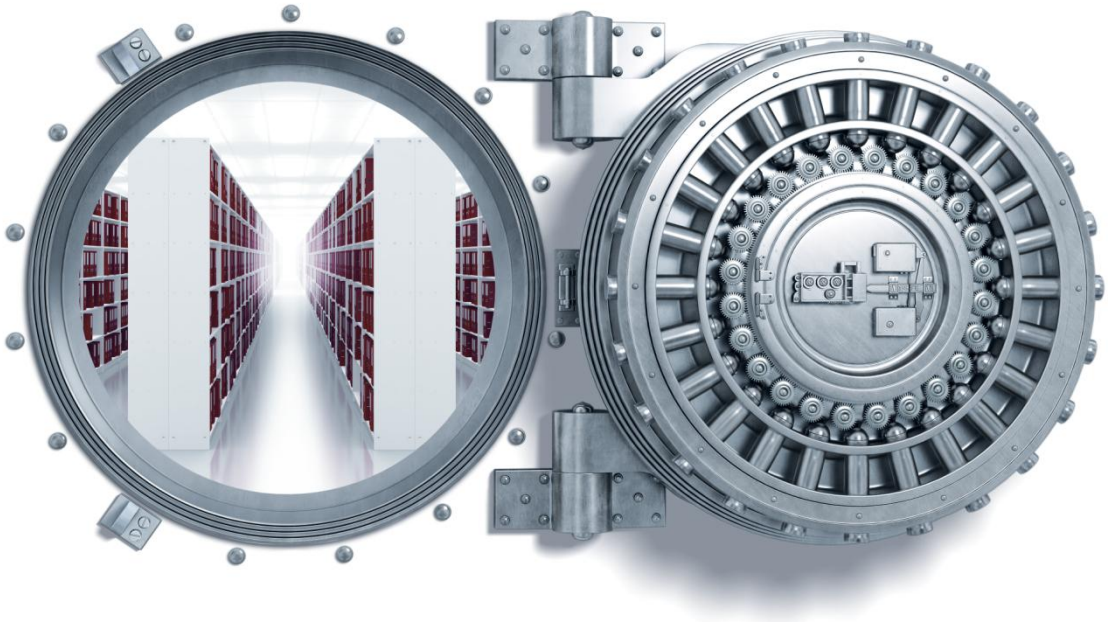


ETERNUS DX60
ETERNUS DX80

Sales Slides

October, 2009

ETERNUS DX60/DX80 – The Data Safe



The characteristics of our entry level disk storage systems

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

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ETERNUS DX60/DX80 – line-up

Optimized storage for Small & Medium Businesses

ETERNUS DX60

Affordable entry
in network storage

Max. 24 drives



ETERNUS DX80



Max. 120 drives
Supports FC 8 Gbit/s
& Solid State Drives

For higher performance
and more expandability

	ETERNUS DX60		ETERNUS DX80	
Storage Controllers	Single	Dual	Single	Dual
Cache Memory	1 GB	2 GB	2 GB	4 GB
Number of host interfaces	2	4	2	4
Number of connectable hosts	32x FC **or** iSCSI **or** 2x SAS	64x FC **or** iSCSI **or** 4x SAS	64x FC **or** iSCSI **or** 2x SAS	128x FC **or** iSCSI **or** 4x SAS
Host interfaces	4 Gbit/s Fibre Channel **or** 1 Gbit/s iSCSI **or** 3 Gbit/s SAS		4 **or** 8 Gbit/s Fibre Channel **or** 1 Gbit/s iSCSI **or** 3 Gbit/s SAS	
Drive Count	2 – 24 (no SSD)		2–120 (max. 5 SSD)	2–120 (max. 9 SSD)
Maximum Storage Capacity	10.8 TB w/ SAS drives		54 TB w/ SAS drives	
	24 TB w/ Nearline SAS drives		120 TB w/ Nearline SAS drives	

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ETERNUS DX60/DX80 – reliable storage

FUJITSU

ETERNUS DX60

- Up to 24 disk drives mixed SAS & Nearline SAS
- FC **or** iSCSI model for up to 4 direct or 64 network attached hosts
- SAS model for up to 4 direct attached hosts



ETERNUS DX80

- Up to 120 disk drives mixed SAS & Nearline SAS & SSD
- FC **or** iSCSI model for up to 4 direct or 128 network attached hosts
- SAS model for up to 4 direct attached hosts



- RAID 0, 1, 1+0, 5, 5+0, 6 support
- Redundant & Hot-pluggable components

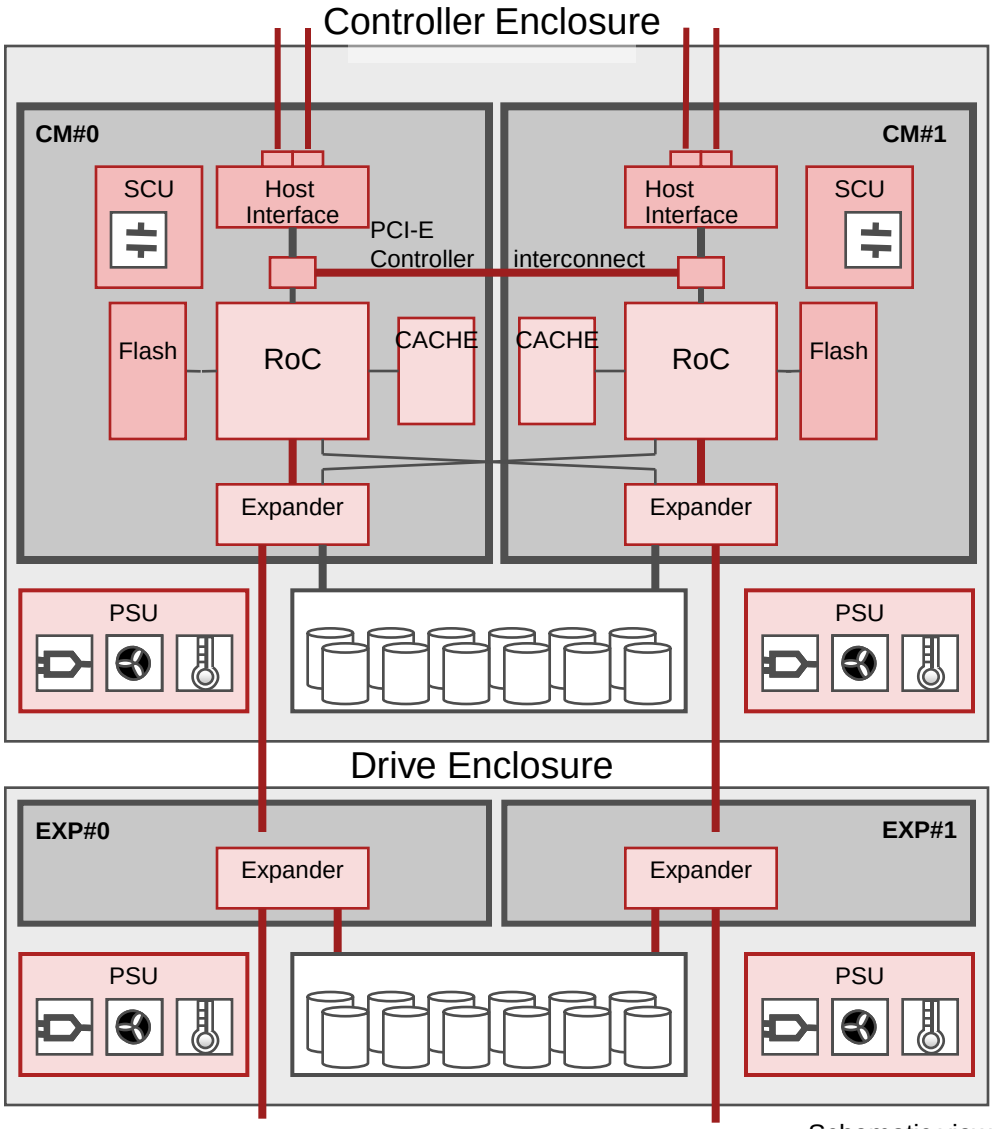
Outstanding Benefits

- RAID Migration
- Redundant Copy
- Data Block Guard
- Cache Protector
- SAS, Nearline SAS or SSD
- Energy-efficient Eco-mode
- Data Encryption
- Snapshots & Clones
- Connectivity of choice
- Supported servers & OS
- Simple operation
- Versatile usage scenarios

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Redundant & hot-pluggable components

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



Schematic view

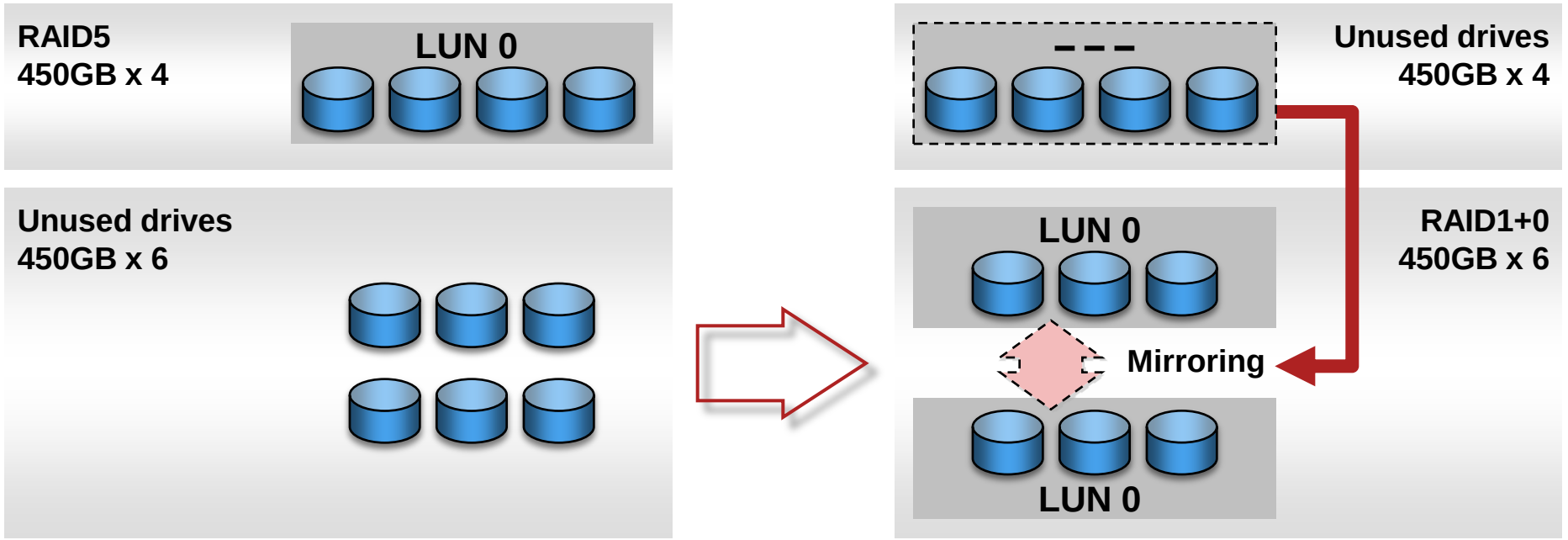
CM: Controller Module, EXP: Expansion Module, PSU: Power Supply Unit , SCU: System Capacitor Unit, RoC: RAID-On-Chip

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RAID Migration

- RAID levels 0, 1, 1+0, 5, 5+0 and 6 available
- RAID migration enables moving data between different RAID groups without interrupting operation

Migration to highly reliable RAID level: RAID 5 ➔ RAID 1+0

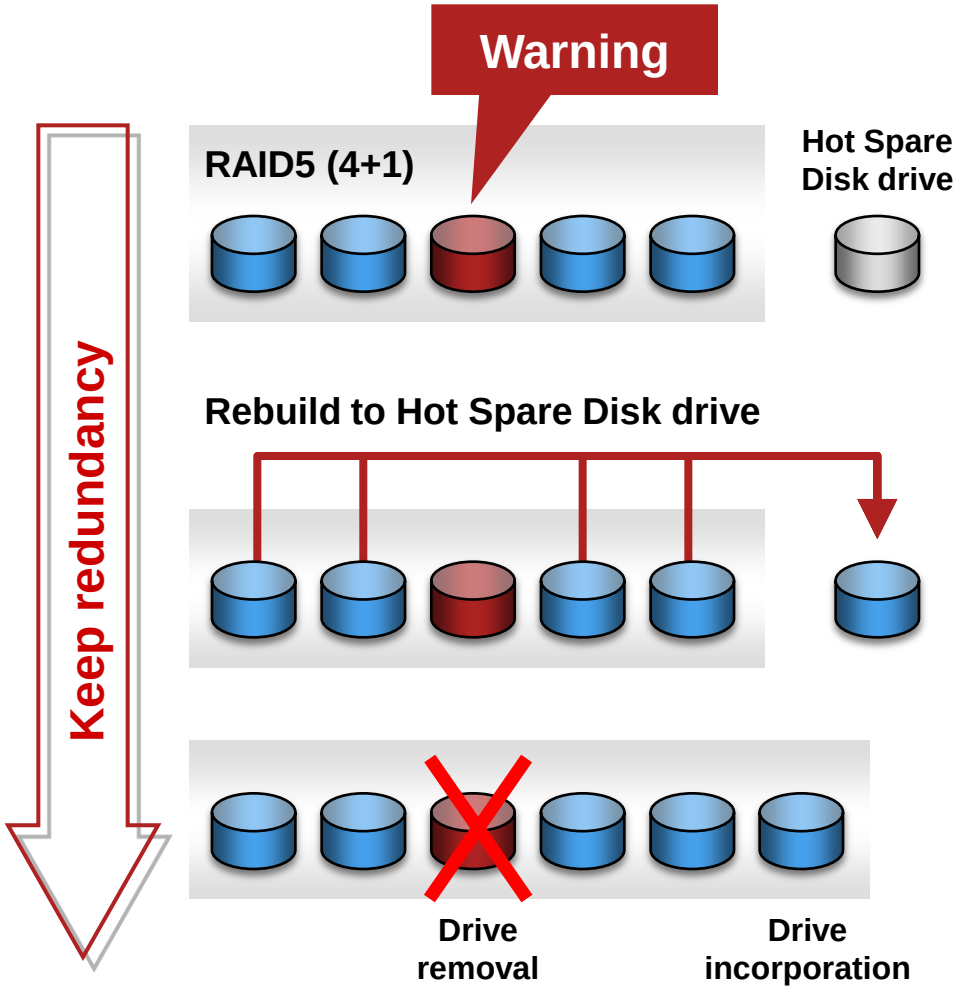


- Use the most appropriate RAID level for your data
- If requirements change => move data to more suitable drives/RAID levels

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Redundant Copy

- All disk drives are monitored by the system
- Starts rebuild automatically to Hot Spare if same type of error occurs repeatedly and exceeded a defined threshold
- After rebuild is completed, the disk drive showing signs of failure is disabled

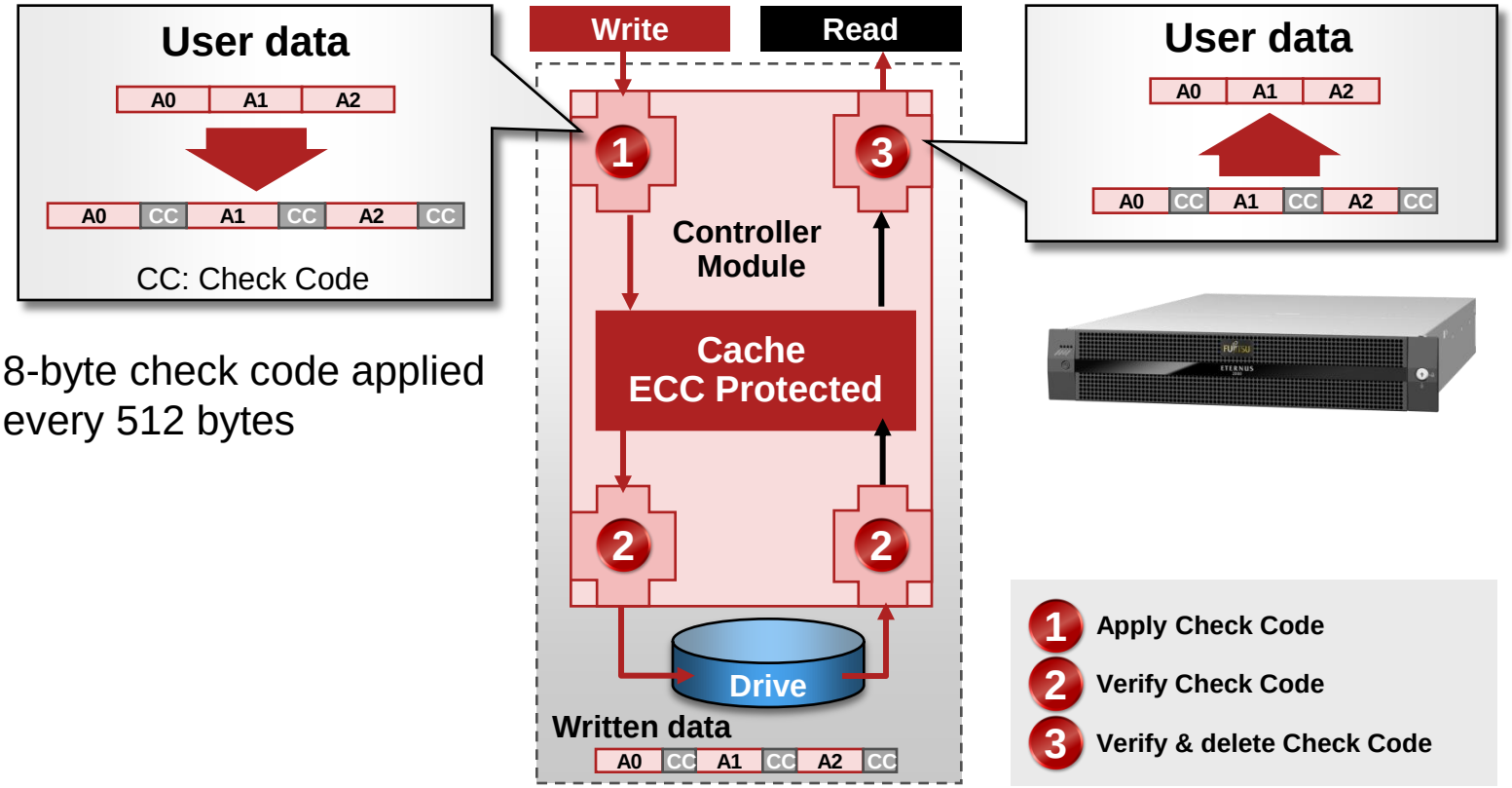


- Replace failing drives to keep up redundancy

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Data Block Guard

- **8-byte check code is added to every 512-byte data to control data integrity both on the drive and in the cache**



8-byte check code applied every 512 bytes

- **Improve data integrity beyond RAID**

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Cache Protector

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**

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SAS, Nearline SAS, or Solid State Drives

3.5” SAS drives for mission critical data

- High performance and enterprise reliability
- 300 GB, 450 GB / 15k rpm

3.5” Nearline SAS drives deliver cost-efficient capacity

- Large capacity at lowest cost
- 750 GB, 1 TB / 7.2k rpm

2.5” SAS drives for more spindles per unit of height, at less power

- 146 GB, 300 GB / 10k rpm, 24 drives in 2U enclosure
- Maximum drive count per model unchanged
- Enclosures can be mixed and matched in ETERNUS DX80
- Available as of January 2010

Enterprise-class SSD provide best IO/$

- Excellent random reads and writes, lowest latency
- Good for highest IOPS demands with ETERNUS DX80

- **All drives of the same form factor (2.5” or 3.5”) can be intermixed**

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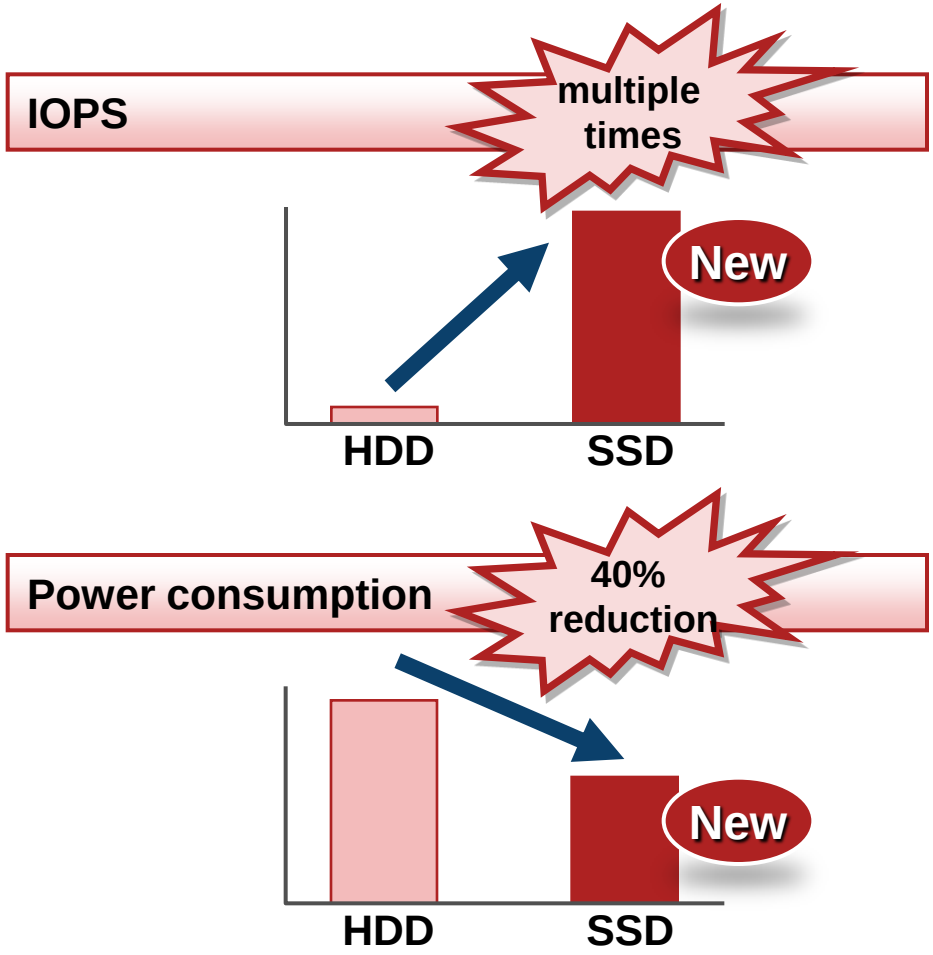
SSD (Solid State Drive) Support*

High performance
- Super random access performance
- Lowest latencies (microseconds)
- Highest IOPS

High reliability
- No motors and no mechanical parts

Low power consumption
- Semiconductor technology

Application scenarios:
- Databases that require 1000s of IO/second



- **Ideal for performance critical applications**

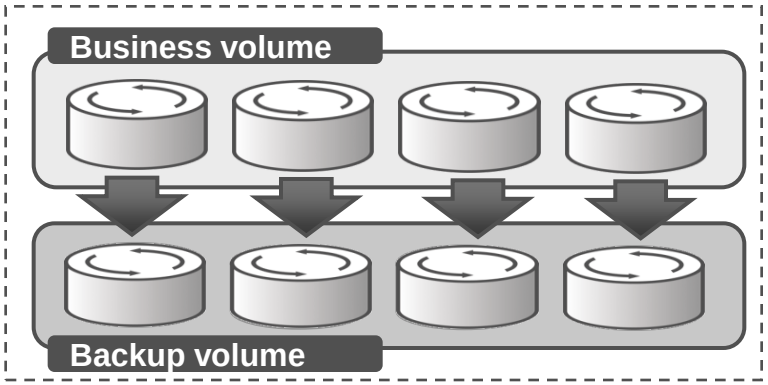
*DX80 only

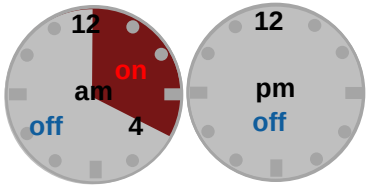
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Energy-efficient Eco-mode

When drives (RAID groups) are used only a few hours per day (e.g. for backup), Eco-mode is a simple way of saving power

- Drives are spun down or up depending on IO activity
- Drive rotation can be scheduled with ETERNUSmgr
- Applications can control drive rotation through CLI



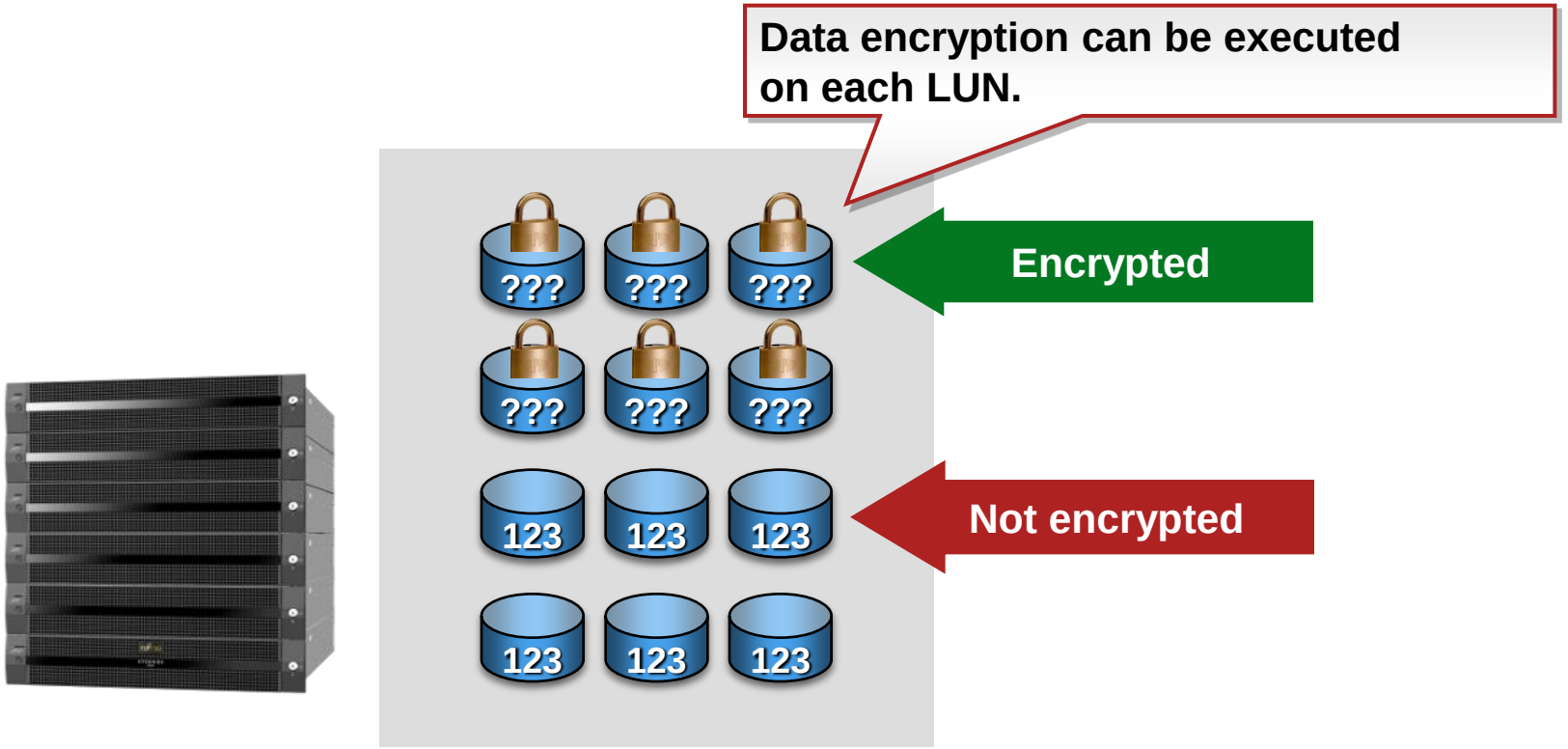


Save up to 10% energy by spinning down less frequently used drives

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Data Encryption

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



- Removed encrypted drives are protected from unauthorized access

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Snapshots and Clones

For data management and protection:

- **Create instant backups (point-in-time copies)**
  - Hardly any impact on application performance
  - Minimal drive capacity consumption
  - Immediate availability
- **Immediate access to backup data**
  - Eliminates delayed access associated with tap-based backup
- **Create copies of data that can be used to support key IT functions, e.g. assess impact of upgrades**
  - Read + write snapshot of a database before upgrading its release

- **Shorter Backup Window**
- **Faster Restores**
- **More Flexibility to `play` with data**

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Connectivity of choice

FUJITSU

Fibre Channel

- 4 or 8 Gbit/s, can connect up to 128 servers (DX80)
- Recommended for data centers and business critical applications

iSCSI

- Enables SAN functionality via the known Internet protocol at 1 Gbit/s
- Requires smaller investment in new IT infrastructure compared to FC
- Employees do not have to be trained separately

SAS

- Fastest connection version with a speed of up to 3 Gbit/s
- Technology to directly connect server and array
- Very low-priced cluster configurations can be implemented

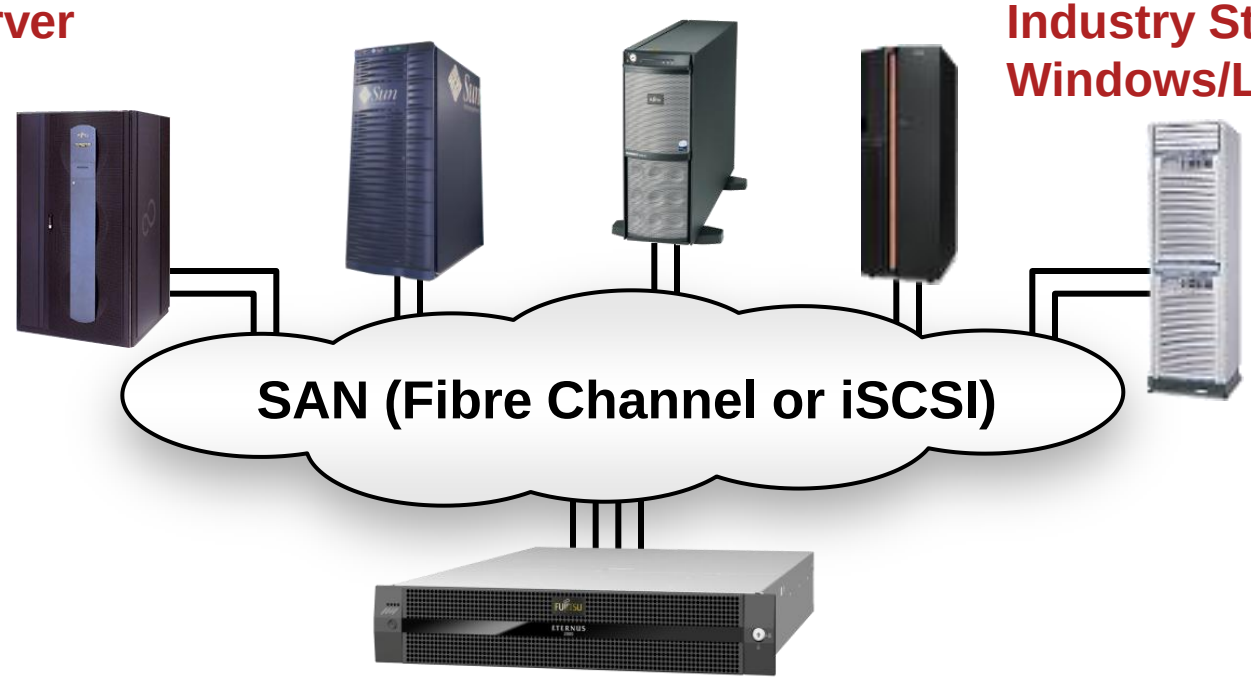
Host ports and performance are ideal for storage consolidation projects

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Supported servers & OS

Fujitsu & other vendors' UNIX server

Fujitsu & other vendors' Industry Standard Server Windows/Linux



Supported OS (Fibre Channel & iSCSI)

UNIX servers
- Solaris™ (FC)
- HP-UX
- AIX (FC only)

Industry Standard Servers
- Windows Server® 2003
- Windows Server® 2008
- Red Hat Enterprise Linux AS/ES
- SUSE Linux Enterprise Server
- VMware®

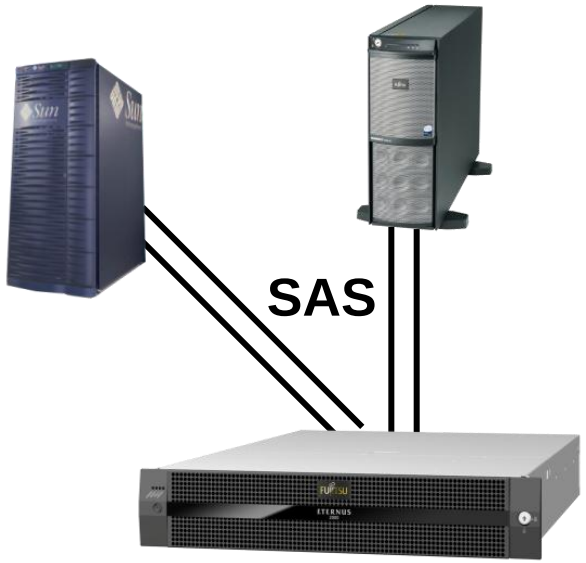
■ **Supports a wide variety of servers such as Fujitsu, IBM, and HP**

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Supported OS for SAS connections

Fujitsu & other vendors' Solaris server

Fujitsu & other vendors' Industry Standard Server Windows/Linux



Supported OS (SAS)

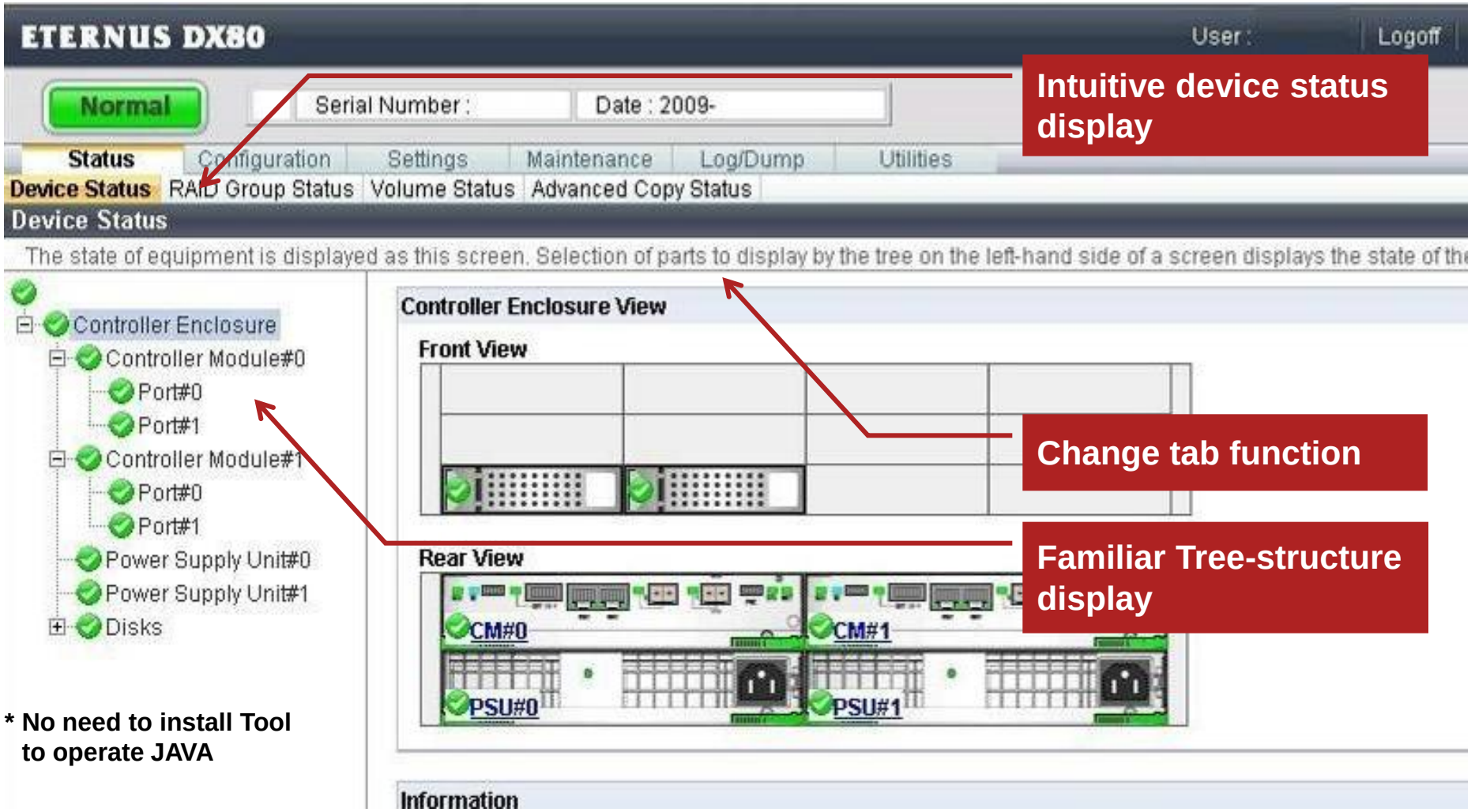
UNIX Servers
- Solaris™ 10

Industry Standard Servers
- Windows Server® 2003
- Windows Server® 2008
- VMware® vSphere 4
- Red Hat Enterprise Linux AS/ES
- Red Had Linux 5
- SUSE Linux Enterprise Server 10

■ **Supports a wide variety of Operating Systems for SAS connections**

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Simple operation

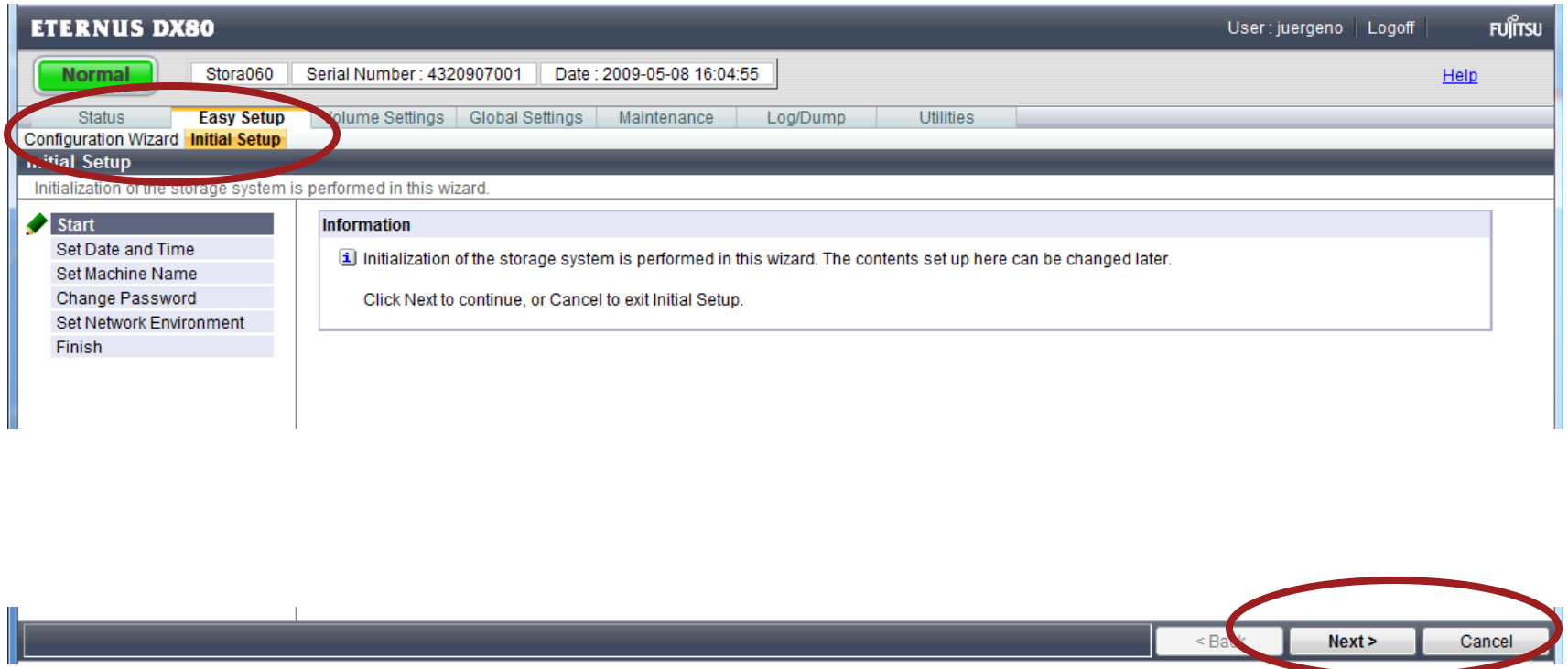


* No need to install Tool to operate JAVA

■ Fast intuitive operation using familiar Tree-structured display

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Easy Setup Wizard



- **Wizard-driven setup reduces deployment efforts to a minimum**

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ETERNUS SF Storage Cruiser

Realize stable and efficient storage operation



- Easy storage setup: Storage Volume Configuration Navigator
- Fault management with quick comprehension of failure and impact extent
- Performance management delivers optimal operational performance
- Detailed resource correlation management, even for the smallest resources
- SAN management for the entire storage system
- Greener storage management with ETERNUS MAID function

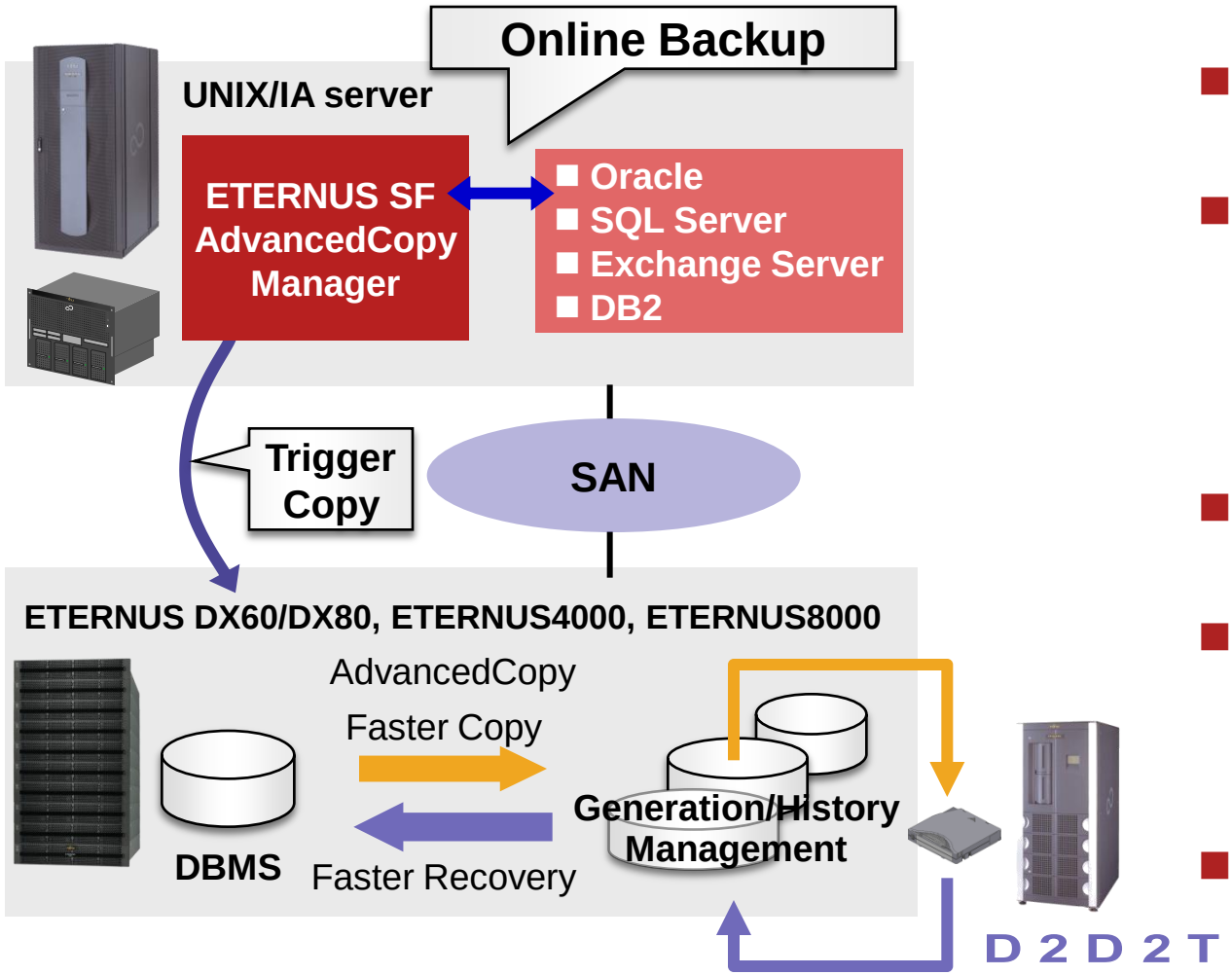
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ETERNUS SF AdvancedCopy Manager

FUJITSU

Improve business continuity

by minimizing backup window and fast recovery



- High-speed disk volume copy
- Backup without stopping database systems
- High-speed system backup enabling easy patch management and working on alternate scenarios
- Seamless disk to tape backup
- Disaster recovery with remote SAN copy. ETERNUS 4000/8000 already, DX80 by Jan. 2010
- Environmental power saving with MAID

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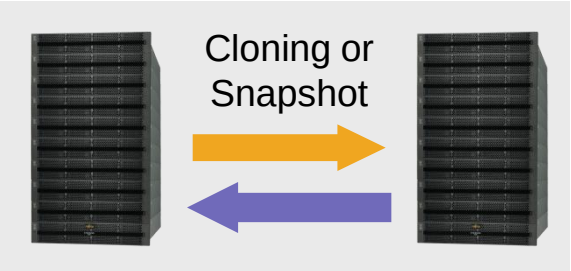
Versatile usage scenarios

ETERNUS DX60/DX80 are perfect for… :

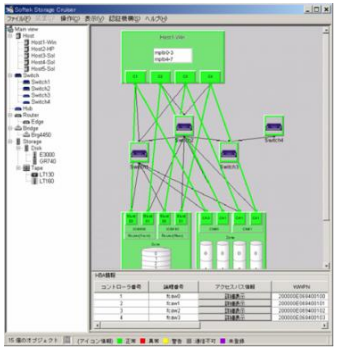
- PRIMERGY server environments
- A Cluster
- Direct attachment to servers
- Backup-to-disk
- Databases such as Microsoft SQL Server, Oracle or SymfoWARE
- Archiving
- Storage Consolidation
- Applications like Microsoft Exchange, Microsoft IIS and SAP
- Tiered Storage, using tools like Symantec Enterprise Vault
- VMware
- Scale Out Scenarios
- Data center Scenarios

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Usage scenario: Backup-to-disk



- Eco-mode - Operates drives only when used for backup
- ETERNUSmgr - Schedules drive rotation
- ETERNUS SF Storage Cruiser
  - Visualizes the disk rotation status



- ETERNUS SF AdvancedCopy Manager
  - Controls disk rotation in conjunction with backup operation
- Supported backup solutions
  - Veritas Storage Foundation 5.0 Enterprise HA
  - IBM Tivoli Storage Manager for Space Management
  - Fujitsu/EMC NetWorker, Symantec Backup Exec, CA ARCserve Backup

Save energy by spinning down idle disk drives

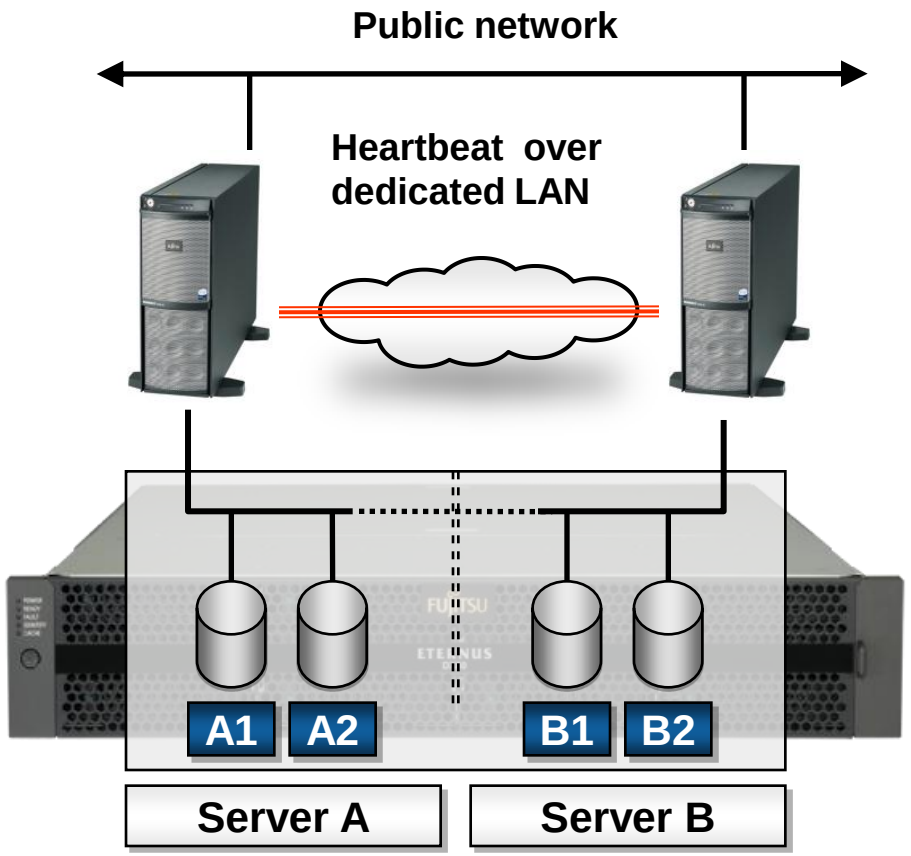
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Usage scenario: Cluster services

Active RAID storage system like the ETERNUS DX60/DX80 are perfect companions for all cluster solutions

Cluster service will be certified with ETERNUS DX60/DX80 for

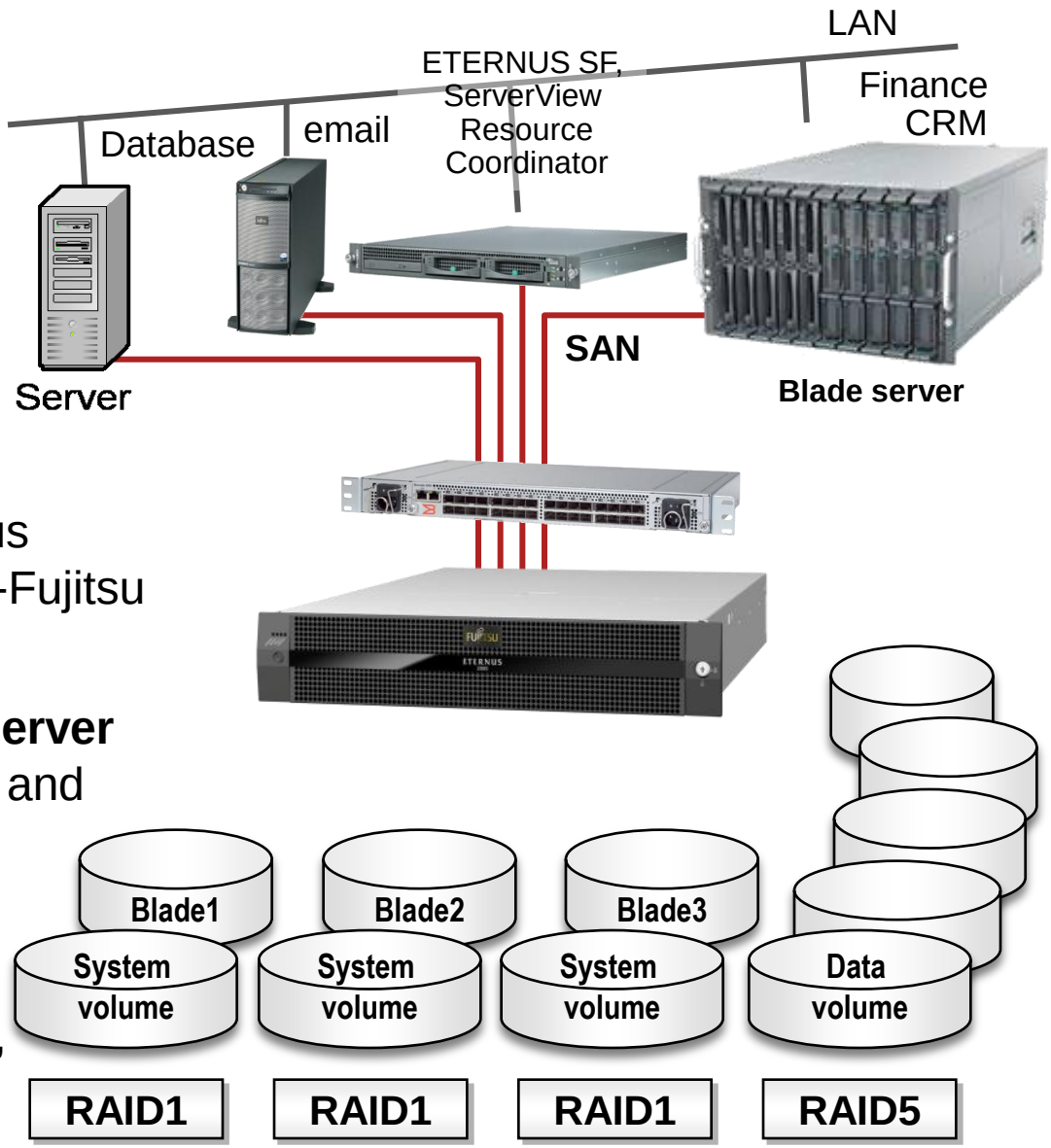
- PRIMECLUSTER
- Microsoft Cluster Service and Windows Server Failover Cluster
- Symantec Cluster (VCS)
- Oracle Real Application Clusters (RAC)



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Usage scenario: Storage consolidation

- **Ease of installation**
- **Centralized management**
- **Compact design**
- **Mix SAS/Nearline SAS** for tiered storage
- **ETERNUS DX60/DX80** are open to connect to a wide variety of servers in heterogeneous environments (PRIMERGY & non-Fujitsu Servers)
- **Consolidate all data including server boot drives** (to improve reliability and enable efficient management for Blade Server)
- **OS:** Linux, Windows, VMware, Solaris, AIX and HP-UX



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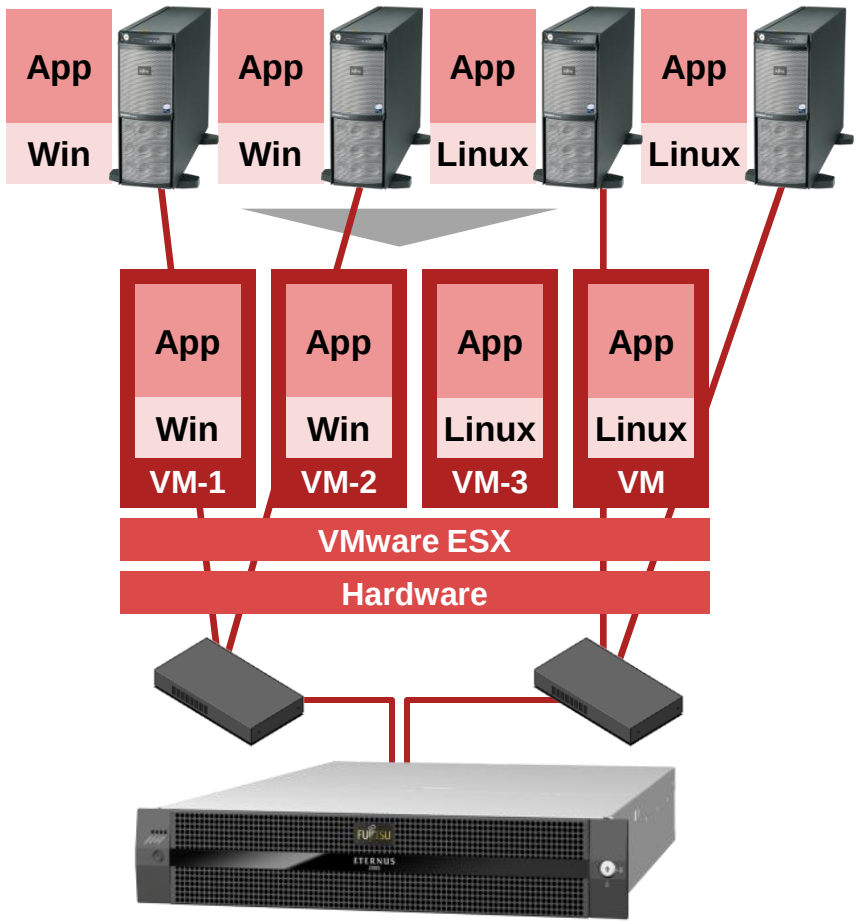
Usage scenario: VMware consolidation

Consolidation of several under-utilized servers to a larger systems using virtual machines

- Better utilization of the system due to virtualization
- Reduction of administration costs
- Easy switching of applications between systems
- Easy adding of additional servers or applications

ETERNUS DX60/DX80 benefits:

- Central storage for virtual machine data, also for multiple VMware ESX servers
- Certified with VMware ESX server
- Direct attached FC connections possible



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Usage scenario: Exchange Server

ETERNUS DX60/DX80 is certified as suitable storage for Exchange Server 2007.

Microsoft provides the certification program for Exchange Server 2007 with strict examinations.

- **Microsoft Gold Certified Partner.**
- **High performance and reliability.**
  - **http://technet.microsoft.com/en-us/exchange/bb412164.aspx**
  - **http://sp.ts.fujitsu.com/dmsp/docs/wp-ms-espr-eternus-dx80.pdf**
- **Certified hardware by Windows system.**
  - http://www.windowsservercatalog.com/item.aspx?idItem=d1de1463-1433-6f38-f6fb-a0a07aa7bcb6&bCatID=1282

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Usage scenario: Oracle databases

Oracle 11g Real Application Clusters is for everyone

- Oracle Real Application Clusters (RAC) is a cluster database that overcomes the limitations of traditional shared approaches while dramatically reducing administration costs.

ETERNUS DX60/DX80 will support Oracle RAC active/active clusters, provides good performance and supports high availability through snapshots

Whitepaper:

- Using Oracle Database 11g Automatic Storage Management with FUJITSU Disk Storage Systems

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Online resources for EMEA

Available on the Internet at ts.fujitsu.com/eternus_dx:

- ETERNUS DX60 and ETERNUS DX80 data sheets
- White papers of solution scenarios
- A product brochure for Small and Medium-sized Businesses and
- Usage scenarios in the Dream Team with PRIMERGY servers

On the Fujitsu Technology Solutions Extranet partners find:

- Further sales, technical and competitive information
- Infrastructure Promotions in solutions with PRIMERGY servers

On the Fujitsu media server we offer public downloads of:

- Product pictures and visuals in high resolution as well as
- Marketing collaterals like ads, posters, flyers, mailings, banners, etc.

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Online resources for APAC, US

Available on the Internet at www.fujitsu.com/eternus:

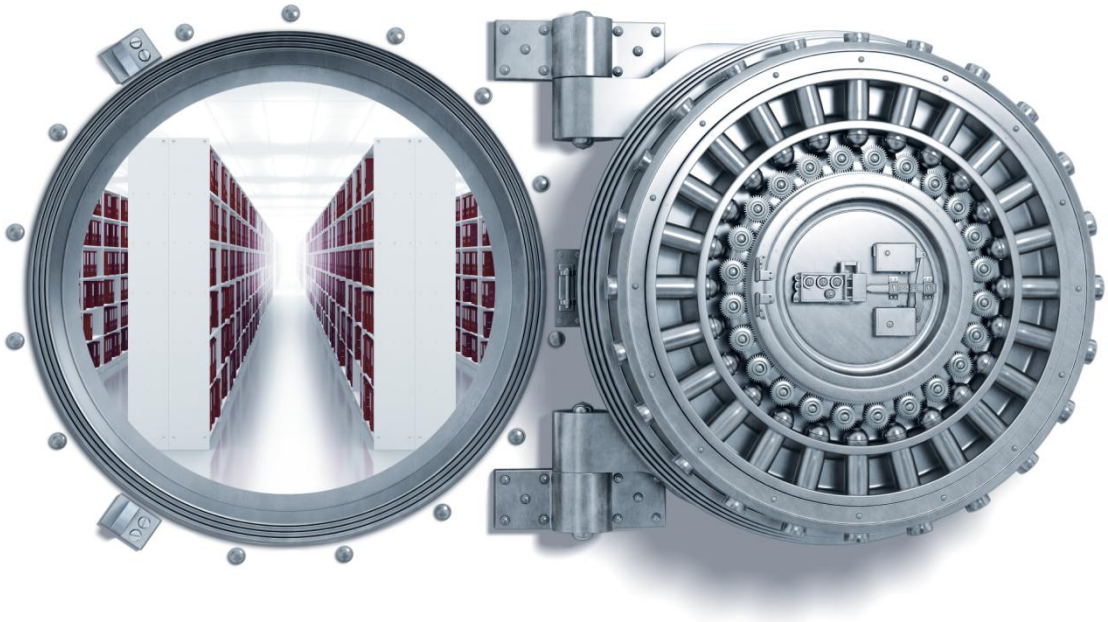
- ETERNUS DX60 and ETERNUS DX80 data sheets
- Product brochure for Small and Medium-sized Businesses

Registered PRIMEWEB users can download:

- Further sales, technical and competitive information
- Product pictures and visuals in high resolution

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ETERNUS DX60/DX80 – The Data Safe



Simplicity

Ease-of-use

Versatility

Innovation

Quality

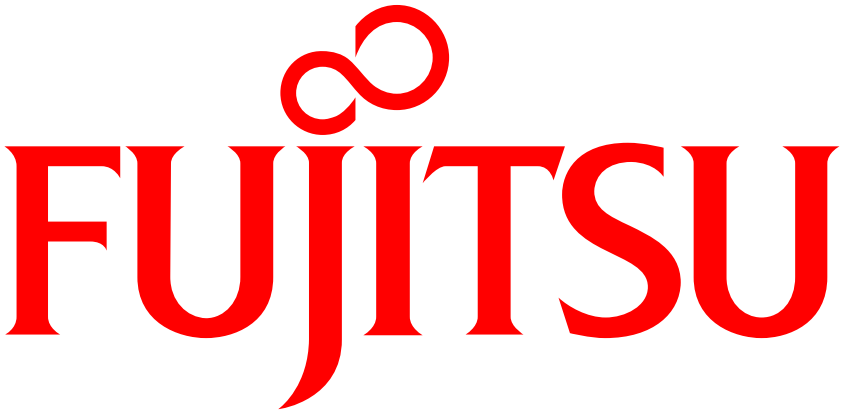
Affordable

Speed

Reliability

http://www.fujitsu.com/eternus

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