

Systems and Technology Group

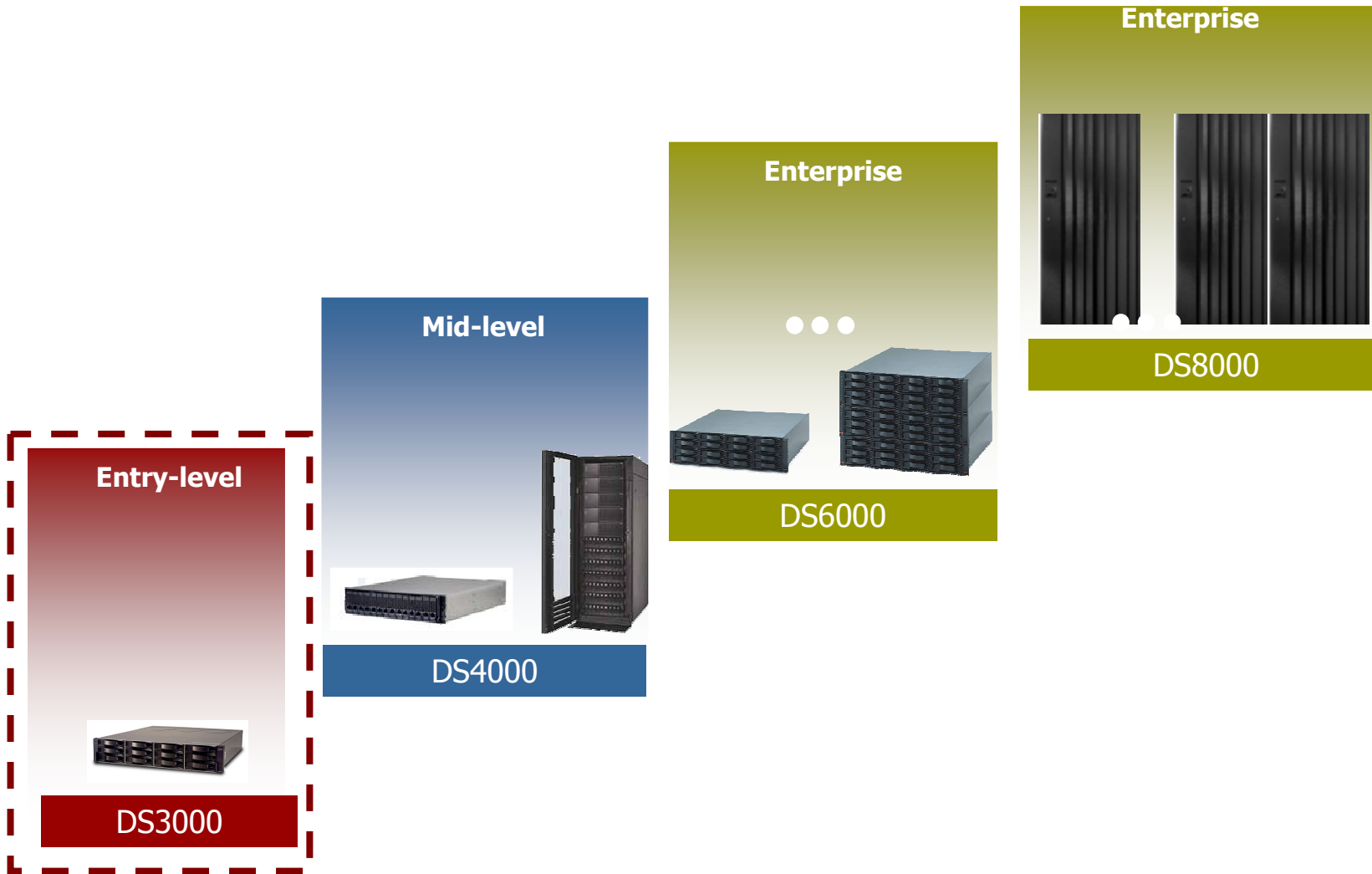
Storage integration with DS3000 family

- 18 marzo 2009 -

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STG Training BladeCenter & System x



IBM TotalStorage and System Storage family



DS3200, DS3300, DS3400 Introduction

DS3200



DS3300



DS3400



| | | |
|---|---|--|
| <p>New level of functionality for direct-attach storage with SAS interface technology</p> | <p>iSCSI connectivity well-suited for low-cost storage networks</p> | <p>FC host technology to support existing FC SANs or as a FC SAN-ready solutions</p> |
| <p>Direct attach configurations</p> | <p>IP SAN attach configurations</p> | <p>Direct or FC SAN-attach configurations</p> |
| <p>Enables shared storage to improve efficiencies</p> <ul style="list-style-type: none"> ▶ Solution of choice for 2-node clustered topologies ▶ Storage consolidation for heterogeneous hosts | <p>Leverage low-cost and familiar IP networks</p> <ul style="list-style-type: none"> • Consolidation, single management • Increases efficiencies within the IT infrastructure | <p>Suited for building new SANs or extending existing SANs</p> <ul style="list-style-type: none"> ▶ Initially deploy as direct-attach and then seamlessly transition to a SAN when ready ▶ Easily integrate into existing 1, 2 and 4Gb/s infrastructures |
| <p>Solution for System x servers</p> | <p>Solution for System x servers, BladeCenter servers, and BladeCenter Power blade servers (running Linux)</p> | <p>Solution for System x servers, System p servers (running AIX or Linux), BladeCenter servers, and BladeCenter Power blade servers (running AIX or Linux)</p> |

Target Markets/ Sweet Spots

DS3200



SMB customers

- Transitioning from internal storage
- Currently purchasing SCSI drives and/or a legacy SCSI storage system

Enterprise departments and remote sites

- Seeking simple, low-cost shared one-room DAS

DS3300



SMB customers

- Transitioning from direct attached to networked storage
- Want to leverage existing in-house IP networking equipment and expertise
- Need quick, low-cost, and simple implementation

Enterprise departments and remote sites

- Implement an IP SAN to support locations other than the corporate office
- Would like to connect all servers (including low-cost and blade servers) to a SAN

DS3400



SMB Customers

- Considering a FC SAN, but do not have the immediate budget
- With the DS3400, they can start with a DAS and seamlessly transition to a SAN when needed

Enterprise departments and remote sites

- Would like to affordably add more FC-based systems to their current FC infrastructure
- Need to support remote sites where limited IT expertise resides - The DS3400 is simple enough for these sites to leverage the benefits of a FC SAN

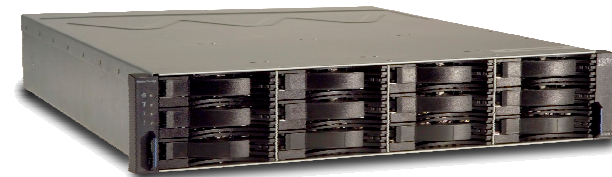
IBM System Storage DS3000 series overview

- **Fully-featured storage systems targeted for entry-level and secondary storage requirements**
 - ▶ **Designed to deliver high-end functionality at an attractive cost-per-GB**
- **Managed by powerful / intuitive DS3000 Storage Manager software**
 - ▶ **Premium Feature software available such as FlashCopy and VolumeCopy**
- **Supports Serial Attached SCSI (SAS) in a 2U enclosure**
- **Single or dual-active controllers and up to 48 SAS drives**
- **Two different types of DS3000**
 - ▶ **DS3200 with two 3-Gbps SAS host interfaces**
DS3200 with six 3-Gbps SAS host interfaces
 - ▶ **DS3400 with four 4Gb/s FC host interfaces**



DS3000 common characteristics

- **Processor**
 - Intel X-Scale (667MHz) processor
 - XOR engines
- **512 MB of memory per controller**
- **Optional 1 GB of memory per controller**
- **10/100 Ethernet Management Port**
- **RS232 Serial Port**
- **SAS Expansion Port**
- **SAS Host Port**
 - Disabled on non-SAS daughter card models
- **Dual Power Supplies**
- **Cache Battery Backup Unit (BBU)**



DS3000 disk drive access

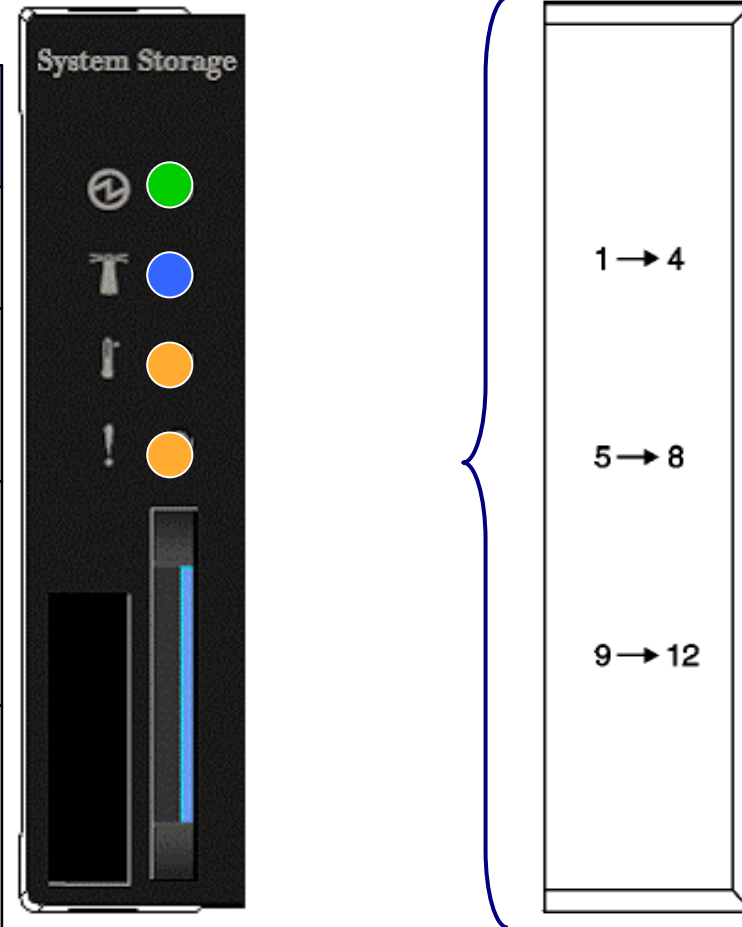
- 12 drive bays
- SAS and Fibre Channel Technology
- 2U rack mount enclosures
- Up to 3.6 TB of storage capacity
- 2 miniSAS connector or 4 dual FC
- Redundant and hot swappable power supplies and fan
- RAID 0, 1, 3, 5, and 10



Bezel LEDs

| LED | Icon | Color | "ON" Behavior |
|---------------------------|------|-------|---|
| Power | | Green | Indicates the enclosure has power 5V power. |
| Enclosure Locate/Identify | | Blue | Indicates the location of the enclosure within the system. |
| Over-Temperature | | Amber | Indicates the environmental temperature has reached an unsafe level. |
| Summary Fault | | Amber | Indicates at least one of the components within the subsystem has detected a fault. |

Numbers reference corresponding drives



IBM common drive tray - LED behavior

| Disk Drive State | Fault Light | Active Light |
|---|-----------------------|--------------------|
| Power is not applied | Off | Off |
| Normal operation, power is turned on, no disk drive I/O activity is occurring | Off | Off |
| Normal operation, disk drive I/O activity is occurring | Off | On blinking |
| Identify / Locate Drive | Amber Flashing | Off |
| Service action required, a fault condition exists and the disk drive is offline | Amber on solid | On solid |

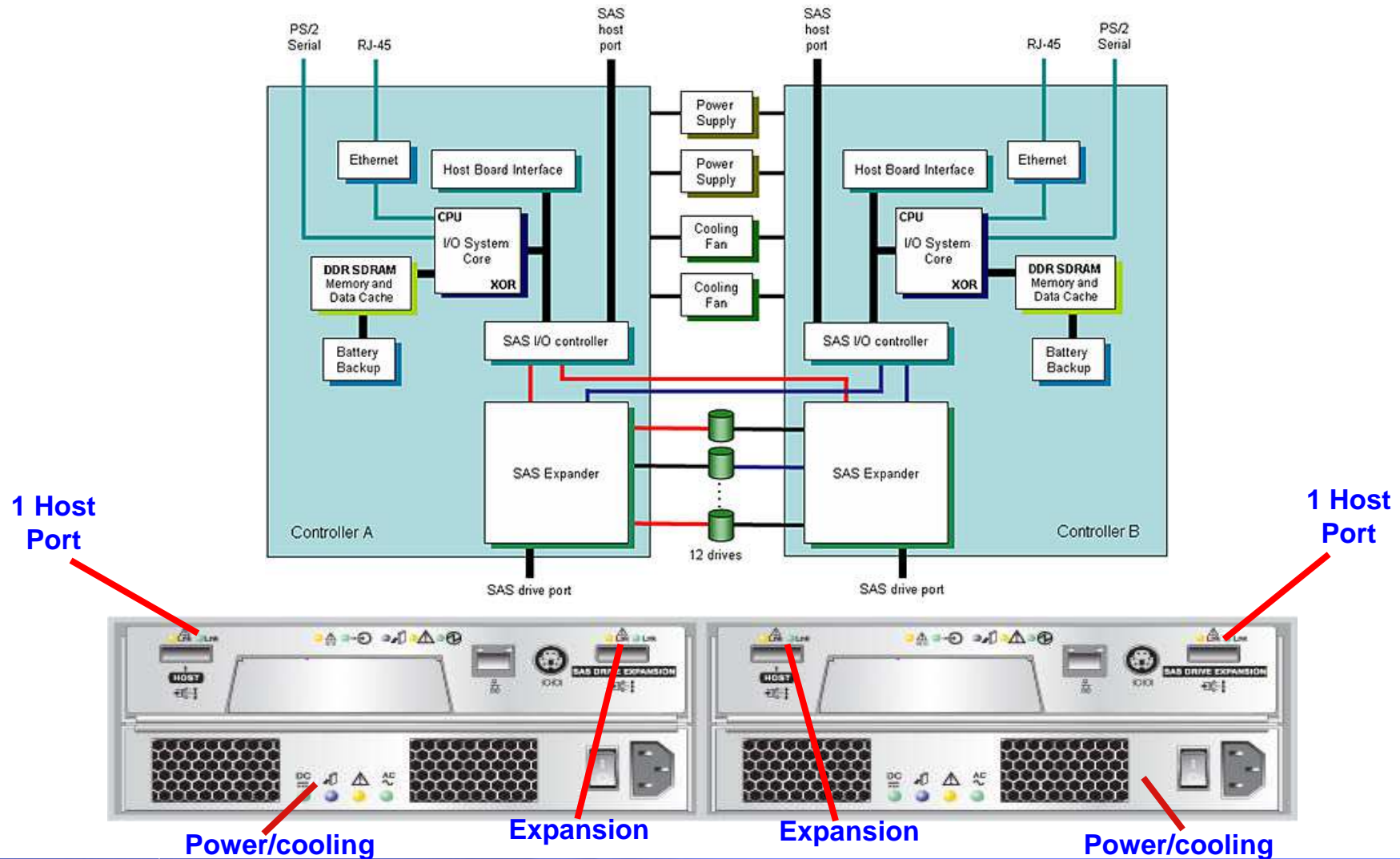
IBM System Storage DS3200

Easy, Scalable, Affordable

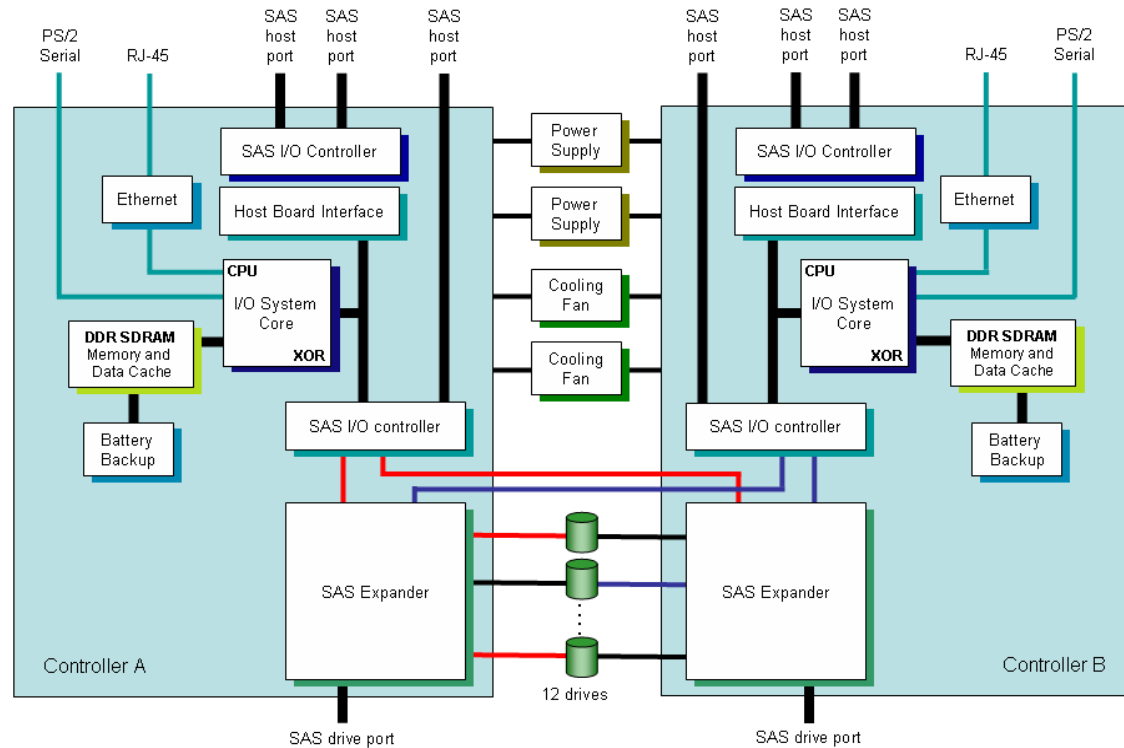
- **3-Gbps SAS connect to host**
- **Managed by the intuitive DS3000 Storage Manager**
- **For System x servers**
- **Two models**
 - ▶ **Entry-level Single Controller model**
 - ▶ **Dual Controller model to help ensure data-availability**
- **Up to 6 SAS ports for flexible direct-attach configurations**
- **Capacity**
 - ▶ **Support twelve 3.5" SAS hard disk drives for 3.6TB**
 - ▶ **Scale up to 48 hard disk drives by using EXP3000s for 14.4TB**
- **Support RAID 0, 1, 3, 5, 10**
- **512 MB of controller memory with battery-backed cache**
- **Redundant Power Supply**
- **OS: RedHat 3, 4; SuSE 9, 10; Microsoft Windows 2003 Standard, Enterprise, Web**
- **Support for MSCS**



DS3200 Architecture Controller - 2 SAS host ports



DS3200 Architecture Controller - 6 SAS host ports



1 Host Port

1 Host Port

2 Host Ports

2 Host Ports

Power/cooling

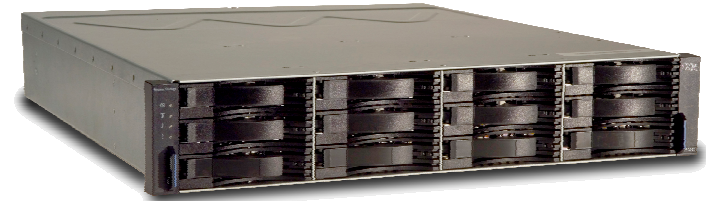
Expansion

Expansion

Power/cooling

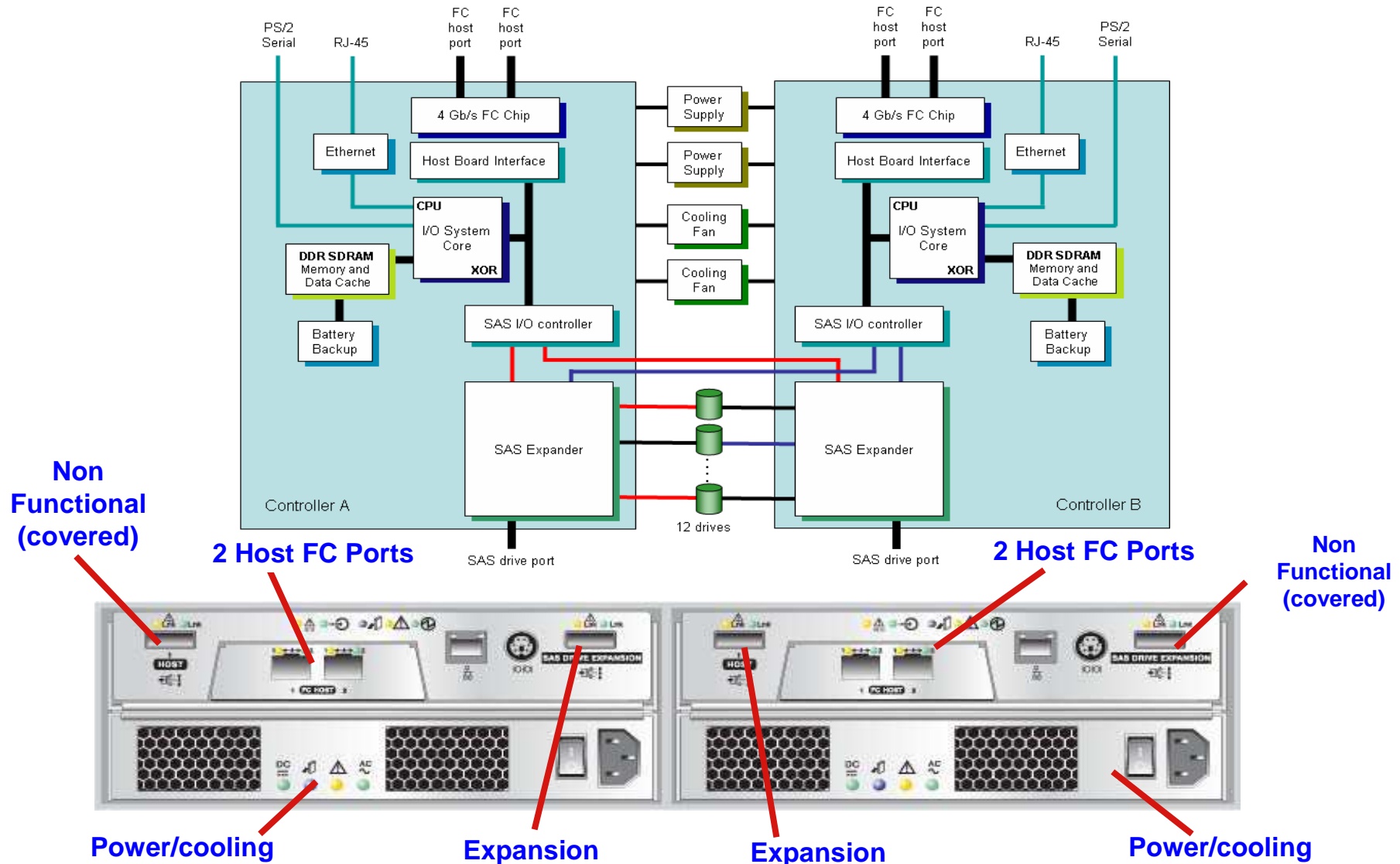
IBM System Storage DS3400

Easy, Scalable, Flexible, Affordable



- 4-Gbps Fibre Channel connect to host
- Managed by the intuitive DS3000 Storage Manager
- For System x and BladeCenter servers
- Two models
 - ▶ Entry-level Single Controller model
 - ▶ Dual Controller model to help ensure data-availability
- Up to 4 Fibre Channel ports for flexible direct-attach or SAN configurations
- Capacity
 - ▶ Support twelve 3.5" SAS hard disk drives for 3.6TB
 - ▶ Scale up to 48 hard disk drives by using EXP3000s for 14.4TB
- Support RAID 0, 1, 3, 5, 10
- 512 MB of controller memory with battery-backed cache
- Redundant Power Supply
- OS: RedHat 3, 4; SuSE 9, 10; Microsoft Windows 2003 Standard, Enterprise, Web
- VMware 2.5.4, 3.0.1
- Support for MSCS

DS3400 Architecture Controller



IBM System Storage DS3300

Easy, Scalable, Flexible, Affordable

- 1-Gbps iSCSI connect to host
- Managed by the intuitive DS3000 Storage Manager
- For System x and BladeCenter servers
- Two models
 - ▶ Entry-level Single Controller model
 - ▶ Dual Controller model to help ensure data-availability
- Up to 4 iSCSI ports for flexible direct-attach or SAN configurations
- Capacity
 - ▶ Support twelve 3.5" SAS hard disk drives for 3.6TB
 - ▶ Scale up to 48 hard disk drives by using EXP3000s for 14.4TB
- Support RAID 0, 1, 3, 5, 10
- 512 MB of controller memory with battery-backed cache
- Redundant Power Supply



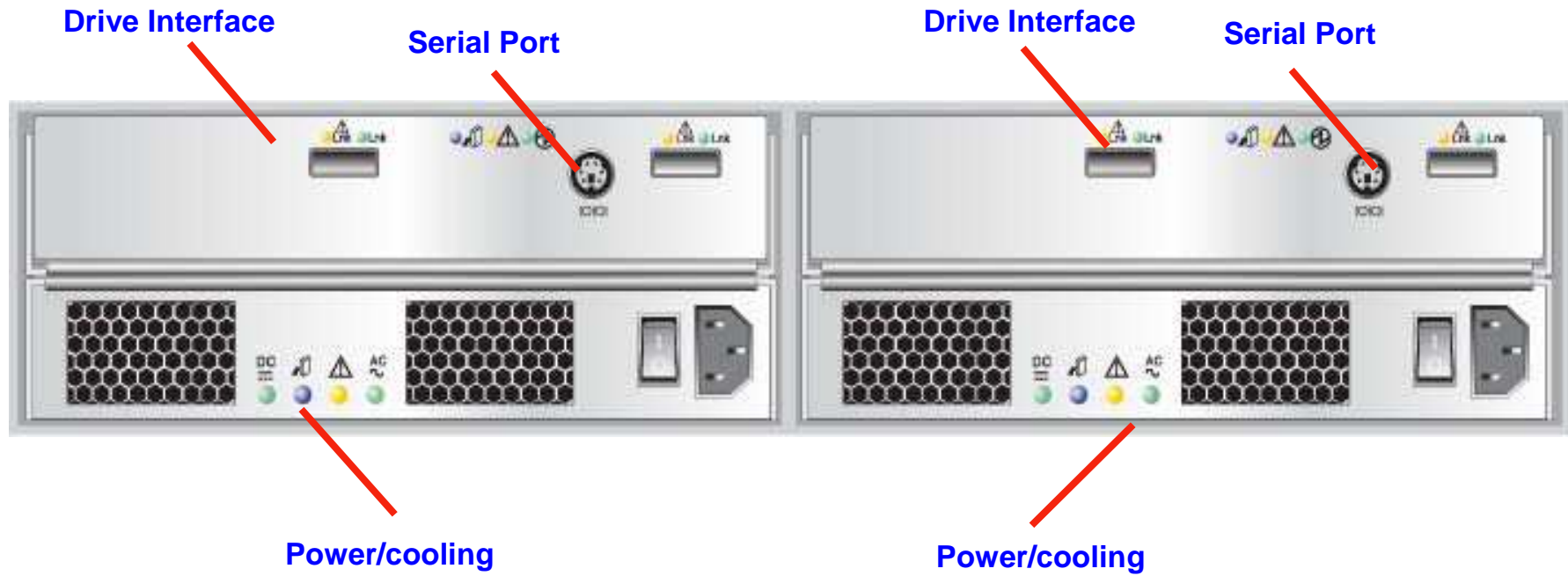
IBM System Storage EXP3000

Affordable, Scalable, Manageable

- **3-Gbps SAS interface technology**
- **Support for up to 3.6 TB of storage in a single enclosure**
- **Support for up to 14.4 TB in a cascaded configuration with MegaRAID 8480 adapter**
- **SAS hard disk drives supported**
- **Powerful and comprehensive management and configuration tools included**

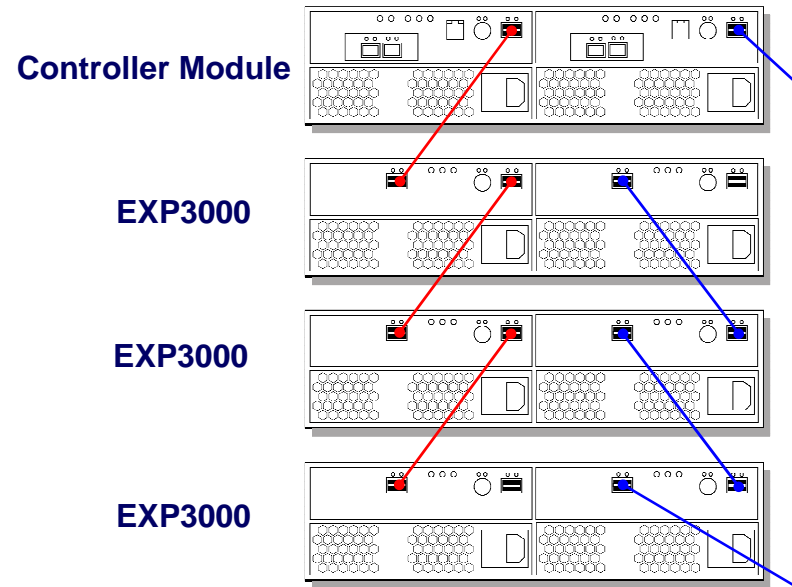
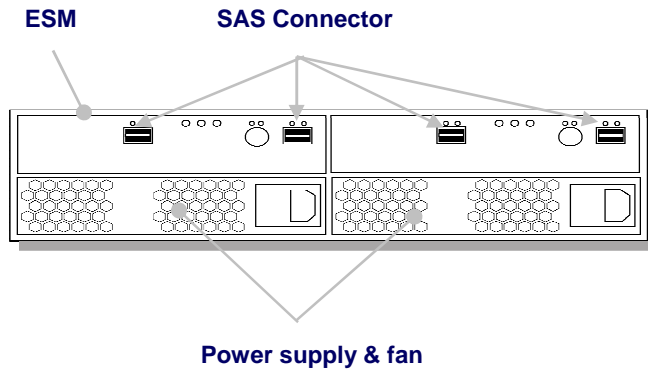


EXP3000 ESM modules



DS3000 recommended cabling

When attaching enclosures, drive channels are configured as redundant pairs utilizing one connector from each controller and “**top-down/ bottom-up**” cabling. This helps ensure data access in the event of a path/channel or controller failure.



When cabling the ESM, the “out” connector of one ESM must be cabled to the “in” connector of the next enclosure’s ESM

Sample Shown: DS3400

DS3000 series summary

- **Faster storage**
 - **3 Gbps SAS or 4 Gbps Fibre speeds to handle demanding applications**

- **Scalability**
 - **Scale over 14 Terabytes of capacity by using the existing EXP3000 enclosures**

- **Increased availability**
 - **Clustering support and advanced copy functions to help protect data**

- **Simpler storage**
 - **6 steps to setup and easy to manage with DS3000 Storage Manager**



DS3000 Storage Manager (1 of 2)

Included at no charge

Point & click functionality

Compatible with the DS4000 Storage Manager

Access data while enclosure is in operation using:

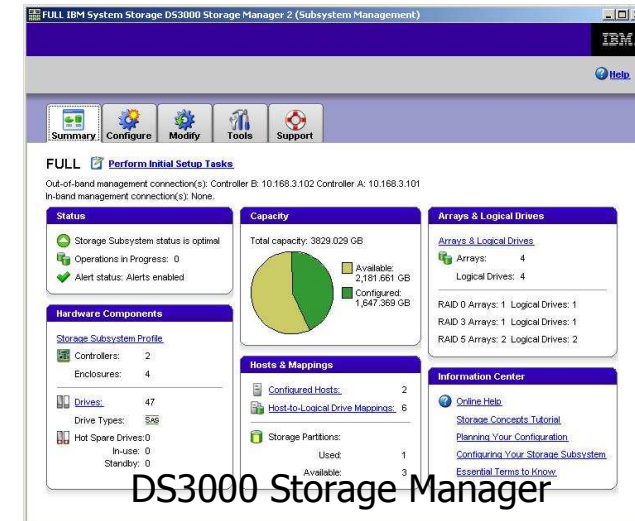
Dynamic Volume Expansion

Dynamic RAID Level Migration

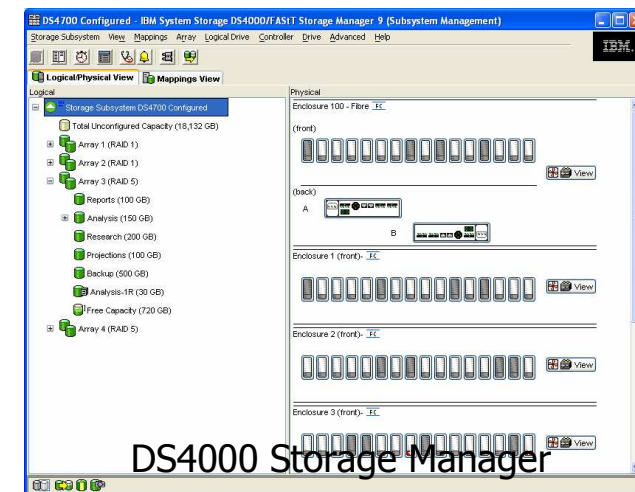
Dynamic Segment Size Migration

FlashCopy

VolumeCopy



DS3000 Storage Manager



DS4000 Storage Manager

DS3000 Storage Manager (2 of 2)

- **Functions use a step-by-step wizard navigation scheme**
- **Supports RAID levels 0, 1, 3, 5 and 10**
- **Recovery Guru and email diagnostic alerts**
 - ▶ Alerts the administrator if a problem occurs and determines the appropriate recovery procedure
- **Automatic I/O path failover**
- **Online administration**
 - ▶ Logical drive creation
 - ▶ The new logical drive can be mapped to a host at the same time
 - ▶ Capacity expansion, configuration and LUN access
 - ▶ Firmware updates
- **Automatic or manual Hot Spare configuration**
- **Maximum of 256 logical drives per disk system**

