

Why NEC earned the *Recommended* Ranking in DCIG's Evaluation of Small and Midsize Enterprise All-Flash Arrays

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NEC

COMPANY

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NEC Corporation
nec.com

North America (USA & Canada)
NEC Corporation of America
necam.com

NEC Enterprise Solutions
NEC Europe Ltd
nec-enterprise.com

APAC
NEC Asia Pacific Pte Ltd
sg.nec.com

Latin America
NEC Latin America
lasc.necam.com

Founded 1899

INDUSTRY

Data Storage

SOLUTION

NEC M310F All-Flash Array

DIFFERENTIATORS

- Connectivity and Capacity for Demanding Workloads
- Management Integration for Diverse Environments
- Data Protection
- Broad Operating System and Application Integration

All-Flash Arrays Meet SME Requirements

Small and midsize enterprises (SMEs) no longer need to wait: all-flash arrays (AFAs) targeted at them are shipping now. These AFA models provide many of the same availability, data management, and performance characteristics that larger AFA models offer with price points that better align with SME budgets.

The NEC M310F All-Flash Array exemplifies the latest generation of AFAs. For example, NEC simplifies M-Series deployments through a new all-inclusive approach to licensing. In terms of performance, the M310F delivers 300K SPC-1 IOPS, a 10x improvement over the prior generation M300 disk array, while consuming less space and power. This combination of NEC M310F features gives SMEs the motivation to act now so they may start experiencing the benefits that flash offers today.

DCIG Ranks NEC M310F All-Flash Array as *Recommended*

- **Connectivity and Capacity for Demanding Workloads.** The NEC M310F All-Flash Array provides 10GbE and 16Gb Fibre Channel (FC) interfaces for external network connectivity. NEC M-Series arrays provide native SAN protocol support and uses a NAS gateway appliance for unified storage capabilities. The M310F is one of three vendors ranked *Recommended* that utilizes 12 Gb SAS backend connectivity to SSDs unlocking performance and increasing bandwidth. The array scales up to 480 drives with a maximum raw flash capacity of 1.9 PB.
- **Management Integration for Diverse Environments.** NEC arrays integrate

seamlessly into any data center. These arrays simplify storage management through a unified interface and through integration with OpenStack, Microsoft Systems Center Virtual Machine Manager (SCVMM), SMI-S and VMware vCenter — including VVols.

- **Data Protection.** NEC arrays incorporate multiple strategies to protect critical data from loss and theft and. The M310F is one of four arrays ranked *Recommended* that employs synchronous replication. Replication can be configured at a datastore or VM level. NEC arrays protect data from theft by using self-encrypting drives (SED) and DoD-compliant data erasure technology.

“NEC’s versatile M310F All-Flash Array delivers the all-flash capacity and features to meet diverse business requirements.”

— Chuck Cook, DCIG Senior Analyst

- **Broad Operating System and Application Integration.** The NEC M310F has broad operating system support, including HP-UX and IBM AIX. It is certified for seven of the eight applications surveyed, including Hadoop and Oracle RAC. SAP HANA is an increasingly important business intelligence and analytics platform providing a real-time view of business operations. NEC is one of three *Recommended* vendors offering SAP HANA certified products. The M310F supports up to 8 SAP HANA nodes.

2017-18 SME ALL-FLASH ARRAY BULLETIN Overall Rankings

| RANKING | PRODUCT |
|--------------------|-------------------------------------|
| RECOMMENDED | NEC 310F All-Flash Array* |
| | Dell EMC Unity 500F All-Flash |
| | Dell EMC Unity 400F All-Flash |
| | Dell EMC Unity 300F All-Flash |
| | FUJITSU Storage ETERNUS AF250 |
| | Kaminario K2 All-Flash Array |
| | Pivot3 N5-1500 PCIe All Flash Array |
| | Pure Storage FlashArray //m50 |
| | Tegile T10KHD-100 |
| | Tegile T3800 |
| | Tegile T3700 |
| Tegile T3600 | |
| Tegile T3500 | |
| EXCELLENT | Dell EMC XtremIO |
| | iXsystems TrueNAS Z50 TrueFlash |
| | NetApp SolidFire SF9605 |
| | NetApp SolidFire SF4805 |
| | NetApp SolidFire SF2405 |
| | Nimble Storage AF7000 |
| | Nimble Storage AF5000 |
| | Nimble Storage AF3000 |
| | Pure Storage FlashArray //m20 |
| | Tintri T5080 |
| Tintri T5060 | |

Workload Consolidation is a Key to Unlocking Business Value

All-Flash arrays (AFA) are now replacing traditional enterprise storage arrays in mainstream businesses. These businesses purchase an AFA with the intention of accelerating all active workloads in flash. Product features that enable maximum workload consolidation are key considerations for these businesses. These features include:

- Unified storage (SAN and NAS)
- High performance FC and iSCSI network connectivity
- Quality of Service (QoS) features
- Broad hypervisor, operating system and application support
- Sufficient capacity, enhanced through inline deduplication and/or compression

Observations: **Overall**

Small and midsize enterprises (SMEs) require the same breadth of data services as large enterprises, but at a smaller scale. Therefore, it is not surprising that most of the products in this Bulletin are the middle models in their respective product families. These arrays possess all the features of the top models, but with lower maximum capacities. Some products are from companies that generally serve the midmarket but have discovered that AFA editions of their products enable them to extend their reach into the small and midsize enterprise.

* The licensing provider is listed at the beginning of each ranking category in which its products are included. One should not draw any negative inferences about any other products included in that ranking.

Observations: **Recommended**

While researching products for the *DCIG 2017-18 SME All-Flash Array Bulletin*, DCIG observed that the following characteristics and features distinguish *Recommended* arrays from other SME and Midmarket arrays:

- Unified storage
- Provide advanced QoS options
- VM-level replication

NEC is one of three vendors with a *Recommended* product that supports 12Gb SAS backend connectivity to SSDs unlocking performance with increased bandwidth. The NEC M310F All-Flash Array is one of four *Recommended* arrays that supports synchronous replication, and one of three that supports VMware Virtual Volumes (VVol).

The Dell EMC Unity products were released in May 2016, replacing the VNX line. These arrays provide unified storage in a single appliance. They support 15.3 TB SSD drives and, as a result, can provide up to 384 TB in just 2U. This impressive raw density is further enhanced through inline compression.

The FUJITSU Storage ETERNUS AF250 is based on the ETERNUS DX architecture and is one of three product families in this group that supports synchronous replication. The ETERNUS AF250 supports many of the data protection features surveyed and is the only vendor ranked *Recommended* that support the T10-PI standard for ensuring end-to-end data integrity. Automated QoS policies can be set based on maximum IOPS or by using pre-defined service levels.

Kaminario is one of three block-only arrays to receive a *Recommended* ranking. It is also the only array in this group that offers both scale-up and scale-out capabilities. The K2 currently supports up to eight rack-mountable controllers. Kaminario is also distinguished from most other arrays in this group through its support for optimized metadata handling, erasure coding, DRAM cache greater than 192 GB, 25 GbE connectivity, FIPS 140-2 certification and a 7-year warranty on flash media. QoS options include min/max IOPS or bandwidth and using pre-defined service levels.

In February 2016, Pivot3 acquired NexGen Storage and rebranded NexGen's NVMe-ready PCIe all-flash arrays. The Pivot3 arrays provide extensive automation and provisioning options. Pivot3 provides comprehensive QoS features including five pre-defined QoS policies to assign performance characteristics to each volume, and support for VMware Virtual Volumes (VVol) exposes these same policies on a per-VM basis within vCenter Server.

“NEC simplifies M-Series deployments through a new all-inclusive approach to licensing; while the M310F delivers 300K SPC-1 IOPS, a 10x improvement over the prior generation M300 disk array, while consuming less space and power.”

— Chuck Cook, DCIG Senior Analyst

The Pure Storage FlashArray//m50 array utilizes a chassis-based design allowing for modular expansion and upgrades for multiple hardware generations. The FlashArray //m50 is the only product in this Bulletin that integrates NVDIMMs technology, providing very low latency, high-bandwidth persistent memory. The FlashArray is one of two products in this group that supports more than 32 CPU cores, more than 192 GB of DRAM cache, and more than 16 storage networking ports.

Tegile IntelliFlash Arrays natively support block and file protocols in a single appliance and multiple virtual NAS. The arrays can also be scaled up by adding all-flash or hybrid storage shelves. Flash drives of 8TB are supported, and flash media is warranted for 7 years. IntelliFlash is caching-oriented rather than data tiering-oriented, and is the only product in this Bulletin that supports all surveyed flash-based caching methods.

Observations: **Excellent**

While researching products for the *DCIG 2017-18 SME All-Flash Array Bulletin*, DCIG observed that the following characteristics and features distinguish *Excellent* arrays from other SME and midmarket arrays:

- 12Gb SAS connectivity
- Provide advanced QoS options
- Inline data services

The Dell EMC XtremIO scales out from one to eight X-Brick clusters (16 controllers) supporting up to 320TB of raw capacity. XtremIO delivers essential VMware VAAI integrations and data efficiency technologies including thin provisioning, inline deduplication and compression. At Dell EMC World, it was announced that XtremIO would release add-on NAS support (thus providing a unified XtremIO platform) in 2017.

iXsystems TrueNAS Z50 TrueFlash is the only array ranking *Excellent* that offers unified SAN/NAS support. iXsystems provides inline deduplication and compression. The TrueNAS Z50 provides concurrent Fibre Channel (FC) and iSCSI support and is the only array ranked as *Excellent* which provides 40GbE ports. iXsystems provides remote monitoring and proactive remediation as part of its standard 3-year warranty.

The NetApp SolidFire SF-Series block storage system that scales out to 100 nodes. Single-node scaling allows organizations to expand gradually as business needs require. SolidFire automates storage administration via API's and ensures performance with guaranteed minimum, maximum, and burst IOPS settings. SolidFire's rich automation and QoS features reflect a focus on cloud service providers and enterprises adopting an ITaaS approach.

The Nimble Storage AF Series of arrays continues with Nimble's legacy of scale-up and scale-out capabilities, now in an all-flash configuration. The AF series arrays differ from one another in performance and capacity. Its cloud-based InfoSight predictive storage analytics service continually monitors Nimble arrays which set the bar regarding proactive support for the entire storage industry.

The Pure Storage FlashArray//m20 shares the same architecture as its larger sibling, the FlashArray//m50. It differs only in terms of slightly lower capacity and performance.

“Arrays ranked as Excellent distinguished themselves by providing advanced QoS options and inline data services.”

— Chuck Cook, DCIG Senior Analyst

The Tintri VMstore T5000 All-Flash Series arrays are VM-aware (or VM-centric) storage systems. There are no LUNs to manage with these arrays; all management including provisioning, replication and monitoring is done on a per-VM basis. The T5000 arrays are the only arrays in this Bulletin other than Pure Storage that indicated support for NVDIMM flash modules. Tintri VM Scale-out optimizes VM distribution across VMstore pools by monitoring performance and recommending actions for improvement.

Inclusion and Exclusion Criteria

A definition of “SME all-flash array” was necessary to prepare this Bulletin. The scope of IT requirements for small and midsize enterprises are like the requirements of large enterprises, but at a smaller scale. The following criteria were used when determining whether to include as a specific storage array from the DCIG Storage Array Body of Research:

- Must be marketed as an all-flash array (AFA). The best evidence of meeting this criterion is the existence of a specific all-flash SKU.
- Must use flash memory as primary storage, not merely as an extended cache. May permit storage expansion with disk shelves that contain HDDs or the virtualization of external disk-based arrays—essentially converting the all-flash array into a hybrid storage array.
- Must support one or more of the following storage networking protocols: iSCSI, Fibre Channel, InfiniBand, NFS.
- Provides features and capacities appropriate for small/midsize enterprises.

Disclosures

In that vein, there are several important facts to keep in mind regarding the information contained in this SME All-Flash Array Bulletin and its merit.

- No vendor paid DCIG any fee to research this topic or arrive at pre-determined conclusions.
- DCIG did not guarantee any vendor that its product would be included in this Bulletin.
- DCIG did not imply or guarantee that a specific product would receive a preferential ranking, before or after completion of research.
- All research was based upon publicly available information, information provided by the vendor, and/or the expertise of those evaluating the information.

- No negative inferences can be drawn against any vendor not included in the Bulletin.
- It is a misuse of this Bulletin to make comparisons between any vendor not ranked in the Bulletin versus any vendor ranked in the Bulletin.
- This Bulletin reflects DCIG’s independent research and opinion though the content developed for page one was developed specifically for the vendor licensing this Bulletin.

Because of the number of features analyzed and weighed, there was no way for DCIG to accurately predict at the outset how individual products would end up ranking. DCIG wants to emphasize that no vendor was privy to how DCIG weighted individual features. In every case the vendor only found out the rankings of its product(s) after the analysis was complete.

The Six-Step Process Used to Rank SME All-Flash Arrays

1. DCIG established which features would be evaluated and which ones would not. Prior to selecting the features which would be evaluated, DCIG quantified the features possessed by the products. As part of this process, DCIG “normalized” the list of available features such that a common name for each feature was established. In cases where a feature could not be objectively defined or understood, it was excluded from consideration.
2. DCIG completed a survey for each vendor’s product(s) and then sent the survey(s) to each vendor for verification. Each vendor was invited to review their data and respond with any corrections or edits to the DCIG-completed survey(s). In every case, every vendor had the opportunity to review and respond to any DCIG-completed survey.
3. DCIG identified a list of products that met the DCIG definition for “SME All-Flash Array” based on the inclusion/exclusion criteria.

4. *DCIG weighted each feature.* The weighting of each feature was done by a team of DCIG research analysts. The weightings were used to reflect if a feature was supported and potentially how useful and/or important the feature is to end users.
5. *Features were scored based on the information gathered from the surveys.* Features were marked as either “supported” or “unsupported/undetermined” and then scored accordingly. Rankings were finalized after any updates received from vendors had been entered.
6. *Products were ranked using standard scoring techniques.* One of the goals of this Bulletin is to establish clear lines of differentiation with conclusions that are arrived at objectively. To accomplish this goal, the mean or average score for all products was first determined and then the standard deviation. DCIG developed an overall ranking for each product based on where that product’s overall score fit into standard deviation ranges.

The full set of products and feature data may be accessed in the DCIG Analysis Portal available through DCIG’s website: www.dcig.com. ■

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