

SAS RAID Storage System:

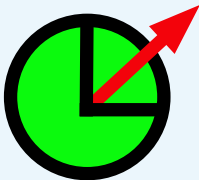
- Direct Attached Storage via dual proven and powerful Serial Attached SCSI (SAS) interfaces
- Extends existing IT environments and offers huge and cost effective storage, like online backup or data archive
- 2U / 3U rack versions

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 extended 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 tool 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.

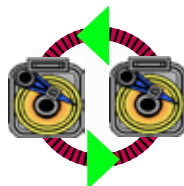


80plus certified PSUs

VessRAID and VessJBOD storage systems are using high efficient 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 System 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.

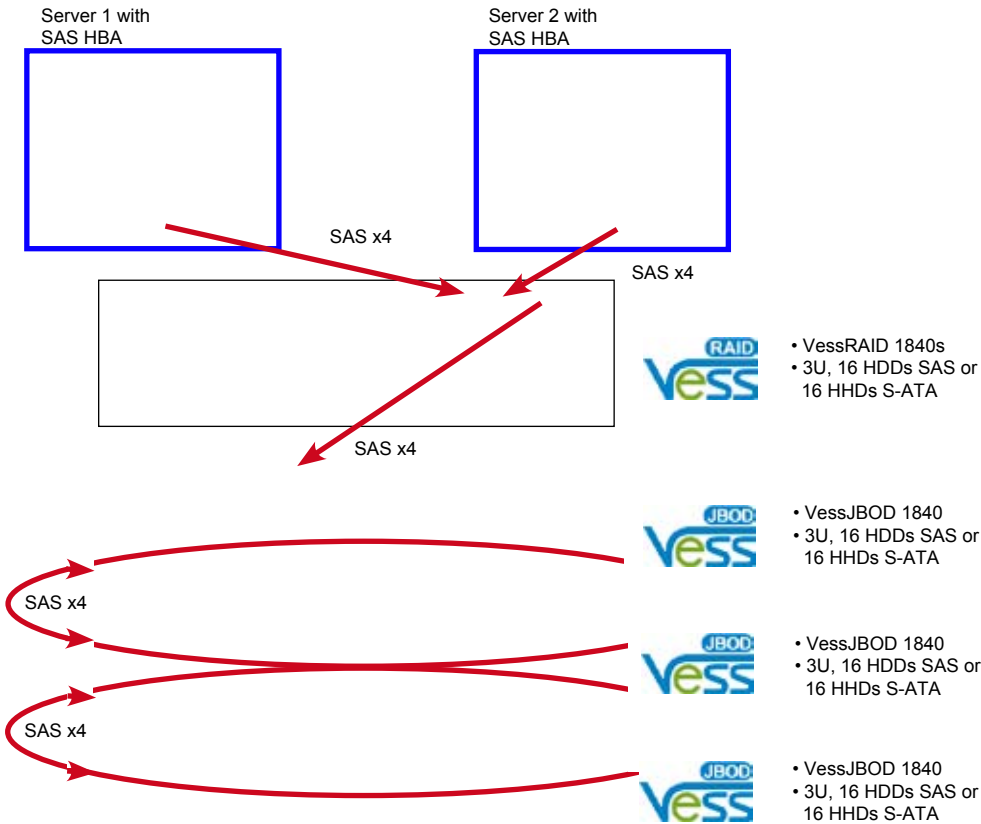


Video Surveillance

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.



VessRAID Storage System connected to two Servers:
up to 80 hard disk drives in SAS environment



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.

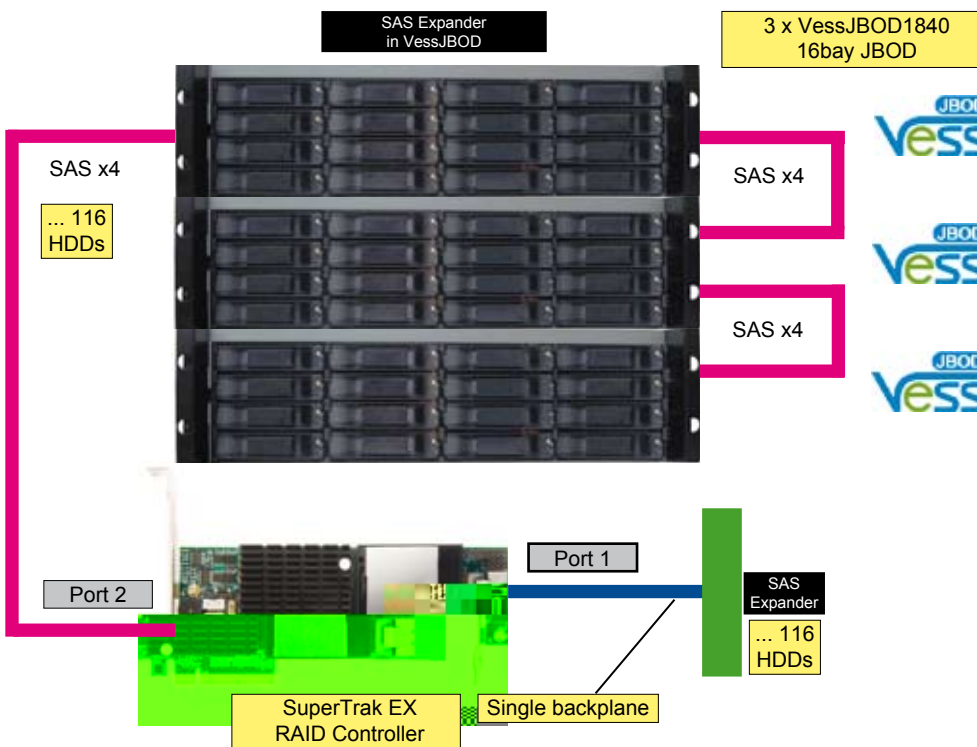
With 750+GB hard drives the amount of time required to completely rebuild a failed drive in a 12-15 drive RAID 5 logical drive is measured in days rather than hours. The longer the rebuild takes the higher the risk to your data.

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 it is 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.

VessJBOD Extention Units connected to SAS RAID Controller:
Cabel int.: SFF8087 to SFF8087
Cabel ext.: SFF8088 to SFF8088



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 fastened 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 rails, Battery Backup Unit (BBU) and data cables. These products are available as accessories and needed to be ordered separately.

| Product Type | Scope of Delivery |
|--------------|--|
| VessRAID | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 acoustic 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 buffering 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)

www.promise.com

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