SAS vs. SATA
Enterprise Class HDD Interfaces

Source: Fujitsu
SAS is Exceptionally Scalable

- SAS supports up to 16,384 devices in a single domain. Greatly improving on the 16-device limit of Parallel SCSI Bus.

- Each device is assigned a unique World Wide Name (WWN) as well as FCAL. Making SCS Bus IDs no longer necessary.

- Smaller connector size enables Small Form Factor (SFF) HDDs for increasing drive density and spindle count.
Serial Technology Enables Choice

One backplane accommodates either SAS or SATA HDDs

- High-performance & highly reliable serial attached SCSI disk drives are suitable for mission critical and performance oriented applications
- High capacity SATA drives can be used for disk enhanced backup or reference data
Difference on System Requirements (1/2)

Near-line
- 24x7 power-on hours
- Highly random
- Low IOPS
- Low duty cycle

Highly Transactional Database
General Purpose Server

Reference Database
Disk-to-disk backup

Low Cost Server
Desktop

Online
- 24x7 power-on hours
- Highly random
- High IOPS
- High duty cycle

Low-Cost Server
- 8x5 power-on hours
- More sequential (Low random)
- Frequent start/stop (Low IOPS)
- Low duty cycle
Difference on System Requirements

Near-line SATA

- Cost
- Capacity
- Duty Cycle
- Reliability
- Scalability
- Environment
- Performance
- Data Integrity
- Power Consumption
- System Architecture

Enterprise SAS

Each application gets parameters it needs

Fujitsu Proprietary and Confidential
# Key Decision Factors

<table>
<thead>
<tr>
<th>SATA</th>
<th>SAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highest performance capability</strong></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>- Full duplex, higher bandwidth, port aggregation extensive command queuing, rich command feature set</td>
</tr>
<tr>
<td><strong>Lowest cost per gigabyte</strong></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>- Low acquisition cost</td>
</tr>
<tr>
<td><strong>Best performance for transactional data</strong></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>- High frequency immediate random-access type data</td>
</tr>
<tr>
<td></td>
<td>- Database, on-line purchase, bank transactions, CRM etc.</td>
</tr>
<tr>
<td><strong>Most cost effective for reference and sequential-type data</strong></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>- Low frequency access, streaming and sequential data</td>
</tr>
<tr>
<td></td>
<td>- File-sharing/Email/Web/Nearline/Backup and archival data</td>
</tr>
<tr>
<td><strong>Greater Scalability</strong></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>- Greatest physical device addressing range</td>
</tr>
<tr>
<td></td>
<td>- Connection to out-of-box storage, long (8-meter) cable length</td>
</tr>
</tbody>
</table>

Note: This matrix reflects the inherent capabilities of the interface, not vendors’ product features.

Source: STA

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# Key Decision Factors

## SATA
- **First to volume disk interconnect**
  - Specification completed in 2001
  - Products started shipping in 2002
- **Highest reliability and availability**
  - More extensive error recovery techniques
  - Multi-initiator (simultaneous access) + Dual-active port support
- **Simplest configuration setup**
  - Ubiquitous drivers – No requirement for vendor drivers
  - Motherboard chipset integration
- **Greatest device flexibility**
  - Support for Serial Attached SCSI and Serial ATA devices
- **Power management**
  - Saves power by automatically powering-down when not in use

## SAS
- **First to volume disk interconnect**
- **Highest reliability and availability**
- **Simplest configuration setup**
- **Greatest device flexibility**
- **Power management**

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Source: STA
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*Note: This matrix reflects the inherent capabilities of the interface, not vendors’ product features*
Fujitsu

THE POSSIBILITIES ARE INFINITE