2007 survey by Boston-based analyst firm Aberdeen Group, Inc. found that 94 percent of companies worldwide expect their bandwidth requirements to grow in the next 12 months. However, intelligent proxy devices such as BIG-IP LTM and BIG-IP WebAccelerator can help you support more traffic without buying more connectivity. "When it comes to getting the most out of bandwidth, and improving application performance and user experience, the first rule of thumb is don't put data on the wire that doesn't need to be there in the first place, and compress the data whenever possible," says Erik Giesa, F5's vice president of product management and marketing. BIG-IP LTM and WebAccelerator use techniques such as compression, caching, Intelligent Browser Referencing, and TCP optimization to reduce unnecessary bandwidth consumption. In fact, according to F5 performance tests, BIG-IP LTM and WebAccelerator can reduce bandwidth utilization by more than 75 percent.

The result is often serious savings. For example, MSN Games, a Microsoft division that runs one of the world's largest and busiest Internet gaming portals, saves an estimated \$144,000 a year on network bandwidth charges, thanks to the BIG-IP system's bandwidth compression functionality alone.

4. Let Servers Serve

Servers work hard enough as it is. Why waste their processing capacity on tasks that other devices perform more efficiently? Authenticating users and encrypting SSL transactions, for example, are repetitive, labor-intensive chores for which your servers are overqualified.

Offloading such rote functions to Application Delivery Networking products such as the BIG-IP product family frees up server processing power. According to Giesa, companies that use the network instead of servers for just three or four resource-hogging tasks can trim the processing burden on their servers by as much as 50 percent. "That means 50 percent

Additional resources

Virtualization resources from the newsweekly Network World: www.networkworld.com/topics/virtualization.html

Solution center white papers from F5: www.f5.com/solution-center/white-papers

The MSN Games case study: www.F5world.com

TWO ADDITIONAL TIPS FOR DOING MORE WITH LESS

Technologies such as virtualization can help you scale an infrastructure quickly and cost-effectively. But James Staten, a principal analyst at Cambridge, Mass.-based Forrester Research, Inc., encourages IT managers to consider less technical strategies as well:

- **Optimize your operational processes:** Adopting proven, standardized IT management processes, such as those defined in the Information Technology Infrastructure Library (ITIL), can help network engineers respond to demand spikes faster—and with fewer gaffes. "Nothing is more expensive than human-error mistakes when you're trying to add resources to a popular application," Staten observes.
- **Outsource the overflow:** Expecting orders to surge during the holiday season? Consider temporarily supplementing your infrastructure with the help of an outsourced data center. Such facilities can free you from the expense of maintaining enough capacity to handle traffic flows you encounter only five weeks out of the year.

more capacity to run additional applications," he adds.

Deploying network solutions with built-in caching functionality can further help you reduce server utilization. Caching systems spare servers from having to continually process identical requests for frequently accessed content. "That way, the application server can spend its cycles giving out brand-new content," notes Alan Murphy, a technical marketing manager at F5. The impact can be substantial: F5's BIG-IP Fast Cache module cuts processing loads by up to 50 percent, while the dynamic caching functionality in F5's BIG-IP WebAccelerator lightens server loads by as much as 80 percent. This translates directly into reduced outlays for extra hardware.

5. Prioritize Workloads Dynamically

Allocating processing power intelligently is another great way to get extra mileage from existing infrastructure. Policy-based networking systems can help you ensure that your most important workloads are always first in line for server cycles. For example, using F5's iControl application programming interface, developers can create resource allocation rules that automatically keep mission-critical applications speedy and responsive, even when activity on less important systems is mounting. That can help you mitigate the effects of network traffic congestion without having to add servers.

Of course, strategies such as these are merely a starting point. Keeping pace with growth is a never-ending struggle, so the most important tip of all is to ensure that the technologies you deploy today will adapt to tomorrow's even greater requirements. That's why F5 designs all its products to make adding new functionality and extra capacity simpler. "We provide an architecture that allows customers to address their immediate pain point but know that as they build out, they're getting components that integrate and work together," Giesa says. No one can predict for certain what challenges future growth will bring, but F5 customers can at least take comfort in knowing they are armed to overcome them. ✨

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