

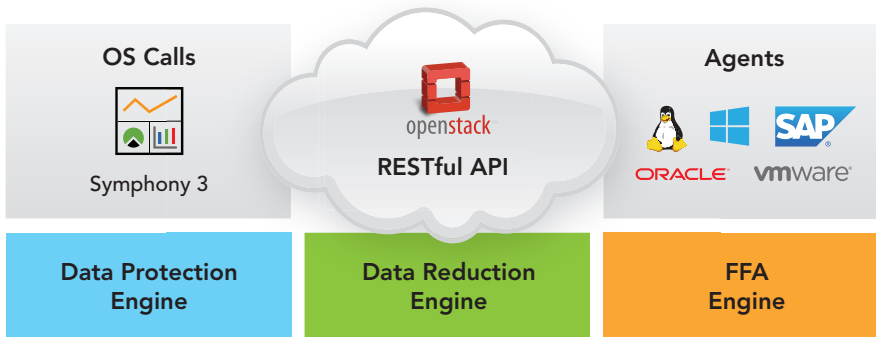
Flash for Primary Storage



The **Flash Storage Platform (FSP)** is the next step in the evolution of solid state storage. Violin Memory led the evolution of flash memory by breaking away from the old model of using hard disk drive technology to connect SSDs. We created the groundbreaking Flash Fabric Architecture (FFA), a new way of connecting to flash storage, using a design that has been created and optimized for reading from and writing to flash.

Now with the FSP, Violin is taking flash storage to the next level. The FSP is a single platform that brings all of the components of a complete flash storage system together in one vertically integrated solution. Violin's unique architecture allows us to connect directly with the flash instead of going through an SSD controller. The result is an array that delivers consistent low latency, high IOPS and high throughput which, along with data efficiency technologies that bring the effective cost of flash storage on par with legacy arrays, makes it the ideal solution for use as primary storage. No longer will you have to choose between storage cost and performance.

Concerto OS 7™



Concerto OS7, the single platform OS that drives the FSP integrates Continuous Data Protection (CDP), Stretch Cluster and LUN mirroring. Powered by our Data Protection, Data reduction and FFA engines, Concerto OS 7 delivers consistent low latency and high IOPS, making the FSP the right choice for primary storage.

The Flash Storage Platform is an industry first. It is a complete flash storage solution, designed from scratch, to deliver the best performance, storage efficiency, data redundancy and value. It is the first all flash storage solution that can store data at the same effective cost as enterprise disk arrays while providing the performance to be primary storage.



**SAME COST AS
LEGACY DISK ARRAYS**



**CONSISTENT
LOW LATENCY**



**ENTERPRISE
DATA SERVICES**



**SIMPLIFIED
MANAGEMENT**

Primary Storage at the Cost of Disk

Some people still talk about flash being expensive. While this may be true for some arrays, Violin has turned this upside down by making flash as affordable as enterprise disk. Now, data centers can use the Flash Storage Platform as primary storage to simplify multiple storage tiers into only 2 tiers: primary storage and archival.

To determine the cost of storage, rather than simply look at the cost per gigabyte, you need to consider what the cost is to use that storage. How does that storage perform? What is the amount of data it will actually hold? Storage cost is not just a matter of the price of the hardware, it is a function of how much data the device can actually hold and the real world cost of performing reads and writes. When comparing how deduplication and compression impacts storage and the speed at which data is delivered the result is the cost per transaction. Every time a user reads or writes from that drive, what is the cost of that transaction?

When considering the cost of actually using storage and what you get out of it, Violin is the obvious choice as the leader in both performance and value.



If You Can Store Your Data on Flash, for the Same Price You Would Pay To Store That Same Data on Disk, Why Wouldn't You?

| | Violin 7300 | SSD Array 1 | SSD Array 2 | Hybrid Array |
|-------------------------------|--------------------|------------------------|--------------------------|------------------------|
| Array List Price | \$340,000 | \$546,380 ¹ | \$568,262 ^{1,2} | \$551,650 ¹ |
| Array Raw Capacity | 17.5 TB | 20 TB | 22 TB | 20 TB |
| \$/GB Raw List Price | \$19.43 | \$27.32 | \$25.83 | \$27.58 |
| Sustained IOPS | 580,000 | 150,000 | 200,000 | 200,000 |
| Transactions/sec ³ | 14,500 | 3,750 | 5,000 | 5,000 |
| \$/Transaction/sec | \$23.45 | \$145.70 | \$113.65 | \$110.33 |
| \$/Transaction | \$0.39 | \$2.43 | \$1.89 | \$1.84 |

Up to 85% less \$/Transaction with Violin over SSD-based Arrays

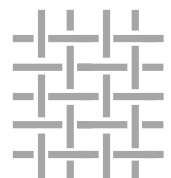
¹ Up to 85% less \$/Transaction with Violin a ¹Based on publicly available information as of January 12, 2015

² Discounted GSA pricing instead of list price

³ Assumes 40 I/Os per transaction

Flash Fabric Architecture™ – the Key to Consistent Low Latency

Violin Memory feels that to get the most from flash technology, you can't rely on SSDs. By creating a highly integrated design from the flash chips, to Violin's optimized cards, fabric backplane, controller firmware and data services and data reduction software you deliver what traditional architectures can't achieve. Flash Fabric Architecture enables low cost, high resilience, high sustained performance and control of the entire platform, from chip to GUI to achieve the optimum enterprise storage design.



Enterprise Data Services

An integrated, fully featured operating system that powers the FSP, Concerto OS7 delivers consistent low latency with high IOPS with new levels of functionality and ease-of-use through enterprise class data services. It provides application consistent snapshots, CDP and replication, granular block level dedupe and the best management in storage.



Business Continuity

- Remote asynchronous replication
- WAN Optimized Replication
- Automated App DR management
- Synchronous mirroring (Local & Metro)
- Zero RPO and RTO with stretch clusters

Data Protection

- Snapshots (app & crash consistent)
- Consistency Groups (snaps & replication)
- Continuous data protection
- Backup app integration
- Transparent LUN mirroring
- Encryption

Data Scaling

- Selective data reduction
- Online expansion of capacity
- Online LUN expansion
- Scale-up to over 422 TB raw (1.3 PB effective) capacity pooling in a single name space

Data Efficiency

- Snapshots (app consistent, writable)
- Thin Provisioning
- Thin Clones
- Graphical Symphony Management

All Flash Primary Storage

The 7300 Flash Storage Platform is the new workhorse of the data center, and is designed to provide primary storage in today's demanding enterprise environments. The software heart of the 7300 FSP is Concerto OS 7 which includes data reduction and Enterprise Data Services. The 7300 FSP is designed to be heavily loaded with a wide variety of workloads found in enterprise primary storage.



The 7300 FSP is Available in Two Models:

The 64 VIMM 7300 FSP has up to 70 TB raw capacity, and 217 TB effective for workloads that can deliver a 6:1 storage savings with data reduction.

The 32 VIMM 7300E FSP has up to 35 TB raw and 125 TB effective for workloads that can deliver a 6:1 storage savings with data reduction.

7300 Flash Storage Platform – New Levels of Consistent Performance and Data Efficiency

- Concerto OS 7 with integrated Enterprise Data Services
- Inline Granular Block Deduplication and Compression
- 7300 up to 70 TB raw, 221 TB effective capacity in 3 RU
- 7300E up to 35 TB raw, 127 TB effective capacity in 3 RU
- Fourth Generation Flash Fabric Architecture™ for improved consistent performance
- High workload capacity

Scale Up Primary Storage

The 7700 FSP has been designed to be modular for significant flexibility. The software heart of the 7700, just as with the 7300, is Concerto OS 7. The modular nature of the 7700 allows any combination of features as demanded by workloads or policy. Scaling up to 1.3 PB in a 24 RU space, with any combination of up to six shelves of FC 6000 AFA or 7300 FSP, sets new levels of data center density while fourth generation FFA provides the consistent sustained performance for primary storage.

The workload capacity of the 7700 is what generates the economic returns that make previous generations of legacy spinning or hybrid storage obsolete. You get more and pay less with the Flash Storage Platform from Violin.



7700 Flash Storage Platform – New Levels of Scalability and Cost Effective Storage

- Concerto OS 7 with integrated Enterprise Data Services
- Scale-Up solution for up to 1.3 PB effective capacity
- Mix and match any combination of FC 6000 AFA or 7300 FSP for up to 6 shelves
- Fourth Generation Flash Fabric Architecture™ for improved consistent performance
- Highest Capacity Workload
- Upgrade 6000 series arrays to 7700
- Upgrade 7200 to Concerto OS 7

Symphony 3

Violin's Symphony flash management console provides a single portal for managing petabytes of primary, flash-based storage across hundreds of Violin Memory Flash Storage Platforms and All Flash Arrays.

Symphony simplifies the storage management experience with user-selectable data services, real-time, SLA-based health monitoring, customizable dashboards and comprehensive reporting, all under centralized management and administration.



- Single Pane of Glass Management
- Performance, Capacity, Health and Data Services
- Personalized Dashboards
- Advanced Analytics; Custom/automated reporting
- Proactive Health Checks

Windows Flash Array

With record setting performance the Windows Flash Array is the ideal solution for scale out NAS environments. Designed jointly by Violin Memory and Microsoft, the Windows Flash Array is perfect for large, tier 1 NAS or NFS environments as the combination of Windows data services, SMB Direct, Violin Memory's Flash Fabric Architecture and Windows Storage Server 2012 R2 deliver game changing performance while reducing the CPU load for every workload.

Streamlined Storage

The ideal solution for those who simply want raw performance, the Violin Memory 6000 series All Flash Array delivers extremely high IOPS with sustained low latency for the most demanding environments. The family that redefined high performance storage, the 6000 series continues to deliver all the benefits that you have come to expect from Violin, including a highly reliable architecture designed specifically to deliver on the promise of solid state memory while maintaining reliability and long life for flash.



With the Violin Pay-as-you-Grow program you can choose just the right amount of high performance storage that you need now and grow your capacity as your needs change.

Pay-As-You-Grow

Violin Memory understand that your storage needs are going to change. You may want to take advantage of the benefits of flash storage for some of your applications now, while you may not yet be ready to upgrade your existing storage for other applications. That is why we offer the Pay-as-you-Grow option.



Violin's Pay-as-you-Grow option allows users to acquire the high performance flash storage that they need now and to seamlessly scale that storage and to align CAPEX with the value as it is received.

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