The RAID Storage System:

- Primary storage
- Expand existing IT environments
- 2U/3U Rackmount form factor

The External Interfaces:

- The iSCSI Storage System is presented as block storage to the network and is typically managed by a network server.
- FibreChannel RAID Storage Systems will be connected to existing SANs (Storage Area Networks) and offers cost effective storage for Online Backup or Online Archive.
- Proven SCSI U320 Technology connects a RAID Storage System with the server in a Direct Attached Storage (DAS) solution.

The Hard Disk Drive Features:

- Use of S-ATA HDDs with 1,5 Gb/s or 3,0 Gb/s standards
- Supports NCQ/TCQ command sets
- Up to15 HDDs in one VTrak RAID storage system
- Over 10 TeraByte capacity (with 750 GB HDDs)

VTrak Main Features:

- Advanced Data Protection (Predictive Data Migration)
- Proven PerfectRAID engine
- HDD HotSpare and HotSwap functionality
- RAID Level 0,1,5,6,10,50
- Online Capacity Extension
- LUN Masking/Mapping
- Embedded Browser Management
- NetSend and Email Notification
- High quality
- Easy to handle
- Redundant power supplies and fans
- BatteryPack for Cache-Buffering
- HotSwap components
- ROHS conform

Promise Technology:

- Market leader in ATA and S-ATA RAID
- Co-founder of ATA/S-ATA RAID technologies
- A global company
- RAID Storage Systems
- ISO Quality certification
- Developer and manufacturer of SAS and S-ATA Storage Systems
- Developer and manufacturer for PCI and PCI-E RAID Controller
- ATA and S-ATA HostBusAdapter
- 3 year warranty
- Sales, marketing, presales, support and service centers all over the world

VTrak M-Class

S-ATA external RAID Storage Systems from Promise Technology

Professional Storage Systems
for entry and medium sized
IT environments

SERIAL ATA

VTrak

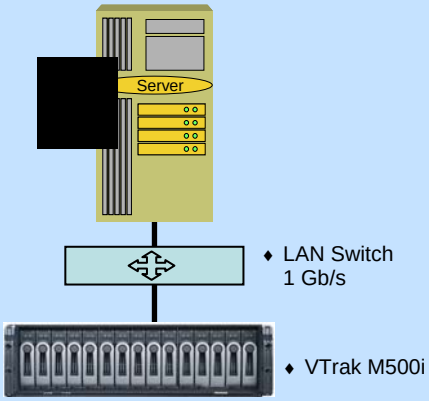
RAID Storage Systems, based on SATA Hard Disk technology are increasingly used in the modern, high performance IT environment. Rackmount equipment is simple, cost effective and easy to install and upgrade.

Storage Systems from Promise Technology implement high capacity, value based SATA hard disks. When combined in a RAID system they can then demonstrate enterprise level performance and reliability. Proven RAID striping (RAID 0), Data mirroring (RAID 1) or redundancy using Parity or Double Parity (RAID 5 or RAID 6) are extended with RAID techniques from Promise Technology such as Advanced Error Recognition and Predictive Data Migration.

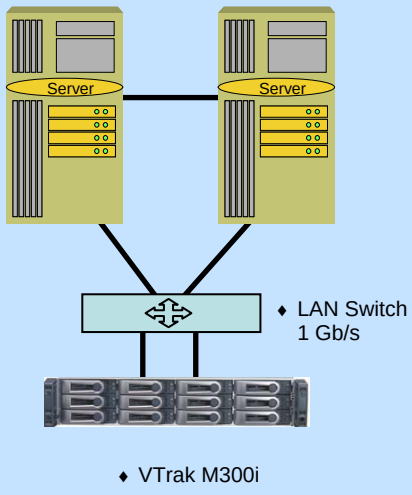
High performance host connections including iSCSI, FibreChannel and U320 SCSI give access to high capacity storage for the most strenuous applications, like Video-Streaming, Video-Operation, CAD, Databases, CRM, ERP and more.

iSCSI Storage Solutions:

- Server with Microsoft iSCSI Initiator connected via one internal LAN 1Gb/s port



- Server Cluster solution with 2 server (nodes) and one centralized storage system.



Arguments for use of an iSCSI storage solution:

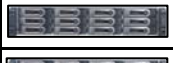
- Easy installation
- Use of the standard LAN ports via iSCSI initiators available from most operating system manufacturers
- Access and management of data 100% under control of the server's operation system
- Storage organization via data blocks
- Easy to manage system via embedded browser tool (PAM)
- Flexible and easy capacity expansion
- Use of cost effective S-ATA hard disk drives
- High data availability through professional RAID level and implemented Predictive Data Migration (Advanced Data Protection)

iSCSI RAID Storage Systems – a technology breakthrough!

iSCSI technology uses the common Ethernet Topology to transfer data between the server and the RAID Storage System as "internet" SCSI. For the hardware, 1Gbit/s LAN is standard now in 19"Racks and on most server motherboards, or specific iSCSI adapters can be added. On the software side, iSCSI initiators are available for most operating systems (for example Windows server, Linux-Derivate and Novell-Netware). The iSCSI Storage System is presented as block storage to the network and is typically managed by a network server.

The combination of two familiar technologies: SCSI and Ethernet makes for a solution that is easily understood and managed. When implemented with a LAN switch the topology is the first step towards a professional SAN (Storage Area Network). These solutions are often found in small and medium sized IT environments as the upgrade path is a simple cost-conscious way to add shared storage in a workgroup or to a networked server.

Application: **iSCSI systems are the best solution for small and medium sized storage solution as well as MiniSAN (SimpleSAN) or Server Cluster Environment.**

Product	Form factor	Interfaces	RAID Level	No of HDDs	HotSwap Hotspare	Front view
VTrak M500i	3U rackmount	2 x iSCSI - 1Gb/s 1 x LAN Mgm Port	0,1,1E,5,10,50	15 S-ATA 1,5-3,0 Gb/s	Yes	
VTrak M300i	2U rackmount	2 x iSCSI - 1Gb/s 1 x LAN Mgm Port	0,1,1E,5,10,50	12 S-ATA 1,5-3,0 Gb/s	Yes	
VTrak M200i	2U rackmount	2 x iSCSI - 1Gb/s 1 x LAN Mgm Port	0,1,1E,5,10,50	8 S-ATA 1,5-3,0 Gb/s	Yes	

FibreChannel RAID Storage Systems – SAN solutions!

Storage Area Networks (SANs) have over the last few years established themselves in many Enterprise IT environments. The storage is separated from the client network, into its own Storage Area Network generally using 1 or 2 Gbit/s FibreChannel, interconnect Fibre Channel and SCSI Storage Systems, Tape Autoloader and Libraries as well as optical storage systems are networked for enterprise servers.

These high performance and costly data storage systems are often supplemented with high capacity, cost effective SATA based RAID Storage Systems. Using SATA RAID for simple File-serving, Online-data security/protection (BackUpToDisk) or Data archiving is common practice. These systems have external FibreChannel host connections so can easily be implemented in an available SAN structure. The assignment of the storage place is carried out by Storage Virtualising software or the SAN management server.

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Application: **S-ATA Storage Systems extent FibreChannel SAN for Online Backup or Online Archive applications.**

Product	Form factor	Interfaces	RAID Level	No of HDDs	HotSwap Hotspare	Front view
VTrak M500f	3U rackmount	2 x FC- 2Gb/s 1 x LAN Mgm Port	0,1,1E,5,10,50	15 S-ATA 1,5-3,0 Gb/s	Yes	
VTrak M300f	2U rackmount	2 x FC - 2Gb/s 1 x LAN Mgm Port	0,1,1E,5,10,50	12 S-ATA 1,5-3,0 Gb/s	Yes	
VTrak M200f	2U rackmount	2 x FC - 2Gb/s 1 x LAN Mgm Port	0,1,1E,5,10,50	8 S-ATA 1,5-3,0 Gb/s	Yes	

SCSI U320 RAID Storage Systems – Proven Technology!

Proven SCSI Technology connects a RAID Storage System with the server in a Direct Attached Storage (DAS) solution. The dedicated data bus enables high data transfer rates of block data. Direct connection to a single server improves data security and availability. The SCSI bus can also be connected to two servers in a clustered environment, or even daisy chained to other external storage systems that can then extend the available storage capacity > 40 TeraBytes or more.

Application: **Direct Access Storage - connected to server as primary mass-storage device i.e. Database-, Application or File-Server**

Product	Form factor	Interfaces	RAID Level	No of HDDs	HotSwap Hotspare	Front view
VTrak M500p	3U rackmount	2 x SCSI - U320 1 x LAN Mgm Port	0,1,5,10,50	15 S-ATA 1,5-3,0 Gb/s	Yes	
VTrak M3!0p	2U rackmount	2 x SCSI - U320 1 x LAN Mgm Port	0,1,1E, 5,**6**,10,50	12 S-ATA 1,5-3,0 Gb/s	Yes	
VTrak M2!0p	2U rackmount	2 x SCSI - U320 1 x LAN Mgm Port	0,1,1E, 5,**6**,10,50	8 S-ATA 1,5-3,0 Gb/s	Yes	

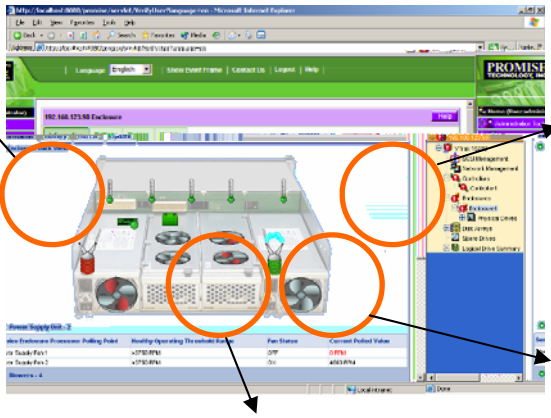
webPAMe
- the Promise Array Management

The complete management of the VTrak RAID storage systems will be done via a webbased embedded software tool connected via a LAN to a simple PC by using a normal web browser..

PAM -
Promise Array Manager

Main menu for management of the VTrak RAID Storage System:

- RAID Level
- LUN Management
- System Status
- Interface Parameter
- IP-Addresses
- System Monitoring
- Alarm Management (i.e. Net Send or Email)



Monitoring of voltages and temperatures

Monitoring of the fan unit

Monitoring of the power supplies

Professional design
- service friendly

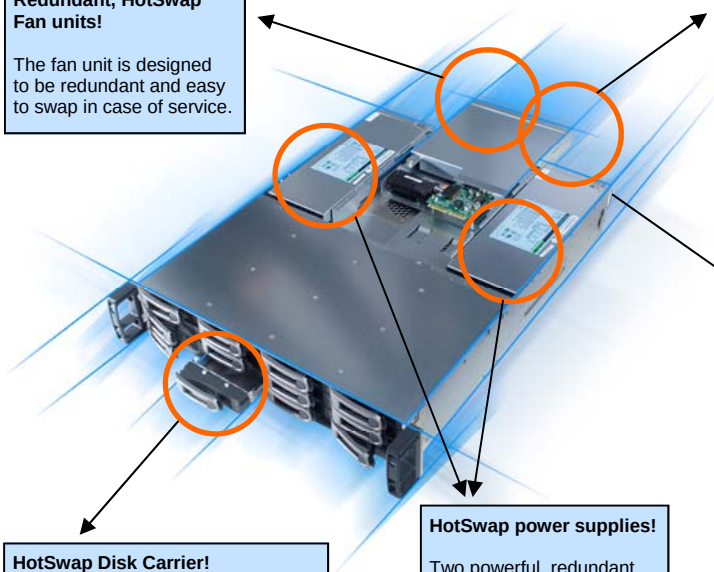
During research and development of the VTrak RAID Storage Systems as many as possible units have been designed for a easy handling. No screws need to be used while exchanging most of the units, like: controller unit, fan unit or power supplies..

Redundant, HotSwap Fan units!

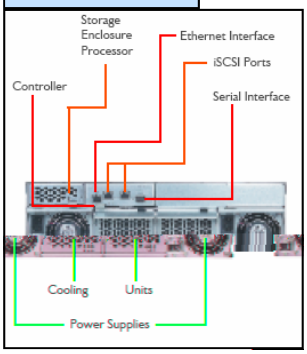
The fan unit is designed to be redundant and easy to swap in case of service.

Swappable Interface/RAID Controller!

The RAID/Interface controller with iSCSI, SCSI or FibreChannel interfaces are easy to swap in case of service.



Back view VTrak



HotSwap power supplies!

Two powerful, redundant power supplies are available for the whole system and easy to swap in case of service.

HotSwap Disk Carrier!

Each of the 8, 12 or 15 Disk Carrier are locked, HotSwap exchangeable. In each there is one S-ATA hard disk drive built in. The hard disk drives are connected direct to the backplane without any additional converter.

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 VTrak 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.