
Normalizing OSS BACKUP

Using BackHome[®]/TSM V6.00



WHITE PAPER

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After an overview of the native tools to backup/restore OSS files available in Guardian/OSS, this paper presents how OSS backups are implemented in BackHome/TSM version 6.

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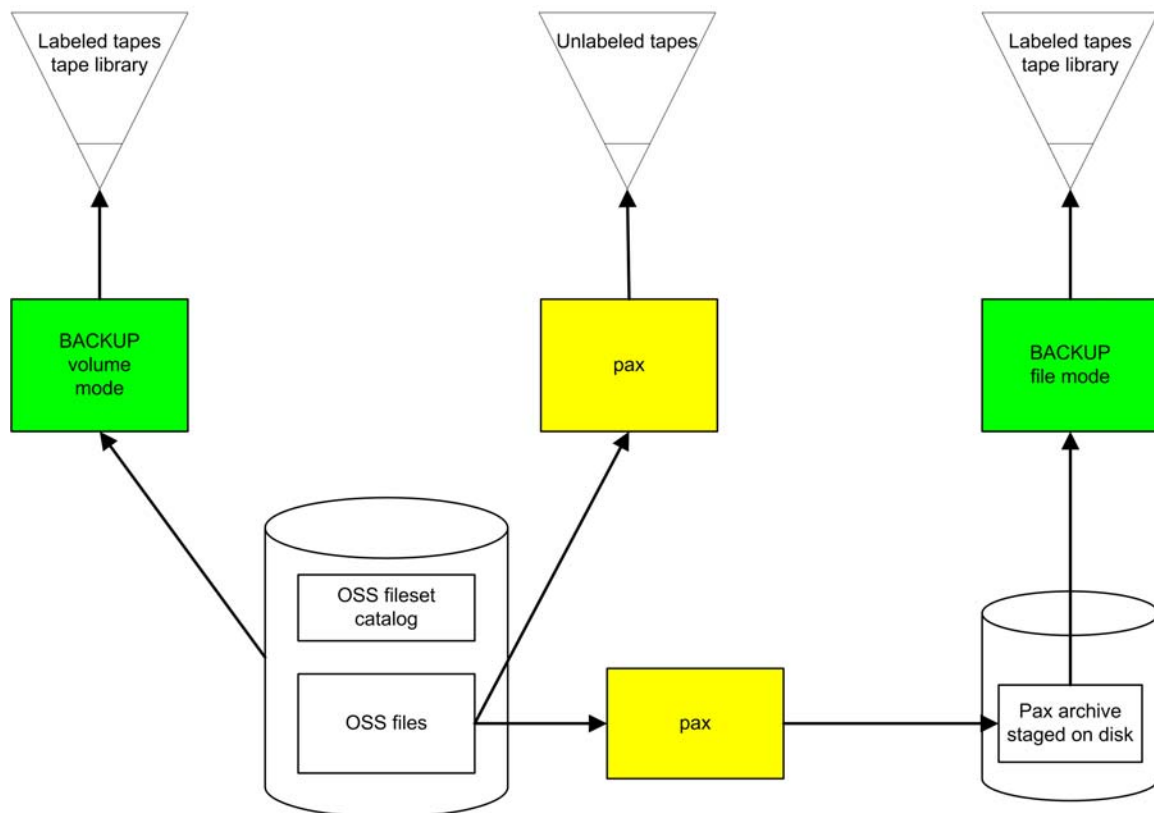
The current native backup tools provided in Guardian/OSS have limitations, compared to backup solutions in a standard UNIX environment or in the Guardian environment.

Native OSS backup tools

The GUARDIAN BACKUP utility is not available for backing up OSS files in file mode.

Backup of OSS files is based on two tools:

- the GUARDIAN volume-mode BACKUP
- a few OSS archive utilities, among them pax being the most frequently used



GUARDIAN volume mode BACKUP

Benefits	Limitations, difficulties
<ul style="list-style-type: none"> • The backup can be stored on any tape media supported by NonStop 	<ul style="list-style-type: none"> • the volume, and the applications using it, must be stopped to allow backup or restore • it is not possible to restore a single file, the whole volume must be restored • the OSS filesets and their related Guardian catalog files must reside on the same volume being archived, or both volumes must be archived in the same operation

OSS utility pax

Benefits	Limitations, difficulties
<ul style="list-style-type: none"> • Usual Unix pax utility • Able to write an unlabeled tape on a Guardian drive • Able to write the backup media on a disk file, Guardian or OSS file • Backup and restore at file granularity 	<ul style="list-style-type: none"> • The backup media can not be a labeled tape • The backup media can not be a Storage Management Foundation (SMF) logical volume • The tape libraries are not supported

Usual workaround

As workaround to the limitation of backup media available to pax backups, users frequently back up the OSS files in two steps:

- pax creates an archive in a Guardian disk file
- the regular Guardian BACKUP utility backs up this archive

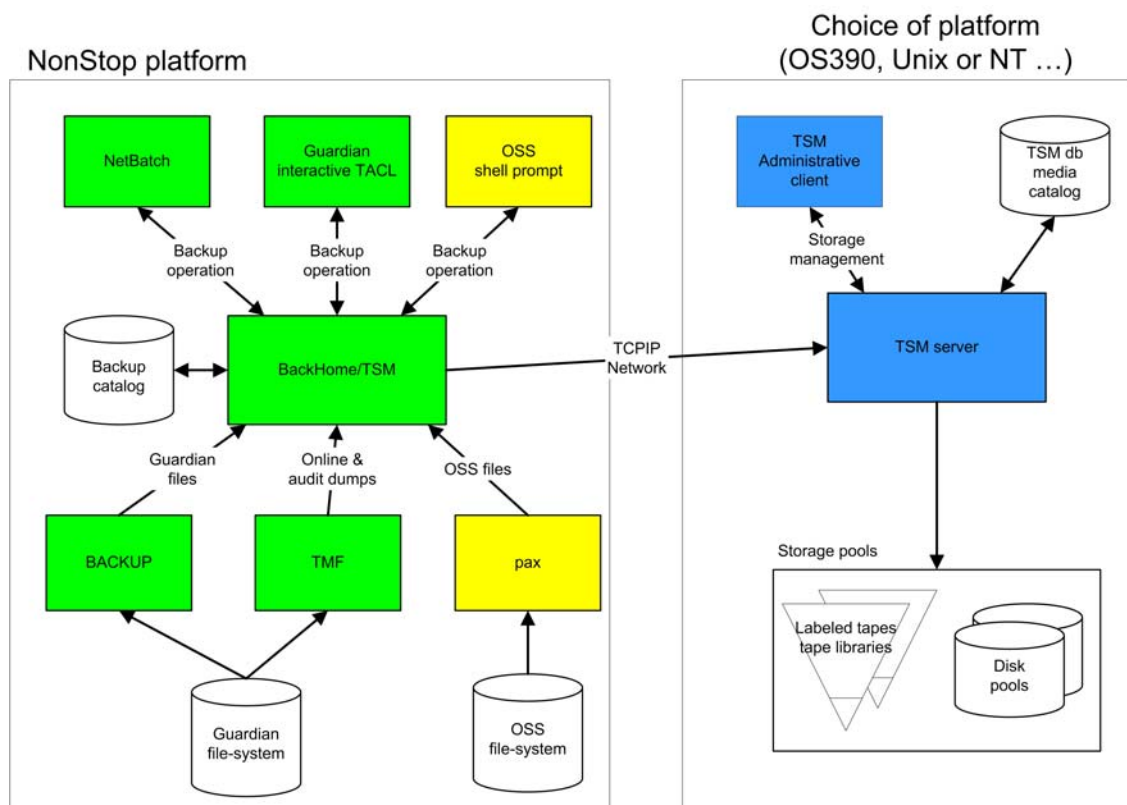
Benefits	Limitations, difficulties
<ul style="list-style-type: none"> • Usual Unix pax utility • Backup and restore at file granularity • The backup can be stored on any tape media, using any device supported by NonStop Guardian 	<ul style="list-style-type: none"> • Disk cost, delay and complexity of a staging on disk, in both backup and restore operations

Support of OSS files in BackHome/TSM V6.00

The legacy BackHome/TSM product provides services to the backup of Guardian files. The V6.00 release gives the same level of services to the backup of OSS files.

The BackHome/TSM services are implemented by integrating the NonStop backups in an enterprise backup architecture, the IBM Tivoli Storage Manager (TSM), in a way where:

- backup and restore are still executed by the native NonStop backup programs, that send to a TSM server the output of a backup execution
- the backup data is entrusted to a TSM server
- the product is focused on the automation of backups



Integration of OSS backups in BackHome/TSM

The backup of OSS files has been implemented as an extension to the unmodified architecture of BackHome/TSM:

- The native backup program is used to access local disks. In the case of OSS, pax has been chosen.
- BackHome/TSM is still essentially a Guardian application, a very few new OSS processes are launched to integrate the pax process in the BackHome/TSM environment.
- The BFSINT command line interface is normally run from a Guardian terminal. It can also be run from an OSS shell to execute commands such the submission a backup.
- All features related to the transfer of backup data to a TSM server are unchanged.
- The local backup catalog has been extended to record the particular attributes of OSS files. A navigation in the "file tree" of backed up files has been added to ease the query of long pathnames.

Features provided to the backup of OSS files

- The choices of backup devices and media is extended to the wide range of hardware supported by a TSM server
- The backup media are managed by policies in the TSM server
- The backup data stream is not staged locally, but directly redirected to the TSM server
- The detail of backed up files is cataloged on the NonStop platform
- Backup/restore jobs are internally queued for batch processing, and monitored to provide checkpoint/restart facility
- Incremental and differential backups are easily submitted
- A Fast Restore processing reduces the quantity of unused data transferred to restore part of a backup

Implementation details

Backup/restore definition

- Similarly to Guardian backup requests, OSS backup are defined to BackHome/TSM as requests that essentially contain:
 - the native OSS backup command
 - the name of TSM objects that will contain the backup data
- The native command will be interpreted by an OSS shell
- `bh_pax` must be used as a replacement for the `pax` command, with almost all the same options and flags. USTAR and CPIO data-stream formats are supported.
- Pipes are supported, allowing commands such as:

```
cd /home/user2 && find dir1 -name "*.dat" | bh_pax -wv
```
- The backup request can also refer to a script file that will contain the `bh_pax` command.

Local catalog

- The local BackHome/TSM catalog contains an entry for each backup execution, and as many entries as backed up OSS file.
- The OSS files are cataloged under their absolute pathname. Pathnames up to 1023 characters long are supported.
- For OSS files, the query commands allow to navigate the file tree of backed up OSS files and list their available backups.

Restore request

The native `pax` requires that the names of files to restore, the archive members, are specified exactly as they were specified at backup time.

This requirement is still valid when `pax` is executed through the BackHome environment that provides two facilities to conform to it.

- The archive member is recorded in the catalog and is available via queries.
- The new SET-RESTORE command prepares the whole BackHome/TSM request that restores a file using the catalog information.

Conclusion

By supporting the backup of OSS files, BackHome/TSM fulfills a need.

BackHome/TSM provides now a comprehensive, unified solution for the NonStop platform, for backups of:

- Guardian files
- OSS files
- TMF dumps