Storage Decisions

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Remote Office Backups

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Remote Backup Methodologies

- **Remote tape-based backups (managed by "them" with oversight by "you")**
- **Remote tape-based backups (managed by your office)**
- **Remote consolidate to disk, transfer to virtual tape over WAN**
- **Remote consolidate to disk, transfer to NetVault/backup ASP over WAN**
- **Remote consolidate to disk, replicate to disk over WAN**
- **Remote consolidate to disk, transfer to whatever via iSCSI**

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The Challenge, Part I

- **Each remote office has its own LAN with its own peculiarities.**
- **And on that LAN is the data that needs protecting surrounded by detritus.**

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The Challenge, Part II

- **Management**
- **Reporting**
- **Budget**
- **Remote Office Staff**
- **How do we ensure the backups meet org. standards?**
- **How do we stay informed/meet compliance regs?**
- **Never enough $$**
- **They can't even change a tape…**

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Why you don't want to back up to tape over the WAN

- **Tapes are not disks**
  - **Disk block ~= Tape block**
  - **Disk volume ~= Tape extent (sequence of blocks)**
  - **Disk = random access**
  - **Tape = sequential access**
  - **Tapes must stream, disks don't care.**
- **Backup architecture focus**
  - ***where* it is done**
  - ***how* problems are resolved**
  - ***how* restores are conducted**

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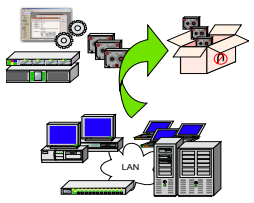
Remote tape-based backups, I

- **Tape HW at RO**
- **Tape SW at RO**
- **Offsite pickup & delivery at RO**
- **Reporting through SRM software to CO**
- **They have to manage tapes**



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Software and Hardware

- **Software**
  - **CommVault, Backup Exec/Net Backup, NovaStor, TOLIS BRU (Unix only)**
  - **Profiler Rx for Storage and Backup monitoring**
- **Hardware**
  - **DLT/LTO Autoloader such as Quantum SuperLoader**

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Pros and Cons

- **Pros**
  - Faster recovery in comparison to recovering data from tapes stored at the regional data center since all recovery operations are performed at the remote site and do not involve transferring data over a slow network.
  - Minimum or no need for any network connectivity between regional data center and remote offices.
- **Cons**
  - Additional tape hardware, backup software, and support costs for each remote office.
  - Additional IT staff may be required at each remote office to perform daily tape backup-and-restore operations. This becomes a recurring cost and can get quite expensive in comparison to the other methods described below.
  - Relying on untrained staff to perform daily backup administration increases the risk of data loss due to numerous reasons, some of which include failed backups going unnoticed, inappropriate backup policies, and inappropriate tape media handling.

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Pros and Cons, II

Cons

- Additional tape hardware, backup software, and support costs for each remote office.
- Additional IT staff may be required at each remote office to perform daily tape backup-and-restore operations. This becomes a recurring cost and can get quite expensive in comparison to the other methods described below.
- Relying on untrained staff to perform daily backup administration increases the risk of data loss due to numerous reasons, some of which include failed backups going unnoticed, inappropriate backup policies, and inappropriate tape media handling.

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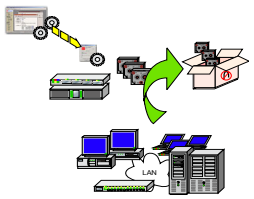
Remote tape-based backups, II

- **Tape HW at RO**
- **Tape SW at CO running LOH controls to RO**
- **Offsite pickup & delivery at RO – managed by CO**
- **They have to "manage" tapes.**



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What your backup software will need:

- **Complete backup server deployment**
- **Backup job development and setup**
- **Backup job and server monitoring**
- **Alert and notification**
- **Remote problem investigation**
- **Remote server administration**
- **Single and multi-server historical reporting**

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Software and Hardware

- **Software**
  - CommVault, Backup Exec/Net Backup, NovaStor, TOLIS BRU (Unix only)
  - VERITAS® Admin Plus Pack Option software allow administrators to install, monitor, and manage remote servers.
  - Profiler Rx for Storage and Backup monitoring
- **Hardware**
  - DLT/LTO Autoloader such as Quantum SuperLoader

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Pros and Cons

- **Pros**
  - Faster recovery in comparison to recovering data from tapes stored at the regional data center since all recovery operations are performed at the remote site and do not involve transferring data over a slow network.
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- **Cons**
  - Additional tape hardware, backup software, and support costs for each remote office.
  - Additional IT staff may be required at each remote office to perform daily tape backup-and-restore operations.
  - Relying on central office IT staff to perform daily backup administration increases the troubleshooting time due to troubleshooting across a WAN instead of "in person."

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Pros and Cons, II

- **Cons**
  - Additional tape hardware, backup software, and support costs for each remote office.
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  - Relying on central office IT staff to perform daily backup administration increases the troubleshooting time due to troubleshooting across a WAN instead of "in person."

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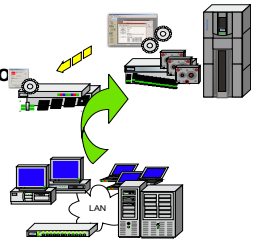
Consolidate to Disk, back up to Disk, Virtual Tape or Tape

- **NAS filers at RO**
- **SW at CO running controls to RO**
- **Eliminates Tapes at RO**
- **Adds cost of WAN bandwidth**
- **Adds cost of Virtual Tape device at CO**
- **Create "synthetic fulls" after 1st.**



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Software and Hardware

- **Software**
  - Local Backup: Symantec V2i Protector, CommVault, Backup Exec, Dantz, TOLIS BRU (Unix only)
  - CommVault, NetBackup for WAN backup to tape or disk
  - NovaNet WEB for WAN backup to disk
- **Hardware**
  - Modular tape libraries, such as M1500-2500, or PX series from Quantum for tape-based backups
  - NAS or SAN for disk-based backups

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Pros and Cons

- **Pros**
  - **Eliminates the need to deploy tape hardware or backup software in each remote office. This significantly reduces the capital acquisition costs associated with a remote office backup solution.**
  - **Eliminates the need for a backup administrator at each remote office. This significantly reduces the recurring costs associated with deploying a remote office backup solution.**
  - **Since backups are performed by trained backup administrators at the central data center with the right level of data protection policies, this method significantly reduces the risk of data loss.**
  - **Since the backup copies are stored off-site at the central data center, the data is protected against a major disaster (fire, flood, theft, etc.) at the remote office.**
- **Cons**
  - Additional network connectivity may be required between the central data center and remote offices in order to transfer the backup data in a reasonable backup window.
  - Since backup-and-recovery data moves over the network, the backup-and-recovery process may take a longer time in comparison to doing all tape backup and recovery at the remote office.
  - If your software doesn't support "restart where we left off" feature, failed backups (network failure, tape drive failure etc.) would require that the entire backup be restarted from the beginning. For remote office fixers, this would mean re-transferring all the backup data over the WAN.

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Pros and Cons, II

- **Pros**
  - Eliminates the need to deploy tape hardware or backup software in each remote office. This significantly reduces the capital acquisition costs associated with a remote office backup solution.
  - Eliminates the need for a backup administrator at each remote office. This significantly reduces the recurring costs associated with deploying a remote office backup solution.
  - Since backups are performed by trained backup administrators at the central data center with the right level of data protection policies, this method significantly reduces the risk of data loss.
  - Since the backup copies are stored off-site at the central data center, the data is protected against a major disaster (fire, flood, theft, etc.) at the remote office.

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Pros and Cons, III

- **Cons**
  - Additional network connectivity may be required between the central data center and remote offices in order to transfer the backup data in a reasonable backup window.
  - Since backup-and-recovery data moves over the network, the backup-and-recovery process may take a longer time in comparison to doing all tape backup and recovery at the remote office.
  - If your software doesn't support "restart where we left off" feature, failed backups (network failure, tape drive failure etc.) would require that the entire backup be restarted from the beginning. For remote office filers, this would mean re-transferring all the backup data over the WAN.

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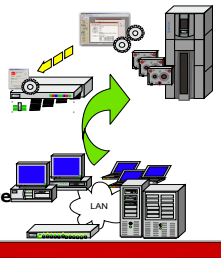
Consolidate to Disk, Transfer to ASP

- **NAS/SAN at RO**
- **SW from running at RO**
- **Eliminates Tapes**
- **Adds cost of WAN bandwidth**
- **Adds cost of ASP**
- **Locked into ASP software**



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Solutions Providers

- **Multiple quotes: http://www.buyerzone.com/computers/backup-remote/qz_questions_7.jhtml**

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Pros and Cons

- **Pros**
  - No specialized hardware at RO needed
- **Cons**
  - Can get pricy quickly
  - Tied directly into each provider's proprietary software
  - Must spend time checking out reliability of providers

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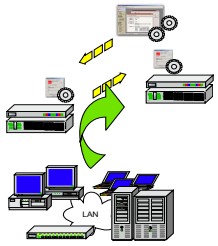
Consolidate to Disk, Snap, or Replicate

- **NAS/SAN at RO & CO**
- **SW at CO running LOH controls to RO**
- **Snap, Replication Engine can handle latency**
- **No tapes to manage**
- **Only problem can be fill-depth**



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Software and Hardware

- **Software**
  - Disk-based consolidation at RO: Symantec V2i, Dantz Retrospect, TOLIS BRU (Unix only), CommVault
  - Profiler Rx for Storage & Backup monitoring
  - Replication: VERITAS Storage Replicator, CommVault iGalaxy, NetApp SnapMirror, EverStor Replicator
- **Hardware**
  - Small offices: RocketVault in RO, Windows 2003 powered NAS, IOMEGA NAS
  - NetApp NearStore R200 series
  - Actona CoreServer at CO with Actona Edge Servers at ROs
  - Tacit Ishared server + appliances

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Pros and Cons

- **Pros**
  - Eliminates the need to deploy tape hardware or backup software in each remote office. This significantly reduces the capital costs associated with implementing a remote office backup solution.
  - Since tape backups are now performed off the replicated copy, the backup window is much larger than when tape backups are done directly off the remote office filers. The larger backup window reduces the number of tape drives required to complete the backups.
  - Eliminates the need for a backup administrator at each remote office. This reduces the recurring costs associated with deploying a remote office backup solution.
  - Since backups are performed by trained backup administrators at the regional data center with the right level of data protection policies, this method significantly reduces the risk of data loss.
  - Since the backup copies are stored off-site (both on disk and tape) at the regional data center, the data is protected against a major disaster (fire, flood, theft, etc.) at the remote office.
  - Because a copy of the data (backup) is on disk, users recover data very quickly.
  - Efficient data movement by StorageMirror or replication significantly reduces the network bandwidth requirements in comparison with NDMP backups over a network.
  - Eliminates backup overhead from the remote-office filer, allowing it to perform the primary file serving function.
- **Cons**
  - Additional network connectivity (significantly less than Transfer to Disk, Consolidate to Tape) may be required between the regional data center and remote offices in order to transfer the backup data in a reasonable backup window.
  - This solution requires additional storage capacity in the regional data center to store the replicated copy of the remote office data.

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Pros and Cons, II

- **Pros**
  - Eliminates the need to deploy tape hardware or backup software in each remote office. This significantly reduces the capital costs associated with implementing a remote office backup solution.
  - Since tape backups are now performed off the replicated copy, the backup window is much larger than when tape backups are done directly off the remote office filers. The larger backup window reduces the number of tape drives required to complete the backups.

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Pros and Cons, III

- **Pros (continued)**
  - Eliminates the need for a backup administrator at each remote office. This reduces the recurring costs associated with deploying a remote office backup solution.
  - Since backups are performed by trained backup administrators at the regional data center with the right level of data protection policies, this method significantly reduces the risk of data loss.

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Pros and Cons, IV

- **Pros (continued)**
  - Since the backup copies are stored offsite (both on disk and tape) at the regional data center, the data is protected against a major disaster (fire, flood, theft, etc.) at the remote office.
  - Because a copy of the data (backup) is on disk, users recover data very quickly.
  - Efficient data movement by SnapMirror or replication significantly reduces the network bandwidth requirements in comparison with NDMP backups over a network.
  - Eliminates backup overhead from the remote office filer, allowing it to perform the primary file serving function.

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Pros and Cons, V

- **Cons**
  - Additional network connectivity (significantly less than Transfer to Disk, Consolidate to Tape) may be required between the regional data center and remote offices in order to transfer the backup data in a reasonable backup window.
  - This solution requires additional storage capacity in the regional data center to store the replicated copy of the remote office data.

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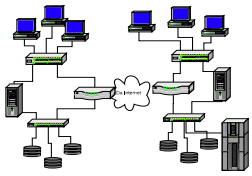
Shared Storage & FCIP, iFCP, iSCSI

- **Standard SNIA model**
- **Can choose between appropriate protocols, HW, SW**
- **Integrates tape into the SNIA model**



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Software and Hardware

- **Software**
  - Any basic iSCSI aware backup software, such as NetBackup, Backup Exec, CommVault
- **Hardware**
  - Small Offices: IPStor Appliance

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Pros and Cons

- **Pros**
  - This *is* the future
- **Cons**
  - You'd better have well trained staff
  - The future isn't *quite* here yet

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Wrap Up

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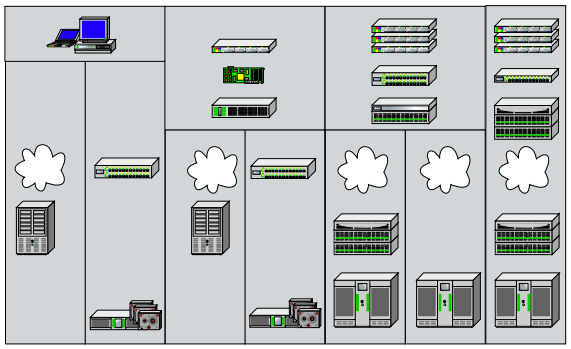

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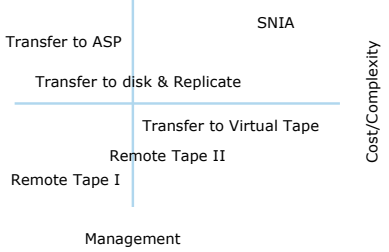
Decision Matrix



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Questions? Thank you.

- **I'll be at the "Ask-the-Experts" booth**
  - **5-6 PM Monday**
  - **4-5 PM Tuesday**
  - **Or dcougias@netfrontiers.com**

Audience Response
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