LET THE TRANSFORMATION BEGIN
Modernize with All-Flash

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Modernize with All-Flash
Efficiency

Modern business requirements

Speed

Agility
Pillars of the modern data center

**Protection and trust**
- Security/Governance
- Encryption
- Data Protection
- Services/Support

**Flash**
- Reduce costs (# of drives, power, floor space, etc.)
- Consistent and predictable performance

**Cloud-enabled**
- Policy driven service delivery
- On/off premises data and/or application mobility

**Scale-out**
- Lower entry costs and scale as you grow
- Manage massive capacity with fewer resources

**Software-defined**
- Automated provisioning and business agility
- Flexible and programmable data services

Internal Use - Confidential
Every day more customers choose flash

Competitive edge
Infrastructure agility
Lower TCO

"10% of companies are all flash today (they’re not telling anyone) – 80% have a plan to get there."

— Eric Burgener, IDC
Flash – a fundamental market shift...
Driven by economics

Source: DELL EMC Market Research 2016  *Capacity Cost Factors In Data Reduction Technologies On Flash
Market leader in all-flash

All Flash Market Leader

More Share Than The Closest Competitor

#1

2.5X

Revenue Share

40%

Architecture matters

Use Flash = Go Faster = Go Faster Business Agility = Get Smarter

It’s about the right architecture
It unlocks unique business value
2016
The year of all flash for primary storage
Rack-scale Flash

Mid-range All-flash Array

High-end All-flash Arrays

SMB All-flash Arrays
SC series flash arrays

Value-optimized, mid-market proven solutions

Built-in business continuity solution
Auto-tiering, auto-RAID provisioning
Lowest $/GB AFA
All-flash or hybrid options

Great choice for PowerEdge installs
Leverages Dell server design, 90% PowerEdge attach²

1 Net usable capacity price with 5 years of support, after 4:1 data reduction, vs. major competitors net of data reduction. Street price analysis is based on a variety of sources including analyst data, price sheets when available, and public information as of May 2016.

2 Over 90% of SC arrays are sold into PowerEdge environments. Source: Dell internal analysis of worldwide known end customer SC array sales, as of August 2016, for the four previous quarters.
SC series flash arrays

Value-optimized, mid-market proven solutions

Easy
- Self-optimizing platform
- Built-in virtualization features

Efficient
- Dedupe/compression savings
- Pervasive “thin methods”

Expandable
- Modular, “right-sized” design
- Multiprotocol, SAN/DAS/NAS option
- Multi-array federation

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Unity – the new midrange product line

Simple
Slick UX, CloudIQ™ Proactive Assist, Non disruptive software updates

Flexible
Virtual & purpose-built & converged
Unified NAS & SAN & VVOLS

Modern
All-flash design with integrated copy data management

Affordable
All-Flash Starting Under $18k
Hybrid Option Starting > $8k,
< $1/Gb
The all-flash market leader

**Simple**
Provision storage in less than 30 seconds. Designed for IT generalists.

**Modern Data Services**
Maximize Efficiency. All Thin Provisioned, Always Inline Deduplication and Compression

**Speed**
Scale-out design delivers predictable linear scale.

**Integrated**
Rich Application Integration. No Compromise Copy services.
NEW VMAX 250F

Biggest All Flash Array

Scale up to 4.3PB

Modernizing All Applications

Open Systems, iSeries and Mainframe

World Class Replication

Six 9s Availability

Rich Data Efficiency Services

Enabling The Agile Data Center

Powered by Intel® Xeon® Processors
## Architected for all flash

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td>Gigantic Scale</td>
<td>Intel Multi-core, multi-threaded</td>
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<tr>
<td>3D/TLC Flash Optimized</td>
<td>Designed for +1M VM's</td>
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<tr>
<td>Ultra Low Latency</td>
<td>Scalable low latency IB fabric</td>
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<tr>
<td>Ultra High IOPS</td>
<td>Massive global memory</td>
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<tr>
<td>Unmatched Bandwidth</td>
<td>Write folding to minimize cell wear</td>
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<td>Advanced flash wear analytics</td>
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<td></td>
<td>Huge write cache</td>
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<tr>
<td></td>
<td>Intelligent read/write algorithms</td>
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<td>Flash Boost technology</td>
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<td>Pooled cores with dynamic allocation</td>
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<td>Advanced QoS, priority controls</td>
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<td></td>
<td>Tunable FE/BE profiles</td>
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<td></td>
<td>Industry leading SPC throughput</td>
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<td></td>
<td>Supports BI and DW use cases</td>
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<td>Enables in memory computing</td>
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Modern business model

Modern pricing approach

All inclusive software licensing

Maintenance = 11% of net per year

Promoting 2X longer storage lifecycle
Xpect more

Lifetime* Maintenance price protection

3-year Money-back warranty

Lifetime* Flash endurance protection

*See EMC.com/XpectMore for details, terms and conditions.
Modernize with converged infrastructure

Fundamental shift from building to buying infrastructure

A comprehensive set of storage offerings
Buy your outcomes

Build what hasn’t been solved

5x more apps deployed

4x faster time-to-market

96% reduction in downtime

41% more time to innovate

Converged operations
Flash is the foundation for the future
But it doesn’t solve everything
What about?

Always-on availability  
Insight & analytics  
Automation  
Storage efficiency
Data protection everywhere

#1 in data protection

#1 in replication

#1 in purpose-built backup appliance

$16.5B in cumulative R&D investments, $17B in technology acquisitions

isolated recovery solutions - cyber attack protection
World-class data protection

In the array
Instant copies

- No Impact
- Consistent Performance
- Almost Unlimited

In the datacenter
ProtectPoint

- 20 times faster backups
- Reduces backup storage requirement by 10-30 times
- Eliminates production impact

Across datacenters

- Active/Active
- Sync/Asynch replication
- Metro & Geo
- Multi Site
- Heterogeneous Replication
- Continuous availability
- Federated Live Migrations
- Zero RTO
Copy data management approaches

... And the new integrated CDM option

<table>
<thead>
<tr>
<th></th>
<th>Full copies “clones”</th>
<th>Traditional snapshots “copy/redirect-on-write”</th>
<th>Subsets</th>
<th>3rd party CDM Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>$$$$$</td>
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<tr>
<td>Performance</td>
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<tr>
<td>Agility</td>
<td>Limited</td>
<td>Moderate</td>
<td>Limited</td>
<td>Moderate</td>
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<tr>
<td>Scalability</td>
<td>Limited</td>
<td>Limited</td>
<td>Limited</td>
<td>Very limited</td>
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DELL EMC integrated copy data management

Workflow consolidation and self service

DELL EMC all-flash copies

Consistent scale-up or scale-out performance & data services

App self-service

App integration and orchestration

More Copies? Why Not?

Data analytics

Operations

Data protection
DELL EMC ViPR SRM


Capacity utilization
Performance analysis
Infrastructure monitoring
DELL EMC ViPR Controller

Improve efficiency & increase agility

<60 seconds
Discover and ingest new storage

5 Simple Steps
End-user self-service access to storage resources

63%
Average reduction in time to provision storage

Up to 73%
Reduction in storage provisioning costs

100%
Savings in SAN zoning task costs

to 63%
Reduction in VM provisioning costs

Realizing Software-Defined Storage with DELL EMC ViPR, Principled Technologies, 2014
Reducing Operating Expense with DELL EMC ViPR Controller and ViPR SRM, Principled Technologies, 2014
DELL EMC ViPR Controller

Improve efficiency & increase agility

“Reduces the risk of human error and the need for lengthy management reviews and can make your organization more agile.”

— Principled technologies

Realizing Software-Defined Storage with DELL EMC ViPR, Principled Technologies, 2014

Reducing Operating Expense with DELL EMC ViPR Controller and ViPR SRM, Principled Technologies, 2014
FLASH

Where you need it
CLOUD
Where you don’t
Modernize without compromise

90% reduction in provisioning tasks

10—100x reduction in planning & architecture
Modernize without compromise

Agility

75%
reduction in batch processing

Speed

10–20x
improvement in application performance

Efficient
Modernize without compromise

- **Agility**
  - Reduction in floor space: 83+% reduction

- **Speed**
  - Reduction in physical storage capacity: 2–10x reduction

- **Efficient**
  - Reduction in power & cooling: 71% reduction
Flash-sessment

**Performance Impact**
- IOPS
- Response time
- Bandwidth

**Operational Impact**
- Power
- Cooling
- Floor space
- Data efficiency services
- Ease of use

**Financial Impact**
- Current costs
- Future costs
- TCO

**Business Impact**
- Application data
- Workload improvement

**DATA**
- Performance Impact
- Operational Impact
- Financial Impact
- Business Impact
Validate the value

KPIs

- \$85K annual cooling and power savings
- 8x less avg. latency
- 2.2:1 data reduction
- 66% / 45% less power/cooling
- 75% less floor space
- 15x more performance

8 x “Cloud Pods”

- 2.3 PB useable (No data reduction)
- Cooling: 270k BTU/hour
- Power: 80kW
- 8ms avg. latency
- ~320K IOPs
- Operational management
  Manual perf tuning, storage engineering
  No ability for data reduction
  Reactive storage tiering

Current environment at scale
Validate the value

KPIs

$85K annual cooling and power savings

8x less avg. latency

2.2:1 data reduction

66% / 45% less power/cooling

75% less floor space

15x more performance

• 2.3 PB useable (@1.8:1 reduction)
• Cooling: 85k BTU/hour
• Power: 27 kW
• <1 ms avg. response latency
• 4.8M IOPs
• Operational management

Dell EMC VMAX All Flash proposed
Related Resources

- Infographic
- Brochure
- Video
- Website
Customer Testimony

Global Digital Niaga (GDN)
Why and what

1. GDN already a customer of DellEMC since 2011
2. Today, with DellEMC AFA technology (XtremIO) many benefits perceived by the GDN:
   a) The process is more faster than before by using DellEMC AFA technology.
   b) Reduced power consumption and floor space.
   c) The data duplication avoided, which therefore becomes an efficient data storage.
thank you