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Page(s) 3 in print issue

Data Centers Face A Brave New World

Blades, Security & A Talent Shortage Make For A Complex Mix

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Corporate data centers remain a critical part of most large companies' IT strategy. While smaller servers and workgroup computing may be a valid solution for some functions, sometimes nothing but heavy iron and big disk farms will do for application deployment. But even inside the data center, change is coming.

One big change is the move from a single-sourced hardware environment to the anything-goes mixed-platform strategy common today. This approach offers a better choice of products and some resistance to single-point-of-failure problems, but it also has its perils, according to Stephanie Balaouras, a senior analyst in Yankee Group's Enterprise Computing and Networking practice.

"Most people have built their data centers with heterogeneous vendor equipment, from the servers to the storage to all the internetworking equipment, as well," says Balaouras. "[For] every different type of vendor equipment that you have, you have to launch a separate management console to configure, manage, and check the status of that device."

Rob Schaefer, senior program director at the Meta Group, agrees. "[Alternatives to mainframes] introduced low-cost, solid performance but also introduced management headaches [and] heterogeneity . . . and with that came complexity." He believes that complexity is increasing exponentially in the data center, notably as Windows and Linux servers join traditional mainframes.

Schaefer points out that the Internet has also raised the stakes, especially from a security standpoint. Twenty years ago, mainframe security was a knowable domain because there were relatively few technologies to understand. "Now you've got not only a heterogeneous area—where you've got Unix systems, the Desktop, Linux, everybody hammering at that mainframe, extracting data, and doing God knows what with it—but now you have the Internet." He considers security one of the primary concerns facing data center administrators today.

■ Keep Your Cool

In addition to adding diversity, the new generation of devices coming to data centers also has

vastly different infrastructure requirements. Schaefer is looking closely at the trends in power consumption and heat generation.

"Our view is that data center computing capacity overall—the total on-the-floor compute power—is growing at roughly 40% a year, certainly over the next five years or so," he says. And, according to Schaefer, there is no reason the trend won't continue in the future. "You're going to see an average square-foot power consumption at more than 100-plus watts per square foot. And let me tell you, with blade, 400 watts a square foot is just a starting point." Schaefer advises data center managers to focus on that issue as they build out their data centers.

Schaefer points to EMC as one vendor taking a proactive approach to the problem, but the recent change in the way data centers are designed may prove to be a stumbling block. "Ten to 20 years ago, everything was raised-floor, water-cooled, mainframe-based. That has all faded toward rack-mounted blades, etc., and raised-floor is becoming the exception and not the rule. The challenge there is, how do I add reasonable compute power efficiently from a power vs. thermal perspective?"

Balaouras also thinks that physical floor space is also becoming a daunting challenge. "Take storage, for example; a lot of these [devices] are refrigerator-sized equipment. A lot of it's rack-mountable, but it does take up a lot of floor space."

■ How Do You Back Up A Petabyte?

Storage has become ridiculously cheap, but with larger and larger disk farms, archiving and disaster recovery is no longer a straightforward proposition. At the same time, both analysts point to new regulations such as HIPAA and Sarbanes-Oxley, which have created onerous requirements for extensive archiving of just about everything a business does.

Schaefer reminisces, "In the old days, you had hierarchical storage management, a mainframe-based thing that's 20 or 25 years old. It's very straightforward. It's done on a time basis: 30 days, 60 days, 90 days. You archive it off the tape, and everybody is happy. Now you've got emails that are 90 days or nine years old that have to be back within a matter of days for regulatory reasons." Balaouras does the number on corporate email: "If you're a company of 5,000 employees, you're going to need at least 4TB of storage every year."

Those kinds of storage demands make traditional backup media impractical, but Schaefer says that there is a solution emerging. "Serial ATA has come out with 250GB, and by the end of this year, you'll see 400GB Serial ATA drives. At literally \$3 or \$4 a gigabyte and dropping pretty fast, that quickly gets into the tape arena, and you've got online access. It's certainly a lot slower than SCSI-based drives; it's certainly not as reliable as SCSI-based drives. So you back it up; you have duplicates."

■ The Human Touch

Beyond the hardware and software, the last big challenge may be the human one. Schaefer highlights a problem on one end of the historical spectrum: the aging of the mainframe workforce. "Our view is roughly 60% of [IT workers with] mainframe-based skills are 50 years or older and going to be retiring soon. The other side of that coin is that they ain't making any more of them. Nobody's going to CICS school anymore, you know." As a result, it may become difficult to find staff that can handle the older legacy hardware and software.

Things are challenging on newer technology, too, according to Balaouras. "Staffing is definitely tough. Most people aren't adding any actual staff, and what they're hoping to do is, instead of having staff who are [either Windows or Unix] specialists . . . they'd like to have like an integrated staff that manages both types." ■

by James Turner

Shared Facilities

Faced with all the problems that can plague a large data center, some companies simply throw up their hands and give all the worries to a third party, such as GE Capital Information Solutions, HP, or IBM.

The plus side is that someone else gets to worry about configuring and managing the data center infrastructure, according to The Yankee Group's Stephanie Balaouras. "Maybe you don't have the real estate to build a huge data center, but a lot of it could definitely be skill; having the ability to manage a multivendor data center is definitely difficult." She says that a more recent trend is to outsource specific applications, such as email, rather than the entire data center functionality.

The Meta Group's Rob Schaefer agrees. "There have been, you know, the war stories: It sounds good for the first couple of years, but then the out years are where the pains happen from a flexibility standpoint. But, that model is pretty well worn now. What you're seeing more and more is services that take on more than just running your infrastructure. They start taking on the application side. They actually start taking on the business process side."

He cautions that outsourcing comes with its own problems, however. Because a company becomes dependent on the outsourcer, and it is very difficult to leave once applications have become entrenched at a provider, an initially rosy situation may not be so attractive a few years down the road. "That's the problem; the outsourcer knows that, so the first year or two makes the guy look like a hero, and then by the time you're three to five years into it, the pain starts because you missed your projections by a few percentage points and it cost you an arm and a leg to change. Barriers to exit are too high, so you grin and bear it."