# Scalable Storage

## Storage and Information Management Platform Lab

Enterprises, especially those focused on the web, have an ever-growing appetite for storage due to the huge amounts of digital information being created. Applications such as search engines and email, as well as video- and photo-sharing sites are generating, or consuming, masses of data – and it has to be stored somewhere.

Researchers at HP Labs, the central research and development arm of HP, are developing a data storage system to help enterprises meet the demands of the cloud computing era by offering a non-stop, fault-tolerant, self-managing platform. The HP Labs Scalable Storage project, aimed at enterprises that need in-house cloud storage systems, is developing a stand-alone appliance to provide storage as a service to multiple users, within or outside of an enterprise.

The initial prototype will have a few petabytes of storage capacity – one petabyte of storage is the equivalent of approximately 20 million four-drawer filing cabinets full of text.

A cloud infrastructure storage system must be inexpensive, easy to manage, reliable and readily scalable in capacity and performance across multiple sites. It must provide great flexibility, supporting more interfaces and offering greater control over its capabilities than current offerings. While there are existing storage systems that support some of these features, most are only available to their own developers, and none offers everything that is needed. The Scalable Storage project aims to deliver these requirements.

The Scalable Storage project is building a high degree of failure tolerance into the system to ensure that performance, availability and reliability remain high. This tolerance includes the ability to continue operation without loss even if an entire data center fails.

The team hopes to fulfill the needs of multiple "tenants" using the system simultaneously for different purposes. This requires delivery of different quality of service (QoS) levels to different tenants at the same time, as well as ensuring users are isolated from each other.

Another feature under investigation is function shipping – moving an application to the storage to perform a task, rather than moving the data to the application. If a few petabytes of data must be scanned to find a few items, moving the data to the client is likely to overwhelm the network. Instead, the system will be able to move the application to the storage so the scan can be carried out at much higher speed, close to the data.

Along with other HP Labs projects, the Scalable Storage project will use the open cloud computing research test bed, launched by HP, Intel and Yahoo!, to test and develop its technologies.

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