

Dell EMC Storage Innovations

Midrange Storage Portfolio Overview



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Modern Data Center



Flash



Scale-out



Software-defined



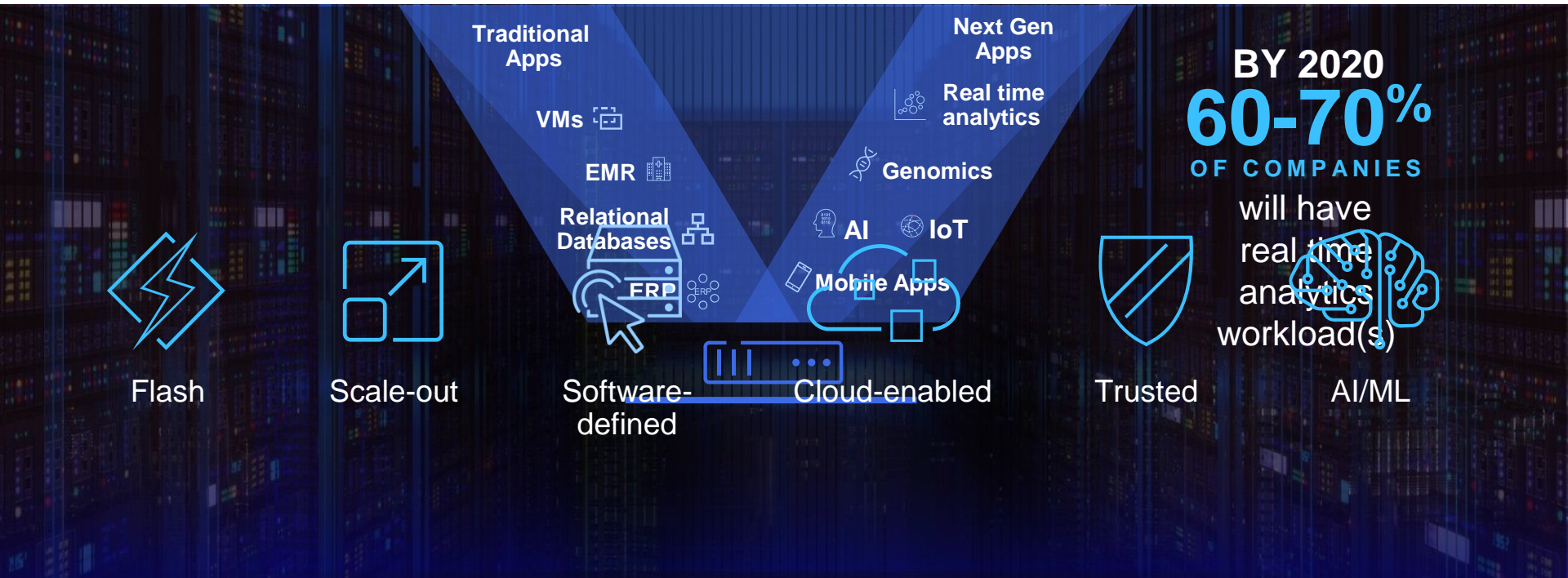
Cloud-enabled



Trusted



AI/ML



Modern Data Center

UNITY & SC Series



Industry's #1 Midrange Portfolio



SC SERIES

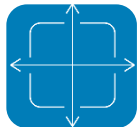


DELL EMC UNITY



INTELLIGENT EFFICIENCY

POST-PROCESS DATA REDUCTION



FEDERATED

DATA MOBILITY ACROSS MULTIPLE SYSTEMS



BEST ECONOMICS

LOW ENTRY PRICE - LOWEST \$ / GB



INLINE EFFICIENCY

INLINE DATA REDUCTION



UNIFIED

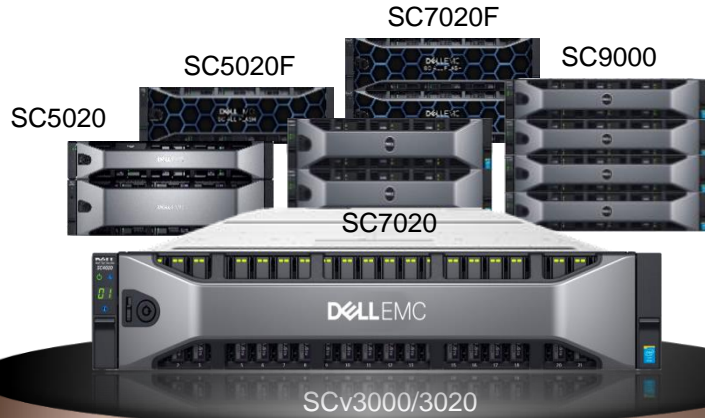
UNIFIED FILE & BLOCK DATA



INTEGRATED HYBRID CLOUD

UNIFIED CLOUD TIERING

The Dell EMC Midrange Family

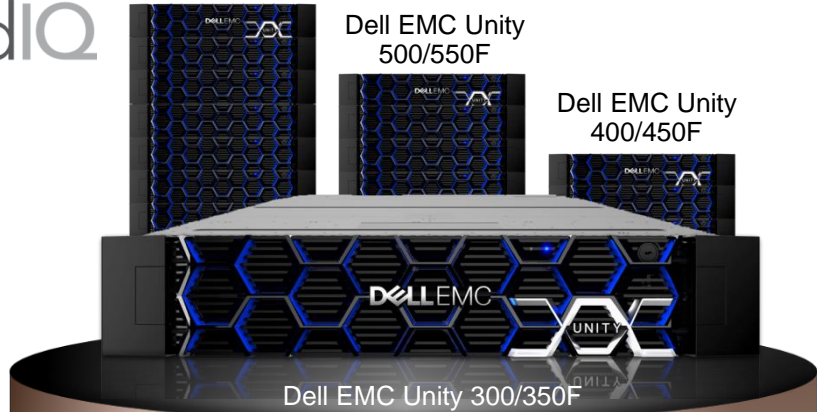


SC Series

Dell EMC Unity 600/650F

Dell EMC Unity 500/550F

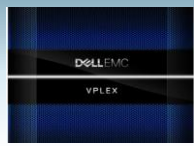
Dell EMC Unity 400/450F



Dell EMC Unity



POWERPATH



RECOVERPOINT

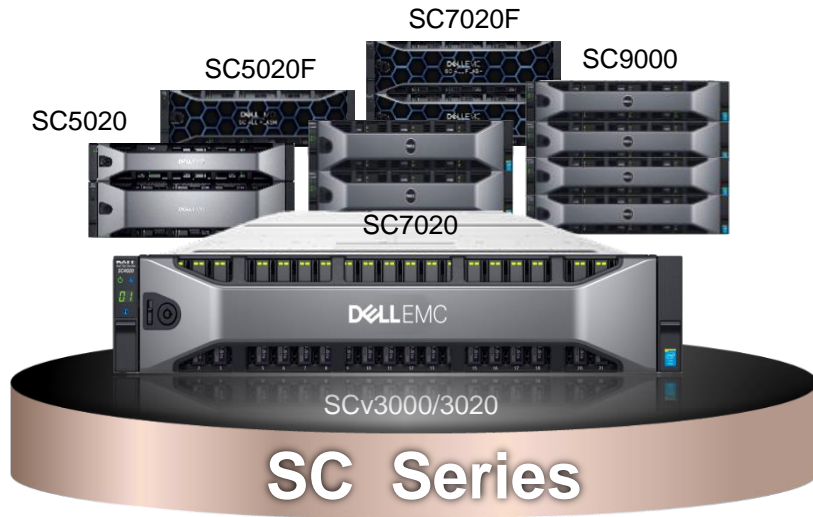


AVAMAR NETWORKER



Dell EMC SC Series

SC Series value



**MOST ECONOMICAL
STORAGE SOLUTION**

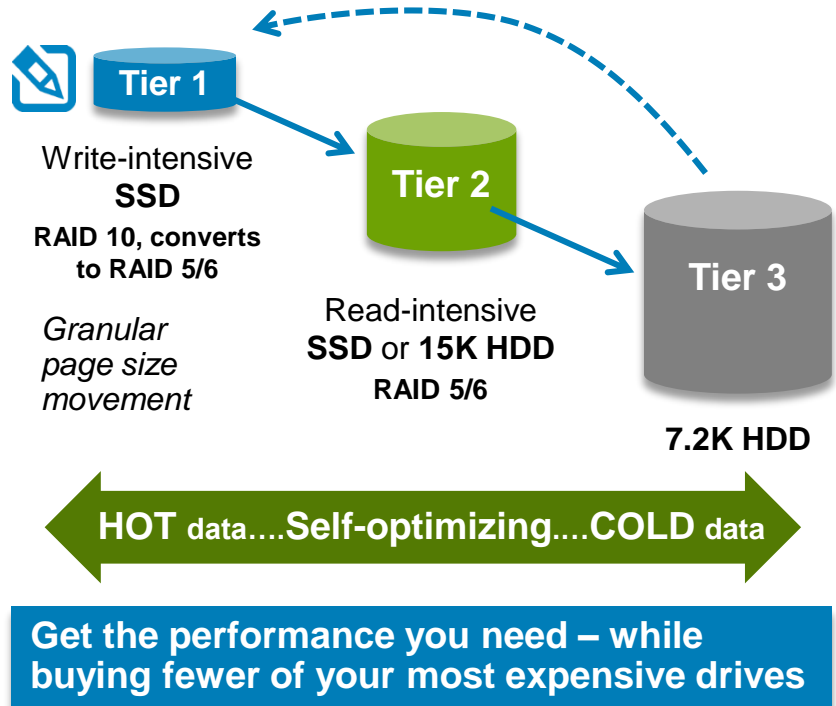


**MIXED MAINSTREAM
WORKLOADS**



**SCALABLE GENERAL
PURPOSE STORAGE**

Granular auto-tiering (data progression)



Achieve simultaneous performance and cost goals

- Directs ALL incoming writes to Tier 1 drives at fastest RAID levels
- Moves inactive data to lower-cost drives, space-efficient RAID levels

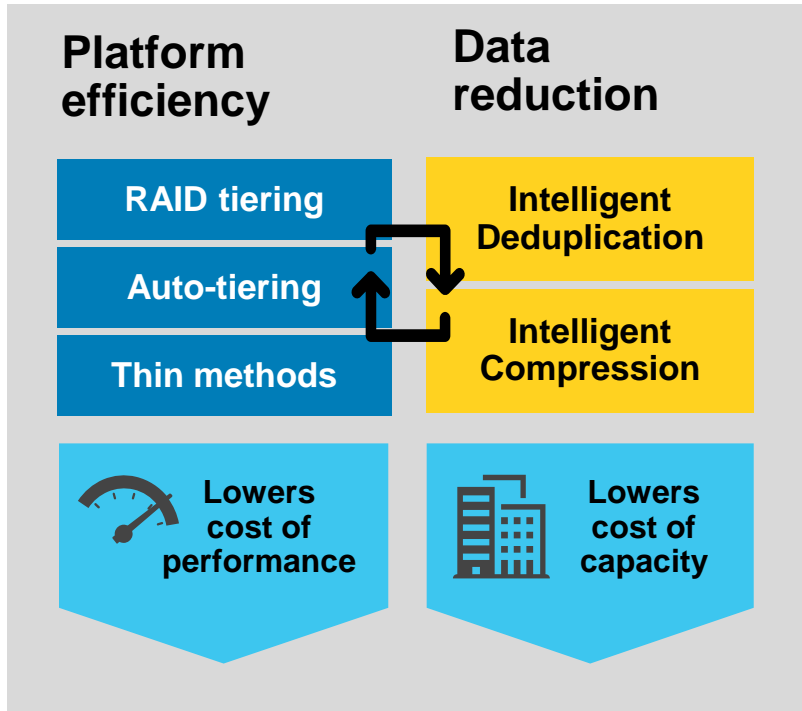
Enables cost-effective all-flash and hybrid solutions

- Separates reads from writes

Seamless integration with Storage Center OS

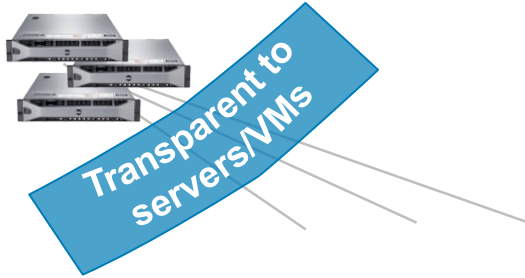
- Snapshots, Replication

Intelligent compression and deduplication



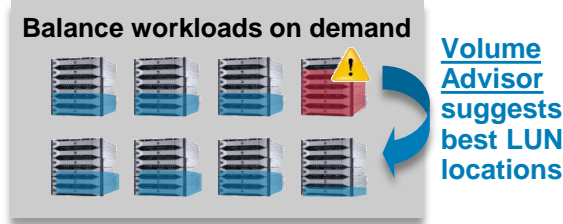
- ✓ Automated efficiency methods work together to maximize your savings
- ✓ Post-process operation compresses and dedupes inactive data
- ✓ Delivers the lowest \$/GB with hybrid and data efficiencies

Live Volume Federation: Scale, DR, migrate, & more



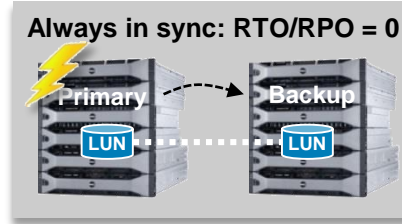
Virtualized LUN mapping allows moving LUNs between systems without interrupting workloads

Federated systems



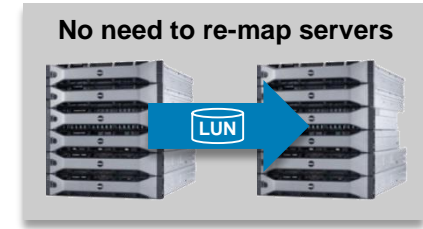
Easy optimization of multiple arrays under unified management

Disaster recovery



Auto-failover to 100% synchronized backup volumes

Data migration



Move volumes seamlessly between arrays

Dell EMC SC Series SCOS 7.3 (DA code release)

FREE software update provides quantum leap forward in

Performance

Huge IOPS boost across all platforms

Increased max capacity

- SC9000 now 6PB (2X)
- SC7020/F now 4 PB

10X faster networks

- With 100Gb iSCSI

Simplicity

Web UI (HTML 5)

Now manage anywhere!

CloudIQ support

Easier upgrades and expansion

- DIP upgrades (SC4020)
- Full federation for SCv2000

Efficiency

Distributed Sparring

HA enhancements

- Live Volume ALUA: lower latency, less network traffic
- Up to 500 Live Volumes

Lowest \$/GB for Flash and Hybrid Flash

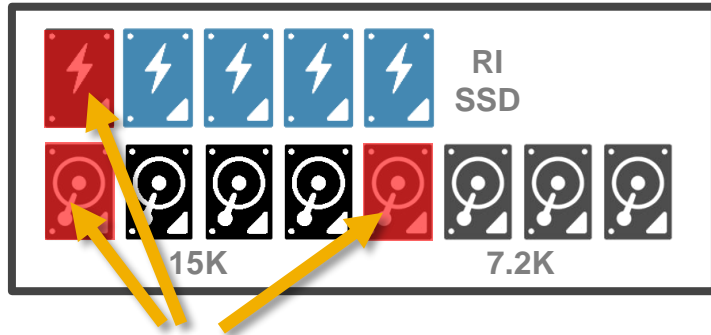
Increase value for every SC All-Flash and Hybrid model: SC9, 8, 7, 5, 4, v3, v2



SCOS 7.3: Distributed Sparing

Old way

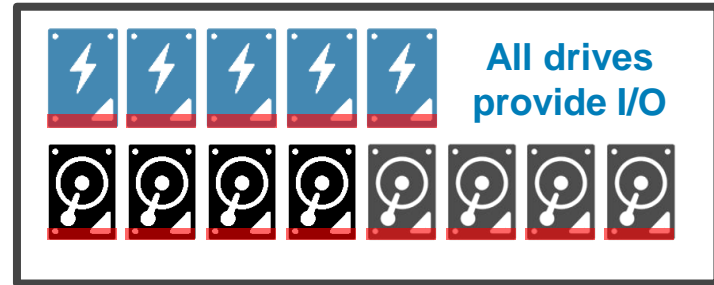
Dedicated spares – One for every 20 drives AND per drive type



- × Spares remain idle until needed, do not contribute to I/O
- × Rebuilds take longer, writes to single spare = bottleneck

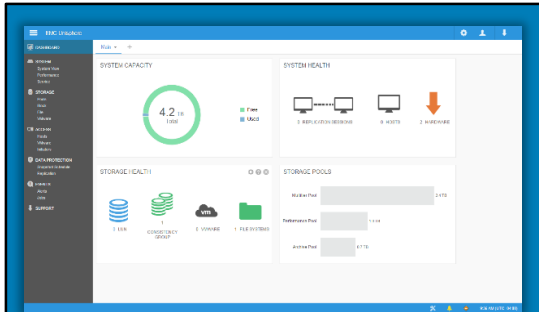
Distributed sparing

Spare capacity spread across all drives
No dedicated spares required



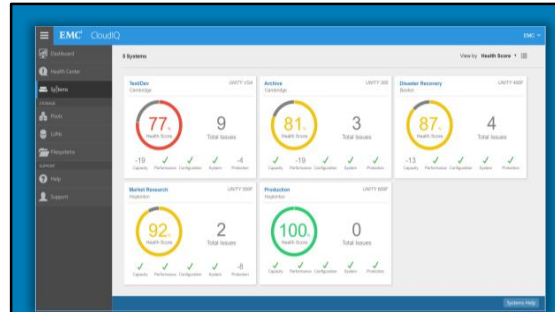
- ✓ Improved efficiency
- ✓ Reduced risk of data loss
- ✓ Up to 500% faster rebuilds

SCOS 7.3 simplified management



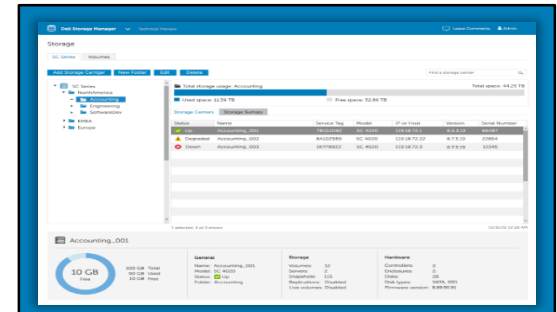
HTML-5 BASED
UNISPHERE FOR SC

- ✓ Access from anywhere
- ✓ Modern look and feel
- ✓ No install required



CloudIQ

- ✓ Cloud based analytics
- ✓ Built-in machine learning predicts anomalies



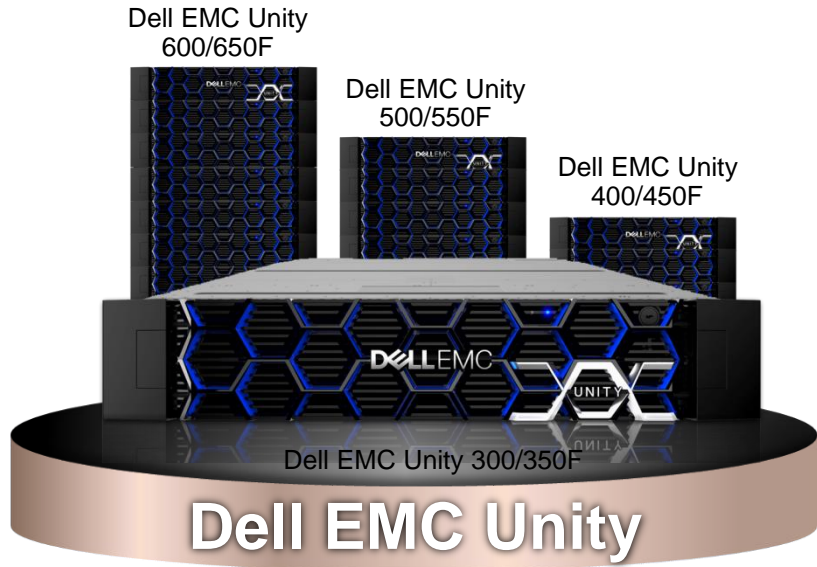
HTML-5 UNISPHERE
CENTRAL FOR SC
(Dell Storage Manager)

- ✓ Central management and monitoring on-site
- ✓ Supports up to 10 arrays

Dell EMC Unity



Dell EMC Unity's All-Flash value



**CONSISTENT
RESPONSE TIME**

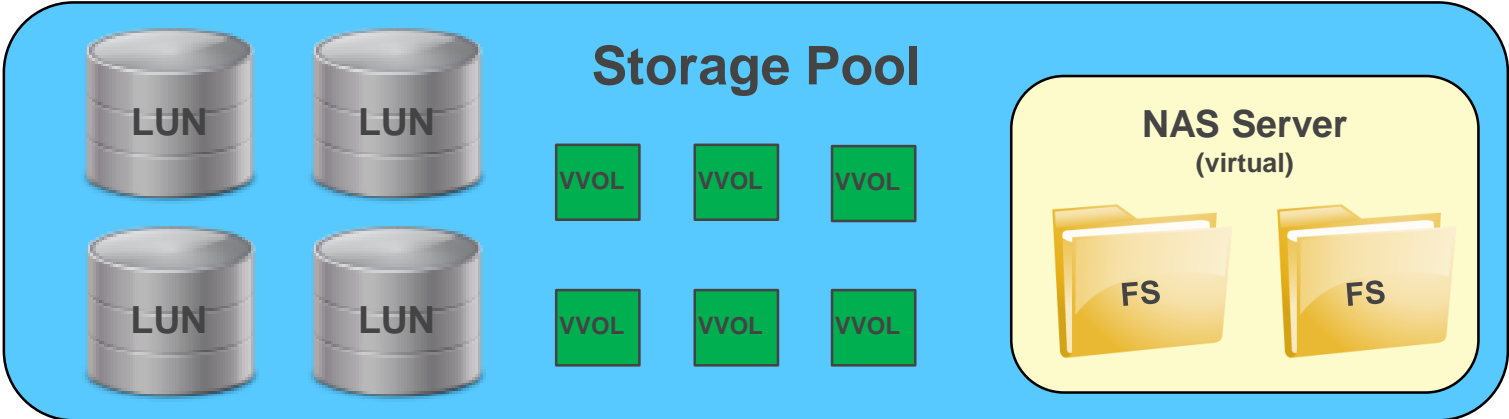


**SIMPLE TO SETUP,
MANAGE AND USE**



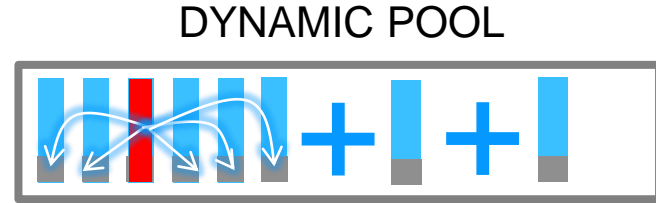
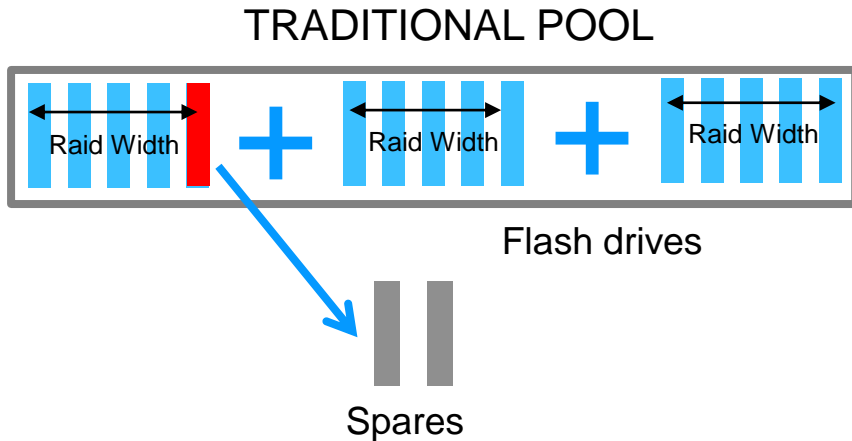
**NEW USES & APPLICATION
OPPORTUNITIES**

Unified Storage Pool architecture



Dell EMC Unity All-Flash array: Dynamic Pools

Maximize performance & efficiently save space and budget



Flash drives

Distributed sparing and more flexible pool size

ADD SINGLE
DRIVE TO
POOL

HIGHER
SPACE
UTILIZATION

FASTER
REBUILD
TIME

SIMPLER
AND
LOWER TCO

Automated iCDM with Dell EMC Unity & AppSync

Minimize copy costs, extend the business value of your AFA storage with app-aware copy data management



AppSync iCDM Starter Bundle for Dell EMC Unity

Business Challenge: Everyone Needs a Copy



Solution: Application-aware Automation

SIMPLE: Copy creation & scheduling across applications with self service for app owners

SMART: Automates discovery and awareness of applications & Dell EMC Unity copy/replication services relationship & adapts to changes

FRICITIONLESS: Everyone is on the same page with a transparent copy workflow

Policy-based Cloud Tiering

Free up capacity with the benefits of cloud economics

- Reduce backup windows
- Improve TCO
- Physical, Virtual, HA



FILE TIERING &
SNAPSHOT ARCHIVE

Archive 'cold' data to cloud



Public Clouds



Private Clouds

**AUTOMATIC
POLICY-BASED**

**PUSH OUT SELECTED DATA
BASED ON-POLICIES**

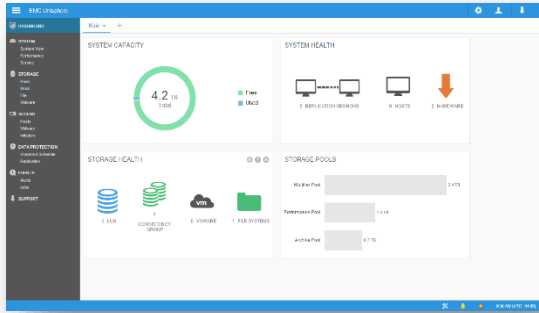
**TRANSPARENT,
NON-DISRUPTIVE**

**NO CHANGE TO APPS; NO
IMPACT TO USERS**

**ON DEMAND
RECALL**

**EASILY RECALL DATA
WHEN NEEDED**

Simple to manage and use



HTML-5 BASED UNISPHERE

- ✓ COMPATIBLE WITH MOST MODERN BROWSERS
- ✓ EASY NAVIGATION, SIMPLE WORKFLOWS
- ✓ MODERN LOOK AND FEEL
- ✓ UNIFIED MGMT. PARADIGM



CloudIQ

- ✓ MONITORING, ALERTING AND REPORTING
- ✓ PRO-ACTIVE ANALYSIS AND SUPPORT
- ✓ SUPPORT PLANNING AND OPTIMIZATION

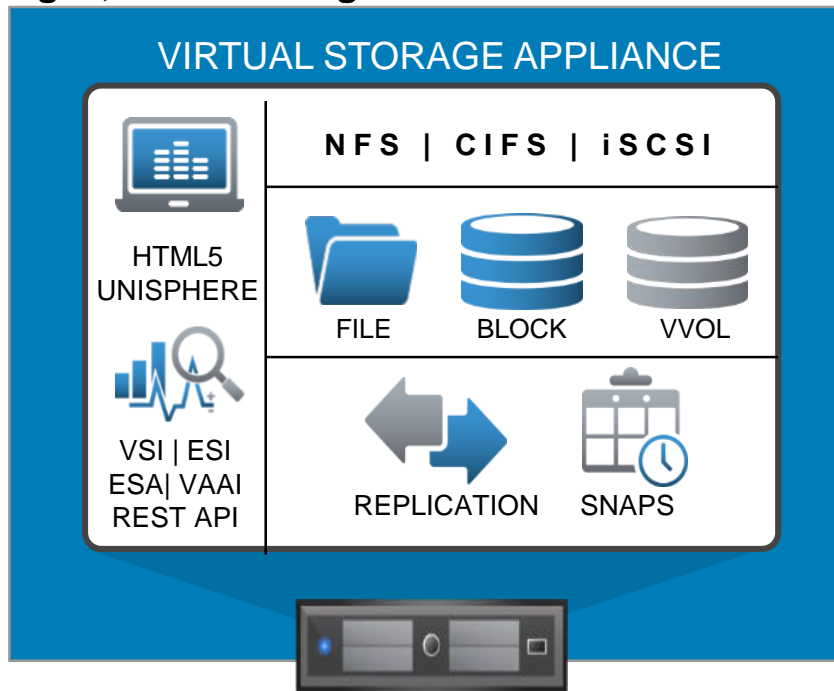


NEW UNIFIED CLI AND REST API

- ✓ EASIER APP INTEGRATION
- ✓ SIMPLE HTTP COMMANDS
- ✓ API ACCESS FROM CLI, BROWSER, APP AND SCRIPT

Software Defined, Dell EMC Unity VSA

Agile, virtual storage



COMMUNITY EDITION



Easy In-Place Upgrade

PROFESSIONAL EDITION



- COMMUNITY SUPPORT
- FREE DOWNLOAD
- 4TB CAPACITY LIMIT

- EMC SUPPORT
- SUBSCRIPTION LICENSE
- 10TB | 25TB | 50TB

USE CASES

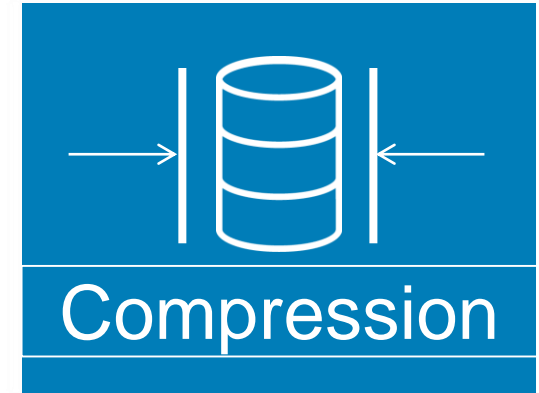
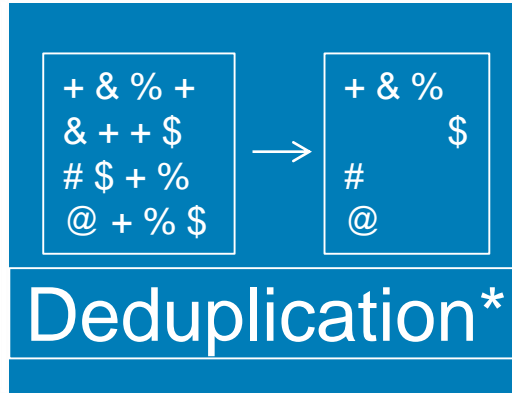
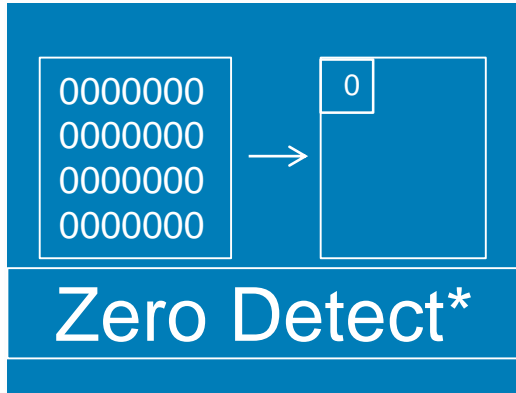
TEST DEV | RAPID DEPLOYMENT
REMOTE BRANCH OFFICES | LOW-COST STORAGE
RETAIL | EDUCATION | HEALTHCARE | CLOUD | NAS
IN SOFTWARE DEFINED INFRASTRUCTURE
(SCALEIO OR VSAN)

Dell EMC Unity OE v4.3: Major new features

- Flash Efficiency
 - Inline zero detect (block & file)
 - Inline deduplication (block & file): Pattern recognition
- Performance
- Simplicity
 - Set Host Initiator Type in Unity
 - Customer control dial home suppression
 - Automatic copy back from failed drives
 - Automated Software Upgrades
- Enterprise Features
 - APL (Approve Products List test and certification)



Dell EMC Unity OE v4.3 All-inclusive Inline Efficiency



- ✓ Estimated 3X data reduction for virtualized environments
- ✓ Unified: Data reduction applicable to both file and block

- ✓ Inline: Data reduction in memory before being written to drive
- ✓ Simple all-inclusive single setting – set on/off per LUN/filesystem

Our customer commitment

“Because our combination is very complementary... **we are fully committed to, supporting and investing in both Dell EMC Unity and Dell EMC SC.**”



Michael Dell

One more thing...

PowerVault



Introducing the Dell EMC PowerVault ME4 Series

New



ME4012 (2U)
Single/Dual



ME4024 (2U)
Single/Dual



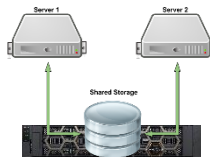
ME4084 (5U Dense)
Dual Only



**ALL FLASH or HYBRID
TO 4PB RAW CAPACITY**



**DIRECT ATTACH
READY**



**SHARED SAN
STORAGE**

All from the #1 in the Entry Storage Market²

1 AD# G18000167 Based on Seagate Technology's LX-3 Performance Characterization report, 2018 (Virtual Test Results)

2 WW Enterprise Storage Systems (HW) Market Overview: Q1CY18 IDC Results June 2018



- **ENTRY LEVEL AFFORDABLE**

Low cost starting configurations

All-inclusive enterprise-class SW

Buy the exact expansion capacity you need

- **SIMPLE & EASY TO USE**

New web-based (HTML5) management GUI

Installs and configures in 15 minutes

Flexibly deploy from 0 to 100% flash

- **FAST & POWERFUL**

4 core Broadwell Processors

Up to 320K¹ IOPs performance

Performance @ scale via 12G SAS backend

PowerVault ME4 Series applications/use cases



PowerVault ME4012



PowerVault ME4024



PowerVault ME4084



Surveillance



HPC



vmware®
Virtualization/VDI



SAN/DAS Exchange



ROBO



OEM Solutions



NoSQL
Databases



Video Editing

PowerVault ME4 software is all-inclusive

BUILT-IN SOFTWARE FEATURES

ADAPT (Distributed RAID)

Improved DDP-like functionality enabling affordable capacity expansion and faster drive rebuild times.

Thin Provisioning

Allocate and consume physical storage capacity as needed in disk pools

SSD Read Cache

Increase execution speed of applications by caching previously read data

IP Remote Replication

Replicate data to any global location that includes mirroring thin provisioned pools

FC Remote Replication

Replicate data to any global location that includes mirroring thin provisioned pools

Snapshots

Easily recover files after accidental deletion or alteration with point-in-time copies of data

3 Level Tiering

Improve performance and efficiency with less hardware expense



Volume Copy

Seamlessly clone volumes for re-purposing on different spindles and drives

Encryption (SED)

Render data useless to unauthorized users with drive-level encryption, even if the drive has been removed from the enclosure

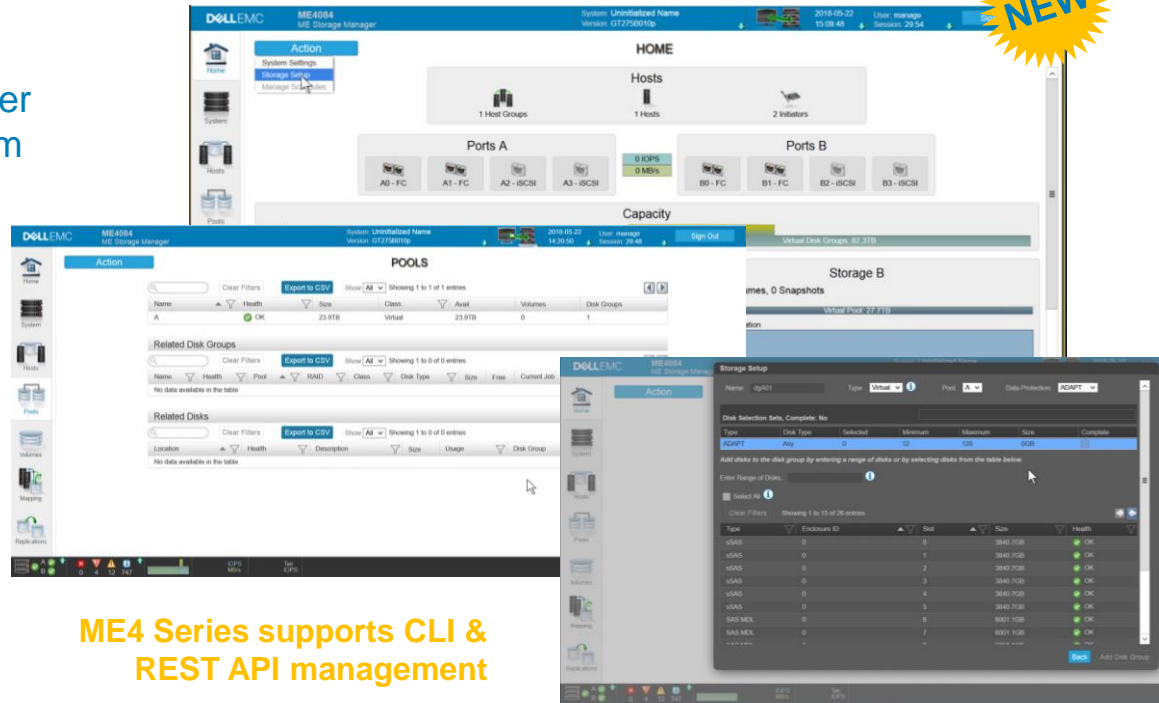
vCenter/SRM

VMware vCenter Server & SRM integration to move live VMs at scale between sites



Simplified web-based management

- HTML5
- Single-array intuitive element manager
- Use common management tasks from convenient locations
- Manage storage profiles, network connections, alerts, more
- Configure in 15 minutes



ME4 Series supports CLI & REST API management

D  **LEMC**