

Compellent Company and Product Overview

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Regal IT

- Independent IT Consulting & Project Management
- Application, Desktop & Server Delivery
- Data Storage, Management, Security & Archiving
- Virtualisation – Storage, Servers, Desktop
- Disaster Recovery / Business Continuity
- Procurement – Licensing ,Software & Hardware
- Service Desk – Support 7 x 24

Regal IT – Preferred Solutions



Compellent

Compellent is completely redefining the impact data storage can have on enterprises around the world

- World's fastest growing storage company
- NYSE:CML
- Award-winning products – SAN of the Year
- Lowest TCO in the industry
- Worldwide installs across all industries
 - 98% customer satisfaction ratings

Key Technology Partners



Australian References

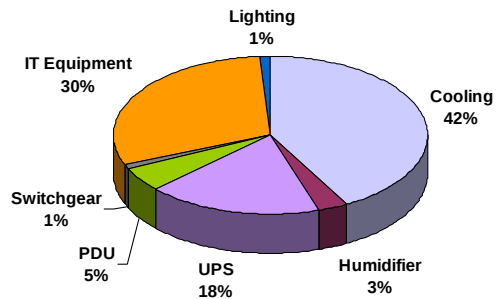


Growth of the Data Center

Pain Points

- Applications growth and storage needs
- Underutilized servers and storage
- Insufficient floor space, power and cooling
- Maximizing existing data center resources

Typical Data Center Power Requirements*



The Green Data Center: An Opportunity to Reduce TCO and Implement Enterprise DR

*Source: "Guidelines for Energy-Efficient Datacenters," The Green Grid, Feb. 2007



Storage Pain Points

Pain Point

Business Impact

CAPEX

- | | |
|--|--|
| Inactive Data | 80% of data is managed on high-cost drives |
| Inefficient Storage Utilization | Wasted disk drive capacity on empty space |
| Risk of Technology Obsolescence | Forklift upgrades, CAPEX wasted, downtime |

OPEX

- | | |
|--|---|
| Need for Virtual Infrastructure | Inefficient use of capital, difficult to manage |
| System Complexity | How many people manage storage today? |
| Power, Cooling & Floorspace | Costs skyrocketing, run out of power & floorspace |

AVAILABILITY

- | | |
|------------------------------|--|
| Disaster Preparedness | Expensive, disruptive DR implementation & test |
| System Uptime | Outages consume resources, impact production |
| Backup and Recovery | Recovery from tape is slow and unreliable |

Enabling the Green Data Center

Enabling Technologies

1. Storage Virtualization
2. Automated tiered storage
3. Thin provisioning
4. Space-efficient snapshots
5. Modular architecture
6. Automated boot from SAN

Virtualized Storage Array



Reduced Disks, Power, Cooling

1. Optimized data placement
2. Buy fewer Tier 1 disks
3. Buy disks for actual data, not allocated
4. Snapshot pointers eliminate wasted disks
5. Scalable HW reduces datacenter footprint
6. Diskless servers

The Green Data Center is an Opportunity to Reduce TCO and Implement Enterprise DR

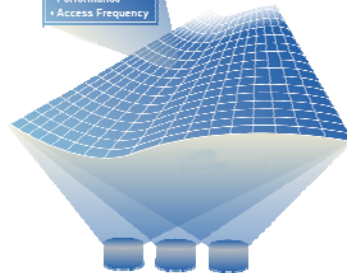
The Compellent Advantage: Dynamic Block Architecture

The only storage solution that manages data *inside the volume*

Dynamic Block Architecture™

- Metadata
 - Creation, Access, and Modification time
 - Frequency of access
 - Disk drive type/RAID level
- Sophisticated data movement engine
- No performance impact

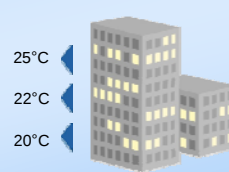
• Availability
• Performance
• Access Frequency



Traditional SANs



Compellent





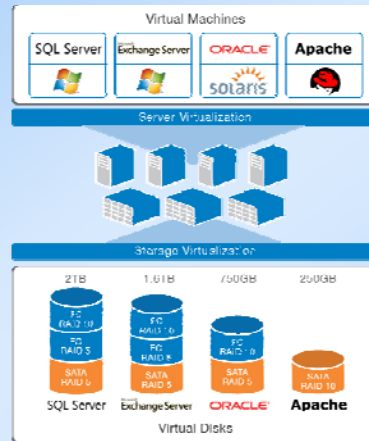
The Virtual Data Center

The perfect SAN for virtualized servers

Compellent & Virtual Servers

- Lower Datacenter TCO
 - 93% less energy required
 - Thin provisioning, auto tiered storage
- Simplified Management
 - Fast "spawning" of VMs
 - iSCSI and FC migrations
 - Quality of Service inside the VM
- Improve Availability
 - Boot VMs from the SAN
 - Continuous snapshots for quick local recovery
 - Simple remote recovery using replicated VMs

Compellent Advantage



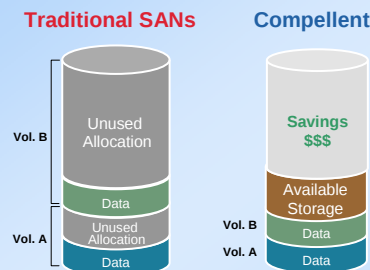
Enabling Efficient Storage Utilization

Eliminate the need for provisioning empty space

Thin Provisioning Benefits

- Only consume capacity when data is written
- Reduce disk drive, space, power and cooling costs
- Instant volume creation
- Automatic growth with applications
- Performance gains
- Thin import for immediate savings

Dynamic Capacity Advantage



Traditional Thin Provisioning

- Much larger chunks
- Pre-allocation required
- Snapshots not thin provisioned
- Windows-unrecoverable space
- "Fat" data migrations
- Limitations on application usage



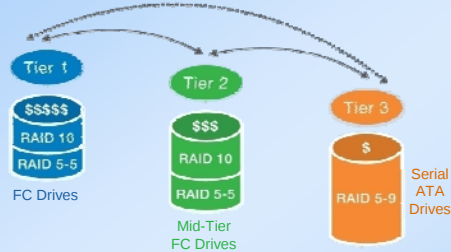
Automated Management of Inactive Data

The ONLY SAN to automate ILM inside the volume

Benefits

- Automatically move inactive data to lower tiers
- Eliminates RAID 5 write penalty
- 74% less disk costs
- Reduced power, cooling and floorspace
- Automatically move snapshots to lower tiers

Data Progression Advantage – Email example



- Active inbox
- 2-4 week old inbox
- Older inbox
- Recently deleted items
- Last month's calendar
- Old sent mail

Traditional Approach to Tiered Storage

- Entire Volume movement ONLY
- Manual data movement
- Manual data classification
- Extra software on each server



Optimize Data Placement

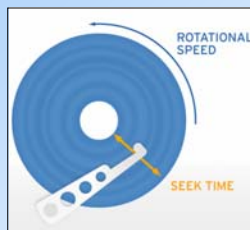
Reduces the number of drives while maintaining performance

Fast Track Benefits

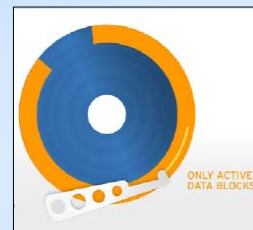
- Operates inside the volume at the block-level
- Use up to 30% fewer drives
- Reduce the need for costly, high-power drives
- Improve disk utilization
- Optimize performance on actual usage patterns
- Significantly lower latency on read/write operations

Fast Track Data Placement

Minimize seek time



Data on the Fast Track



Traditional Data Placement

- Volume-level placement
- Active data distributed across the drives
- Allocated but empty space on outer tracks
- Wasted inner tracks on the drive



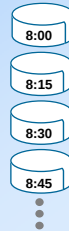
Rapid Data Recovery

Industry's most advanced snapshots reduce downtime and save time

Data Instant Replay Benefits

- Readable and writeable *instantly*
- Space efficient – freeze pointers
- No space pre-allocation
- Integration with common applications
- Reduce dependence on tape

Compellent Approach



Data Instant Replay Advantage

	Replays	Traditional Snapshots
Mount by any server	Yes	No
Recovery time	Seconds	Hours–Cloning required
Writeable	Yes	No
Boot volume	Yes	No
Maximum allowed	Unlimited	Limited 8-12
Pre-allocation	None	20-50% required
Copy-on-write	No	Yes
Drive type used	Any–user defines	Same as active volume



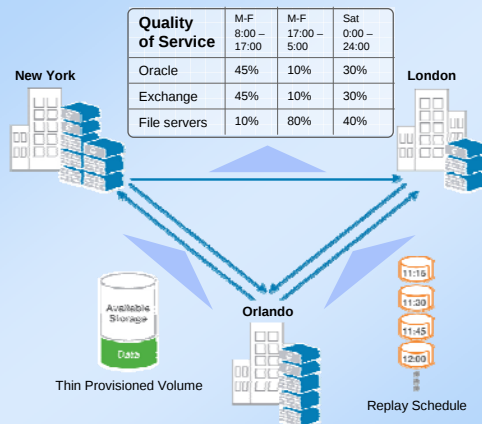
Simplified, Low-cost Disaster Recovery

Live testing anytime, fast recovery minimizes outage time

Thin Replication Benefits

- Significant reduction in bandwidth and management costs
- Sync / Async, FC &/or ISCSI
- Replication in 6 clicks + One button, automated restore
- No space pre-allocation
- Use lower cost / power disks at DR site
- Reduced power, cooling and floorspace

Remote Instant Replay Advantage





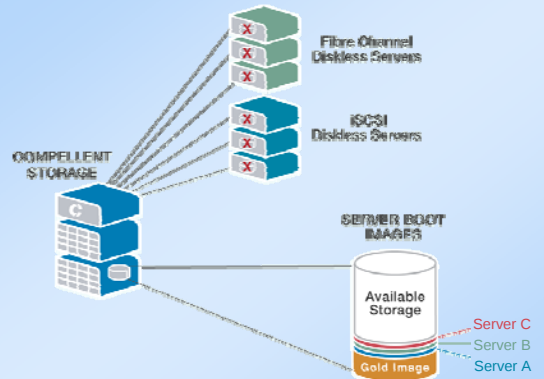
Boot From SAN

Lower server costs by more than \$100,000 for every 25 servers

Boot from SAN Benefits

- Diskless servers
- Thin provisioned boot volumes
- Less power, cooling and floorspace
- "Spawning" of boot images
- Replace failed servers in less than 15 minutes
- Easy to replicate boot images for DR

The Complete Boot From SAN Solution



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Compare Disk, Power, Cooling Savings

Legacy Storage System

- 20TB Usable System with RAID-10
- Traditional Provisioning, Manual Data Classification/ILM
- 274 enterprise HDD (all on Tier 1 FC)
- Power Costs over 5 Years: \$26,370 (Assumes Avg. Energy Costs of \$.10/kWh)

"Green" Virtualized Array

- 20TB Usable System with RAID-5 and RAID-10
- Automated Tiered Storage and Thin Provisioning
- 28 Enterprise disks and 14 SATA disks (64% reduction)
- Power Costs over 5 Years: \$3,758
- 86% Reduction in Power Costs
- Improved Utilization and Space Efficiency

Summary of case study – read more in "Compellent's Green Advantage" whitepaper available for download at www.compellent.com

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Reduced Drive Count Saves Energy 50TB example

Reduce storage electricity consumption up to 93%

Use Fewer Drives

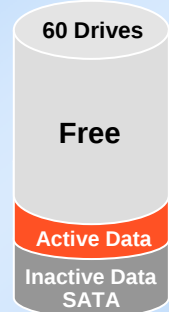
- Thin Provisioning
- Automated Tiered Storage
- Additional savings
 - Diskless servers
 - Space-efficient replays
- Eliminate the purchase of additional:
 - Generators, PDUs, A/C units, UPS's, humidifiers
- Delay data center expansions

Real-world example – 50TB provisioned

Traditional SANs



Compellent



- No enclosures
- No drives
- No electricity
- Zero footprint

- Low energy
- Small footprint

200,000 kW-H

40,000 kW-H

First year power consumption



Design For Persistence, Not Obsolescence

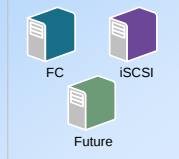
Grow without the “forklift” upgrade

Upgrading Benefits

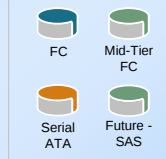
- Eliminate technology risk: mix and match at any time
- Scale from small to large in the same system
- Non-disruptive controller software upgrades
- One controller type supports all configurations
- No Forklift upgrades – EVER

Compellent Advantage

Server Independence



Disk Independence



Technology Independence

- 1/2/4 Gb FC
- SBOD or JBOD
- NAS
- Server OS independence
- IP or FC Replication

Comprehensive Solution

The lowest TCO in the industry

Features

- Core / Virtualization
- Dynamic Capacity
- Data Progression
- Fast Track
- Data Instant Replay
- Remote Instant Replay
- Enterprise Manager
- Replay Manager
- NAS

Services

- Support
- Installation
- Training
- Optimize
- Consult

Connectivity

- Servers: iSCSI, FC, all operating systems
- Disk Drives: 1TB – 500TB+
- NAS (NFS, CIFS)
- Switches & HBAs



Summary: Economies of the Green Data Center

- The green data center is an opportunity for end users to reduce TCO and implement DR
- Server and storage virtualization together are the foundation for the green data center
- End users can maximize assets to postpone or eliminate costly upgrades of HW, power, cooling, and space
- Ease of use and simplified management can reduce administrative burden

FOR FURTHER INFORMATION SEE
www.compellent.com WHERE YOU CAN DOWNLOAD
OUR GREEN ADVANTAGE WHITE PAPER