the Availability Digest

# Virtual Tape for NonStop Servers with ETI-NET's EZX-BackBox

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Magnetic tape has been used for decades to back up critical data in data centers. However, magnetic tape brings with it a host of problems:

- Recovery can take a long time – hours to days – especially if multiple incremental backups must be restored on top of a full backup.
- Tape management can take immense amounts of staff time.
- Magnetic tape machines require a significant maintenance commitment.
- Tapes must be moved to offsite storage and then retrieved in the event of a failure.
- Tapes can get lost or destroyed.
- Tape errors can render a backup useless.

Consequently, many data centers are moving to virtual tape systems, in which backups are made to disk instead of to tape. Virtual tape servers emulate the tape storage systems that they replace so that their installation and use is transparent to the data center's operation.

## The EZX-BackBox Virtual Tape System

EZX-BackBox is a part of the EZX product family from ETI-NET. The EZX-BackBox virtual tape system provides a powerful virtual tape robot solution for all HP NonStop servers and allows NonStop systems to use existing corporate storage environments.

EZX-BackBox emulates one or more native tape devices attached to HP NonStop servers. It is seen by the operating system as standard tape drives connected to SCSI or fiber channel ports. The standard NSK tape process is used. Virtual volumes are managed using unmodified Guardian media manager software such as DSM/TC or TMFCOM. Distinct volume pools are reserved for virtual volumes.

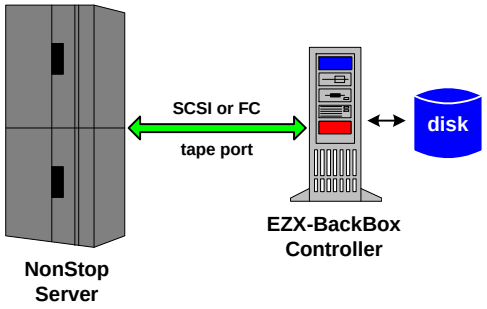
Short-term backups are stored in disk pools, from which they can be rapidly restored when required. Upon reaching the expiration of their designated retention periods, their backup data is automatically deleted from the disk pools; and that space is freed up for subsequent use. There is no need for removable media. There is no risk of tape media failures. Storage administrator time is freed up for more critical tasks.

Of course, data that must be retained for longer periods is still archived to tape. This can be done directly from the disk pools and does not require further host activity.

Enterprise storage management products from IBM/Tivoli, Veritas, Legato, and others can easily be integrated for archive tape management and cross-platform backup consolidation.

Recently announced is the use of *deduplication* to significantly reduce the bandwidth required for replication to remote sites and to drastically increase effective disk storage capacity

## *The EZX-BackBox Architecture*

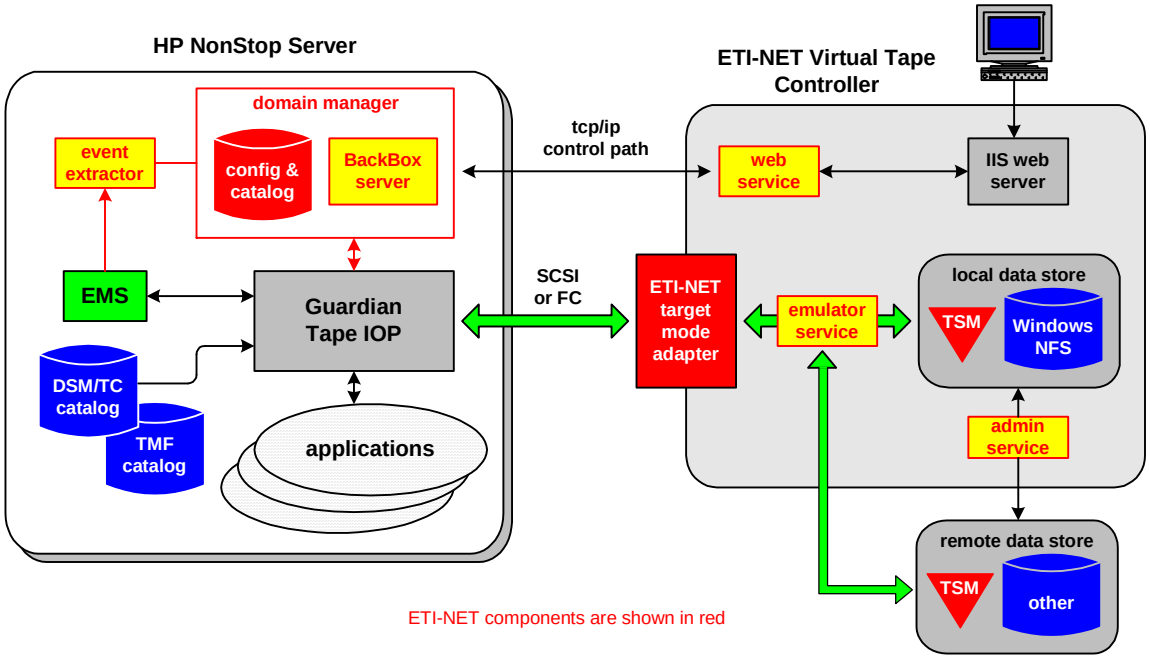



Virtual tape backup is performed by the EZX-BackBox Virtual Tape Controller. The Controller resides on a standard Windows server platform and can attach to multiple HVD SCSI or two-gigabyte fiber channel (FC) tape ports on NonStop S-series or Integrity servers. Furthermore, the Controller can attach to multiple NonStop nodes.

The Guardian tape I/O process is unaware that it is not driving a tape machine. Rather, the EZX-BackBox Controller emulates any one of the native tape devices used on NonStop servers. It accepts tape write commands and writes the data to disk instead of tape. It can also accept tape read commands and read data from disk, passing it to the tape process just as if it had come from tape.

The disks that the Controller uses to store backup data can be locally resident on the Windows server, or they can be external, such as storage area networks (SANs) or enterprise backup servers.

The Controller integrates with DSM/TC (the Distributed System Management Tape Catalog) to provide automatic cataloging of virtual volumes. Virtual volumes are managed by Guardian media management software such as DSM/TC or TMFCOM. The Controller automatically mounts the virtual volumes requested by tape applications and provides scratch tape management.




The EZX-BackBox maintains all metadata in a NonStop database. This provides fault tolerance for EZX Controller failures.

System setup and configuration is done via the EZX-BackBox user interface. This interface also provides a range of manual operations. The user interface is browser-based. It can be accessed from any location by a Web browser. It is secured by a Guardian login and can be further secured with SSL. Functions of the interface include:

- Configure EZX Controllers, data stores, volume groups, and host connections.
- View the state of all virtual tape devices.
- Allocate (catalog) and delete virtual media.

A fully automated backup appliance can be created by integrating an Enterprise Storage Manager (ESM) on the EZX-BackBox platform. ESM products supported by EZX-BackBox include IBM Tivoli, Veritas NetBackup, and Legato NetWorker. Doing so provides:

- Disk pools with capacity thresholds.
- Policy-based tape retentions.
- Scriptable disk-to-tape pool migration.
- System-managed space reclamation.
- Automatic catalog sync with the ESM.
- Archive tape management.
- Cross-platform backup consolidation.

EZX-BackBox supports optional encryption and compression in the EZX Controller. This applies to all virtual media in a data store as well as to objects sent to an ESM. EZX-BackBox can also integrate with various hardware and software corporate encryption solutions.

## Disaster Recovery

EZX-BackBox can replicate backup data to a remote site to provide a recovery database in the event of a disaster that takes down a primary processing site. Data can be sent to multiple remote sites for enhanced backup protection. Conversely, one remote site can serve as the backup for several primary sites.

## Deduplication

Data deduplication is an approach for drastically increasing disk storage capacities for backup data and for drastically decreasing the bandwidth required to replicate this data to a remote site.

Data deduplication relies on the fact that relatively little data on a host system typically changes between the time of one backup to the next. Most backup utilities, such as NonStop Backup/Restore, take this into account by providing incremental backups which record only that data which has changed since the last backup.

However, within individual files, only a few bytes may have changed; but these files will be backed up in their entirety by an incremental backup. The same is true of database changes. NonStop TMF incrementally backs up entire tables even though only a few bytes have changed.

Data deduplication methods monitor the content of backup data streams being generated by the host tape process and store only the actual data elements that have changed (for instance, only a record or a row). This can be done without any direct knowledge of the data structures involved on the host system. Thus, data deduplication leads to a significant reduction in the backup data stream. This translates to smaller disk storage requirements and reduced bandwidth.

ETI-NET has integrated a powerful data deduplication product into EZX-BackBox. This product is Restorer from Data Domain, Inc. (www.datadomain.com) of Santa Clara, California, a pioneer in

data deduplication. NonStop data formats are made transparently compressible by Restore and require only a small fraction of their normal disk storage requirements. In fact, Data Domain claims data reduction ratios of 20:1 and comparable reductions in bandwidth requirements.

## ETI-NET

ETI-NET (www.etinet.com) develops products that are designed to easily integrate files and transactions from dissimilar computers. Shipping products since 1987, ETI-NET has a worldwide installed base of over 800 licenses.

Its other products include:

- BCOM provides file transfer services between NonStop, IBM/MVS, NT, and OpenVMS platforms.
- EZX-Gateway transfers large amounts of data from NonStop servers to IBM mainframes using HP StorageWorks XP disk arrays for a repository of the data to be exchanged. EZX-Gateway uses technology from EZX-BackBox and BCOM.
- BackHome provides backup for network data. It supports NonStop servers and IBM/MVS systems.
- BackHome/TSM allows transfer of NonStop backup objects to and from the Tivoli TSM Enterprise Storage Management server.
- BackHome/Ultra provides high-speed backup and restore of large databases on NonStop Integrity systems.
- HCOM provides online transaction interchange between NonStop servers and IBM hosts. HCOM also supports a store-and-forward messaging facility.
- ANYPRINT! meets the needs for printing across diverse platforms via spooler-to-spooler transfers. It supports NonStop, IBM/MVS, NT, and OpenVMS systems.

Based in Montreal, Canada, where its product development center is located, ETI-NET also has field operations centers in Boca Raton, Florida, and in San Mateo, California.