Exploring the full Dell Compellent Storage Center feature set from thin provisioning to dynamic capacity and everything in between

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Agenda

Exploring the Full Feature Set:
• All features at a glance
• Fluid Data Architecture
• Dynamic Capacity
• Data Instant Replay
• Data Progression
• Fast Track
• Remote Instant Replay
• Live Volume
• Enterprise Manager
• Volume Advisor
• Active Directory/LDAP
Feature Overview:
More efficient use of every disk in your system

- Automated Tiered Storage
- Block-Level Virtualization
- Thin Provisioning
- Fast Track
- Thin Write
- Enterprise Manager
- Continuous Snapshots
- Integration:
  - VMware
  - Microsoft
  - Oracle

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Tenets of Fluid Data Architecture

Virtualization
- SSD, FC, SAS, SATA
- RAID 10, RAID 5, RAID 6
- 15K, 10K, 7.2K
- Simplify management
- Ideal for virtual servers
- Independence from drive type, interface type and RAID

Intelligence
- METADATA
- Data about the data
- Block-level intelligence
- Manages data inside the volume
- Tracks frequency of access
- Enables unique feature/benefits

Automation
- Tier 1
- Tier 2
- Tier 3
- Sophisticated data movement engine
- Set policies and let the system run
- Optimized data placement

Utilization
- Disks not purchased
- Unused Allocation
- "No waste" when storing data
- Buy fewer disk drives
- Save on energy and floor space
Inside the Fluid Data Architecture

• The Page Pool
  – The core of the Fluid Data Architecture
  – Automated, Sophisticated Block Management
    › Grows/Shrink as needed
    › Self Tuning
    › Multiple drive types and RAID levels
  – Change configurations on the fly
  – Abstracts the physical (hardware) architecture
Dynamic Capacity - Thin Provisioning
Use fewer physical disks

Thin provisioning benefits

• No pre-allocation required
• Snapshots are thin provisioned

• “Thin” data migrations
• Free space is automatically recovered
Data Instant Replay: Continuous snapshots
Eliminate your backup window

Replay-based architecture benefits
• Space efficient – freeze pointers
• No space pre-allocation
• **Replays automatically move down to lower cost disk**
• Delete any one, keep any one
• Integration with common applications
• Ideal for test/dev, VMs, Boot from SAN, Consistency Groups

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Benefits of Dynamic Capacity and Replays

- Thin Provisioning and Replays
  - Eliminates need of primary deduplication of static boot volume data
    › Remove delays in hydration
  - Easy, time and space efficient server provisioning
    › Physical and virtual
Data Progression - Automated Tiered Storage
Buy fewer and less expensive drives

Proven technology, in production since 2005
• Automatically moves granular blocks of inactive data to lower-cost disk
• Stores most frequently accessed data on the outer edge of the drive

• Seamlessly integrates with snapshots and replication
• Leverage SSD performance without breaking the bank
Fast Track – Automated Drive Level Tiering

- Outer 20% of drive capacity reserved as Fast Tracks
- Stores most frequently accessed data on the outer edge of the drive
- Most active blocks are automatically placed on the outer edge
- Provides day one performance as capacity increases
Remote Instant Replay

Replicate thin to save
• Volumes are thin, replication is thin
• Significant reduction in cost of bandwidth and management
• Only replicate changed blocks of data (no duplication)

• Set up replication in 6 clicks
• No space pre-allocation
• One button, automated restore
• DR Testing – without downtime

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Remote Instant Replay - Asynchronous Replication Options

- **Active Replay vs Non-active replay**
  - Active Replay replicated writes to the remote system as soon as possible
  - Non-active replay replicates solely on the replay schedule

- **Deduplication – what is it?**
  - Compares the source volume page to the destination page
  - Sends only the differences, instead of the full page
  - Only applies to non-active replay replications
  - Suggested only for limited bandwidth WANs

- **QoS**
  - Allows for setting the amount of bandwidth between the replicating systems
  - Can throttle the percentage of bandwidth to use in increments of hours
Remote Instant Replay - Multi-site Replication

Multiple Topologies
- Cascade
- Mixed Mode
  › 1-to-N (N=2 in v6.3)

Improved failure recovery
- Minimal recopy

Management
- Replication status and statistical information available via Enterprise Manager
Live Volume

Dynamic Business Continuity
• Share a virtual storage volume between two SANs in a semi-synchronous configuration
• Storage moves in sync with IO load

• Deliver storage agility and high availability
• Balance workloads on demand
• Shift storage resources on demand to overcome planned downtime
Live Volume with clusters/virtual servers

Volumes can move non-disruptively between Storage Centers

Virtualization Host A

Virtualization Host B

Storage Center A

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Enterprise Manager: Intelligent storage automation
Sophisticated is now automated and simple

Integration
- VMware
- Microsoft
- Oracle

Manage Multiple Systems

Chargeback

Setup Replication in 6 clicks

Increase Staff Productivity

Enterprise Manager

Storage Resource Management

Powerful Threshold Alerting

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Enterprise Manager Components

• Data Collector
  – Monitoring and management of Storage Centers
  – Stores historical data in flat file or database
  – Runs on a Windows server

• Remote Data Collector
  – Remote data center
  – Synchronizes between main data collector
  – Enables disaster recovery features

• Client
  – Single pane of glass for multiple Storage Centers
    › Monitoring and Management
    › Replication and Live Volume management
  – Runs on a Windows client
Enterprise Manager - Graphing
Enterprise Manager - Reporting

• System reports present storage management information allowing strategic storage decisions to be made easily.
• Reporting capabilities includes:
  – Capacity utilization
  – Point in time views of storage sizes, allocations, system object and RAID savings
  – Disk class utilization views
  – Alerts over a period of time
  – Volume sizing statistics
  – Replication statistics for all replications
• Ability to e-mail storage reports daily, weekly and/or monthly or store in a public directory.
• Saved in Adobe (PDF), Crystal Reports (RPT) and Excel, Rich Text (RTF) formats to name a few.
Enterprise Manager - Threshold Alerting
Enterprise Manager - Chargeback

- Automatically calculates storage costs based on the actual space consumed by applications.
- Assign different costs to each volume based on disk class or storage tier.
- Reports identify the cost of storage consumption based on department name or account number.
- Reports can be scheduled for automatic email delivery to business units daily, weekly, monthly or quarterly.
Replay Manager

- Easy basic recovery tool competitively priced
- Space efficient application/VM consistent Repays
- Supports Microsoft VSS Applications and VMware VMs
  - Exchange
  - SQL
  - Hyper-V
- RM Replay can be replicated for DR purposes using EM
- Multiple recovery options for VMware and SQL
Volume Advisor

• Intelligent volume placement guidance across multiple systems
  – Used with Live Volume

• New Volumes
  – Eliminates monitoring of key performance tools, reduces errors
  – Advisor replaces current approach of 18 clicks/per system

• Existing Volumes
  – Provides on-going advice on optimum placement
Active Directory (AD) and Lightweight Directory Access Protocol (LDAP)

- Simplified management
- Single authentication across clients and Storage Center
- Integrated with Microsoft Active Directory (AD) from a single management console (EM or Storage Center)
- Supports native authentication with:
  - Microsoft Active Directory
  - OpenLDAP on AD with Unix
Feature Overview:
More efficient use of every disk in your system

Automated Tiered Storage

Block-Level Virtualization

Continuous Snapshots

Thin Provisioning

Fast Track

Enterprise Manager Manager

Mountable Replays

Integration
- VMware
- Microsoft
- Oracle

New York Thin Replication

London

Thin Replication

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Q & A
Thank You
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