

ETERNUS DX80

ETERNUS DX60

Technical Slides

June, 2009

Fujitsu Limited



Business Value

Reliable Storage Solutions

- Quality and reliability
- Innovation and speed
- Simple installation and easy-to-manage
- Versatile usage scenarios
- Very affordable

ETERNUS DX60 and DX80 - Line-up



■ Optimized storage for Small & Medium Enterprises

Affordable entry
in network storage



ETERNUS DX60

Max.24 drives



ETERNUS DX80

Max.120 drives
Supports FC 8Gbit/s

For higher performance
and more expandability

	DX60	DX80	Note
No. of drives	24	120	
Storage capacity	10.8 TB	54.0 TB	With 450GB SAS drives
	24.0 TB	120.0 TB	With 1TB Nearline SAS drives
Cache capacity	2 GB	4 GB	In configurations with two controllers
Host ports	4x FC 4Gbit/s	4x FC 4Gbit/s or 8Gbit/s	+ SAS + iSCSI as of 09/2009

ETERNUS DX60 Specification Summary



		ETERNUS DX60	ETERNUS2000 Model100	FibreCAT SX60
Number of Controllers		1 or 2	2	1 or 2
Cache Capacity		1 or 2 GB	2 GB	.5 or 1 GB
Cache Data backup / Cache Hold Time		CacheProtector (write back to Flash powered by SCU), unlimited hold time	Memory Backed up by BBU, 48 or 96 hour hold time	FibreCAP, unlimited hold time
Host Interfaces	FC	4 Gbit/s	4 Gbit/s	4 Gbit/s
	iSCSI	1 Gbit/s*	1 Gbit/s	-
	SAS	3 Gbit/s*	3 Gbit/s	-
Drive Types		SAS / NL-SAS (3 Gbit/s)	SAS/SATA (3 Gbit/s)	SATA (3 Gbit/s)
RAID Levels		0,1,1+0,5,6,5+0	0,1,1+0,5,6	0,1,10,3,5,50,6
Max. Number of HDD HDD Number/Enclosure		24 (12 in 2U) with 3.5"	24 (12 in 2U) with 3.5"	24 (12 in 2U) with 3.5"
		24* (24 in 2U) with 2.5"	-	-
Max.LUN Number		512	512	128
Max.HBA Number		64 (32/port)	64/(16/port)	16
Additional data protection features		Data Block Guard, Redundant Copy, Global + Dedicated Hot Spares	Data Block Guard, Redundant Copy, Global Hot Spares	Global + Dedicated Hot Spares
RAID migration		x	x	-
Copy Functions		SnapOPC+, OPC, QuickOPC, EC	SnapOPC+, OPC, QuickOPC, EC	Snapshots
Encryption		x	-	-
ECO mode		x	x	-
Supported OS		Windows, Linux, Unix, VMware	Windows, Linux, Unix, VMware	Windows, Linux, VMware

*2nd Release

ETERNUS DX80 Specification Summary



		ETERNUS DX80	ETERNUS2000 Model200	FibreCAT SX80/SX88
Number of Controllers		1 or 2	2	1 or 2
Cache Capacity		2 or 4 GB	4 GB	1 or 2 GB
Cache Data backup / Cache Hold Time		CacheProtector (write back to Flash powered by SCU), unlimited hold time	Memory Backed up by BBU, 48 or 96 hour hold time	FibreCAP, unlimited hold time
Host Interfaces	FC	4 or 8 Gbit/s	4 Gbit/s	4 Gbit/s
	iSCSI	1 Gbit/s*	1 Gbit/s	1 Gbit/s
	SAS	3 Gbit/s*	3 Gbit/s	-
Drive Types		SAS / NL-SAS (3 Gbit/s), SSD*	SAS/SATA (3 Gbit/s)	SAS/SATA (3 Gbit/s)
RAID Levels		0,1,1+0,5,6,5+0	0,1,1+0,5,6	0,1,10,3,5,50,6
Max. Number of HDD HDD Number/Enclosure		120 (12 in 2U) with 3.5”	120 (12 in 2U) with 3.5”	56 (12 in 2U) with 3.5”
		120 * (24 in 2U) with 2.5”	-	-
Max.LUN Number		1024	1024	256
Max.HBA Number		128(32/port)	128/(32/port)	32
Additional data protection features		Data Block Guard, Redundant Copy, Global + Dedicated Hot Spares	Data Block Guard, Redundant Copy, Global Hot Spares	Global + Dedicated Hot Spares
RAID migration		x	x	-
Copy Functions		SnapOPC+, OPC, QuickOPC, EC	SnapOPC+, OPC, QuickOPC, EC	Snapshots
Encryption		x	-	-
ECO mode		x	x	-

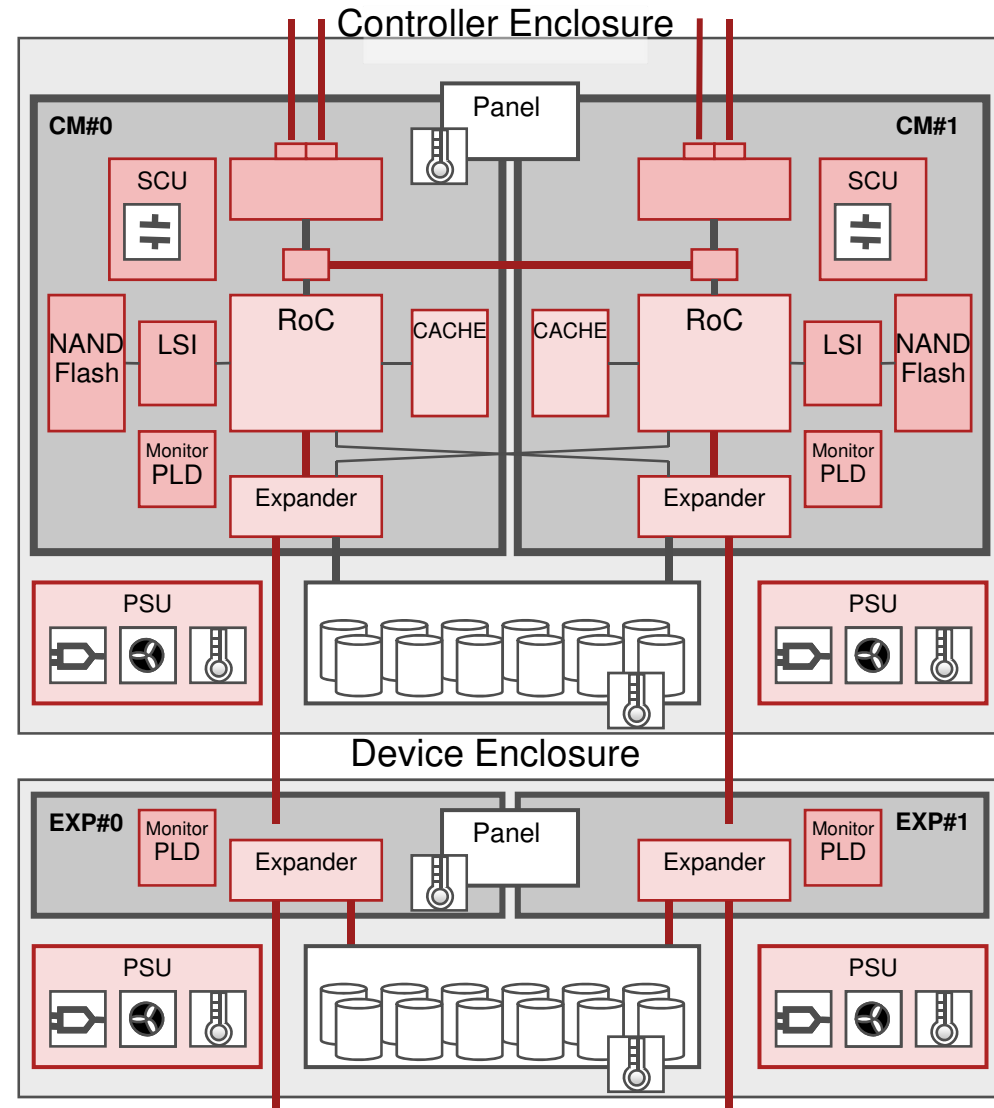
*2nd Release

Quality and Reliability

- Advanced data protection
- CacheProtector
- Redundant Copy
- Disk encryption
- RAID Migration

Redundant & hot-pluggable components

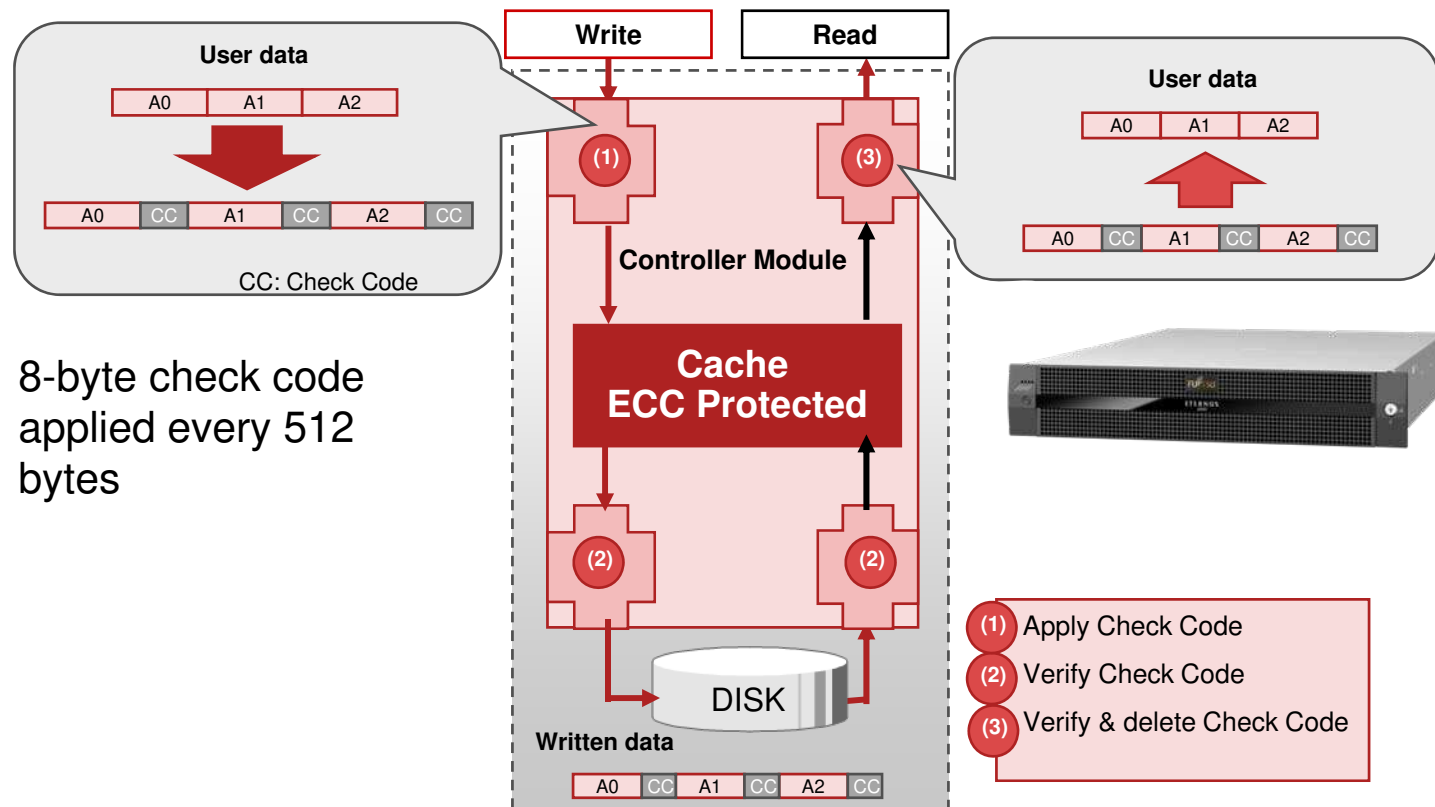
- Main components are redundant and hot-pluggable, such as controllers, power supply units, cooling fans and hard disk drives.
- Components are hot swappable without stopping system in case of failure.
- Hot expansion of disk drives
- Firmware can be upgraded without stopping operations.



CM: Controller Module, EXP: Expansion Module, PSU: Power Supply Unit, SCU: System Capacitor Unit, RoC: RAID-On-Chip

Data Block Guard

- saves additional 8-byte check code to every 512-byte data to ensure data integrity both on the disk and in the cache



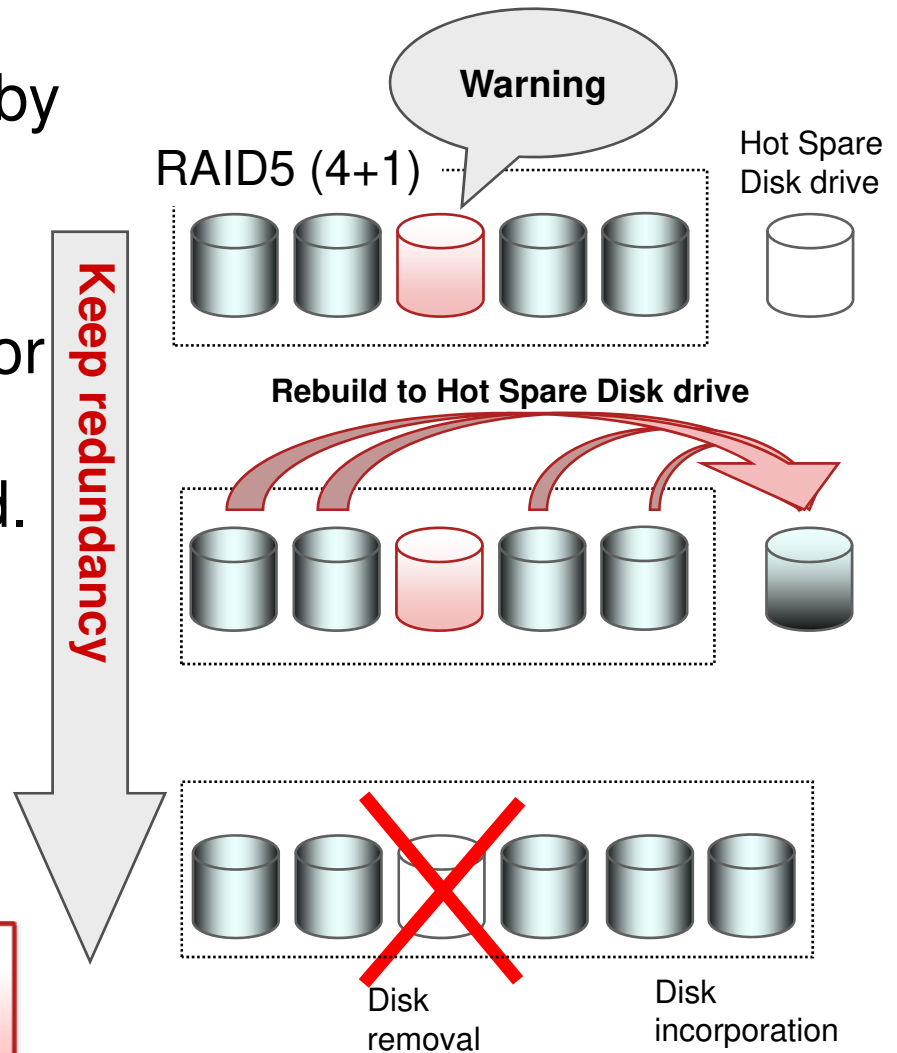
- Improve data integrity beyond RAID

- When power fails, a capacitor maintains power until the cache content is saved to non-volatile memory (flash)
 - Cache data is safe for unlimited time, it does not depend on battery capacity
- The Capacitor recharges within 1 minute when power is restored
 - High performance (write cache) available much sooner than with battery backup solutions
- No periodic replacement
 - No maintenance necessary for Capacitor
 - Battery backup solutions must be monitored constantly and batteries need to be exchanged every 3 years

- No time limit to restore the data in case of power failure
- Fast restart after power failure
- No maintenance necessary for CompactFlash and Capacitor

Redundant Copy

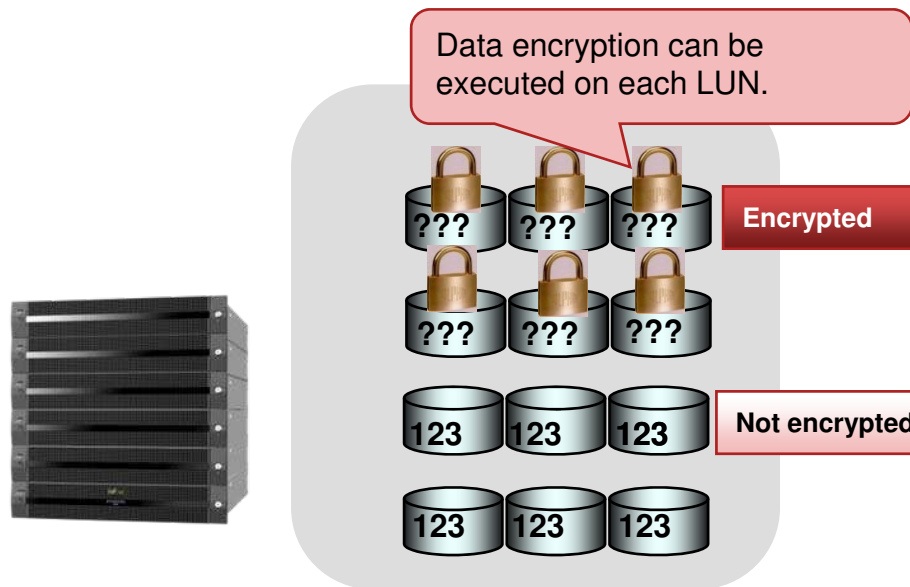
- All disk drives are monitored by system.
- Start rebuild automatically to Hot Spare if same type of error occurs repeatedly and exceeded a defined threshold.
- After rebuild is done, disable the disk.



- Replace failing disk to keep up redundancy

Disk Encryption

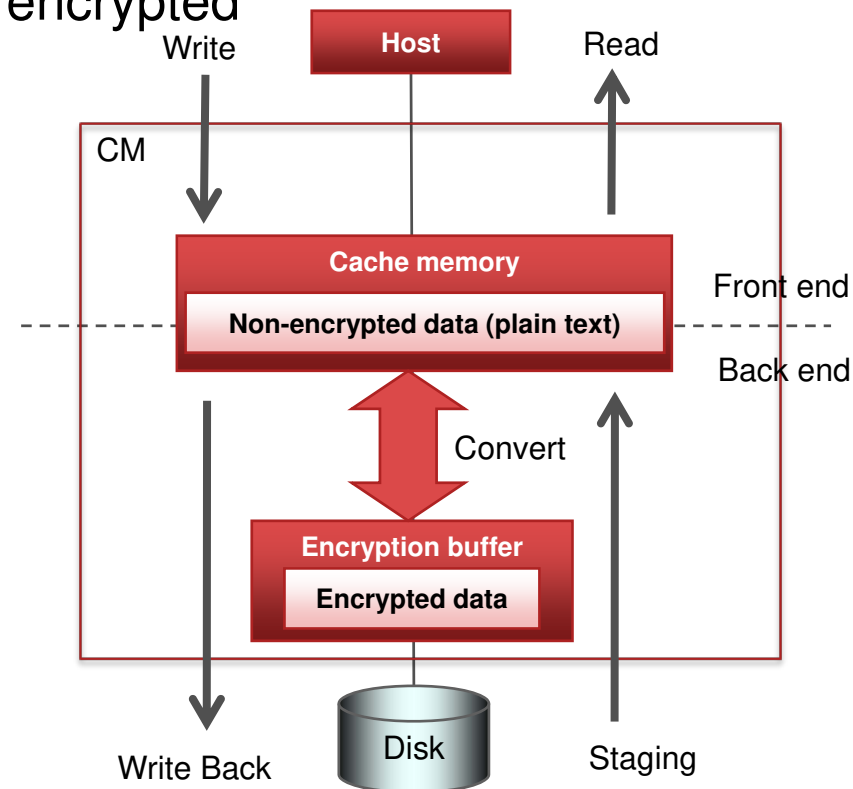
- Key is generated automatically by the system
- Encryption can be configured per volume



- Protects your data even on defective or decommissioned disk drives

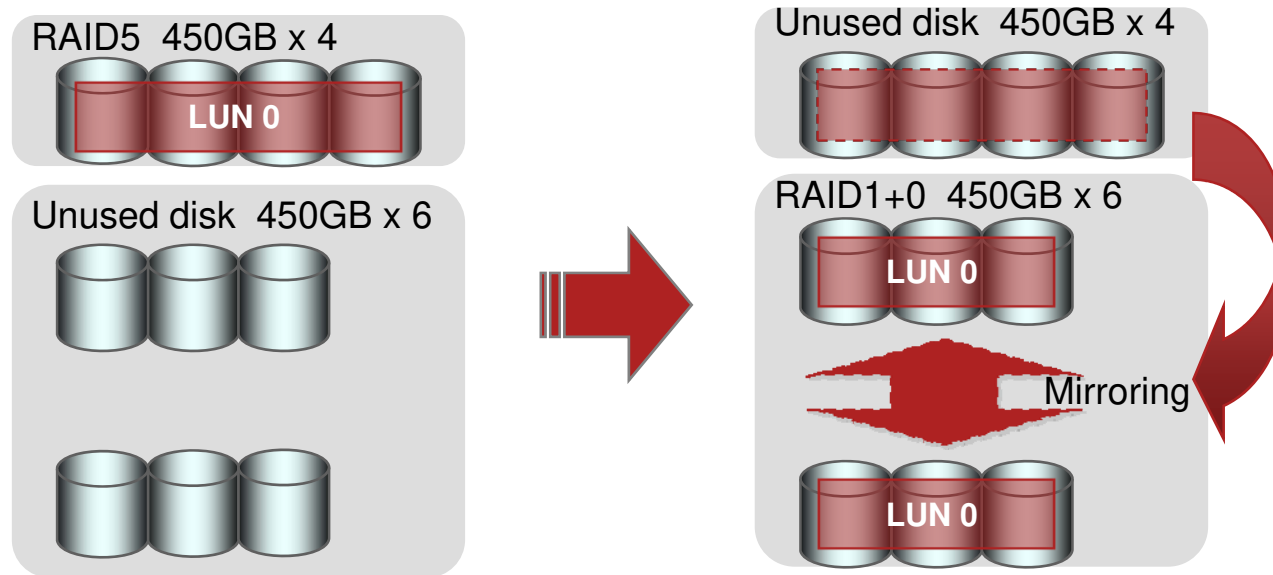
Working with Disk Encryption

- Encryption can be turned on per volume
 - At creation time
 - Or converted during operations
 - It can not be turned off later
 - Requires also encrypted copy destination volumes for snapshots or clones in case of source volumes are encrypted
- Encryption is done by the controller (CM)
 - Will have an impact on controller performance



RAID Migration

- LUNs can be migrated on the fly to other drives, different RAID groups, other drive types (e.g. SAS to NL SAS, SAS to SSD)



- Reduce hot spots
- Move LUNs to more suitable disk type or RAID type if requirements change

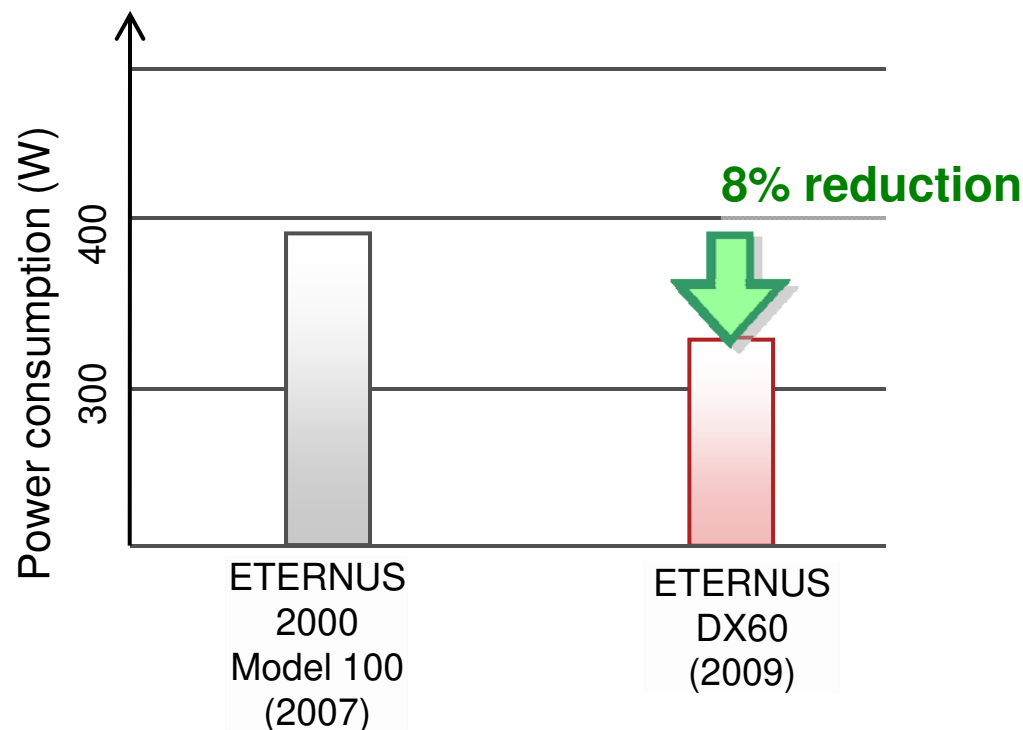
Innovation and Flexibility

- High Power Efficiency
- ECO Mode
- Flexibility
- SSD Support

■ Max. 8% reduction in power consumption

- Improved enhancement of Power Supply Unit (PSU) efficiency for 10 %
- Improvement of FAN-spin-speed control equipment

■ ECO Mode can achieve additional power savings



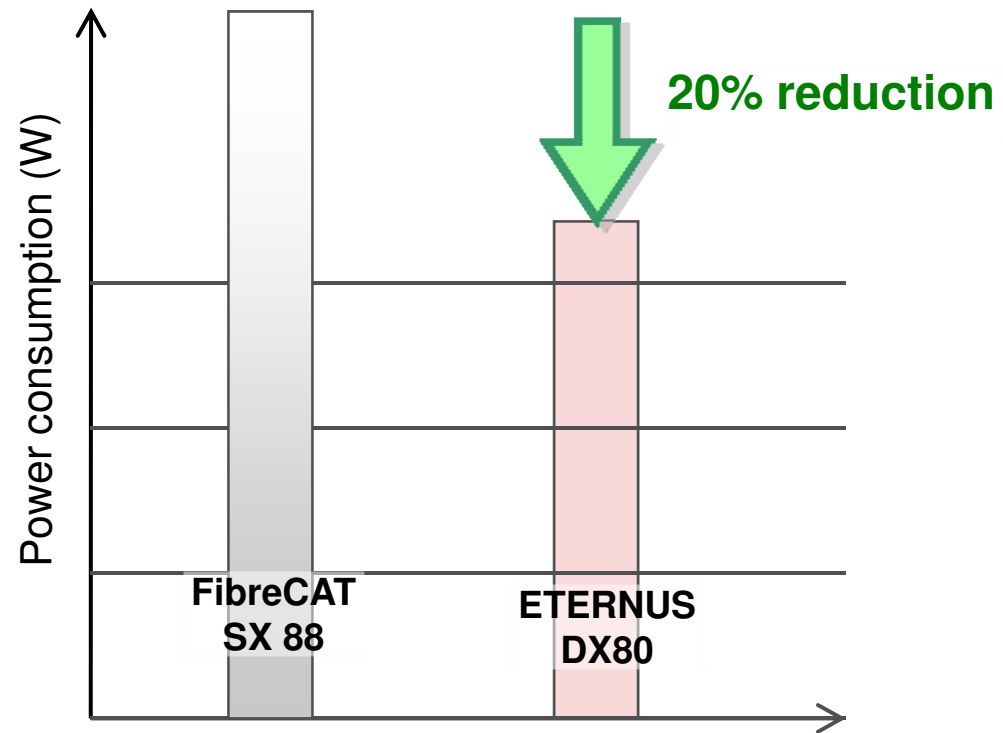
Test environment : 2 controllers and 12 HDDs at 25 deg C

High Power Efficiency (for EMEA)

■ Max. 20% reduction in power consumption

- Improved enhancement of Power Supply Unit (PSU) efficiency for 10 %
- Improvement of FAN-spin-speed control equipment

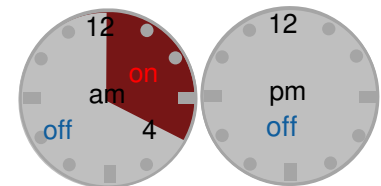
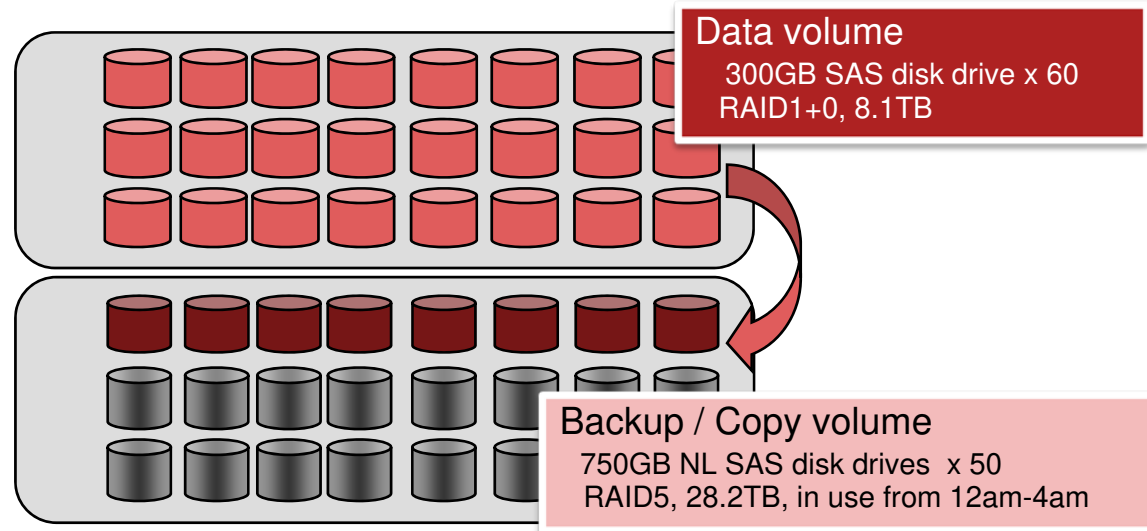
■ ECO Mode can achieve additional power savings



Test environment : 2 controllers and 12 HDDs at 25 deg C

- When disks (Raid groups) are used only a few hours per day (e.g. for backup), ECO mode provides a safe way of saving power

- Define schedules
- Drives are spun down if idle
- Drives are spun up automatically when accessed
- Can be managed with ETERNUS DX60/DX80 Web GUI or CLI



- Benefit: Save up to 10% energy by spinning down less frequently used drives

ECO Mode - Details

- Use ECO mode to save power for idling disks
- Disk drive motors will power off when
 - the RAID group is unused for a configurable time period (e.g. 30 minutes)
 - Or on scheduled times
- Powered on by Host I/O within the host time out value

Set ECO Mode Schedule

Present Set ECO Mode Schedule is displayed. Various setting change and details can be confirmed from the tree

ECO Mode : Disable

RAID Groups

Schedule

ECO Mode Commonness Setting

ECO Mode

☒ Enable ☐ Disable

Host I/O Monitoring Time (min.)

30

Disk Motor Control Limit Count (Cycle/Day)

3

Set ECO Mode Schedule

Present Set ECO Mode Schedule is displayed. Various setting change and details can be confirmed from the tree at the left of the screen.

ECO Mode : Disable

RAID Groups

Schedule

New Schedule

Schedule

No. 0

Schedule Name Test (1 - 16 characters(alphanumeric character blanc sign))

Event List

Event	From Time	To Time
Add	Edit	Delete Delete All

Set Event

Event Type ☒ Everyday ☐ Every week ☐ Specific days ☐ Specific week

From Time

20 : 00

To Time

07 : 00

Apply

Cancel

Fibre Channel: when performance matters

- 4 or 8 Gbit/s connections for bandwidth-hungry applications (streaming, backup)
- Deterministic performance, best scalability
- The choice for datacenter, business-critical applications

iSCSI: easiest step towards networked storage

- 1 Gbit/s connections are OK for most applications
- Well-know IP infrastructure has lower training cost
- Dedicated network recommended for scalability

SAS: cheap and fast direct attachment, especially for small clusters

- SAS HBA is cheaper than FC HBA, and has excellent bandwidth
- Ideal for clusters: 2x HA direct attached, or 4x without failover

SAS, Nearline SAS, or Solid State Drives



3.5" SAS:
for mission critical data

- Enterprise performance and reliability
- 15k rpm, 300 GB, 450 GB

3.5" Nearline SAS: cost-efficient capacity for non-critical data

- Nearline SAS drives are SATA drives (high capacity, low cost) with a SAS interface (dual ported, SAS firmware)
- 7.2k rpm 750 GB, 1 TB

2.5" SAS drives: more spindles/IO per U, at less power

- 10k rpm, 300 GB, 24 drives in 2U enclosure
- Available as of September 2009

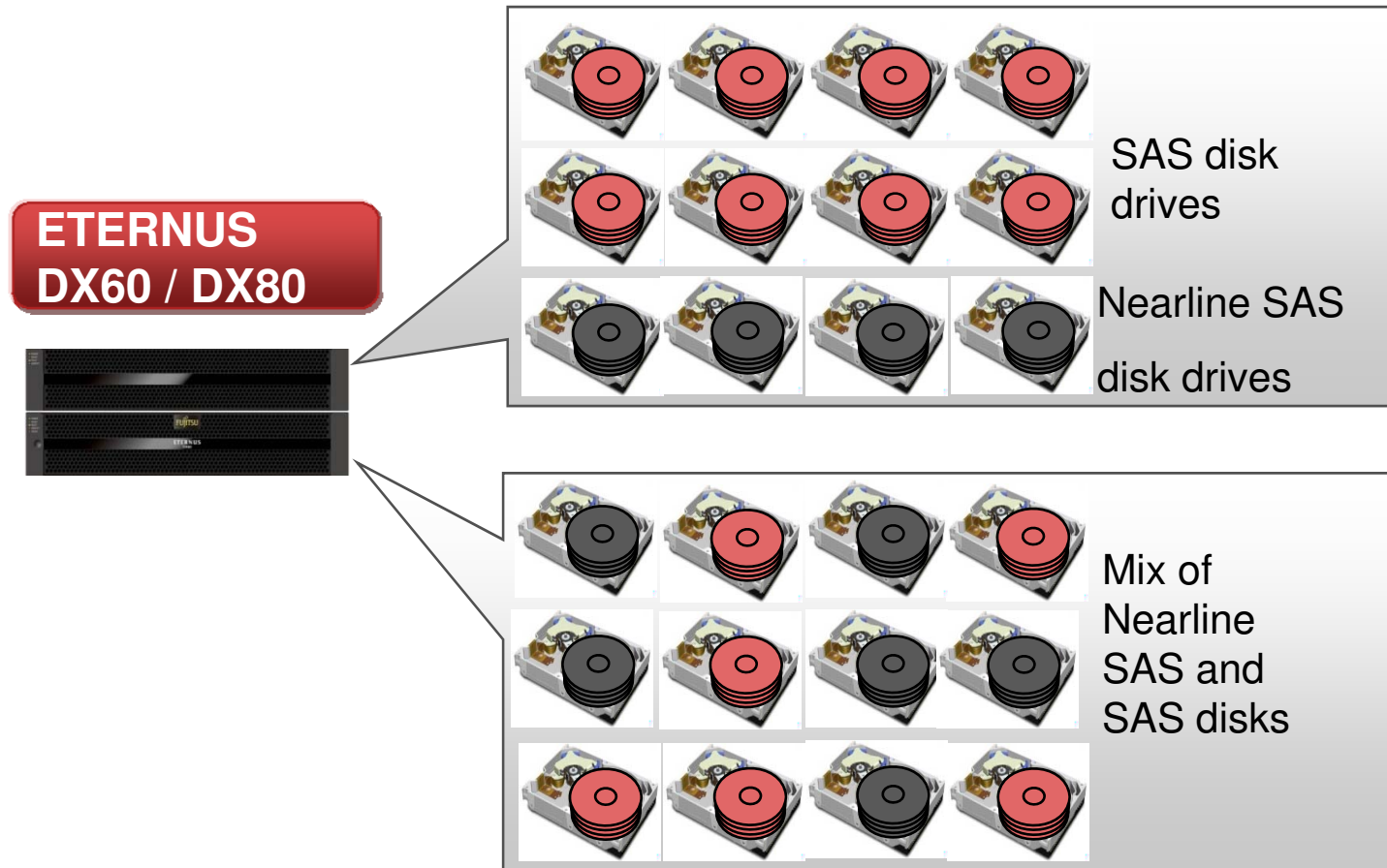
Enterprise SSDs provide best IO/\$

- Excellent random reads and writes, lowest latency
- Good for highest IOPS demands
- Available as of September 2009

3.5" SAS, Nearline SAS and 3.5" SSDs can be intermixed in the same enclosure

Disk Drive Intermix

- Able to mix different disk drives in the same DE (drive enclosure)



Simple installation and easy-to-manage

■ Embedded Web GUI and CLI

- No need to install software
- http or https for the GUI, telnet or ssh for the CLI
- Also used for initial setup

■ Integration

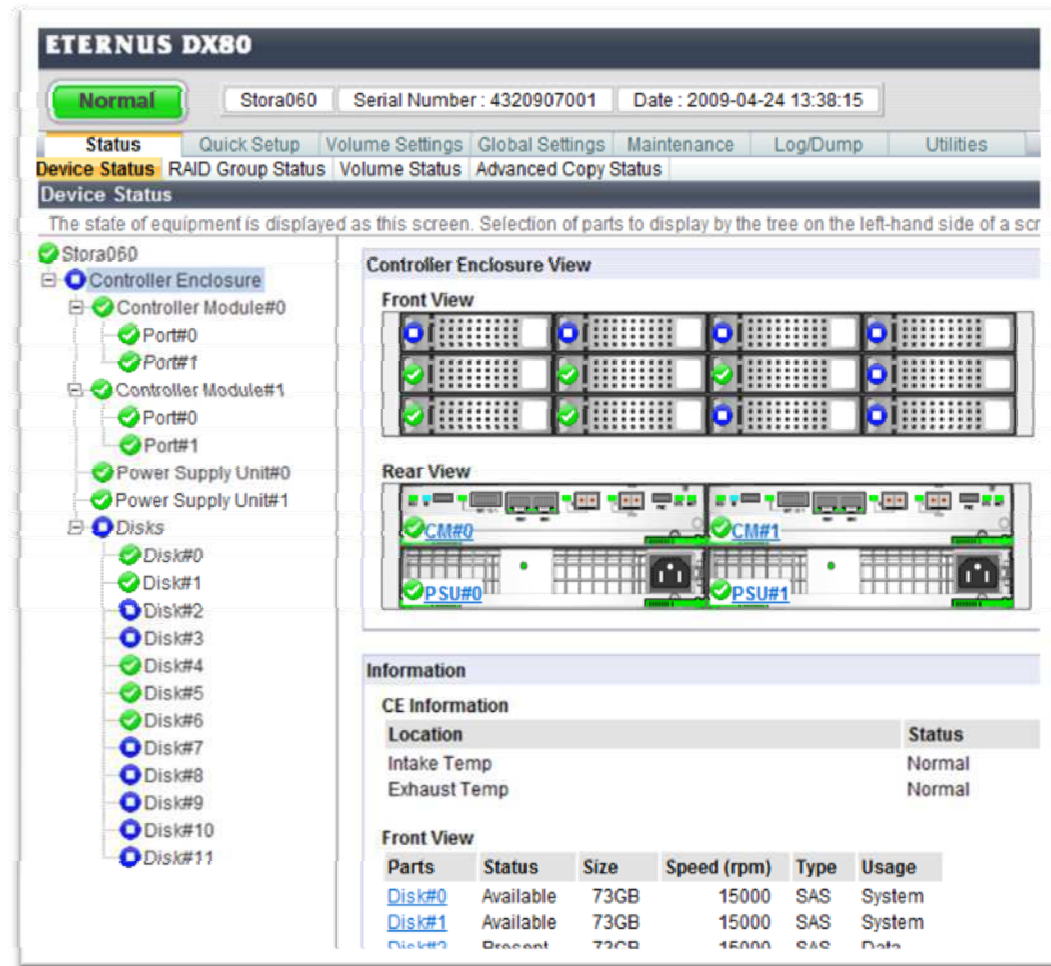
- SNMP: PRIMERGY ServerView 4.90 and others (MIB downloadable from Web GUI)
- SMI-S: PRIMERGY ServerView 4.91
- Microsoft Storage Manager for SANs (VDS)

■ ETERNUS SF

- Storage Cruiser: manage SAN with ETERNUS hardware
- AdvancedCopy manager: leverage all snapshot and clone features of ETERNUS

Web based management

- Initial setup wizard
- Manual operation or Wizard:
 - Create and manage RAID groups, LUNs
 - Manage LUN to host mapping
- Monitor system and component status
- Manage snapshots
- View events, collect diagnostic information
- Manage firmware



The screenshot displays the ETERNUS DX80 web management interface. At the top, the title "ETERNUS DX80" is visible. Below it, a "Normal" status indicator is shown alongside the device name "Stora060", its serial number "4320907001", and the date/time "2009-04-24 13:38:15". A navigation bar includes tabs for "Status", "Quick Setup", "Volume Settings", "Global Settings", "Maintenance", "Log/Dump", and "Utilities". The "Status" tab is active, showing sub-tabs for "Device Status", "RAID Group Status", "Volume Status", and "Advanced Copy Status". The "Device Status" sub-tab is selected, displaying a tree view on the left and a "Controller Enclosure View" on the right. The tree view shows the hierarchy: Stora060 > Controller Enclosure > Controller Module#0 > Port#0, Port#1, Controller Module#1 > Port#0, Port#1, Power Supply Unit#0, Power Supply Unit#1, and Disks > Disk#0 through Disk#11. The "Controller Enclosure View" shows a "Front View" and a "Rear View" of the hardware. The "Front View" shows a grid of components with status indicators. The "Rear View" shows the rear panel components. Below the views, an "Information" section provides details about the Controller Enclosure (CE) and a table of disk status.

Controller Enclosure View

Front View

Rear View

Information

CE Information

Location	Status
Intake Temp	Normal
Exhaust Temp	Normal

Front View

Parts	Status	Size	Speed (rpm)	Type	Usage
Disk#0	Available	73GB	15000	SAS	System
Disk#1	Available	73GB	15000	SAS	System
Disk#2	Present	73GB	15000	SAS	Data

Easy to use Web GUI

■ Device Status overview

Intuitive device status display

Familiar Tree-structure display

The state of equipment is displayed as this screen. Selection of parts to display by the tree on the left-hand side of a screen displays the state of the part.

Controller Enclosure View

Front View

Rear View

Information

CE Information

Location	Status	Error Code
Intake Temp	Normal	0x0000
Exhaust Temp	Normal	0x0000

Front View

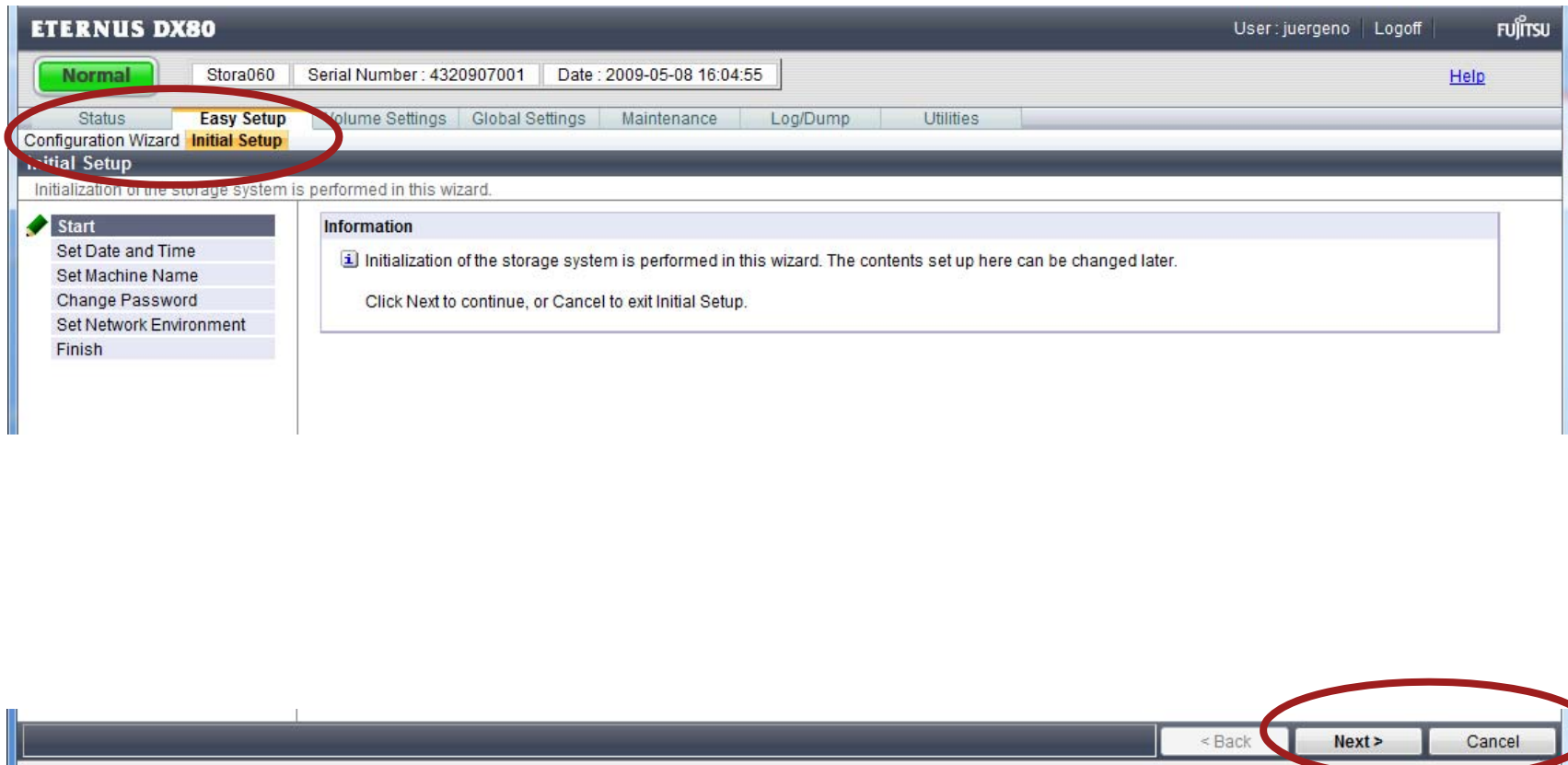
Parts	Status	Size	Speed (rpm)	Type	Usage
Disk#0	Available	73GB	15000	SAS	System
Disk#1	Available	73GB	15000	SAS	System
Disk#2	Available	73GB	15000	SAS	Data
Disk#3	Available	73GB	15000	SAS	Data
Disk#4	Available	146GB	15000	SAS	Data
Disk#5	Available	146GB	15000	SAS	Data
Disk#6	Available	146GB	15000	SAS	Data
Disk#7	Available	146GB	15000	SAS	Data
Disk#8	Available	146GB	15000	SAS	Data
Disk#9	Available	146GB	15000	SAS	Data
Disk#10	Available	146GB	15000	SAS	Data
Disk#11	Available	146GB	15000	SAS	Data

Rear View

Parts	Status	Expanded Information
CM#0	Normal	
CM#1	Normal	

Activate DISK Port Turn ON Location LED Refresh

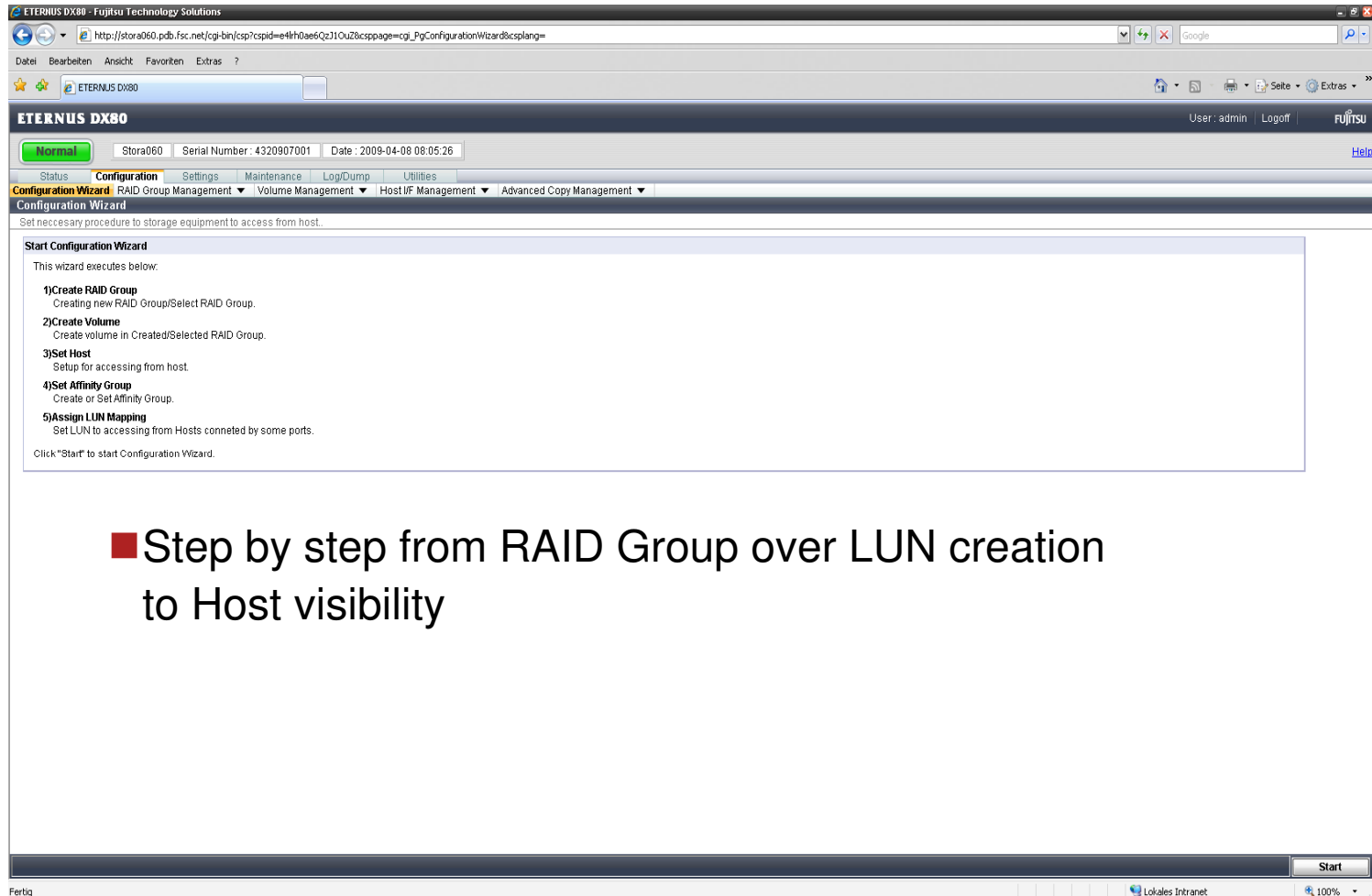
Initial Setup Wizard



- Wizard starts automatically if not configured
- Setup Wizard reduces required trainings for deployment

Configuration Wizard

■ Wizard guided configuration



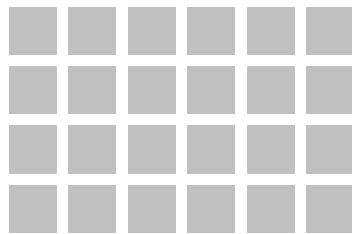
■ Step by step from RAID Group over LUN creation to Host visibility

Snapshots and Clones

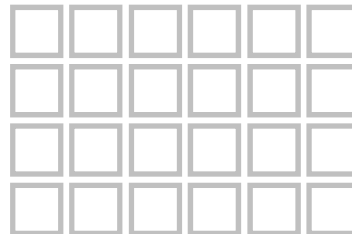
Snapshots and Clones

	Snapshots	Clones
Description	Virtual copy	Real copy
Positioning	For space-efficient temporary copies such as a consistent source for backup to tape	For longer-term copies such as database clone, backup to and restore from disk
ETERNUS DX60/DX80 feature	SnapOPC+	OPC QuickOPC EC
Space requirement	Only for changed data	Same space as source
Performance impact on source LUN during creation	None	OPC: after split, EC: before
Performance impact on source LUN after creation	if source changes or if many reads from snapshot	None
Resilient against failure of original LUN	-	✓

How do Snapshots work



Source volume



9:00 snapshot



Blocks at 9:00

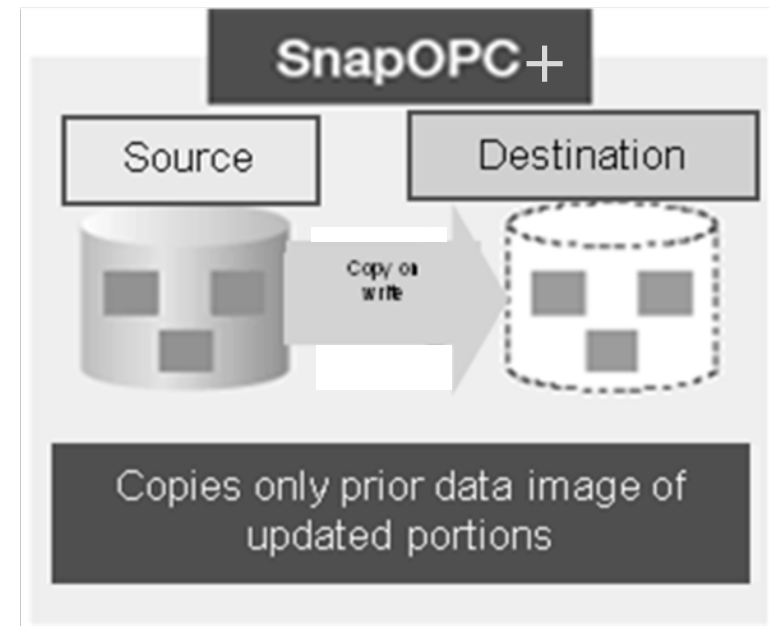


Blocks changed after 9:00

1. At 9:00, a snapshot is made
 - Happens very quickly because the data itself is not copied
2. After 9:00, the customer tries an upgrade and production data on source volume is changed
 - Causes “copy on write” (COW), also called “write-out”
 - Snapshot refers to source volume for unchanged blocks and snapshot volume for changed blocks

ETERNUS DX60/DX80 Snapshots

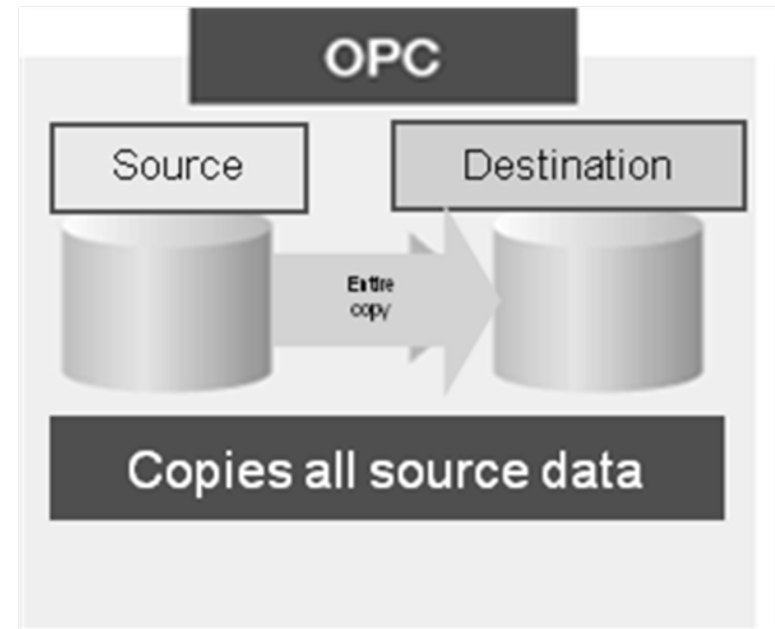
- Snapshots capture changes
 - ETERNUS DX60/DX80: SnapOPC+
 - Space requirement: only for changed data
 - Operational dependence
 - Zero Performance impact when the Snapshot is invoked
 - Latency for first writes to the source (copy-on-write)
 - Heavy reads from the snapshot impact the source LUN
 - Snapshots become invalid if source RAID group fails



Recommendation: for space efficient temporary copies
(e.g. a consistent source for backup to tape)

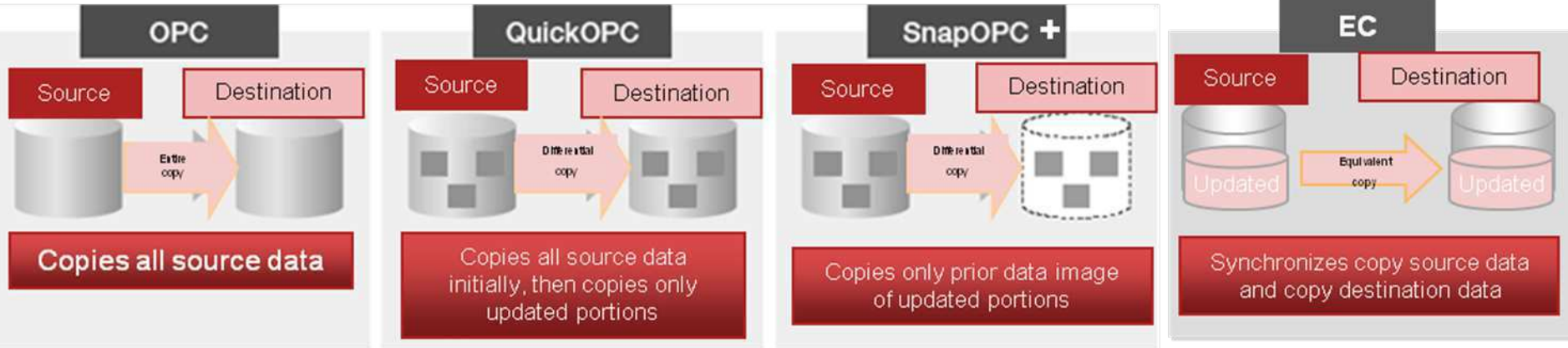
ETERNUS DX60/DX80 Clones

- Clones are full copies
 - ETERNUS DX60/DX80:
OPC, QuickOPC, EC
 - Clones require as much space as the source LUN
 - Operational dependence:
 - Latency for read and write operations on the source during the copy process
 - Zero performance overhead when the copy process is complete
 - Destination is completely independent of source



Recommendation: for longer-term copies
(DB clone, restore from disk)

Snapshots and Clones on ETERNUS DX60/DX80



OPC	Copies entire source data. Suitable for backup operation with generational management. Provides full backup of multi-generation data.
QuickOPC	Copies only updated portions, after initial copy of entire source data. Suitable for database systems which need shorter backup times.
SnapOPC+	Copies only data image prior to update. Enables size reduction of destination disk capacity, and provides multi-generation management. Suitable for backup of data stored on File Servers.
EC	Continually replicates (mirrors) entire source data to the copy destination. Replicated data can be accessed by suspending the EC session. The EC session can be resumed after being suspended. Only the data blocks that have changed data will be copied providing a fast resync of the mirror.

Snapshots & Clones - Licensing

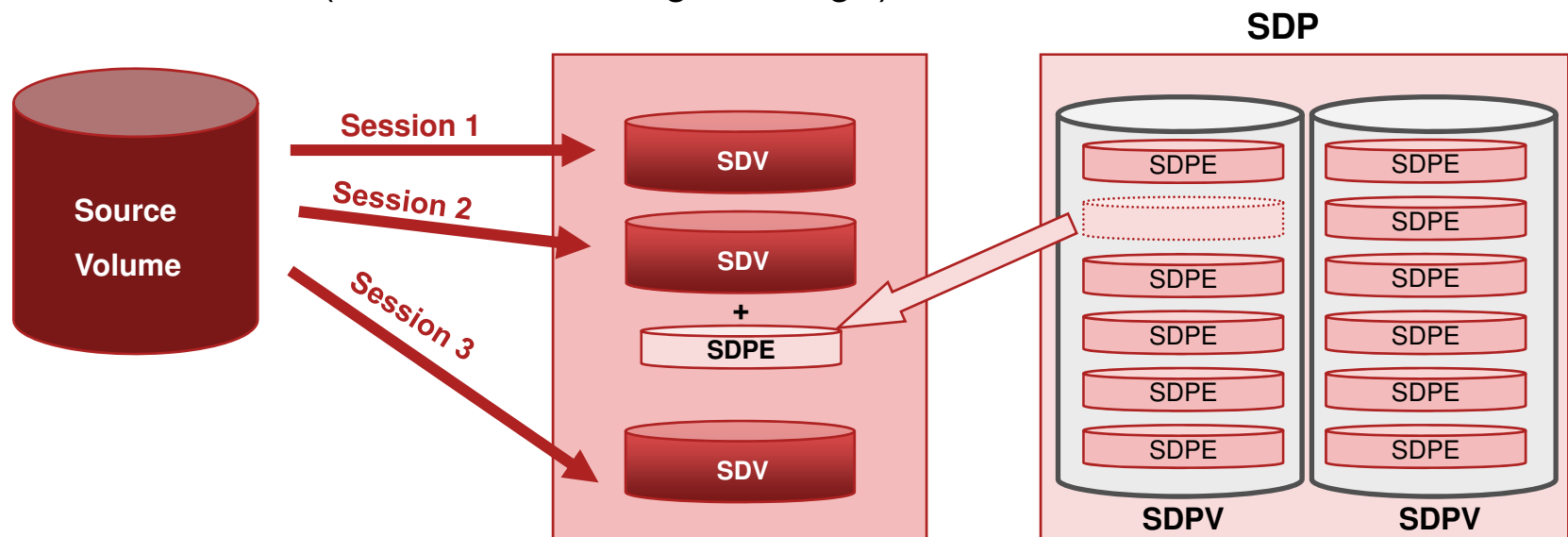


- 8 Snapshots (or Clones) are available for free
 - Web GUI/CLI: SnapOPC+
 - ETERNUS VSS HW Provider: SnapOPC+ or QuickOPC
- ETERNUS DX60/DX80 Advanced Copy License
 - Allows up to 512/1024 Snapshots and Clones
 - ETERNUS SF ACM* required to manage OPC and EC

HW License	Default	With Advanced Copy license	
SW License	NA	Without ETERNUS SF ACM license	With ETERNUS SF ACM license
No. of sessions	8	512 (DX60) or 1024 (DX80)	
Control by	Web GUI/CLI/VSS	Web GUI/CLI/VSS	ACM
SnapOPC+	X	X	X
OPC	-	-	X
QuickOPC	X (via VSS)	X (via VSS)	X
EC	-	-	X

SnapOPC+ Architecture

- **SDP: Snap Data Pool**
 - 1 Pool per ETERNUS DX60/DX80
 - Consists of SDP volumes (created like normal volumes)
- **SDV: Snapshot Data Volume**
 - 1 SDV must be defined per Session
 - SDVs are created like normal volumes, expect for space allocation:
 - from any RAID group at creation time (user must know max size of update)
 - or the SDP (SDP must be large enough)



■ Preparation

- Set up Advanced Copy table (cache tables, copy-on-write resolution depending on concurrent sessions and capacity snapped)
- Create Snapshot Pool (SDP) (1 per system)
- Create SDV devices for each snapshot destination (use own allocated space or from SDP)
- Verify snapshot policies

■ Create snapshot

- Via VSS HW provider (best consistency), CLI (scripting) or Web GUI

■ Map + Mount snapshot

- Use LUN mapping or affinity groups like with any other volume type
- Use operating system tools

■ Unmount+unmap snapshot

- Use operating system tool and unmap it

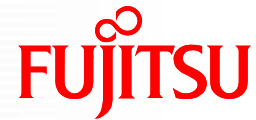
■ Restore from snapshot

- Manually mount snapshot and retrieve the files required
- Full restore is not possible, only for clones

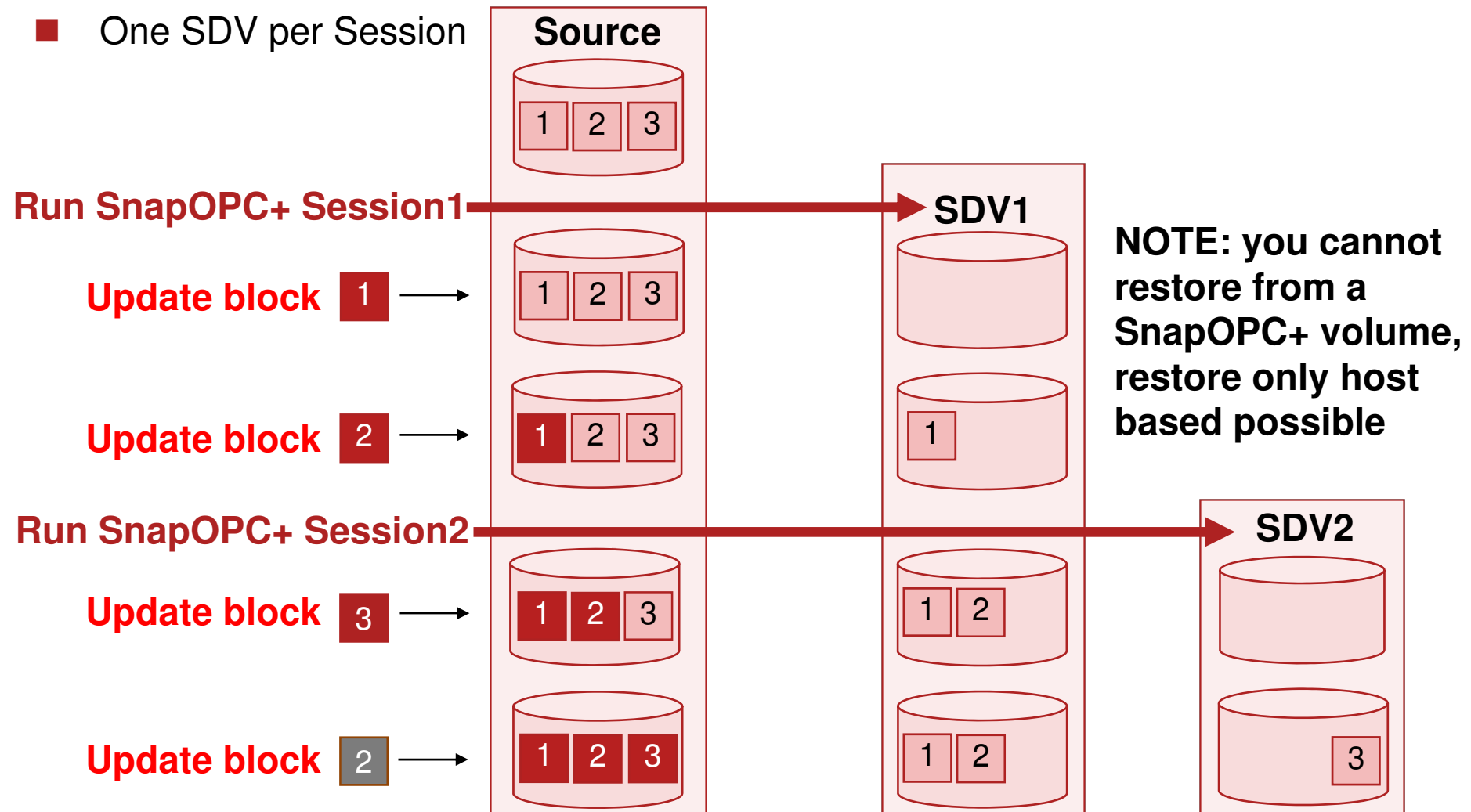
■ Delete snapshot

- Make sure to re-initialize the SDV

SnapOPC+ Multi Generation Operation



- As the copy source volume is updated, ETERNUS DX60/DX80 creates a physical copy of the old data (COW)
- One SDV per Session



Where to best trigger a Snapshot/Clone



- Snapshot or Clone operations are available
 - Snapshots (SnapOPC+) through the Web GUI
 - i.e. application has to be down for snapshot consistency
 - Snapshots (SnapOPC+) through the CLI
 - i.e. scripted interaction with application possible – make sure application is in backup mode or consistent otherwise
 - Snapshots (SnapOPC+) and Clones (QuickOPC) through a Microsoft VSS HW provider
 - i.e. VSS aware applications provide snapshot consistency automatically: Exchange, SQL, File service, Registry, ..
 - ETERNUS SF AdvancedCopy Manager can manage all Snapshots and Clones.*

Snapshot scenario: Symantec BackupExec



1. BackupExec initiates snapshot creation on production server
2. BackupExec mounts snapshot
3. BackupExec creates tape backup from snapshot
4. BackupExec dismounts snapshot
5. BackupExec initiates snapshot deletion

Production server with BackupExec Client +
ETERNUS VSS HW Provider



ETERNUS DX60/DX80

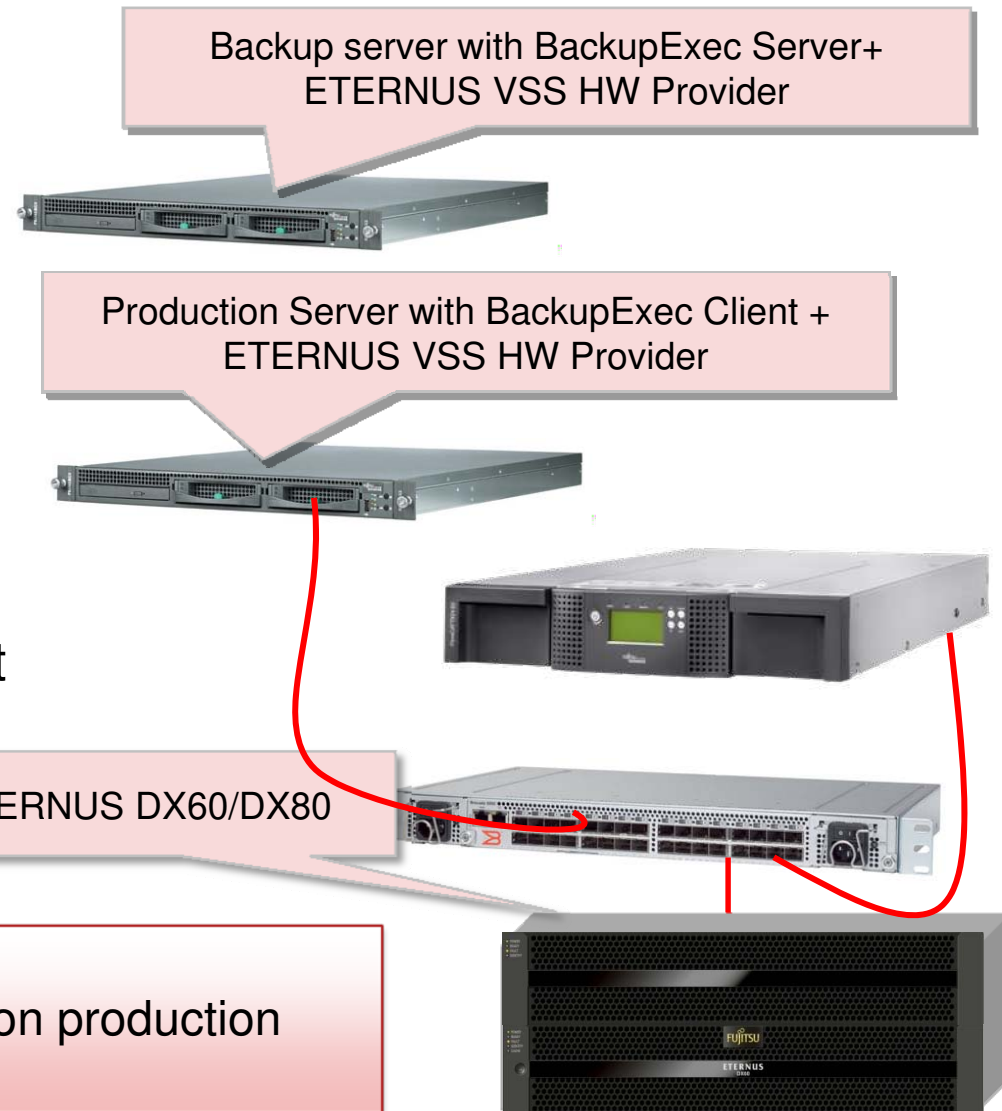


Benefit: Application consistent backup,
very short backup window

Snapshot scenario: Off-host backup

- BackupExec initiates snapshot creation on production server
 - BackupExec mounts snapshot on backup server
 - BackupExec creates tape backup from snapshot on backup server
1. BackupExec dismounts snapshot on backup server
 2. BackupExec initiates snapshot deletion

Benefit: Application consistent backup, very short backup window, low impact on production server during backup



Technology

- Hardware Architecture
- LUN Mapping
- System Disks

ETERNUS DX60/DX80 Terms

■ Controller Enclosure

- Controllers CM#0 and CM#1 (CM#1 optional)
- PSUs 0 and 1
- Disks 0 to 11

■ Drive Enclosure(s)

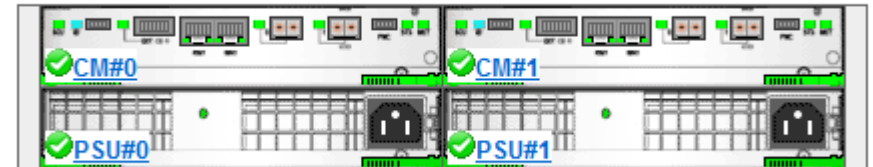
- 0-1 (ETERNUS DX60)
0-9 (ETERNUS DX80)
- Expanders Exp#0 and EXP#1 (EXP#1 optional)
- PSUs 0 and 1
- Note: Disk numbering starts at bottom left and goes to the right, then up

Controller Enclosure View

Front View



Rear View



Drive Enclosure View

Front View



Information

Front View

Parts	Status	Capacity	Speed (rpm)	Type	Usage
Disk#0	Available	1TB	7200	SAS	System
Disk#1	Available	1TB	7200	SAS	System

■ ETERNUS DX60/DX80 terms

- LUN mapping = LUN map per ETERNUS DX60/DX80 port
- Affinity Group = LUN map per host port identification (WWN)

■ Steps for Affinity Groups

1. Enable affinity groups per ETERNUS DX60/DX80 port
2. Define host WWN (by discovery or manual entry)
3. Create LUN map in affinity group and
4. Assign affinity group to ETERNUS DX60/DX80 port and WWN

■ Limitations

- 64 (ETERNUS DX60) or 128 (ETERNUS DX80) concurrent connections (host ports) supported
- LUN map: up to 256 LUNs (more for HP-UX)
- Affinity group: Max. 32 different host WWNs per port

Lun Mapping – Details I

■ Port Settings + LUN map on port

Volume Settings Global Settings Maintenance Log/Dump
Volume Management ▼ Host I/F Management ▼ Advanced Copy Management ▼

reen Logical Volumes and LUNs as seen from the host. It is possible to browse and set the configura

Port Setting

Port	CM#0 Port#0
Host Affinity	Disable
Number of LUN(s)	4

Define LUN Mapping

LUN	Volume No.	Volume Name	Status	Size (MB)
0	2	Thomas_R5_01_2	Available	2048
1	3	Thomas_R5_01_3	Available	2048
2	7	Thomas_R5_02_2	Available	3096
3	8	Thomas_R5_02_3	Available	3096

Status Quick Setup **Volume Settings** Global Se
RAID Group Management ▼ Volume Management ▼ Host I
Set FC Port Parameters
A setup of FC port is changed.

Port Settings

Port	CM#0 Port#0 ▼
Connection	☐ Fabric ☒ FC-AL
Set Loop ID	☐ Manual ☒ Auto
Loop ID	Ascending ▼
Transfer Rate	Auto Negotiation ▼
Frame Size	2048bytes ▼
Host Affinity	☐ Enable ☒ Disable
Host Response	0:Default ▼
Reset Scope	☒ I_T_L ☐ T_L
Reserve Cancel at Chip Reset	☐ Enable ☒ Disable

Lun Mapping – Details II

Affinity Groups

Status Quick Setup **Volume Settings** Global Settings Maintenance Log/Dump

RAID Group Management Volume Management **Host I/F Management** Advanced Copy Management

Assign LUN Mapping

LUN Map defines mapping between Logical Volumes and LUNs as seen from the host. It is possible to browse and set the configuration :

LUN Mapping

- Affinity Group
 - 0:Thomas_01
 - 1:jo1
 - 2:jo2
- Ports
 - CM#0 Port#0
 - CM#0 Port#1
 - CM#1 Port#0
 - CM#1 Port#1

List of Affinity Group(s)

No.	Name	Number of LUN(s)
0	Thomas_01	4
1	jo1	4
2	jo2	4

LUN Mapping

- Affinity Group
 - 0:jo_storb051
- Ports
 - CM#0 Port#0
 - CM#0 Port#1
 - CM#1 Port#0
 - CM#1 Port#1

Port Setting

Port	CM#0 Port#0
Host Affinity	Enable
Number of Host(s)	4

Affinity Group Setting

Host	Affinity Group	Number of LUN(s)
0:storb051-17c6	0:jo_storb051	16
1:storb051-17ca	0:jo_storb051	16
2:storb051-17c7	0:jo_storb051	16
3:storb05-17cb	0:jo_storb051	16

Integration

- Event Notification
- ETERNUS SF Storage Cruiser
- Server List and Alarms

Event Notification

- ETERNUS DX60/DX80 support email alerts and SNMP traps
- SNMP traps are integrated with ServerView
- A MIB can be downloaded from the system

Summary

	E-Mail	SNMP Trap	Host Sense
All Error Events	☒	☒	☒
All Warning Events	☒	☒	☒
All Informational Events	☐	☐	-
Individual Event Settings	No	Yes	No

System Defaults REMCS Defaults

Add New Destination of SNMP Trap

IP Address

Community Name

Add New Destination

Download MIB File

Option ☒ The control code for ServerView is added to the comment line of the MIB definition file

Extended MIB Definition file

ETERNUS SF Storage Cruiser

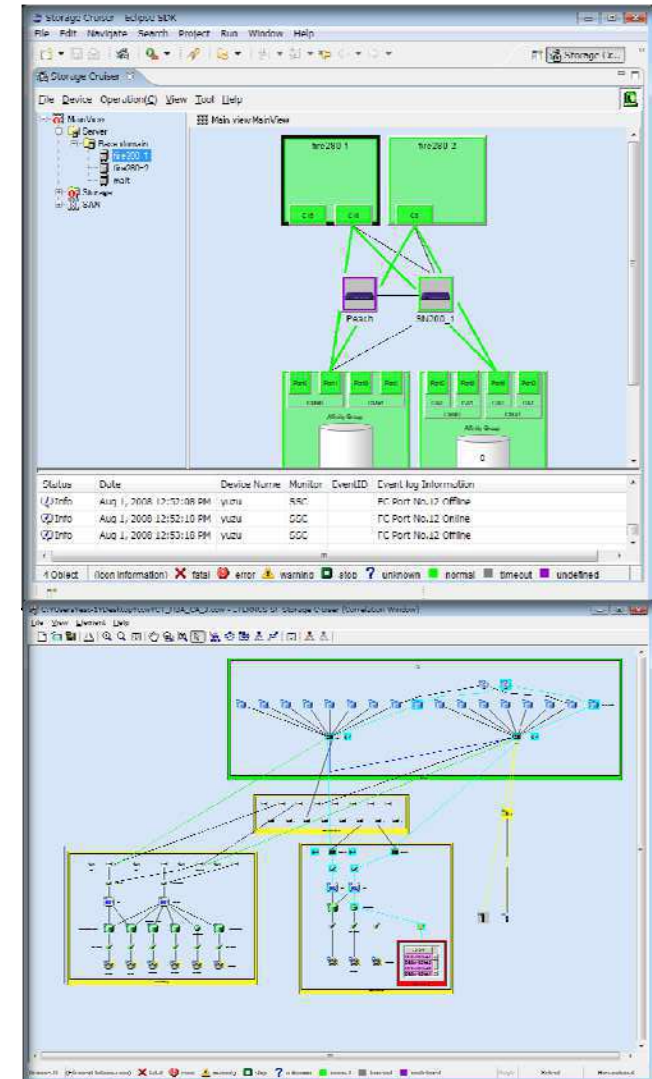


■ ETERNUS and SAN infrastructure storage resource management

- Access path definition
- Consistency checks
- State monitoring and device display
- Power monitoring / ECO mode management
- Performance monitoring

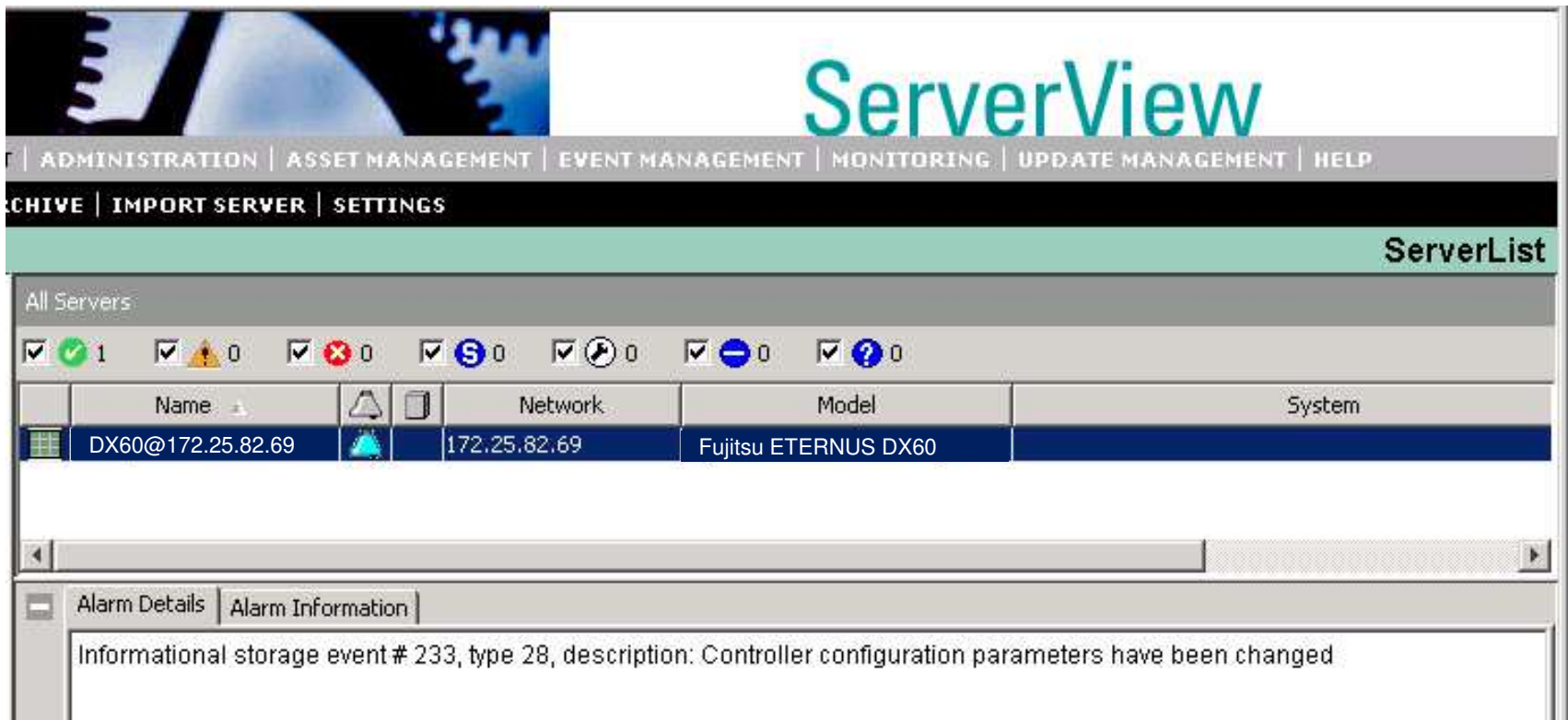
■ Correlation Management

- Resource management of relations between storage systems and servers



Server List and Alarms

- ETERNUS DX60/DX80 are discovered via SNMP and SMI-S
- The overall status is displayed in the Server List
- Traps are displayed



The screenshot displays the ServerView web interface. At the top, there is a navigation bar with links: ADMINISTRATION, ASSET MANAGEMENT, EVENT MANAGEMENT, MONITORING, UPDATE MANAGEMENT, and HELP. Below this is a secondary bar with links: ARCHIVE, IMPORT SERVER, and SETTINGS. The main section is titled "ServerList" and shows a table of servers. The table has columns for Name, Network, Model, and System. A single server is listed: DX60@172.25.82.69, with a status icon of a green triangle and a blue circle. Below the table, there is a section for "Alarm Details" and "Alarm Information". The alarm information shows: "Informational storage event # 233, type 28, description: Controller configuration parameters have been changed".

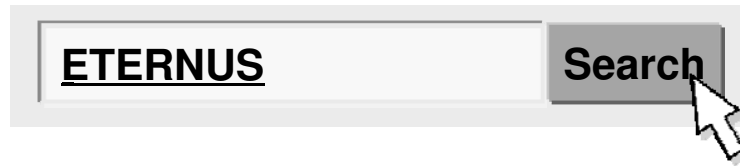
Name	Network	Model	System
DX60@172.25.82.69	172.25.82.69	Fujitsu ETERNUS DX60	

Alarm Details | Alarm Information

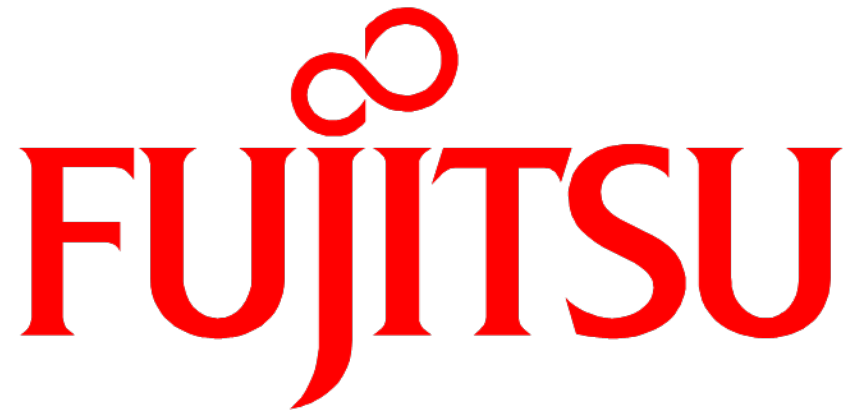
Informational storage event # 233, type 28, description: Controller configuration parameters have been changed

ETERNUS

<http://www.fujitsu.com/storage/>



A search bar with a light gray border. Inside the bar, the word **ETERNUS** is written in a bold, black, sans-serif font. To the right of the text is a gray button with the word **Search** in a bold, black, sans-serif font. A white mouse cursor with a black outline is pointing at the bottom right corner of the search button.



THE POSSIBILITIES ARE INFINITE