Tintri adds all-flash versions of its hybrid storage systems ahead of planned IPO

TIM STAMMERS

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COMPANY MENTIONS (PRIMARY)

TINTRI

COMPANY MENTIONS (OTHER)

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Tintri has launched all-flash versions of its existing midrange hybrid storage systems. The new all-flash array (AFA) will run the same OS and inherit the same virtuesas the company's existing virtualization-friendly hybrid systems, which include per-VM management, QoS controls, a claimed ability to store large numbers of VMs, and in- line de-dupe and compression. List prices for the AFA start at a hefty $250,000 for 36TB of effective capacity. However, Tintri's customer base is heavily skewed toward large organizations, and the company expects those that have already deployed multiple hybrid Tintri devices will be interested in the AFA.

While Tintri claims that its hybrid devices deliver 99% of IOs from flash, the all-flash system will suit performance-sensitive applications that need the consistency of 100% flash. The company stresses that it fully expects its hybrid device to continue dominating its sales – reflecting the pattern in the overall storage market. It also says that it has been waiting for flash prices to reach their current level before launching an AFA.

451 TAKE

Many other vendors of hybrid storage have already made this move, and it makes good sense. Quite apart from the genuine merits of an all-flash option for some customers, it will also help keep doors open for Tintri. Other vendors have said that some customers are reluctant to issue RFPs to suppliers that do not include an option for all-flash storage – even if, in reality, they do not actually need it. Although we believe Tintri's new devices will find healthy sales, we do not expect them to present a major threat to specialist AFA vendors. However, the latter was not Tintri's intention, which was instead to offer a higher-performance option to meet some customers' needs, while continuing to lead its sales pitches with its hybrid devices.

CONTEXT

Founded in 2008 and based in Mountain View, California, Tintri shipped its first storage system in 2011. The company has raised $260m in funding, and the most recent $125m VC round was announced in August. Tintri says that will be its final investment round, and that it hopes to complete an IPO this year, if market conditions are right. Headcount is greater than 450, with 60 sales teams and 35% of revenue coming from overseas. Late in 2013, the company appointed Ken Klein as CEO. Klein previously ran Wind River Systems, an embedded software supplier bought by Intel for $884m in 2009. Tintri says its revenue during 2015 has more than doubled compared with last year, and that more than 800 customers have bought more than 2,000 Tintri VMStore systems.

UPMARKET FOCUS

Tintri operates further upmarket than rival startups in this sector – its target customers are enterprises and service providers. When the IPO happens, this may be significant. While fellow hybrid storage startup Nimble enjoyed a very successful IPO, and its market cap is currently a healthy $2bn, we note Nimble's claims to be moving upmarket as part of its move toward profitability. List prices for the existing Tintri hybrid systems range from $74,000 to $253,000, and the company says more than half of its customers enjoy annual revenues exceeding

$1bn, and six are in the top 15 of the Fortune 500. In March Tintri said that around 20% of its customers are service providers. Applications for Tintri's devices include mainstream IT workloads, such as test and development; Exchange, SQL Server, Oracle and SAP applications; and storage for virtual servers (VSI) and virtual desktop infrastructure (VDI). Tintri also recently released a set of specificationsfor OpenStack deployments, covering server and desktop virtualization, and private clouds.

VIRTUALIZATION-FRIENDLY STORAGE

Unlike the hybrid systems sold by storage incumbents, Tintri's devices were purpose- designed to combine flash with disk, rather than being disk-originated systems retrofitted with flash. This allows Tintri to make strong arguments that its systems use flash more efficiently, to deliver better performance. But this is part of a bigger Tintri claim – that its systems can store data for far more VMs than other systems in less physical space, and with simpler management.

Tintri's OS was designed specifically to store data for VMs, currently for VMware vSphere, Red Hat Enterprise virtualization and Microsoft Hyper-V, with VDI support for VMware Horizon View and Citrix XenDesktop. The Tintri OS includes a data layout and IO mechanism that supports large numbers of data objects – or more specifically, VM virtual disks and snapshot copies. Most rival systems were designed to handle much smaller numbers of data objects – or more specifically, data volumes, each of which contains multiple VMs. This limits the number of VMs they can handle. The number of VMs that vendors claim their storage systems can handle is dependent on multiple assumptions. However, Tintri's claims are noticeably larger than those of other vendors. For example, Tintri's largest hybrid system supports a claimed 3,500 VMs.

The same Tintri design principle also allows per-VM management of storage services, which greatly simplifies day-to-day administration. The difficulty of managing VMs stored within data volumes has long been acknowledged, which is why VMware launched a feature called VVOLs this year. In effect, VVOLs was designed to allowother storage systems to be retrofitted with per-VM management.

VVOLs is set to be widely adopted by Tintri's rivals, but 451 Research believes it will not significantly blunt Tintri's competitive edge. Instead, we believe VVOLs will be positive for Tintri, in part because it highlights the value of per-VM management.

There is also evidence that, for some existing storage systems, VVOLs will only enable per-VM management for a limited number of VMs without suffering significantly lowered performance. Again, this is because those storage systems were not designed to handle large numbers of data objects. Finally, there is not yet an equivalent to VMware VVOLS in Microsoft Hyper-V or Red Hat virtualization, for which Tintri also provides per-VM management.

In-line with its upmarket focus and support for large deployments including private clouds, Tintri provides a console that consolidates the management of multiple Tintri devices. According to Tintri, this provides unusually detailed analytics, down to the level of individual VM performance.

TINTRI'S QOS

Tintri began shipping QoS controls that provide an unusual ability to regulate the share of storage system resources taken by individual VMs this year. This is attractive in virtualized environments because of the IO blender effect and 'noisy neighbor' VMs – particularly for large deployments and service providers offering tiered, performance-based pricing.

Previously, Tintri claimed to offer QoS via per-vDisk IO queuing, which it says allocates resources much more efficiently than IO queuing in other storage systems.

In April it added explicit IOPS controls for individual VMs, or groups of VMs, via its multi-device management console.

TINTRI'S AFAS

Tintri's new AFAs use the same architecture as its existing dual-controller active- passive hybrid arrays, and share the same OS so that all the features of the hybrid systems now appear in the AFAs. The company says the flash-first design of its hybrid system – in which all data is written to flash before being later moved to disk – made it simple to create an all-flash device.

The Tintri hybrid systems already provide in-line de-dupe and compression. Furthermore, Tintri says they handle IOs in a flash-friendly way that minimizes write amplification, or the consumption of the finite write-life of flash.

The update to the Tintri OS allows the new AFAs to de-dupe data in flash at the block level, rather than at the VM level in disk, as the hybrid systems already did. Claimed data-reduction ratios for the AFAs average roughly 3:1 to 5:1, which is the sameas for rival AFAs.

Two Tintri AFAs will begin shipping this month: a 36TB device listing at $250,000 and delivering a claimed 120,000 IOPS, and a 72TB device listing at $370,000 with a claimed 200,000 IOPS. Those are effective capacities after RAID 6 and other overheads, and the effects of de-dupe and compression. That works out to a $7 list price per effective GB for the smaller device, and $5 for the bigger system. These prices appear high compared with other AFA vendors' claims of street prices as low as $1 per effective GB. However, price comparisons are heavily compromised by the different assumptions vendors make in their per-GB calculations, especially in the definition of effective capacity. For example, some vendors – unlike Tintri – include sizeable effects of thin provisioning on effective capacity. Tintri says that the more important parameter is price per stored VM, which it says is lower for its systems because of their ability to handle large numbers of VMs.

Both AFAs are 2U devices. Tintri plans to add expansion shelves during 2016. Currently, loads can be balanced across multiple Tintri arrays, or temporary application demands can be accommodated by manually moving VMs from one system to another. Tintri is developing automated load balancing movements across multiple systems – with manual confirmation – to suit large installations.

COMPETITION

The market for midrange primary storage is dominated by the hybrid disk-and-flash stand-alone SAN-attached storage sold by incumbent suppliers such asEMC, NetApp, Dell, HP and IBM. Among these, Tintri names NetApp as a primary target because of NetApp's strong presence in storage for virtualized servers and desktops. All of these suppliers are selling hybrid SAN-connected storage that was originally designed to be powered entirely by disk, and has been retrofitted with flash drives and policy-based tiering software. Per-VM management in these devices is also being retrofitted, via VMware's VVOLs framework, with varying results.

Tintri is not the first startup to see the opportunity to compete with such systems using hybrid storage that was instead purpose-designed to marry disk with flash. Although Tintri pioneered VM-level management, it is not the only startup to offer the feature without needing VVOLs. Others include NexGen and Coho Data.

The AFA market is crowded, competitive and fast-growing. The clear leader in the market in terms of sales is EMC's XtremIO device, but IBM, HP, Pure Storage and SolidFire each have a strong and growing presence, and there is much movement among other vendors. AFA pioneer Violin Memory is currently fighting back from a tough position with the addition of previously missing software-based storage services that had caused it to lose its leading position. Dell recently added an option to use low- cost triple-level cell flash in all-flash and hybrid versions of its SC storage system, and makes an interesting case that this will turn the tables on its rivals.

We expect that non-Tintri customers looking to buy an AFA will consider the above suppliers as first port of call. The most obvious weakness of Tintri's AFA is its high entry price and per-GB price compared with rivals. Also, Tintri's systems are not scale-out devices, unlike most other AFAs, and cannot provide block-level storage for nonvirtualized servers. However, as discussed above, there are major caveats to all per-GB price claims, and Tintri points to its per-VM pricing and its virtualization- friendliness. It also stresses that it will continue to lead its sales pitches with its hybrid devices.

STRENGTHS
Tintri has developed a product with distinct technical advantages, and built a sizeable and growing customer base.

WEAKNESSES
At $250,000 list price, the entry level for Tintri's AFAs is high.

OPPORTUNITIES
The cost of flash continues to fall, and customers continue to face growing storage performance problems. If Tintri can con-tinue to convince potential buyers that its purposedesigned hybrid storage is more effective than current OEM offerings, its sales should grow.

THREATS
Tintri has not yet reached safe ground or critical mass, and the overall storage market may fail to appreciate the potential limita-tions of VVOLs in legacy systems and the benefits of Tintri's virtualization focus.