



# The 1-2-3's of Choosing the Right Tool for the Job

## SAS or SATA? Just Do the Math!

Serial Attached SCSI (SAS) is not the replacement technology for Serial ATA (SATA). SAS is designed to replace SCSI, though both interfaces will make inroads into the aging SCSI infrastructure: SATA for capacity and sustained data rates and SAS for expansion and database applications. The peaceful coexistence of the two serial interfaces will serve as a means of establishing inexpensive tiered storage hierarchies. Integrators will enjoy unprecedented opportunities to choose the interface technology that best fits their customers' specific requirements as they build systems for their particular storage environments.

### SATA

SATA will remain the cost- and performance-optimized interface for the majority of value-end storage appliances that employ a fixed number of drives to serve vertical applications, like video surveillance.

A SATA direct-connect backplane requires no additional active components for a much simpler design and high overall reliability.



#### Storage Appliances: A SATA RAID Mainstay



- Vertical Applications
- Cost Optimized
- Optimized for Sequential Performance
- Mature Infrastructure

The Majority of Value Appliances Ship with SATA RAID

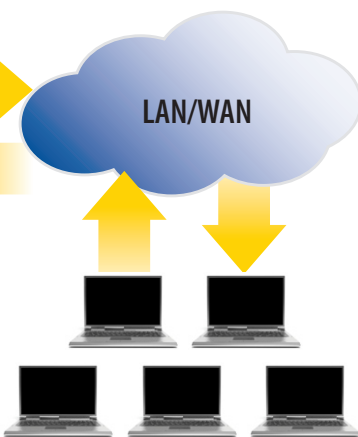
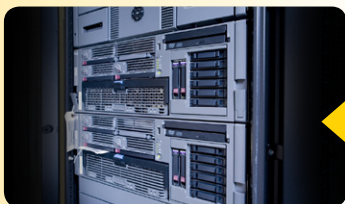
### SAS

SAS will emerge to capture the direct-attach server space, SCSI's former mainstay. Mission critical applications that require higher levels of availability and native expansion will increasingly rely on SAS.

SAS configurations will add to total solution cost and to system complexity, compared to SATA. SAS requires additional active components (expanders) and extra power to fully capitalize on its expandability potential.



#### Direct Attach Servers: SCSI Mainstay



- Mission Critical Applications
- High Availability
- Native Expansion
- Optimized for Random Performance
- Emerging Infrastructure

### Cut Through the Confusion

3ware makes it easy to select a RAID controller with the right interface for your particular needs. Whether you want to connect SAS drives to a SAS controller, SATA drives to a SATA controller, or SATA drives to a SAS controller, 3ware has the RAID controller to get the job done.

RAID Controller	Interface	Supported Drive Type
3ware 9690SA	SAS/SATA II to PCI Express	• SAS • SATA II • SATA
3ware 9650SE	SATA II to PCI Express	• SATA II • SATA
3ware 9550SXU	SATA II to PCI-X	• SATA II • SATA

Don't get derailed by media buzz words. Keeping your head and answering a few very simple questions about your solution objectives, typical use cases, host bus parameters and desired drive quantities will keep you on track to finding the right tool every time (Figures 1 & 2).

### Simply Go with the Flow to Choose the Right Tool

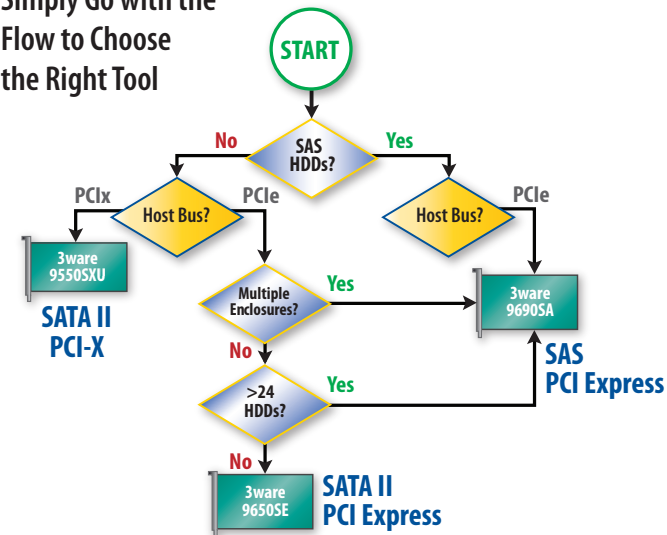


Figure 1: Choosing between SAS and SATA is easy when you consider your options and the interface requirements for your specific applications. Begin by asking yourself whether you need SAS or SATA hard drives, what host bus you desire (PCI-X vs. PCI Express), will you be using a single, or multiple enclosures and will you be using more or fewer than 24 hard drives. Your answers to these simple questions will make your SAS/SATA controller selection as easy as 1-2-3.

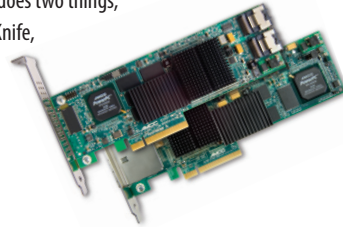
## Consider Your Solution Objectives

Solution Objective	Typical Use Case	Number of Drives per Enclosure	Disk Drive Interface	Infrastructure Type	Preferred Controller Interface
Drive Performance in a single enclosure	Server	= 8	SAS	Direct Connect	SAS
	Email	> 8	SAS	SAS	
Cost/Performance of RAID in a single enclosure	Storage Appliance	= 24	SATA	Direct Connect	SATA
		> 24	SATA	SAS	SAS
Cost/Performance of RAID in multiple enclosures	SAN	NA	SATA	SAS/SATA	SAS
Low cost single enclosures	NAS	= 12	SATA	Direct Connect	SATA

Figure 2: What are your objectives? Is drive performance paramount, or will cost/performance make your SAS/SATA decision? Will a single or multiple enclosures be used? Is cost your overriding concern? Generally, SATA is your choice if you will connect directly to fewer than 25 drives; SAS is your choice for drive counts greater than 24 and up to 128 devices per controller.

## Busting the Unified Serial Storage Myth

Do not be lead astray by SAS misinformation. SAS is not all things to all people. RAID controller companies lacking robust SATA solutions in their product lineup are forced to market SAS as a 'one size fits all' proposition. It is not. Make no mistake, the SAS interface alone is not a unified or universal solution. A so-called unified serial storage solution does two things, but neither very well. You can build a house with a Swiss Army Knife, but why would you? Using the right tools will get the job done better and faster every time. Dedicated SAS and SATA controllers satisfy distinctive requirements of real-world serial storage environments.



### Calculate the Benefits

SATA	SAS
<b>Pros</b>	<b>Pros</b>
<ul style="list-style-type: none"> <li>Value = low cost per GB</li> <li>Much higher capacity drives</li> <li>Direct connect for uncomplicated configuration</li> </ul>	<ul style="list-style-type: none"> <li>Expandability</li> <li>High availability</li> <li>Better random access performance</li> <li>Longer cable length</li> </ul>
<b>Cons</b>	<b>Cons</b>
<ul style="list-style-type: none"> <li>Limited external support</li> <li>Shorter cable length</li> <li>Expandability (limited to controller's port count)</li> </ul>	<ul style="list-style-type: none"> <li>Higher cost per GB</li> <li>System complexity with active components</li> <li>Much lower capacity drives</li> </ul>

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### 3ware 9690SA Series Selection Guide

	9690SA-8I	9690SA-8E	9690SA-4I4E
<b>Form Factor</b>	Low profile	Low profile	Low profile
<b>SAS Ports</b>	8 Internal	8 External	4 Internal/4 External
<b>PCI Express</b>	x8	x8	x8
<b>RAID Levels</b>	0, 1, 5, 6, 10, 50, Single Disk	0, 1, 5, 6, 10, 50, Single Disk	0, 1, 5, 6, 10, 50, Single Disk
<b>Onboard Memory</b>	512MB DDR2 533	512MB DDR2 533	512MB DDR2 533
<b>Connector Type</b>	SFF-8087 mini-SAS	SFF-8088 mini-SAS	SFF-8087/SFF-8088 mini-SAS
<b>BBU with Remote Battery Support</b>	Yes	Yes	Yes



### 3ware 9650SE Series Selection Guide

	9650SE-2LP	9650SE-4LPML	9650SE-4LPME	9650SE-8LPML	9650SE-12ML	9650SE-16ML	9650SE-24ML
<b>Form Factor</b>	Low profile	Low profile	Low profile	Low profile	Full height	Full height	Full height
<b>Port Count</b>	2	4	4	8	12	16	24
<b>PCI Express</b>	x1	x4	x4	x4	x8	x8	x8
<b>RAID Levels</b>	0, 1, Single Disk, JBOD	0, 1, 5, 10, Single Disk, JBOD	0, 1, 5, 10, JBOD	0, 1, 5, 6, 10, 50, Single Disk, JBOD	0, 1, 5, 6, 10, 50, Single Disk, JBOD	0, 1, 5, 6, 10, 50, Single Disk, JBOD	0, 1, 5, 6, 10, 50, Single Disk, JBOD
<b>Onboard Memory</b>	128MB DDR2 533	256MB DDR2 533	256MB DDR2 533	256MB DDR2 533	256MB DDR2 533	256MB DDR2 533	512MB DDR2 533
<b>Connector Type</b>	Discrete	Multi-lane	Multi-lane	Multi-lane	Multi-lane	Multi-lane	Multi-lane
<b>BBU Support</b>	No	Yes	Yes	Yes	Yes	Yes	Yes



### 3ware 9550SXU Series Selection Guide

	9550SXU-4LP	9550SXU-8LP	9550SXU-12	9550SXU-12MI	9550SXU-12ML	9550SXU-16ML
<b>Form Factor</b>	Low profile	Low profile	Full height	Full height	Full height	Full height
<b>Port Count</b>	4	8	12	12	12	16
<b>Host Interface</b>	PCI-X	PCI-X	PCI-X	PCI-X	PCI-X	PCI-X
<b>Host Interface Speed</b>	64-bit/133MHz	64-bit/133MHz	64-bit/133MHz	64-bit/133MHz	64-bit/133MHz	64-bit/133MHz
<b>RAID Levels</b>	0, 1, 5, 10, Single Disk, JBOD	0, 1, 5, 10, 50, Single Disk, JBOD	0, 1, 5, 10, 50, Single Disk, JBOD	0, 1, 5, 10, 50, Single Disk, JBOD	0, 1, 5, 10, 50, Single Disk, JBOD	0, 1, 5, 10, 50, Single Disk, JBOD
<b>Onboard Memory</b>	128MB	128MB	256MB	256MB	256MB	256MB
<b>Connector Type</b>	Discrete	Discrete	Discrete	Multi-lane	Multi-lane	Multi-lane

3ware offers accommodating serial storage product portfolios that include solutions with SATA connectivity for cost/performance optimized vertical installations as well as expandable SAS solutions for high availability in mission critical applications.

Interestingly, it is 3ware that offers real product unity. 3ware RAID controllers include AMCC's integrated, cross-platform RAID management interface and software suite to assure users a simple and truly unified configuration experience with every 3ware controller, irrespective of its storage interface.

### Do the Math

You will find the 3ware RAID controller you need simply by employing some basic arithmetic and common sense. Whether you require SAS, SATA or SAS/SATA connectivity, 3ware provides the right tool for the job.

100%



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