

MARKET NOTE

Broad-Reaching IBM Storage Announcements Deliver Value for Existing and Prospective Customers Alike

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EXECUTIVE SNAPSHOT

FIGURE 1

Executive Snapshot: IBM Is Simplifying and Improving Its Enterprise Storage Offerings

In February 2020, IBM made a number of broad-reaching announcements in the enterprise storage area, including new storage systems that increase performance while reducing price, support for storage-class memory (SCM), and software enhancements. With nondisruptive upgrade paths from older IBM arrays to these newer systems, existing customers looking to make their storage infrastructure more compact and efficient will find much to like. These enhancements also make IBM storage more aggressively competitive against other enterprise storage vendors, not all of whom at this point support this level of infrastructure density (up to 18M IOPS and 16PB effective capacity in 8U) or SCM.

Key Takeaways

- IBM introduced five new storage systems — the 5100, 7200, 9200, 9200R, and the new SAN Volume Controller (SVC) engines — all of which are based on the new 2U IBM FlashSystems node “building block.” The company then brought its entire block-based primary storage portfolio under the “IBM FlashSystem” name (which also includes entry-level 5010 and 5030 arrays that will no longer bear the “Storwize” name).
- IBM also introduced support for SCM devices — specifically Intel Optane SSDs and Samsung Z-SSDs — which will be supported in mixed media configurations on the 5100 and larger arrays.
- This announcement makes clear that the long-term strategic storage platform for block-based primary workloads includes Spectrum Virtualize, IBM Storage Insights, and the new 2U “building block” used in all 5100 and larger systems. This “building block” can deliver storage latencies under 70 microseconds, throughput up to 4.6M IOPS, bandwidth of up to 45GBps, and up to 921.6TB of raw storage capacity — all in a cost-effective, power-efficient 2U form factor.
- IBM has also fine-tuned its overall narrative in other areas, including consumption model options, artificial intelligence/machine learning-driven cloud-based predictive analytics, customer experience guarantee programs, and multipublic cloud integration. This evolution makes it more clear how IBM is driving real value for customers in all of these areas.

Source: IDC, 2020

IN THIS MARKET NOTE

In February 2020, IBM announced a number of broad-reaching enhancements to its enterprise storage portfolio. The improvements cover a variety of different areas, including new systems, support for SCM devices, and streamlining its block-based primary storage portfolio. This IDC Market Note looks at these enhancements, calling out the benefits for both primary storage customers and IBM itself.

Announcement Summary

On February 12, IBM made a set of broad-reaching announcements around its open systems enterprise storage systems portfolio. This announcement includes new primary storage systems, new storage devices, enhanced bundled software capabilities, and improved support for containers in Red Hat Ansible, OpenShift, and Kubernetes-based environments:

- **New IBM FlashSystems.** Seven new enterprise storage systems, all intended for block-based primary storage workloads, were announced, including new IBM FlashSystem 5000s (5010, 5030, and 5100), a 7200, a 9200, a 9200R, and new SAN Volume Controller (SVC) engines. With the exception of the 5010 and 5030, all these systems use the new 2U IBM FlashSystem "node" (hereafter referred to as the "building block") that offers impressive performance capabilities (see next bullet point). IBM has also moved to 2U24 packaging for all its primary storage systems, although the 5010 and 5030 are using slightly different hardware than the larger systems.
- **Storage devices with improved performance and density.** IBM's FlashCore Modules (FCMs) are what most all-flash IBM FlashSystems use, and IBM has introduced a new larger capacity FCM (38.4TB) that enables them to house up to 921.6TB of raw storage capacity in just 2U (that's twice as much as before). IBM is also now supporting SCM in many IBM FlashSystems (not all).
- **Software enhancements.** The latest releases of both IBM Spectrum Virtualize and IBM Storage Insights (which now has broader support for non-IBM storage) are bundled with all of the new IBM FlashSystem portfolio (5010 through SVC). Container Storage Interface (CSI) snapshots were announced, improving the ability of Red Hat OpenShift environments to support snapshot-driven workflows like test/dev and data protection in container-based environments. Cloud Paks, which are enterprise-ready cloud software stacks based on Red Hat OpenShift, were also announced.
- **Price/performance improvements.** Performance improvements of up to 40% were announced, as were price reductions of up to 25%. Latency on systems that use the new building block are now as low as 70 microseconds. Taken together, these result in a nice uptick in price/performance, enabling customers to handle a given set of workloads with smaller, more compact systems that draw less power, use less floorspace, and are easier to manage.

With its announcement, IBM also laid out its updated narratives for hybrid cloud integration, data protection, cyber-resiliency, consumption model options, and customer experience/guarantee programs, enhanced in light of these announcements. There is a lot to digest in this announcement, all of which move the vendor (and its customers) forward on a number of fronts.

IDC'S POINT OF VIEW

While most of the announced features represent incremental improvements over preexisting products, there is a lot here that will make the lives of existing IBM customers better and easier. First and most evident is a refresh of most of its block-based primary storage portfolio, including the new 5100, 7200, 9200, and 9200R systems as well as new engines for its SVC platform. The NEBS-compliant 5010 and 5030 systems have stayed pretty much the same outside of a name change and some additional software that is now bundled with them (IBM Spectrum Virtualize and IBM Storage Insights). The new systems include both performance boosts and price decreases, adding up to a very nice price/performance bump for customers. The portfolio spans quite a range of performance and scalability – the entry-level 5010 starts at 380,000 IOPS and under 10TB of storage capacity, while the high-end 9200 can deliver up to 18 million IOPS and 180GBps of bandwidth per 4 node cluster, up to 16PB of effective storage capacity in 8U (assuming 5:1 data reduction) and deliver storage latencies as low as 70 microseconds using NAND flash media and SCSI host connections.

Second are some positioning adjustments to its block-based primary storage portfolio that make it more internally consistent and streamlined. In the past, all of the systems used the IBM Spectrum Virtualize storage management software, but IBM is now also bundling the Storage Insights product (IBM's artificial intelligence/machine learning [AI/ML]-infused entry in the cloud-based predictive analytics space) with all of the products. The use of these two software platforms (Spectrum Virtualize and Storage Insights) across the entire line provides a consistency not found among most of its competitors that have at least two or three different system types (and storage operating systems) in their primary storage portfolio. IBM is also now using the "IBM FlashSystem" name across the entire primary storage systems portfolio, which means specifically that we won't be seeing the "Storwize" name that had been associated with its lower-end systems anymore. It's notable that IBM did not refresh the A9000 systems with this launch and will in fact be phasing those systems out over the next several years (along with the Spectrum Accelerate software). There is no hurry (and there is a nondisruptive data migration path from the A9000s to the newer IBM FlashSystems), but A9000 customers will want to plan accordingly.

In 2019, IBM moved to a 2U24 packaging configuration, in common usage with many of its all-flash array (AFA) competitors, for its low-end 5010 and 5030 systems. Last year, the larger systems were still using the older 1U12 IBM FlashSystem node that was originally based on intellectual property acquired with the Texas Memory Systems (TMS) acquisition in 2012. The new building block is now based on NVMe and supports up to 24 2.5in. devices in 2U. With the introduction of an updated version of the building block, IBM is moving to the use of 2U24 packaging across its entire primary storage portfolio (which supports 2.5in. form factor devices). The new SVC engines are based on the new building block but don't actually include any storage (that is all externally connected). The 2U24 packaging used with the 5010 and 5030 is different than the one used with the larger systems, and it includes different array controllers, midplanes, and power supplies. The move to 2U24 packaging does, however, create more consistency across the line.

The new building block used in the higher-end systems is impressive, and it makes clear just how strategic IBM's acquisition of TMS really was. That acquisition resulted in IBM's first AFA, the IBM FlashSystem 840, which delivered NVMe-class performance in an enterprise storage system way back in 2013 (based on custom PCIe technology at the time). Based on this acquisition, IBM has been selling enterprise-ready NVMe-class arrays longer than any other vendor selling them today. Since then, the vendor has evolved the FlashSystems to incorporate actual NVMe technology, including various NVMe over Fabric (NVMe-oF) options. Depending upon model number, these systems can

accommodate 12Gb SAS trays, along with support for NAND flash-based off-the-shelf solid state drives (SSDs) and hard disk drives (HDDs) as well as NVMe trays, which can support both off-the-shelf SSDs and IBM's own custom memory modules (CMMs), dubbed FCMs by the vendor. Note, however, that the 5010 and 5030 support both SSDs and HDDs with 12Gb SAS, while the 5100 and larger systems are all based on NVMe and support only FCMs and SSDs (and SCM). The SVC Engine supports external storage, which can be of either the AFA or hybrid flash array (HFA) variety. The building block supports both SCSI and NVMe-oF host connections using a variety of transport options (Fibre Channel [FC] or Ethernet for SCSI and FC and Ethernet or InfiniBand for NVMe-oF) – varying based on the model number.

IBM's FCMs are NVMe-based storage devices that fit into a standard 2.5in. form factor drive slot. They are available in four different capacities – 4.8TB, 9.6TB, 19.2TB, and 38.4TB – and include hardware assist for data services such as compression and encryption (which enable these features to be used without impacting application performance). As these are custom devices, IBM designs the firmware for them, optimizing the devices for their hardware design and target workloads so that the FCMs deliver lower latencies (with storage response times as low as 70 microseconds), higher density, higher efficiency (as measured in watts per IOPS), and higher endurance and reliability (which results in a lower rate of media overprovisioning) than commodity off-the-shelf (COTS) SSDs. IBM's 38.4TB FCM also boasts a lower dollar-per-gigabyte cost than comparable 30TB COTS NVMe SSDs. Claims by other vendors that these advantages to custom designs would soon be surpassed by COTS NVMe SSDs have just not proven to be true so far. With its system design, IBM leverages NAND flash-based media to deliver storage latencies on par with some vendors' more expensive SCM offerings. All devices in the new building block are dual ported and hot pluggable.

Third, IBM is introducing SCM media options for the 5100 and larger systems. The supported SCM devices include Intel Optane SSDs and Samsung Z-SSDs. These are standard 2.5in. form factor devices, and they can be mixed and matched in the new building block with other storage device types. IBM's Easy Tier tiering software ensures that in these types of mixed media systems "hot" data is kept on the higher-performance media. Although most customers will probably not need the kind of performance these devices bring for at least the next year or two, it's nice to know that support is there now. Some of IBM's competitors still do not offer SCM options in their primary storage arrays, so this could be a differentiator (particularly for customers that need the heightened performance for workloads today). Although SCM is not widely used in the industry, IDC is seeing it deployed for real-time big data analytics as well as very performance-sensitive database environments.

IBM Keeping Other Customer Value Drivers Top of Mind as Well

IBM is continuing to improve its overall narrative about how it is driving value for customers with other key programs that have already been available. There has been a lot of focus lately on enterprise storage vendors offering a variety of consumption models to give customers more flexible purchasing options, and IBM is no different. The vendor offers four different consumption models – subscription, utility, lease, and outright purchase – that give customers the flexibility to choose the method which best meets their own needs. IBM also offers excellent cyber-resiliency through encryption, monitoring, snapshots, cloud and tape air gap options, and advanced cyberincident response.

Vendor guarantee programs have also experienced significant evolution in the past year. IBM's FlashWatch program provides data reduction guarantees (up to 5:1, depending on workload mix), all-inclusive software licensing (with Spectrum Virtualize and IBM Storage Insights bundled at no extra charge with all the systems), 24 x 7 support with four-hour onsite response, a lifetime solid state media guarantee (for all systems under warranty or maintenance), up to 90 days of free data migration consulting for IBM and/or non-IBM systems, and a controller technology refresh program with

guaranteed investment protection. IBM also offers a 100% data availability guarantee for HyperSwap configurations on those systems that support clustering. Given IBM's 5:1 data reduction guarantee, its 7200 and 9200 arrays can now support up to 4PB of effective capacity in just 2U and provide all the resiliency necessary to address fault domain size concerns.

With this announcement, IBM has clearly moved the capabilities of its enterprise storage systems forward for its own customers and made its solutions more aggressive in the marketplace. IBM's new systems offer up to 40% performance improvements with up to 25% price reductions. The new building block provides lower latencies for NAND flash-based devices (like its FCMs) than some of its competitors are achieving with more expensive SCM options and now supports SCM devices for those customers that need latencies below 70 microseconds. IBM has a good hybrid multicloud story, covering business continuity (with HyperSwap's 100% data availability guarantee), DevOps analytics (with mobile snapshots), cyber-resiliency (with air gap data copies, encryption, and rapid recovery through Spectrum Protect), and workload migration (which with Spectrum Virtualize supports over 500 different storage arrays as well as multi-public cloud). Improved deduplication in the cloud, support for Red Hat Ansible automation, and enhancements for container environments (including Container Storage Interface support) improve IBM's overall hybrid multicloud integration, rounding out an extremely capable enterprise storage offering.

LEARN MORE

Related Research

- *IDC's Worldwide Enterprise Storage Systems Taxonomy, 2020* (IDC #US45949020, February 2020)
- *Worldwide All-Flash Array Market Shares, 1H19: Share Percentages Are Evolving But Share Ranking Remains Stable Among Top Vendors* (IDC #US45620819, November 2019)

Synopsis

This IDC Market Note discusses IBM's February 2020 storage announcements. The improvements cover a variety of different areas, including new systems, support for SCM devices, and streamlining its block-based primary storage portfolio. This IDC Market Note looks at these enhancements, calling out the benefits for both primary storage customers and IBM itself.

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