

Infinidat Doubles Down on All-Flash with InfiniBox SSA II

Infinidat confirmed its commitment to all-flash storage with the InfiniBox SSA II, the second all-flash version of its enterprise storage platform.

Along with performance improvements, Infinidat strengthened its cyber resilience capabilities and extended its AIOps management capabilities with its SSA II.

Overview

Unlike other major storage vendors, Infinidat did not rush into the all-flash market. Its original **InfiniBox** systems – which remain on the market -- use a mixture of hard disk drives, DRAM and flash as cache. Because it serves most I/O requests directly from DRAM, Infinidat's hybrid InfiniBox models can outperform many competing all-flash systems. InfiniBox also uses a machine learning caching algorithm called Neural Cache to increase caching efficiency and overall performance. InfiniBox utilizes a three controller architecture with up to eight drive enclosures. The controllers are interconnected using InfiniBand with RDMA access between them.

Infinidat kept that design for InfiniBox from its 2015 launch until June 2021, when it brought out InfiniBox SSA flash-only models aimed at mission critical workloads that demand the greatest performance. InfiniBox SSA included the same enterprise storage features and functionality of traditional InfiniBox storage but replaced HDDs with SSDs. The SSA uses two tiers: DRAM cache and TLC SSD back-end storage. InfiniBox SSA still uses Infinidat's Neural Cache with DRAM but the secondary SSD cache is no longer needed because of the full SSD backend.

Just 10 months after the InfiniBox SSA launch, Infinidat added InfiniBox SSA II with improved performance and cyber security features. Infinidat positions the InfiniBox as tier 1 storage and the InfiniBox SSA II for tier 0 workloads requiring low microsecond latencies.

With SSA II, Infinidat:

- Improved performance by adding 16 additional CPU cores on every controller node (48 more across the system), taking the total from 96 cores to 144 cores. It also added newer, faster cores (from Intel Skylake to Cascade Lake CPUs) and increased L3 cache to 35.75 MB from 22 MB. Infinidat reports customers are seeing speeds as fast as 35 microseconds of latency with SSA II.

Highlights

- SSA II is Infinidat's second all-flash storage system
- Improved performance with 48 additional cores, faster CPUs
- 35 microseconds of latency
- Adds InfiniSafe cyber resilience capabilities
- Expanded AIOps for DevOps, Kubernetes support



- Extended its cyber resiliency by bringing InfiniSafe technology to the InfiniBox platform. InfiniSafe combines immutable snapshots, logical air gapping, a fenced forensic environment, and near instantaneous recovery. InfiniSafe was previously available only on Infinidat's **InfiniGuard** secondary storage and data protection platform.
- Updated InfiniBox operating system – version 7.0 supports increased parallelism for additional cores and InfiniBand connectivity between nodes, and new algorithms for workload optimization.
- Launched InfiniOps portfolio through Infinidat's InfiniVerse management interface. InfiniOps includes **AIOps**, DevOps and Kubernetes support, combining monitoring, performance management and integration with 3rd party data center and AIOps packages, such as ServiceNow, VMware and Grafana AIOps.
- Added container storage interface (CSI) 2.1 support for Kubernetes across VMware Tanzu and Red Hat OpenShift environments, extending SSA II's support to containerized workloads.

InfiniBox SSA II Characteristics

InfiniBox SSA II comes in two models: the F4304T and F4308T. The only difference is the amount of capacity. The F4304T scales to 656 TB and the F4308T to 1.312 PB of usable capacity. Effective capacity is improved through the use of inline compression and space-efficient snapshots.

Both SSA II models include:

- 2.3 TB of DRAM
- 24 32 Gb/s Fibre Channel ports
- 12 or 10/25 Gb/s Ethernet ports
- 6 10 Gb/s Ethernet ports (optional)
- N+2 redundant system components, resilient against multiple concurrent failures
- Triple-active redundant controller nodes
- Data at rest encryption
- Immutable snapshots
- Replication between any InfiniBox and InfiniBox SSA model

Although no SPC benchmarks have been published, Infinidat quotes 2.3M IOPs and 38 GB/s bandwidth for SSA II. The Infinidat SSA II is NVMe-over-fabrics ready.

Cyber Security

Infinidat's InfiniSafe reference architecture is a series of guidelines for how customers can build a more cyber resilient infrastructure around primary storage.

Key Features of InfiniSafe:

- Immutable Snapshots
- Logical Local and Remote Air Gapping
- Fenced Forensic Environment using private VLAN connection
- Nearly Instantaneous Recovery

Immutable Snapshots

InfiniSnap enables immutable snapshots for volumes, filesystems, and consistency groups. The immutable snapshots cannot be altered or deleted within a set retention period. A snapshot's lock expiration data can be extended but not shortened. Snapshots may be read-only or writable, and each dataset can store up to 1,000 snapshots. To help with threat detection, admins can set capacity consumption thresholds on snapshots for alerts if a snapshot volume suddenly grows outside the average parameters – a sign of ransomware encryption. When alerted, admins can access and test the data and rapidly recover from the latest good snapshot.

Air Gapping

InfiniSafe's air gaps separate the data plane and control plane, either using a second InfiniBox SSA II in the same data center or on a remote system. Customers can replicate immutable snapshot to a remote site. InfiniSafe allows encrypted data to be replicated bi-directionally across sites with different policies and retention periods set on each InfiniBox device. This allows for longer data retention periods to be set in the DR sites, and cyber resilience tests can be run at each site.

Fenced Forensic Environment

Administrators can set up a private network for data validation, data forensics, and recovery. InfiniBox SSA II systems can be configured to move the data to a private V-Lan for the Forensic environment. By having a fenced area to test the data before it is recovered, you can avoid restoring a data set that has malware or ransomware.

Rapid Recovery

InfiniBox SSA II's N+2 architecture provides redundancy for high availability. Infinidat claims it can recover a last known good copy of data in minutes. Recovery speeds benefit from the system's

InfiniBand interconnections for remote direct memory access (RDMA) networking, intelligent caching, and heavy DRAM usage.

Consumption models

Infinidat offers three acquisition models across all its platforms (InfiniBox SSA II, InfiniBox, and InfiniGuard):

- Traditional purchase – Customer buys and pays for the system with maximum capacity up front.
- Elastic Pricing – capacity-on-demand model. Customers receive a system at full capacity but only pay for an initial base capacity and self-provision if they need more. They are billed in next monthly cycles for Burst Capacity or can expand their Base Capacity.
- FLX – storage-as-a-service purchase. All-inclusive subscription covers hardware, software licenses, warranties, monitoring and support. Customer adds capacity as needed.

Evaluator Group Opinion

The InfiniBox SSA II storage system is the next step of an evolution of architecture from the Israeli-American company headed by Moshe Yanai, who previously delivered EMC Symmetrix and IBM XIV systems.

The SSA II shows a continued commitment to solid-state technology, while competing with **Dell EMC PowerMax** (successor to Symmetrix), **Hitachi Vantara VSP** and **IBM FlashSystem 9500**. Achieving 35 microseconds of latency helps SSA II compete with those high-end systems by setting a new performance bar for the storage industry. The lower latency enables greater real-world application performance and allows enterprises to consolidate systems. Infinidat's 100% availability guarantee is another important consideration for enterprises. In Q3 of 2022 Infinidat will expand its guarantees, adding a performance guarantee and a cyber storage recovery guarantee.

Infinidat still considers InfiniBox with hard disk drives good enough for many workloads but now has an option for customers who demand the highest performance and lowest possible latency that can be achieved with all-flash storage.

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