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# DOD rolls out massive storage network with 17,000 ports

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**September 29, 2006** (Computerworld) The U.S. Department of Defense is finishing the deployment of a storage backbone with more than 17,000 Fibre Channel switch ports to link disparate storage-area networks (SAN) and increase security and resiliency while lowering costs.

Brocade Communications Systems Inc. is claiming that the SAN is among the largest ever built.

The project, which is now mostly completed, will give the DOD and its many branches greater ability to deploy storage as a service.

The SAN is composed of SilkWorm blade-type switches and about 30 SilkWorm 48000 Directors. In all, more than 500 switches from Brocade, in San Jose, are being used in the DOD's network.

The SAN will support multiple petabytes of stored data, Brocade said.

The SAN was designed with securely connected endpoints as well as to control access to the DOD's geographically dispersed storage arrays to safeguard highly sensitive data. The DOD has 6,000 locations in 146 different countries.

The DOD's existing storage network still has some Fibre Channel switches from Cisco Systems Inc. and had formerly included director-class switches from McData Corp., which were migrated out in favor of an all-Brocade network.

Shawn Landry, general manager of infrastructure services at reVision Inc., a Denver consultancy that is working with the DOD on the project, said he would not reveal a total budget for the project or how many users it would serve, but he said hundreds of thousands of government employees would benefit from the new infrastructure. The DOD's budget for this year was \$468 billion.

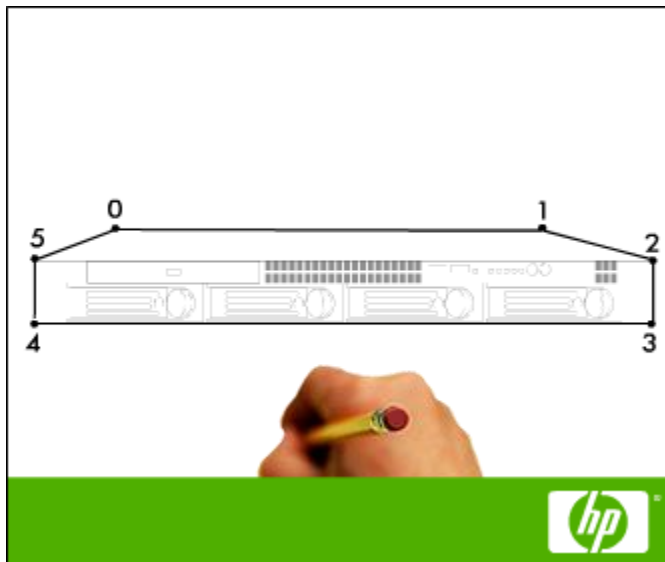
The DOD's new network architecture is designed in three tiers. The first tier connects the host storage and is made up of Brocade SilkWorm 3016 16-port Fibre Channel switches. The DOD hopes eventually to migrate off the 2Gbit/sec. 3016 switches to 4Gbit/sec. Brocade SilkWorm 4020 Fibre Channel switches, Brocade said.

The first tier of switches connect into a second tier that is made up of the Brocade SilkWorm 48000 Directors. The third tier consists of Brocade SilkWorm 48000 Director Blades, model FR4-18i.

The SilkWorm 48000 Directors have up to 256 4Gbit/sec. Fibre Channel ports for a total of up to 2.2Tbits/sec. throughput. The SilkWorm FR4-18 Director Blade features 16 4Gbit/sec. Fibre Channel ports and two Gigabit Ethernet ports.

The project's objective is to provide common IT services for departments within the DOD that have not traditionally worked together, Landry said. The departments can continue to have their own individual SANs, and the backbone enables departments to buy lower-cost options by virtualizing the SANs, he said. New services the backbone supports include disk-to-disk backup, which also allows the DOD standardize on a single backup product -- IBM's Tivoli Storage Manager, he said.

The project also allows the DOD to start looking at storage requirements from more of a business



perspective, Landry said. Previously, the IT departments within DOD were too far removed from business objectives and simply built storage networks to the highest specifications, he said. Now, the common infrastructure will help the departments understand the cost impact of their requirements, he said.

Government agencies have been looking at creating intra-department networks since at least the Sept. 11, 2001, terrorist attacks, when it turned out that data about the terrorists had been located in a remote office that was not accessible from the central office, said Charles King, an analyst at Pund-It Inc. in Hayward, Calif.

"The problem has been that multiple agencies have tended to act as opaque fiefdoms," King said.

By isolating data stores on a variety of computer and storage systems, it becomes more difficult to create a manageable heterogeneous environment, King said.

The concept of creating an aggregated storage architecture, such as Meta SAN, is interesting and unique, he said.

And managing a heterogeneous storage environment is not a problem limited to government agencies, King said. Many large corporations have similar problems, albeit on a smaller scale, he said.

Design for the DOD's Meta SAN project started four years ago. ReVision got involved in the project this past February. Landry said Brocade was chosen over two other major storage infrastructure vendors that he would not reveal. The DOD believes Brocade can do the best job of meeting the project's extensive scalability requirements, he said.

The next step will be to ramp up storage virtualization in the backbone itself, Landry said. Ideally, he would like to commoditize the DOD's storage arrays to the point where the backbone is agnostic of the array, and users could store data on multiple arrays without being aware of it, he said. But, to date, Landry does not believe virtualization options available today can scale to the level required. Landry said storage virtualization for the DOD is at least a year away.

By virtualizing the arrays, individual departments will be able to deploy lower-cost storage, and the DOD will also save money on support by having a centralized support organization for the backbone. Also, because they're developing storage as a service, individual departments will be able to track their own costs.

Landry said the project does not specify what types of storage the individual departments can use and that storage from essentially all the major vendors, including EMC Corp., Hewlett-Packard Co. and IBM, are represented somewhere in the DOD.

The SAN will also enable the DOD to provide more centralized support of storage throughout the agency, Landry said. Historically, few departments have had permanent, on-site storage expertise, he said.

The SAN now has its own staff -- some DOD, some from reVision and some from Brocade, though Landry did not know a total number.

"Everyone can get a level higher in expertise and support without actually paying that premium," Landry said.