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Data Centers Boom

Modular Construction on the Rise as Cloud Services Grow

By **BEN WORTHEN**

Hewlett-Packard Co., Dell Inc. and others are increasingly embracing a faster and more efficient way to build data centers, the vast warehouses of computers that power the Internet and that are giving rise to the growing market known as cloud computing services.



i/o Data Centers LLC

Modular data centers can be built faster and more cheaply. An i/o data center module in transit, above.

Those companies have recently moved to building data centers in prefabricated modules much the way a real-estate developer might a suburban home. The approach has reduced the amount of time it takes to construct a center from as long as two years to 16 weeks in some cases. It also makes the data centers—which can run upward of \$100 million—more cost effective.

H-P last year shifted to the modular approach, rather than custom designs used in the past, when it started to sell prefab data centers to its customers. eBay Inc. made the shift in December when it announced the winner of a contract to build a large modular data center in Phoenix. Dell last week announced plans to build 10 new data centers around the world, which it said it will build using modules.

Building data centers in this fashion "will have a huge impact going forward," said Rick Einhorn, director of world-wide critical facilities service at H-P. He anticipates that 50% of all

new data centers will be built modularly, rather than custom designs, by 2013.

The shift comes as companies race to keep pace with demand for data centers.

The amount of commercial data-center capacity becoming available, which grew 5% in 2010, is projected to hit double-digit growth rates, up to 11% growth in 2014, according to Tier 1 Research. Meanwhile, Tier 1 said demand grew 13% in 2010 and is expected to keep growing above that rate into the future.

"The need now [for new centers] is outstripping the ability of custom to meet it," said George Slessman, chief executive of i/o Data Centers LLC, a Phoenix-based builder of data centers.

Cloud services, a catchall term for data and programs accessed over the Internet, is a large driver of that increase. The market for cloud services is expected to reach \$102.1 billion in 2012, up from \$68.3 billion in 2010, according to research firm Gartner.

Cloud services include streaming videos, online email programs, and corporate applications that are hosted on outside computers.

Companies like i/o used to build each of their data centers differently and on site, but i/o is now able to build 800 modules a year in its Phoenix factory. I/o will soon open its first data center built with the modular approach in Edison, N.J.

Mr. Slessman said it will be six weeks from the time i/o took possession of the building to the time the first customer is activated in the 831,000-square-foot center.

Modules are typically built in specialized factories, and include the servers and other computer equipment that run the data center, plus the wiring, power and cooling systems. They are loaded onto a flatbed when complete and more or less plugged in and turned on when they reach the intended location.

The modular data centers use the same components as custom-designed ones, such as servers, electricity, and cooling equipment. But companies estimate it is anywhere from 10% to 30% cheaper to build a modular data center, in part because of the assembly-line like approach.

Companies such as Sun Microsystems Inc., [Google Inc.](#) and [Microsoft Corp.](#) have long advocated so-called data-center-in-a-shipping-containers, where a bunch of servers are stuffed inside one of the boxes used to transport freight. While those containers have had success on a small scale, often with businesses or government groups looking to add some capacity quickly, the modular approach is intended as a way to build large data centers that can handle the most intensive computing demands.

"I compare it to Levittown, without the shoddy design part," said Rachel Dines, an analyst at Forrester Research, referring to the mid-20th-century planned community in New York that gave rise to the mass produced suburb.

Companies that have made the leap don't see any reason to go back to the old way. [Digital Realty Trust Inc.](#), a San Francisco-based company that builds data centers for Facebook Inc., Morgan Stanley and others, has used the modular approach to reduce the time it takes to build a data center to 16 weeks from two years, not counting the time it takes to rewire and repair a building. Digital Realty Trust first shipped its modules that include cooling and electrical capabilities in December.

Jim Smith, Digital Realty's chief technology officer, said it's cheaper to build a data center this way, and that by designing all the components the same, it can make it cheaper to operate over time, as well. "Demand is increasing so much that we are all coming up with new ways to meet that demand," he said.

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