User experience:
Full Filesystem Restore with TSM

Introduction

UNIX Filesystem Restore

Windows2000 Filesystem Restore

Conclusion

Introduction

- GSI (Gesellschaft für Schwerionenforschung) operates a large, in many aspects worldwide unique accelerator facility for heavy-ion beams
- Location is Darmstadt in Germany

Introduction

- TSM at GSI:
- More than 10 years, starting with Version 2 in MVS.
- Server Installation Date/Time: 12/19/95 11:43:16
- Data repository for experiment data, 100 TB now
- Backup of user data, Windows and UNIX Fileservers, approx. 500 local TSM clients.

Introduction

- Don‘t forget what we are aiming at: It is not backup, it is RESTORE !
- RAID systems are no insurance against need of full filesystem restores !
- Two recent incidents on two different RAID systems at our institute happening the same month with only 11 days between are the background of the following remarks.

UNIX Filesystem Restore

- NAS filer, 600 000 files, 120 GB, AIX client 5.3.0, AIX TSM Server 5.3.1.7
- First try was: „**dsmc restore /filer –subdir=yes**“
- Prompt simply returned, nothing else happened. Perhaps just too many files to sort.
- Reducing the number of files to restore has also advantage of doing several restores (up to 4 or 5).
- „dsmc q backups /filer/ -dirsonly –subdir=no“ gives list of directories.

UNIX Filesystem Restore

- „dsmc restore /filer/dir1 –subdir=yes“
- Up to 4 or 5 sessions in parallel
- 18 hours later restore was finished, no errors.
- Around 2 MB/s, not too bad for rather old client and server equipment (IBM7013, IBM H 50, IBM 3494, IBM3590E)
- User requirement of restoration until next day could be fulfilled

WINDOWS2000 Filesystem Restore

- Windows2000 Fileserver, over 1 million files, 1 TB.
- Windows client 4.1.0, Windows server 5.2.2.0
- First day (Tuesday): Raid fails, two disks broken. Rest of the day needed for rebuild of raid array.
- Second day (Wednesday): Restoring should be simple as „**dsmc restore \\y$\\DVEE$Root -subdir=yes**“
- Problems:
- Several TSM Server crashes
- Restore sessions end with rc=0, but not all restored
- NTFS security information not restored on some FS
- Hardware Problems with LTO1 and STK L700 robot
- DIRMC not set on client, directories are restored from tape

WINDOWS2000 Filesystem Restore

- Third day (Thursday): Opened IBM PMR with client trace
- Stopped virus scanner on TSM client
- Install new TSM client 5.3.0, newest was 5.3.0.8
- TSM Server now stable
- Some filesystems completly restored, others incomplete or without NTFS permissions
- To complete filesystem restore we had to redo some using „**replace=no**“. Use **„-testflag disablenqr**“ to avoid no query restore feature.

WINDOWS2000 Filesystem Restore

- New Problem: TSM is casesensitive for mountpoints, whereas Windows is not.
- New mountpoints for restoring with same spelling, but different casing
- Windows sees no difference, restore goes to new mount points
- But: Next time backup runs, TSM will do full backup of the just restored filesystem, because for TSM they are new

WINDOWS2000 Filesystem Restore

- Day No. 4 to Day No.7 (Friday to Monday) : All Filespaces are restored, using up to 4 sessions.
- NTFS Permissions mostly missing
- PMR open for two weeks, going from first level to second level, then development.
- APAR IC44855,open 15.2.2005, fixed 24.3.2005 in client 5.3.0.8
- TSM client code array to keep information about type of volume mount points is limited to 26 entries
- Customer trace shows 45 volume mount points, so 19 mount points are not in this array

WINDOWS2000 Filesystem Restore

- Upgrade TSM client 5308, reboot fileserver
- Full backup starts on all filesystems because of change in NTFS security information. Will take over 5 days for 1,25 TB on two RAID systems
- Another catch: The successfull field (YES/NO) of the summary records is not referencing the success or failure of restore sessions but reports the completion code of the restore sessions
- Restoration took too long
- Missing NTFS security information

Conclusion

- Use newest client version
- Use parallel sessions
- Drawbacks in Windows file servers
- NTFS permissions need DIRMC and special attention
- Restriction on 26 mountpoints still hanging around in early Version 5 client code !
- Problem to upgrade TSM Server from 5.2.2.0 to 5.3.1.0
- Website: http://people.bu.edu/rbs/ADSM.QuickFacts