

Linux's Growing Role in Storage

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SAN, NAS, Fibre Channel or iSCSI, it all sits on an operating system. Sometimes that OS is UNIX, other times it's Windows, and in a growing number of cases it's now Linux as well.

Since no one seems to track storage OS market data, we asked vendors and analysts for their take on where Linux fits in the enterprise storage space, and not surprisingly, received varied opinions. Linux is in the enterprise storage space today, but how widespread it is and where its future lies is a subject that is open to debate.

"It seems to me that most, if not all, of the storage server suppliers are mum about what operating environment makes their system tick," said IDC research vice president Dan Kusnetzky.

IBM, for one, sees most NAS or SAN products as currently not being Linux-based.

"Most NAS products are UNIX-or Windows-based," IBM TotalStorage program director Pete McCaffrey told *Enterprise Storage Forum*. "A couple of startups use Linux, but the major SAN vendors are not using Linux."

Enterprise Linux vendor (and IBM partner) Novell is more upbeat about the use of Linux as an underlying enterprise storage OS. However, the true nature of Linux adoption by storage vendors is difficult for Novell to quantify, since they admittedly are not the vendor from which NAS and SAN hardware vendors are getting their Linux code.

"We don't have details since most NAS and SAN hardware vendors simply obtain Linux code from the Internet and do not go through Novell or Red Hat," said Novell storage product manager Richard Jones. "However, we do know of a number of appliances that are Linux-based just from interactions with IHVs: Xiotech, FalconStor and most all of the iSCSI storage array vendors, IBM, etc., are known to run Linux as the base OS under their storage appliances/arrays."

Indeed, Xiotech, the largest private storage company, made [headlines](#) recently when it abandoned its proprietary platform for Linux.

Network Appliance has found that Linux has become popular with some of its largest customers in the animation, financial and government industries that are using NetApp-based [NFS](#) on large Linux scale-outs.

"Linux is frequently chosen for large 'scale-out applications where a shared data environment we call a StorageGrid is implemented," said Eric Melvin, NetApp alliance manager to the Linux community. "Linux is used in these environments because other alternatives simply can not scale up effectively from either a price, performance, or manageability standpoint. NetApp complements all of these approaches to data serving with both NAS and SAN."

How Much Do Storage Users Notice the OS?

According to Kyle Fitze, SAN marketing director for HP StorageWorks division, customers don't really care what OS underlies a NAS system. In Fitze view, price, performance, ease of management and availability are what customers are most interested in, not the underlying OS. Linux holds a "Tier 1" spot inside of HP Storage's multi-OS strategy.

Novell Jones also doesn't think that end users ask for a specific OS, at least from an appliance perspective. Instead, the focus for end users is on features as they purchase an appliance, so they don't have to deal with an OS and the management of it. Outside of appliances, though, customer demand for Linux in certain storage segments is much stronger.

"From the OS perspective, for HPCC (high performance compute clusters) deployments, Linux is demanded as virtually the only OS requested for storage systems," Jones said. "For file-serving workloads, Linux is almost exclusively demanded for low-cost additive file server to an existing infrastructure; this performs the same function as NAS but not in an appliance form factor. For line-of-business workloads, Oracle's RAC is almost exclusively demanding Linux for both applications."

IBM also has seen Linux as a "hard requirement" in storage, although not with the same regularity as on the server side.

"We think there is interest, but there doesn't seem to be the same cost drive there was on the server side," McCaffrey said. "Customers seem to view it as a positive, but it's pretty rare, so they aren't asking for it."

Benefits of Linux-Based Storage

Linux-based enterprise storage solutions can offer benefits over other operating systems, such as file system performance and price points.

"For NAS environments, Linux offers higher native network file systems (NFS) performance and compatibility," Fitze said. "For SAN environments, Linux offers favorable price points and the knowledge that the OS is an open system not geared to a particular solution."

The open nature of Linux was also touted by Novell Jones as a key differentiator for the OS, noting that there are a number of proprietary operating systems that support enterprise storage solutions on the market.

"The fundamental value of Linux, in contrast, is the availability of additional software and tools to customize the solution," said Jones. "For broad hardware-independent support, Linux offers the broadest offerings with support of virtually all CPU architectures available, scaling from small handheld devices to very large systems. Its open nature allows vendors great flexibility in supplying value-added tools on top of the Linux-based storage solution."

The Growing Pervasiveness of Linux

Linux has become pervasive in certain server areas, such as the edge of the network, over the last few years, but its future in the storage space is harder to predict.

IBM's McCaffrey doesn't see Linux as becoming pervasive in the enterprise storage space, although he noted that over time it could happen as entry storage devices need lighter-weight operating environments to run on the controllers.

"The use of Linux will grow, but we don't see it being pervasive anytime soon," McCaffrey said.

On the other hand, HP sees Linux as already being pervasive on SANs.

"In terms of SANs, we are presently there," HP Fitze said. "Linux is looked at in the HP storage arena as a first-tier OS."

Michael Karp, senior analyst at Enterprise Management Associates, believes that Linux is already big in storage and becoming more so.

"I'm not quite sure that it will completely pervade the industry," Karp told *ESF*. "But I'm absolutely sure that it's going to represent a significant subset for the foreseeable future of the storage server market."

Article courtesy of [Enterprise Storage Forum](#).