



Nimble Storage Introduction

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- Founded in January 2007; started shipping in August 2010
- Headquartered in San Jose, CA; operations in US, Canada, Europe, and Australia
- Over 600 employees
- Publicly traded – IPO on December 13, 2013

Fastest growing storage company...ever. Rapidly growing installed base of over 3,000 customers, 5,500 installations

Strong alliances with VMware, Microsoft, Cisco and CommVault

Leadership team brings deep industry expertise and business building experience

Hybrid SAN (SATA/SSD) – converge Primary, Backup, DR in same solution

Winner of the 2013 Best Hybrid Flash Storage Award



Where serious technology buyers decide

“...it's Nimble's balanced approach to performance, capacity and manageability that make it such a strong choice for Modern Infrastructure readers.”

--TechTarget



Nimble Storage won this award over 10 competing hybrid flash storage products.



- Tech trends available today
 - Multi TB Drives
 - Multi-core Processors
 - Solid State Disk – most disruptive in recent history
- Virtualization
- Customer challenge & requests when interviewed
 - Performance & Capacity in same storage box
 - Back up & DR in same solution
 - Easy to use & manage

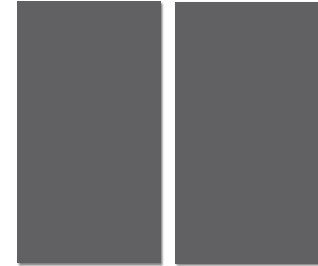
- **Incumbent: EMC VNX7500**
- **Core project drivers:**
 - **Minimize footprint (collocation charges)**
 - **Minimize capital costs**
 - **Better protection than daily backups**
- **Decision based on extensive multi-week testing**

Nimble:
6U; 32 drives



VS.

EMC Solution:
2 Racks: 300 drives



- **Colocation rental savings: \$10,500/month**
- **Capital cost savings: Over 50%**
- **Backup: From daily to Hourly snapshots**
- **DR: Replication integrated with SRM**

Mid-Atlantic Customers



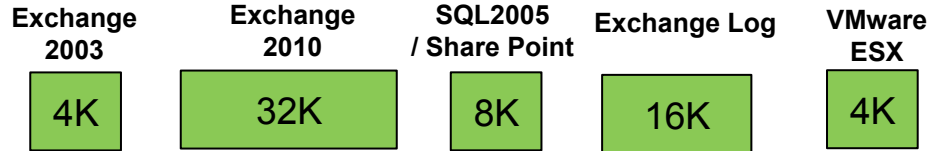
- University of MD, Baltimore County – UMBC
- University of MD, Shady Grove
- University of MD, School of Pharmacy
- University of MD, Facilities
- University of Baltimore
- Baltimore City Community College
- Howard Community College

- Many more across US....



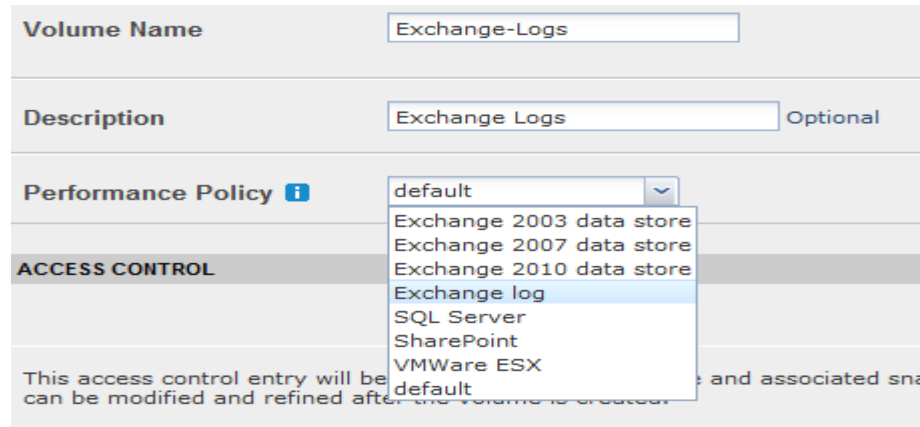
The Architecture

Variable Block File System




Performance Policies:

- 1) Match Application Block Size
- 2) LZ Compression
- 3) Cache



Volume Name: Exchange-Logs

Description: Exchange Logs Optional

Performance Policy : default

- Exchange 2003 data store
- Exchange 2007 data store
- Exchange 2010 data store
- Exchange log
- SQL Server
- SharePoint
- VMWare ESX
- default

ACCESS CONTROL

This access control entry will be... and associated sn...
can be modified and refined after the volume is created...

CASL - Cache Accelerated Sequential Layout

Data Comes into NVRAM

Application acknowledgement
Data Protection – Flash Capacitor

Data Integrity and Compression

CRC check sums that ensures application integrity
Data is LZ compressed 2-4X

Write Sequential Stripes to Disk

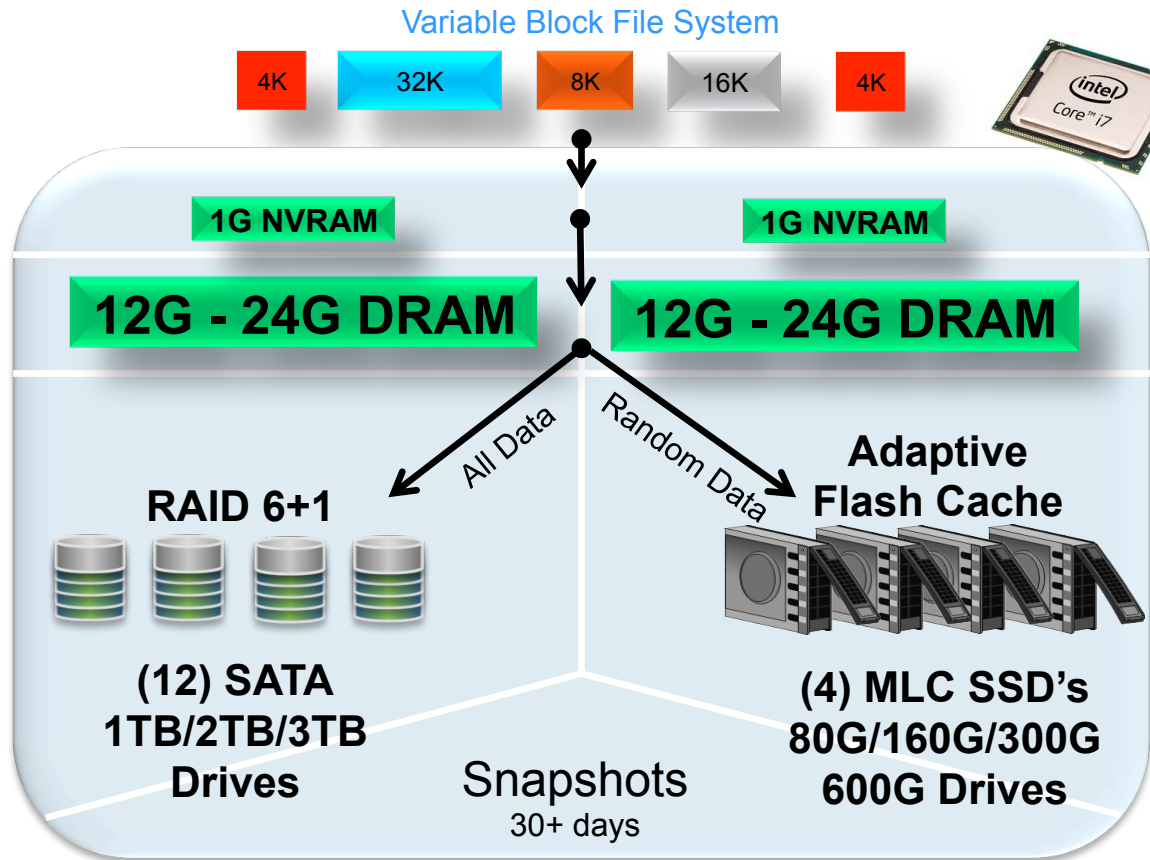
1000s of random I/O concatenated and written using large sequential disk I/O

SSDs are 100% cache for Reads

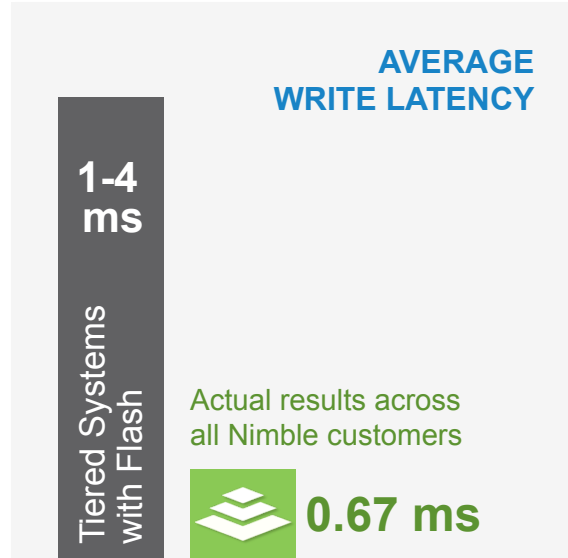
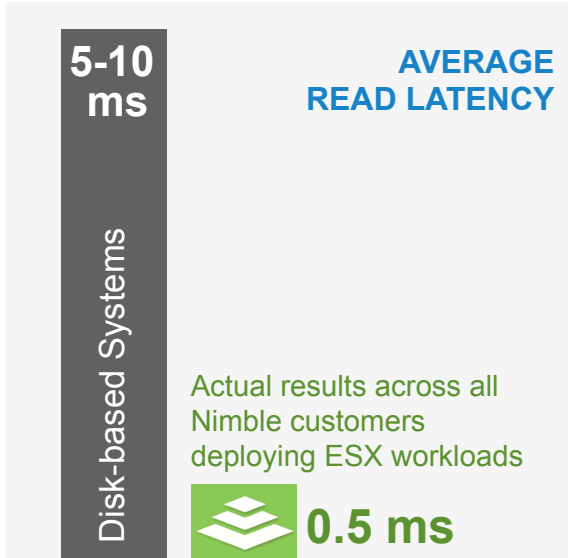
Constant light-weight sweeping ensures constant sequential stripes

12,000 to 75,000 R/W IOPS to 12 - 7.2K RPM Drives and 4 SSDs

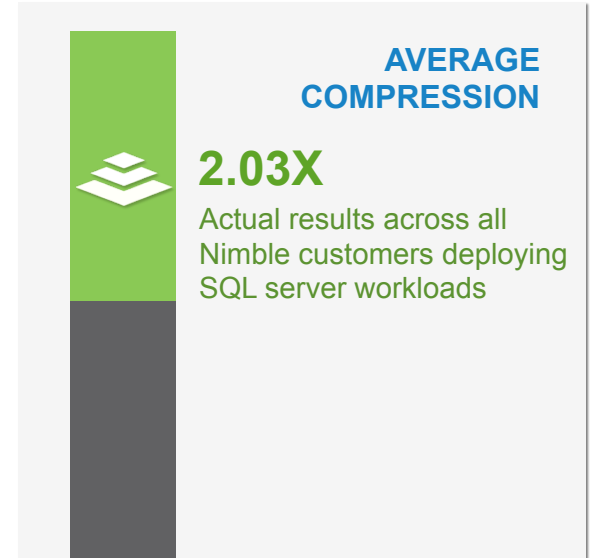
Converging performance / capacity in 3U Chassis



Faster Performance...



...without Sacrificing Capacity



plaxo “The IOPS we’re achieving with the Nimble array has proven game-changing for our development team.”
– *Ethan Erchinger, VP of Operations, Plaxo*

vmware Community “In an IOMeter test of the CS220, the Nimble outperformed EMC by a factor of 7 to 10 in IOPS, latency, and Mbps”

FLORIDA BLOOD SERVICES “With inline compression alone, we’ve freed up 7.48TB of space. Imagine what we can do with that.”
– *Calvin Levy, Florida Blood Services*



Backup & Disaster Recovery

- Data protection did not impact production infrastructure?
- You could easily achieve recovery point objectives of 15 minutes?
- You could recover data in minutes?
- You could roll back data to any day in the last 3 months?
- You could get proactively notified of any problems?
- It was all included and integrated as part of your storage array?



Storage-based snapshots enable aggressive RPOs and RTOs,
while eliminating impact on production infrastructure



- Logical point-in-time copies at the storage level
- Keeps track of blocks in a snapshot through pointers
- No load on the servers
- No load on the network
- Enables instantaneous rollback in case of data corruption or human error

“ESG survey results show that 55% of customers are planning to either replace or augment their traditional backup solutions with either snapshots or replication or a combination of both.”

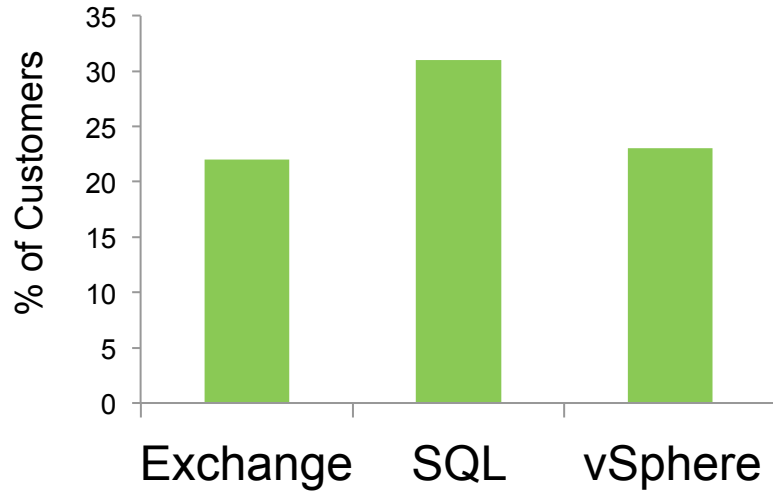
– Jason Buffington

- Performance efficiency
 - Aggressive recovery points
 - Fast recovery times

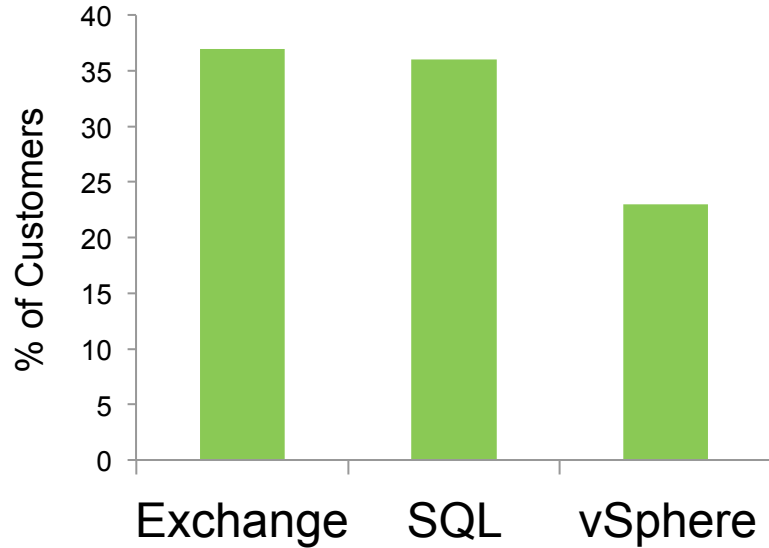
- Space efficiency
 - Longer retention
 - Cost-effective data protection



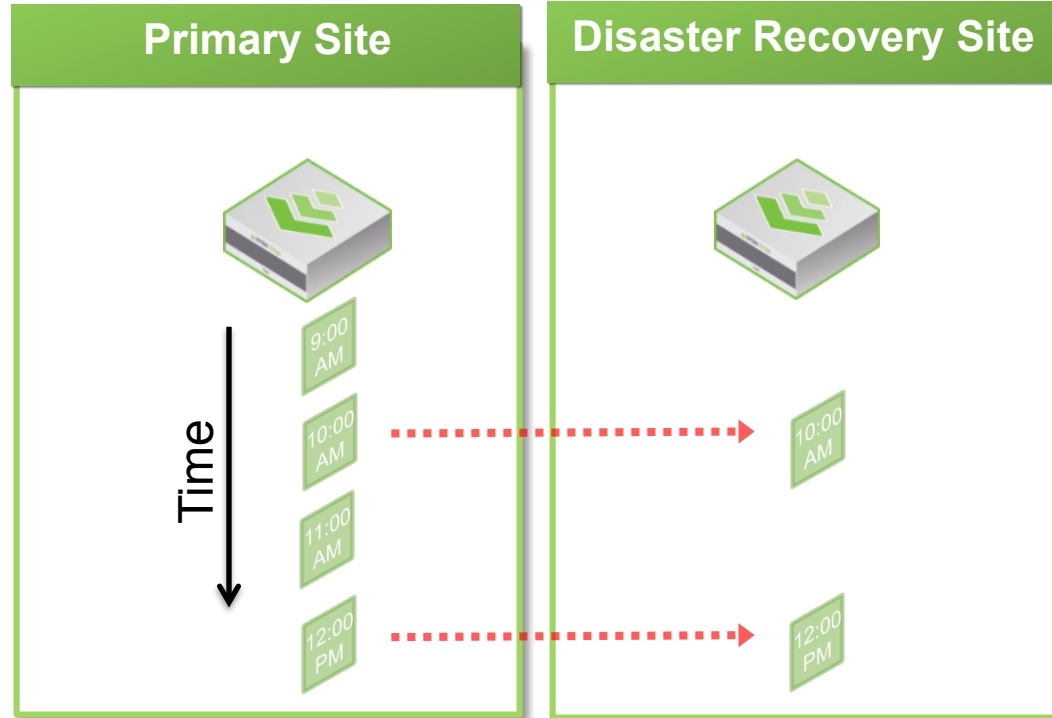
Recovery Point Objectives of 1 hr or less



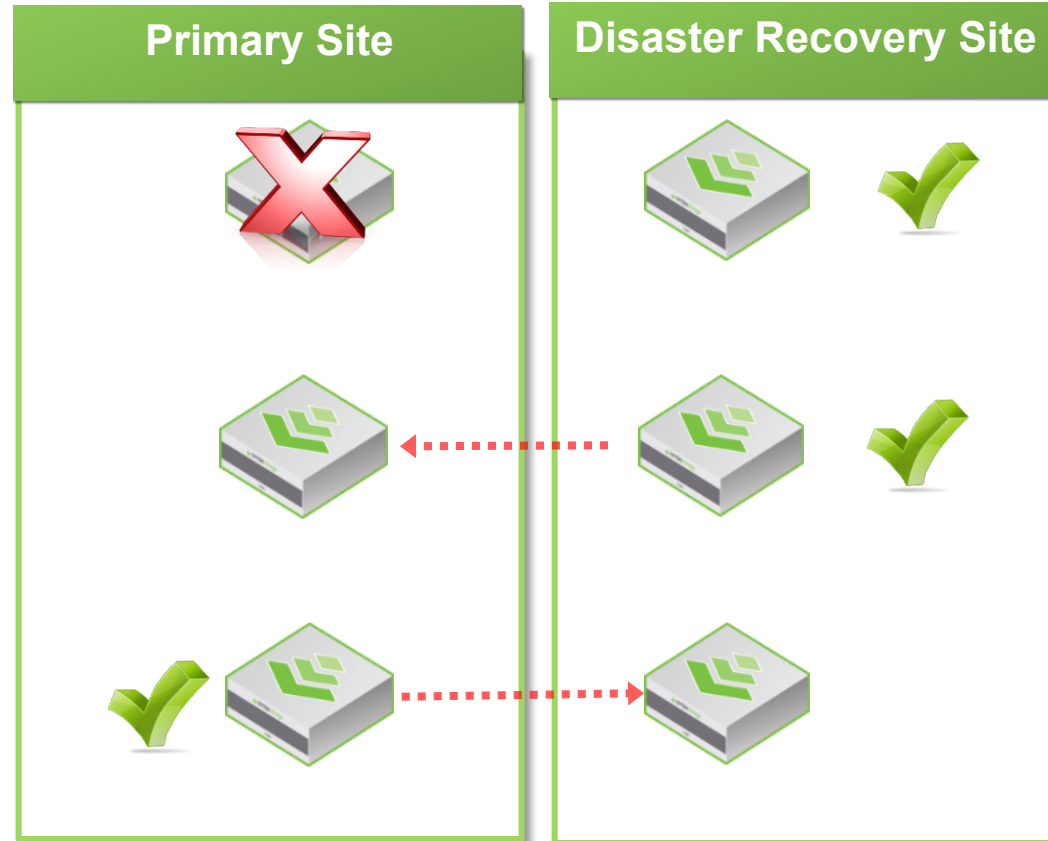
Snapshot retention of 3 months or more

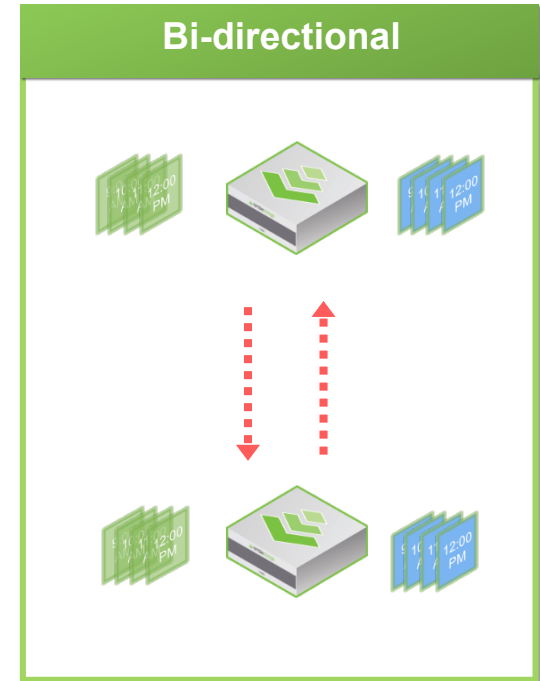
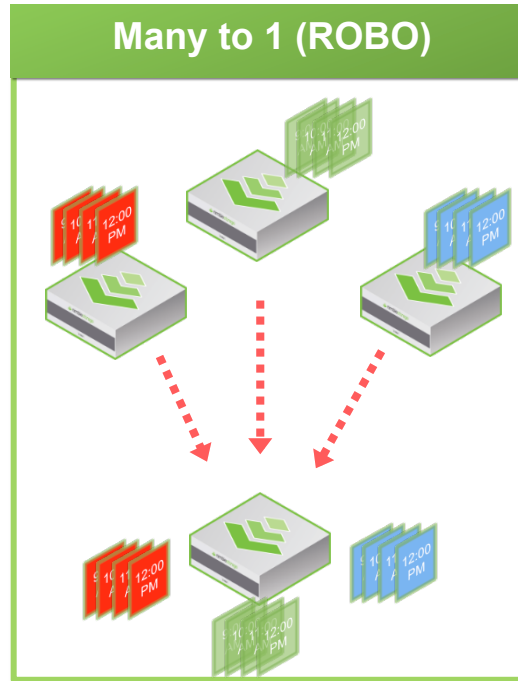
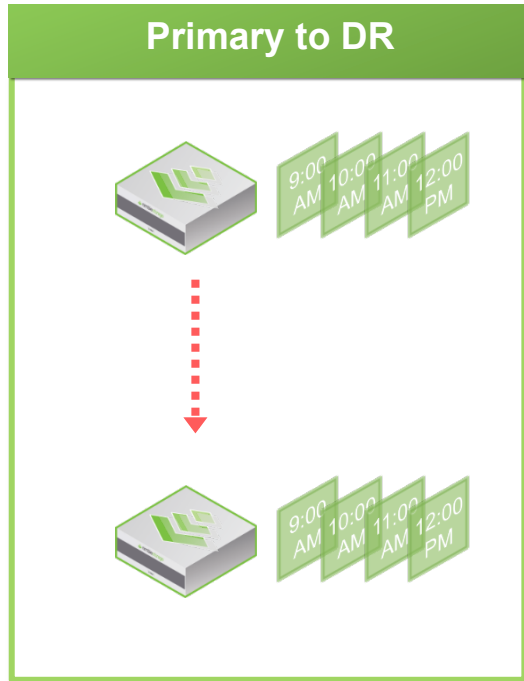


- Efficient: Snapshot-based replication transmits only changed blocks
- Granular: Replicate on a per-volume or volume-collection basis
- Flexible: Configurable replication and retention schedules at the source and target



- Failover: DR site goes live when primary site fails – with full performance
- Re-protect: Replicates from the DR site back to primary to get ready for failback
- Failback: Primary site goes live, normal replication resumes

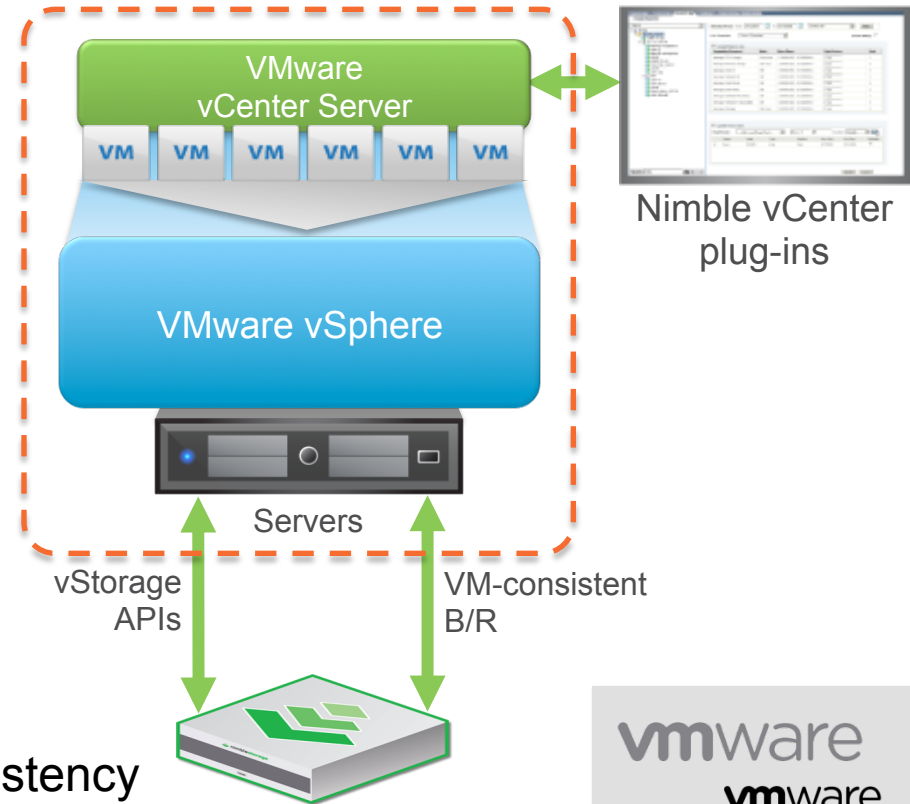




Flexible, efficient WAN-optimized replication facilitates rapid recovery at another site in the event of a disaster

VMware + Nimble = Better Performance, Management

- vCenter Plug-ins to Manage Storage
 - Create datastores/clones
 - Manage snapshots/replication/restores
 - Manage performance and capacity
- vStorage API integrations to improve performance, management
 - Provision VMs, offload clone/copy
 - Set capacity threshold alerts
 - Better error handling
 - VMFS performance improvements
- VMware tools integration to improve protection
- Quiesce/recover VMs with VM/app consistency





Support & Insight

- Real-time monitoring & alerts

- Critical system state, performance, error and capacity email alerts
- Monitored systems send back a heartbeat every 5 minutes



- Daily comprehensive system analysis / health check

- Disk monitoring, system performance and utilization analysis
- Proactive resolution before operations are affected



- Secure remote support

- Configurable array-to-support VPN tunnel for real-time troubleshooting
- Run corrective scripts to prevent downtime



- Nimble support center

- Proactive 24x7 monitoring reacts within minutes for serious incidents
- Automated case creation and escalation





- The InfoSight Engine is built upon:
 - Systems modeling
 - Predictive algorithms
 - Data analytics
- Collects and analyzes >30M sensors per array per day

Transforming big data into insights and actionable information

Ensure a reliable data protection strategy

- Multi-level alerting
- Comprehensive dashboard view

Pinpoint infrastructure problems

- Bad NICs, cables
- MPIO misconfigurations
- Inconsistent jumbo frame settings



Predict availability issues

- Find the cause of software anomalies
- Forecast when anomalies could cause availability issues

Find the performance bottleneck

- Cache and CPU sizing recommendations
- Drill-down metrics



Hardware Configurations & Scale To Fit

Buy the smallest brick you need today.
Add exactly what you need...

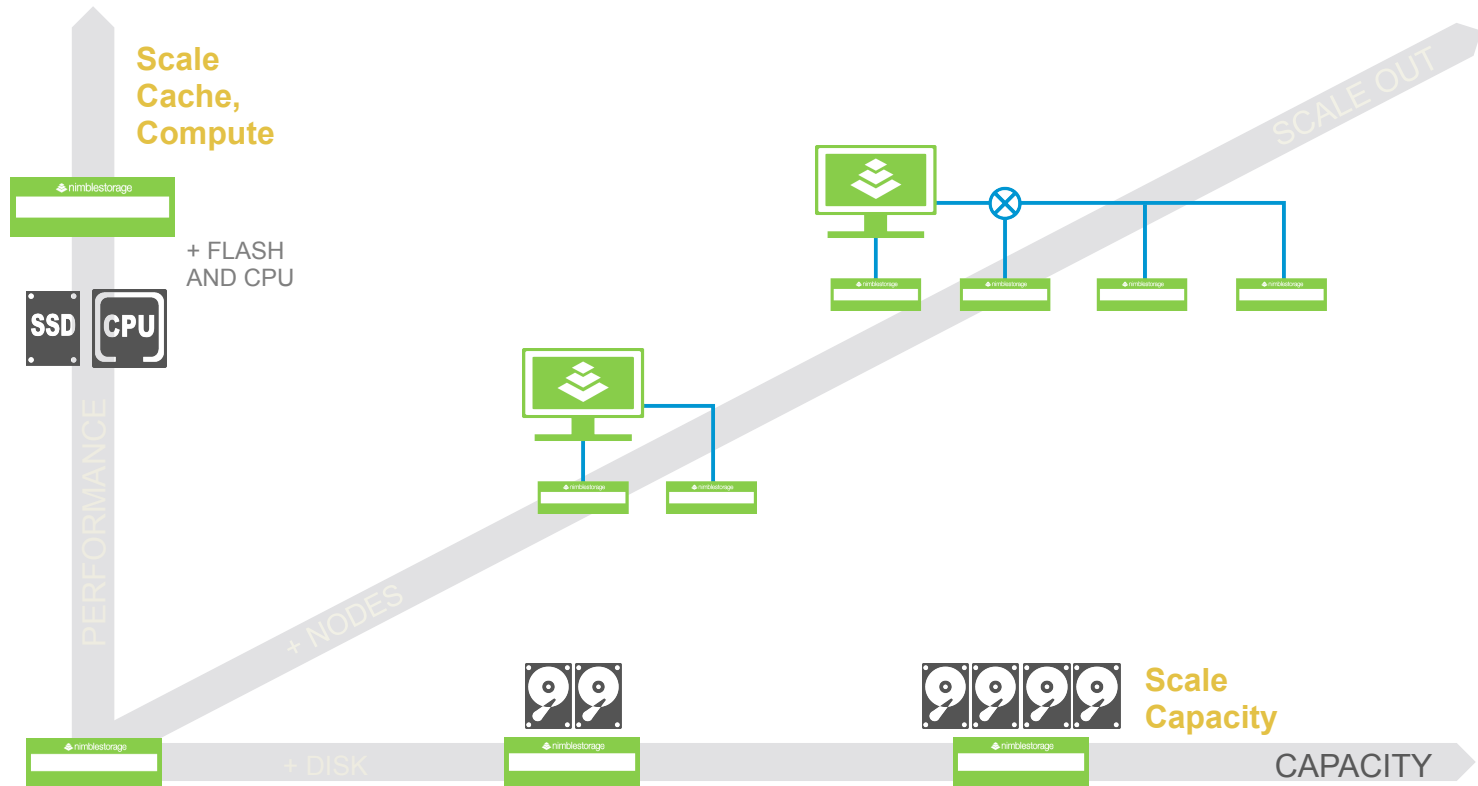
...when you need it.

Upgrade:

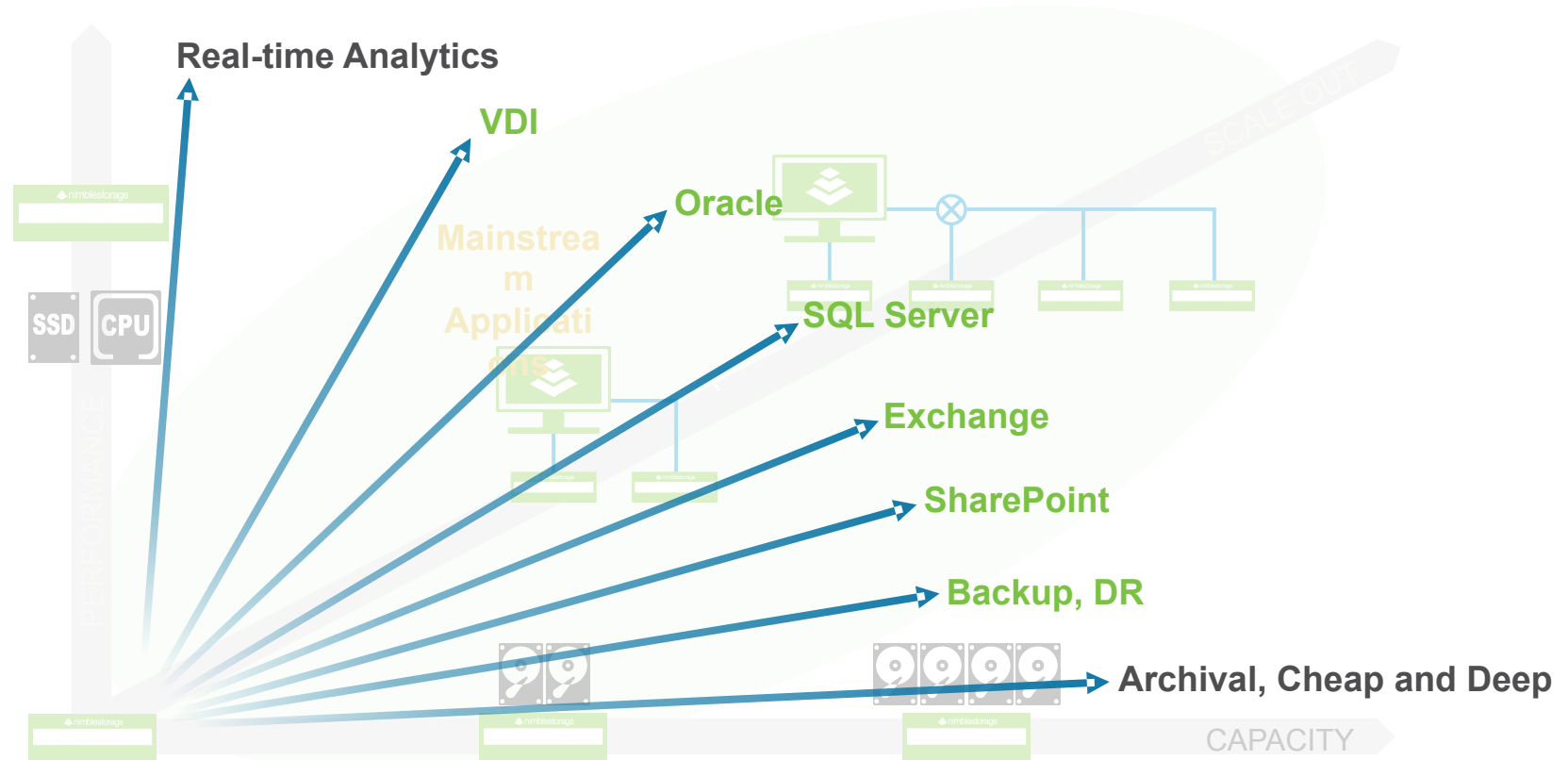
- ✓ Simply
- ✓ Non-disruptively
- ✓ At the **lowest** incremental cost



Flexible. Non-disruptive. Cost-effective.



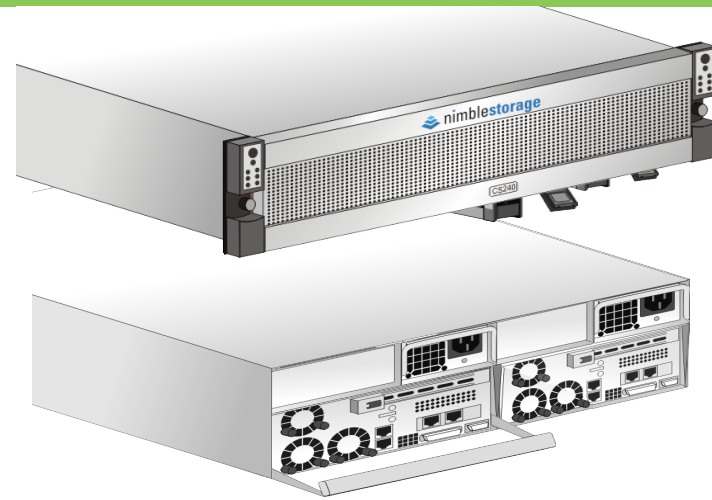
Scaling for Mainstream Applications



Nimble CS-Series Storage Solution



- Consolidate 4x more—high performance and efficiency
 - Compact 3U chassis
- Instant snapshot and restore
 - 1000's of efficient snapshots
 - VSS / VMware integration
 - WAN-efficient replication
- Scale-to-fit architecture
 - Scale-up/scale-capacity/scale-out as needed
- All-inclusive enterprise features
 - Cloning, thin provisioning, replication, etc.
 - Simple management for storage, backup, DR



	CS210	CS220 / CS220G	CS240 / CS240G	CS260 / CS260G	CS420 / CS420G	CS440 / CS440G	CS460 / CS460G
Base array usable capacity	4TB	8TB	16TB	24TB	8TB	16TB	24TB
Flash	160GB	320GB	640GB	1200GB	640GB	640GB	1200GB
Network	4 x 1GbE	6 x 1GbE or 2 x 10GbE + 2 x 1GbE (G models)					
Controllers	Dual hot-swappable controllers in active-passive configurations with mirrored NVRAM						



- **School District Customer**
 - All that IBM storage being replaced by CS260G (3U, 500W)
- **Month of data retained for backups**
 - 1,500 snapshots taken and stored, replacing 2 x DD565s
- **Installed and Serving data in an hour**

