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Computer  
Systems

## I-6983/Ultrium Enterprise Virtual Tape Server for S/390 and Open Systems

### Highlights

The I-6983/Ultrium Enterprise Virtual Tape Server (EVTS) is a Tape Storage Area Network (SAN), offering the best combination of price, performance, capacity, scalability and connectivity. Storage capacity ranges from 3.6 to 14.4 TB\* and bandwidths from 108 to 648 GB per hour. The EVTS is intended for midrange Mainframes as well as for Open Systems Server. It provides centralized management for local and/or remote tape resources and enables enterprise wide archiving, backup and data security strategies.

#### LTO "Ultrium" Technology

The I-6983 Enterprise Virtual Tape Server is based on the latest Linear Tape Open (LTO) "Ultrium" technology. This is the most innovative and reliable magnetic tape technology available today. LTO "Ultrium" has been specified and designed by the LTO Initiative under the leadership of IBM, HP and Seagate.

Servo track controlled high accurate data recording via thin-film magneto resistive read/write heads with read-after-write data verification and advanced error detection and correction guarantees reliability, durability and data integrity. Automatic data caching and read/write buffering enhances performance.

The "Ultrium" high capacity tape cartridge is specially designed for repeated, unattended and trouble-free use in automated tape libraries. It stores 100 GB native data or 200 GB with 2:1 compression. Data rate 15 MB/s native and 30 MB/s with 2:1 compression. The Memory in Cartridge collects usage- and error information for preventive maintenance as well as user data such as Volume and File Labels.

A Ultrium Road Map, released by the LTO Initiative leads far into the next decade and

shows capacity improvements up to 800 GB native per cartridge and data rates up to 160 MB/s.

#### IBM 3583 UltraScale Tape Library

The I-6983 EVTS integrates the IBM 3583 UltraScale Tape Library, providing highly scalable automated tape storage with outstanding retrieval performance. A dual-gripper accessory improves overall performance by retrieving the next cartridge to be mounted, unloading the current cartridge, and loading the next one. The typical cartridge move time is less than 6 seconds and enables more than 500 mounts per hour. Barcode support is a standard feature.

"Ultrium"	1. Generation	2. Generation	3. Generation	4. Generation
Capacity native	100 GB	200 GB	400 GB	800 GB
Data Rate native	15 MB/s	20 MB/s	40 MB/s	80 MB/s

The IBM 3583 is available with 18, 36 and 72 cartridge slots and supports one to six Ultrium tape drives. It provides 3.6 to 14.4 TB compressed tape storage and maintains a compressed data rate of 30 to 180 MB/s. Barcode support for instant media verification and fast inventory is standard. The door accommodates a one or twelve-slot cartridge I/O station for bulk-loading and a

#### LTO "Ultrium" Technology

100/200\* GB per Cartridge  
15/30\* MB/s

#### Tape Library

Up to 72 Cartridges  
Up to 7.2/14.4\* TB  
Up to 6 Tape Drives  
Up to 640\* GB/h Bandwidth

#### Virtual Tape System

Up to 1 TB Disk Cache  
Up to 64 Logical Units  
Remote Attachment

#### Connectivity

ESCON  
Block Multiplex Channel  
Fibre Channel  
SCSI

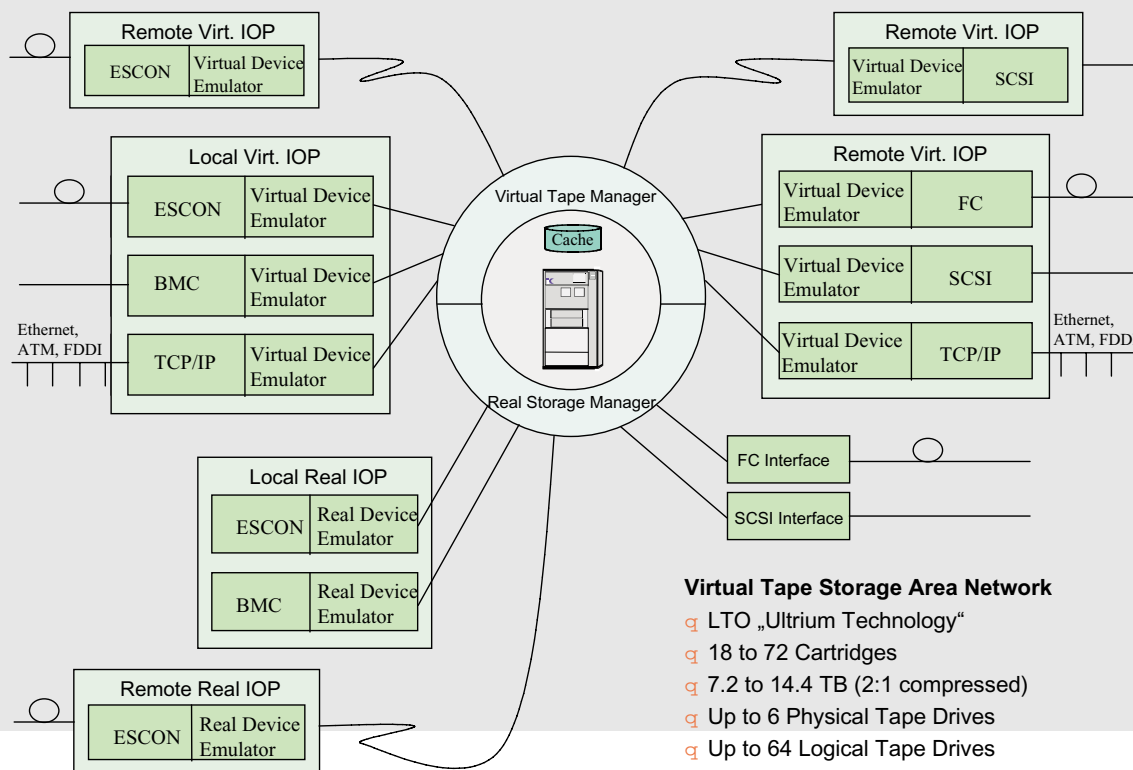
#### System Support

OS/390, VM/VSE  
BS/2000, GCOS 8  
UNIX, LINUX, AIX  
Windows NT/2000

#### Backward Compatibility

36 Track with IBM 3490 Emulation  
18 Track with IBM 3480 Emulation  
9 Track with IBM 3422 Emulation

\* with 2:1 data compression



key lock helps to ensure physical security. Upgrading from 18 to 36 and to 72 cartridges is available. A fully configured IBM 3583 library with 72 cartridges and 6 Ultrium tape drives provides up to 14.4 TB\* storage capacity and an aggregated data rate of up to 180\* MB/s.

## Virtual Tape Management for S/390

As mentioned above, each high capacity LTO "Ultrium" cartridge holds up to 200 GB of compressed data. Most data volumes in the mainframe environment contain just 500 MB of data or less, wasting 95% or more of the available cartridge capacity.

The I-6983 Enterprise Virtual Tape Server makes optimal use of tape resources and provides immediate benefits by reducing personnel, hardware and media expenses. The hosts data volumes are written to virtual drives and temporarily stored on disk cache as virtual volumes. The Virtual Tape Manager migrates virtual volumes according to pre-defined algorithms as logical volumes to real tape. The EVTS can provide faster access to data, reduce tape mounts, utilize the full cartridge capacity, and manage peak loads with reduced hardware by maintaining virtually an unlimited number of virtual tape drives.

## Disk Cache

The I-6983 Enterprise Virtual Tape Server can be equipped with RAID protected disk cache, ranging from 144 to 1.000 GB for parallel processing of up to 64 virtual tape drives and for keeping work files on disk cache for fast retrieval. A Fibre Channel interface is available as optional feature.

## Scalable Bandwidth

The Virtual Input/Output Processor (VIOP) provides connectivity to the host systems via ESCON and Block Multiplex Channel and emulates virtual tape drives. To meet the users bandwidth requirements, up to 4 VIOPs can be attached to an I-6983 Enterprise Virtual Tape Server. Each VIOP can be equipped with up to four ESCON and/or Block Multiplex Channel interfaces.

Each Virtual Input/Output Processor emulates up to 16 virtual tape drives, no matter how many physical tape drives are available. One I-6983 EVTS with 4 Virtual I/O Processors maintains a total of 16 channels and 64 virtual tape drives. The virtual drives compensate for peak loads while dealing with the ever increasing backup data in an ever shrinking backup window and ensures, that no program needs to wait for the availability of tape drives.

Virtual tape drives emulate IBM 3480 or

3490 drives for mainframes, as well as DLT and LTO "Ultrium" for open systems. This feature maintains support for all popular operating systems, including OS/390, MVS, VM/VSE, BS2000, GCOS 8, UNIX, LINUX and Win2000 as well as compatibility to all backup and archiving programs, including Tivoli, Legato Networker and others.

## Real Tape Support

For some applications real tape support may be better suited than virtual tape. The IBM 3584 library can be tailored into two or more logical libraries. One for virtual tapes, maintained by a Virtual IOP (VIOP) and the other for real tapes, maintained by a real Input/Output Processor (IOP). Supported are also real tape drives with IBM 3490, 3480 and 3420 format.

## Local and Remote Copy

Data can be duplicated for improved data security and disaster recovery. Copies can be generated in the same physical library or in another physical library, some 1,000 miles away. Connectivity between two physical libraries is provided via Fibre Channel, ATM, FDDI, Ethernet or any other public or private carrier.

## Remote Tape Processing

For sharing tape resources by remote



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systems, one or more Input/Output Processors can be located remotely and connected via TCP/IP (Ethernet, ATM, FDDI etc.) to the Enterprise Tape Server. Supported are virtual as well as real tape drives. This feature eliminates the need of traditional channel extenders and provides new capabilities in the enterprise wide storage management of locally dispersed systems and in developing new strategies for outsourcing and disaster recovery.

## Import/Export and Data Exchange

One size fits all: For importing and exporting virtual volumes to/from real volumes and for data exchange, the I-6983 EVTS also supports real 36 track, 18 track and 9 track tape drives, providing full backward compatibility to 3490, 3480 and 3420 tape formats. It supports ESCON, Block Multiplex Channel and SCSI connectivity for older tape formats and pays for itself with reduced maintenance costs and savings in floor space, power consumption and increased availability.

Also supported are other tape formats, including but not limited to STK 9840, DLT, AIT, Exabyte, DAT and Optical Disks, CD and DVD.

## True Enterprise Wide Storage Area Network

The I-6983/Enterprise Virtual Tape Server is designed as a Tape Storage Area Network (SAN), providing enterprise wide connectivity to mainframes, UNIX and Windows NT/2000 platforms. The SAN architecture provides centralized management for local and/or remote tape resources and enables an enterprise wide backup and data security strategy.

## Connectivity to IBM S/390 and Open Systems

The I-6983/EVTS connects to Mainframes,

including S/390, AS/400, Fujitsu/Siemens, UNISYS, Tandem and Bull via ESCON or Block Multiplex Channel and to AS/400, AIX, UNIX, LINUX and WIN2000 via SCSI or Fibre Channel, LAN or WAN (Ethernet, ATM, FDDI).

Supported are all popular operating systems, including OS/390, MVS, VM/VSE, BS2000, GCOS 8, AIX, UNIX, LINUX and WIN 2000 by emulating IBM 3490, 3480 or 3420 device characteristics or DLT and LTO "Ultrium" for open systems.

## Reliability and Availability

The I-6984/EVTS is designed for reliability and availability. The Remote Service Facility via public network and Internet is a standard feature, enabling remote diagnostics and statistical error analysis. Tape drives are hot swappable. Multiple Input/Output processors, a clustered Virtual Tape Manager and redundant power supplies provide fault tolerance.

## Ready for the Future

With all these features, the I-6983 Enterprise Virtual Tape Server is the most advanced tape system available today. The Storage Area Network Architecture maintains enterprise wide connectivity, incorporates the latest tape technology, provides full backward compatibility to older tape formats and protects the investment for many years: The LTO Consortium has released an "Ultrium" road map, showing capacity improvements up to 800 GB per cartridge and a data rate beyond of 120 MB/s. Intercom is committed to implementing new features as they become available. Replacing whole tape systems to participate in new tape technologies is a thing of the past.





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## Specifications

	Control Unit	Model L18	Model L36	Model L72
		L32	Frame D32	Frames D32
Number of Cartridges		18	36	72
Capacity native total		1.8 TB	3.6 TB	7.2 TB
Number of I/O-Stations				
Number of Drives		max 6	max 6	max 6
Virtual Tape Drives	64			
I/O Processors	4			
Disk Cache	1 TB			
Host Interfaces	16			
Escon	Yes			
Block Multiplex	Yes			
SCSI F/W	Yes			
Fibre Channel	Yes			
Fault Tolerance	option			
Redudant Power Supply	option			
Raid Protection	option			
Remote Diagnostic	standard			
Dimensions (cm) w x h x d	65x110x92	48.1x63.5x73.5	48.1x63.5x73.5	48.1x63.5x73.5
max. Weight (kg/lb)	82/182	116.6/257.0	116.6/257.0	116.6/257.0
Power 200-240V (kVA) <sup>1</sup>	0.8	0.72	0.72	0.72
Temperature	16° to 32°C	16° to 32°C	16° to 32°C	16° to 32°C
Relative Humidity	20%-80%	20%-80%	20%-80%	20%-80%
Heat Output (Watts per hour)	max. 281	max. 562	max. 562	max. 562

<sup>1</sup> Including 6 LTO Tape Drives

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