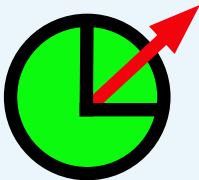**SAS RAID Storage System:**

• Direct Attached Storage via dual proven and powerful Serial Attached SCSI (SAS) interfaces
• Extents existing IT environments and offers huge and cost effective storage, like online backup or data archive
• 2U / 3U rack versions

Hard Disk Drives (HDDs):

• SAS and/or SATA hard disk drives newest generation can be mounted into VessRAID or VessJBOD systems.
• Supports NCQ/TCQ
• Up to 16 hard disk drives in one VessRAID storage system
• Up to 80 hard disk drives connected to one VessRAID storage system unit extented by four VessJBOD extension units

VessRAID Features:

• Advance Data Protection (Predictive Data Migration)
• Proven PerfectRAID engine
• HDD HotSwap and HotSpare functionality
• RAID level 0, 1, 5, 6, 10, 50, 60
• Online Capacity Migration
• RAID Level Migration
• LUN Masking/Mapping
• Embedded Browser Management
• Net Send and Email Notification
• High product quality
• Service friendly design
• Battery Backup Unit for Cache-Buffering, rails, data cables and LCD panel as option available.
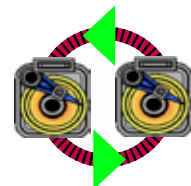
Green Power Scheduler

The new webPAM PROe contains a new time and date scheduler. This tools starts up the system on defined time as well as shutting down into a stand by mode. Using an backup window of e.g. 6 hours the power consumption can be reduced by about 75% compare to systems not using our Green Power Scheduler.

80plus certified PSUs

VessRAID and VessJBOD storage systems are using high effecient power supply units proven by the 80plus standard. Due to this the used power supplies are optimized with 450 watts/350 watts compare to typically used 500 watts/400 watts.

Scalable SAS RAID Storage Systems for Entrylevel from Promise Technology

Cost effective RAID Storage Systeme with Enterprise Level Features for Online-Backup, Data-Archive and Video Surveillance

Online-Backup

Backup-To-Disk (B2D) offers the best and fastest recovery after a data loss and brings back the IT system in to the regular mode. The storing and management of different backup sets will be done from a server based backup suite. The transfer of data is done via two high speed Serial Attached SCSI (SAS) interfaces via the server to the VessRAID storage system.

Data Archive / Online Libraries

In the IT center but also in small and medium size IT environments the need of storage which needed to be available online is increasing. Images, video, audio streams and other digital data are requested online via internet, intranet or LAN from a huge number of persons. The files are available via the access through servers which manage the data on the VessRAID storage systems and make them available for the user.

Video Surveillance

Digital storing and archiving of video and audio due to security reasons request a high demand on storage capacity at a low cost level. VessRAID storage system unit extended by up to four VessJBOD extension units offers a huge capacity of storage to the connected servers. The video surveillance servers manage temporary data as well as archiving of data.

RoHS 2002/95/EC   Serial Attached SCSI   SERIAL ATA   6
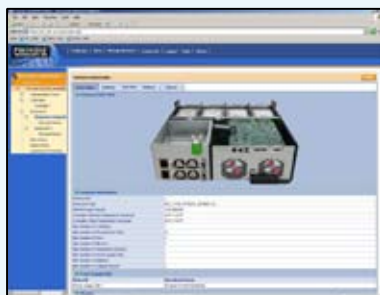
VessRAID System Unit:

VessRAID storage systems are available in 2U or 3U formfactor with 8, 12 or 16 drive carriers.

Rear view with single power supply:

Swappable Field Replacement Unit (FRU):

- OPAS (One Plug Auto Service)
  System data and configuration can be transfered to a USB 2.0 memory stick connected to the integrated USB 2.0 port. These information can be forwarded to to enginieer for technical service or support.

- Power Scheduler
  Via an integrated time/date scheduler the VessRAID storage system can be activiate or shutted down into a stand by mode.

- WOL (Wake On LAN)
  VessRAID storage system can be activate with Freeware/Sharewas WOL software tools via LAN. After activation the systems will be powered up from a stand by mode.

- PerfectRAID Engine
  Proven Promise RAID engine supports mutiple or dedicated HotSpare, Online Capacity Migration, RAID Level Migration, Media Patrol, Advance Data Protection (Predictive Data Migration).

- 512 MB data cache, redundant fans, easy to swap FRU controller unit.

- Optical and acustical alarm

- System interfaces

- WebPAM PROe management tool via web browser:

VessRAID SAS RAID Storage Systems - System Units:

Serial Attached SCSI interfaces (SAS) are the technological follower of the proven parallel SCSI interface and is today's de facto standard for high performance connectivity between host servers and storage systems. VessRAID storage systems offers dual (two) host interfaces each with up to 1,2 GB/s data transfer rate.

Product Type	Rack	PSU 80plus	Interfaces	RAID Level	Drive Carrier	HotSwap Hotspare	Power Scheduler, Wake on LAN, PDM
VessRAID1740s	3U	single	2x SASx4 (SFF8088) 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	16 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1840s	3U	dual	2x SASx4 (SFF8088) 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	16 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1730s	2U	single	2x SASx4 (SFF8088) 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	12 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1830s	2U	dual	2x SASx4 (SFF8088) 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	12 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1720s	2U	single	2 x SASx4 1 x LAN Mgm Port SAS Expansionsport	0, 1, 1E, 5, 6, 10, 50, 60	8 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1820s	2U	dual	2 x SASx4 1 x LAN Mgm Port SAS Expansionsport	0, 1, 1E, 5, 6, 10, 50, 60	8 SAS/S-ATA 3,0 Gb/s	yes	yes

VessRAID iSCSI RAID Storage Systems - System Units:

iSCSI as host interface for storage systems become more and more popular. Four iSCSI channels makes it possible to transfer block data between servers and VessRAID storage systems via four ethernet LAN lines simultaniously. This bandwidth makes VessRAID ideal for using in Storage Area Networks (SANs) as well as centralized storage system for several servers or other iSCSI targets, like cameras.

Product Type (iSCSi available from H2/2009)	Rack	PSU 80plus	Interfaces	RAID Level	Drive Carrier	HotSwap Hotspare	Power Scheduler, Wake on LAN, PDM
VessRAID1740i	3U	single	4x iSCSI 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	16 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1840i	3U	dual	4x iSCSI 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	16 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1730i	2U	single	4x iSCSI 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	12 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1830i	2U	dual	4x iSCSI 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	12 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1720i	2U	single	4x iSCSI 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	8 SAS/S-ATA 3,0 Gb/s	yes	yes
VessRAID1820i	2U	dual	4x iSCSI 1x GbELAN Mgm Port 1x SASx4 Expansion	0, 1, 1E, 5, 6, 10, 50, 60	8 SAS/S-ATA 3,0 Gb/s	yes	yes

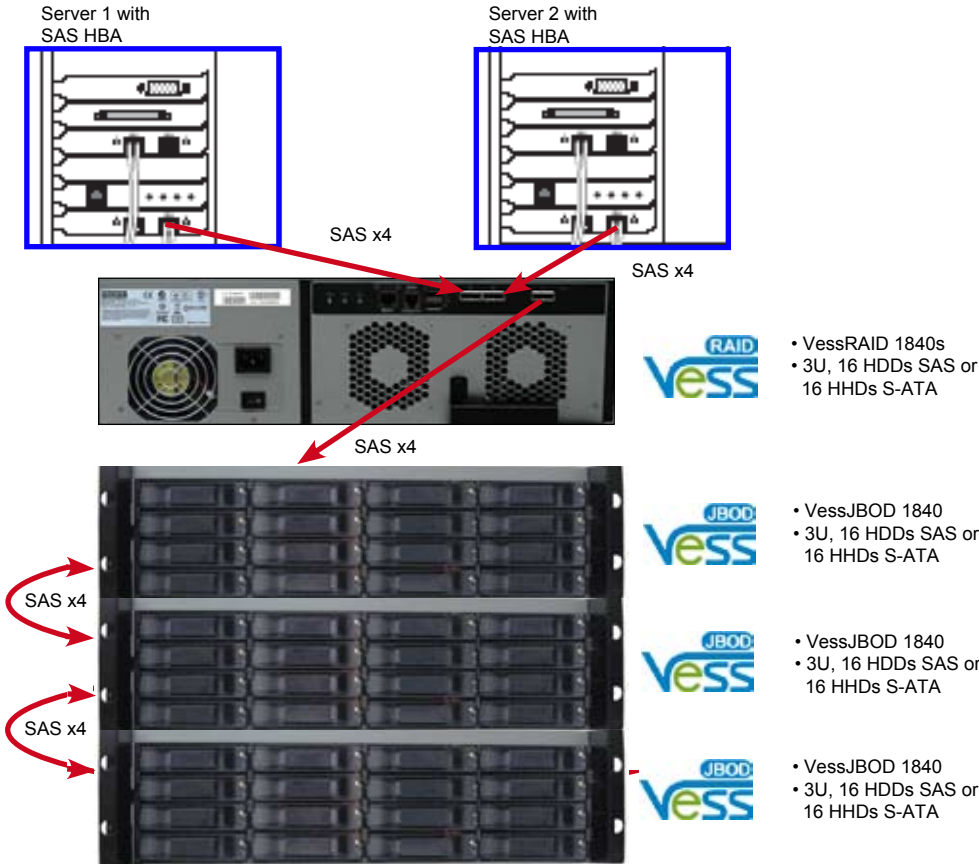## VessJBOD Storage - Extension Units:

Up to four VessJBOD can be connected as extension to ONE VessRAID or an RAID controller.

Product Type	Rack	PSU 80plus	Interfaces	RAID Level	Drive Carrier	Extension for VessRAID	Connection to SAS HBA or RAID Controller
VessJBOD1740	3U	single	2x SASx4 (SFF8088)	JBOD	16 SAS/S-ATA 3,0 Gb/s	yes	yes, e.g. EX8654, EX8658/TX8668
VessJBOD1840	3U	dual	2x SASx4 (SFF8088)	JBOD	16 SAS/S-ATA 3,0 Gb/s	yes	yes, e.g. EX8654, EX8658/TX8668
VessJBOD1730	2U	single	2x SASx4 (SFF8088)	JBOD	12 SAS/S-ATA 3,0 Gb/s	yes	yes, e.g. EX8654, EX8658/TX8668
VessJBOD1840	2U	dual	2x SASx4 (SFF8088)	JBOD	12 SAS/S-ATA 3,0 Gb/s	yes	yes, e.g. EX8654, EX8658/TX8668

Choose by Youselfl ! VessRAID and VessJBOD are shipped without hard drive disks. Please refer to the latest compatibility lists available at www.promise.com

VessRAID Storage System connected to two Servers:

up to 80 hard disk drives in SAS environment

Server 1 with
SAS HBA

Server 2 with
SAS HBA

SAS x4

SAS x4

SAS x4

RAID
Vess

• VessRAID 1840s
• 3U, 16 HDDs SAS or
  16 HHDs S-ATA

SAS x4

SAS x4

JBOD
Vess

• VessJBOD 1840
• 3U, 16 HDDs SAS or
  16 HHDs S-ATA

JBOD
Vess

• VessJBOD 1840
• 3U, 16 HDDs SAS or
  16 HHDs S-ATA

JBOD
Vess

• VessJBOD 1840
• 3U, 16 HDDs SAS or
  16 HHDs S-ATA

VessJBOD Extention Units connected to SAS RAID Controller:

Cabel int.: SFF8087 to SFF8087
Cabel ext.: SFF8088 to SFF8088

SAS Expander
in VessJBOD

3 x VessJBOD1840
16bay JBOD

SAS x4

SAS x4

JBOD
Vess

... 116
HDDs

SAS x4

JBOD
Vess

SAS x4

JBOD
Vess

Port 1

Port 2

SAS
Expander

... 116
HDDs

SuperTrak EX
RAID Controller

Single backplane

Predictive Data Migration (PDM) delivers Advanced Data Protection

Predictive Data Migration is Promise's unique technology that proactively detects possible drive failures before they occur and migrates data to a new healthy drive. Predictive Data Migration dramatically reduces the potential for data loss as well as the likelihood of a logical drive (array) going critical.

The VessRAID system monitors its hard drives for:

• bad blocks
• SMART events
• other Hard drive reliability indicators

If a physical drive reaches a predetermined error threshold (becomes 'sick'), the data on the sick drive is copied directly to a hot-spare drive before the suspect drive fails. Since the drive is replaced in the background before it fails, the chance of data loss is dramatically reduced. Once the data is copied to the new drive the sick drive is set down and the new drive is automatically built into the affected logical drive with zero downtime.

Predictive Data Migration prevents the logical drive from reaching a critical unprotected state and impacting data access. WebPAM Pro enables the administrator to manage the entire process simply and efficiently from anywhere.

Today's massive capacity hard drives and stringent data availability requirements are driving the need for more robust data protection and failure resiliency. With hard drives exceeding 750 GBs in capacity and even larger drives on the horizon the impact of a single drive failing and requiring a very RAID controller intensive XOR rebuild has reached the point of no return.

The likelihood of a second drive having an error or failing completely during the rebuild process of the first failed drive increases exponentially with both the size of the hard drives and the total capacity of the logical drive.

With 750+GB hard drives the amount of time required to completely rebuild a failed drive in a 12-15 drive RAID 5 logical drive is measured in days rather than hours. The longer the rebuild takes the higher the risk to your data.
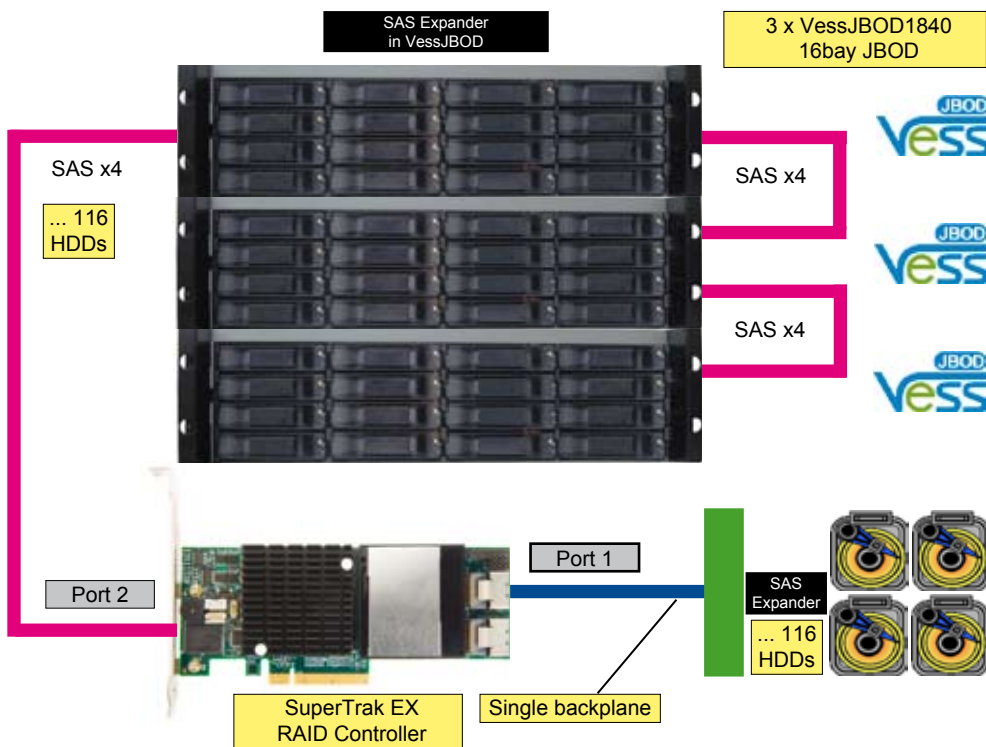
In RAID 5 if you lose a second hard drive while the first one is still rebuilding you lose 100% of your data.

Even RAID 6 only allows a total of two drives to fail before losing all data in the RAID set.

The solution is to remove the need for a complicated and time intensive RAID XOR drive rebuild altogether. That is the purpose of PDM. Because it proactively monitors the health of all hard drives in the system it reacts before the drive fails to migrate data to a known healthy drive. This migration is a straight disk to disk copy that is many times faster and far less RAID engine intensive than a full XOR rebuild. So not only is it much faster to copy data from one drive to the next, but it has less impact on the performance of the RAID engine and the affected logical drive.

Scope of Delivery VessRAID and VessJBOD

VessRAID storage systems and VessJBOD extension units are prepared for immediate implementations.

Disk drives are easy to build into the drive carrier and need to be fastend with specific screws which are part of the product content. The drive carrier are easy to mount into the storage system as described in the manual's instructions.

Additional note:
• VessRAID and VessJBOD systems are delivered without rials, Battery Backup Unit (BBU) and data cables. These products are available as accessories and needed to be ordered separatly.

Product Type	Scope of Delivery
VessRAID	• System unit incl. 1 FRU Controller/Fan unit and 1 dual or single Power Supply Unit as well as 12 or 16 drive carriers • 1 or 2 power cords • Quick Start Guide, CD • HDD screws
VessJBOD	• System unit incl. 1 FRU I/O /Fan unit and 1 dual or single Power Supply Unit as well as 12 or 16 drive carriers • 1 or 2 power cords • Quick Start Guide, CD • HDD screws

Options for VessRAID and VessJBO

VessRAID storage system unit:

• The Battery-Backup-Unit (BBU) stores the data of the controller cache minimum 72 hours after a power failure. The buffered data are available after power on and will be used by the system.
• LCD panel offers access to the main system parameter of VessRAID, like the IP address. Also the acustic buzzer can be switched off here.

VessRAID storage system unit and VessJBOD extension unit:

• Rails needed for built into 19" IT rack as well as MiniSAS data cables are available as accessories and needed to be ordered separately.

Option	Description	for:
Battery Backup Unit (BBU)	BBU for puffering VessRAID's internal data cache with 72 hours after a power failure	VessRAID
LCD Panel	LCD Panel for management of system parameter - mount to the front	VessRAID
Mounting Rails	Rails for mount the VessRAID and VessJBOD into a 19" IT rack	VessRAID VessJBOD
MiniSAS Kabel 1m (SFF8088-SFF8088)	MiniSAS x 4 cable from VessRAID to host interface or from VessRAID to VessJBOD (1 meter)	VessRAID VessJBOD
MiniSAS Kabel 2m (SFF8088-SFF8088)	MiniSAS x 4 cable from VessRAID to host interface or from VessRAID to VessJBOD (2 meter)	VessRAID VessJBOD

Promise Technology
- 20 years of Technology Innovation

SAS- and SATA RAID are the core techniques hold at Promise Technology who is the originator of ATA RAID and worldwide leader in SATA RAID with over 15 million controllers shipped. Using Serial ATA and Serial Attached SCSI (SAS) technology to design and manufacture fast, reliable cost-effective data protection, Promise is the preferred choice for SATA host bus adapters, RAID controllers and SAS/SATA external storage systems. Promise Technology maintains ongoing product development relationships with leading storage and server manufacturers. Headquartered in Milpitas, CA, the company is ISO-9001:2000 and ISO-14001:2004 certified and has offices and operations throughout Asia and Europe to support local business partners and customers. For further information, visit: www.promise.com.

Promise Technology
- Contact us!

We are available for our customers through:

• Worldwide hotline telephone
• E-support via internet

Service Policy for VessRAID and VessJBOD:

• Presales Support
• Hotline (business hours)
• 3 years warranty
• Worldwide service and support centers
• Direct manufacturer RMA handling
• 24 hours advance replacement service (available via hotline contact)