NAS Solutions - A Commvault Engineering White Paper

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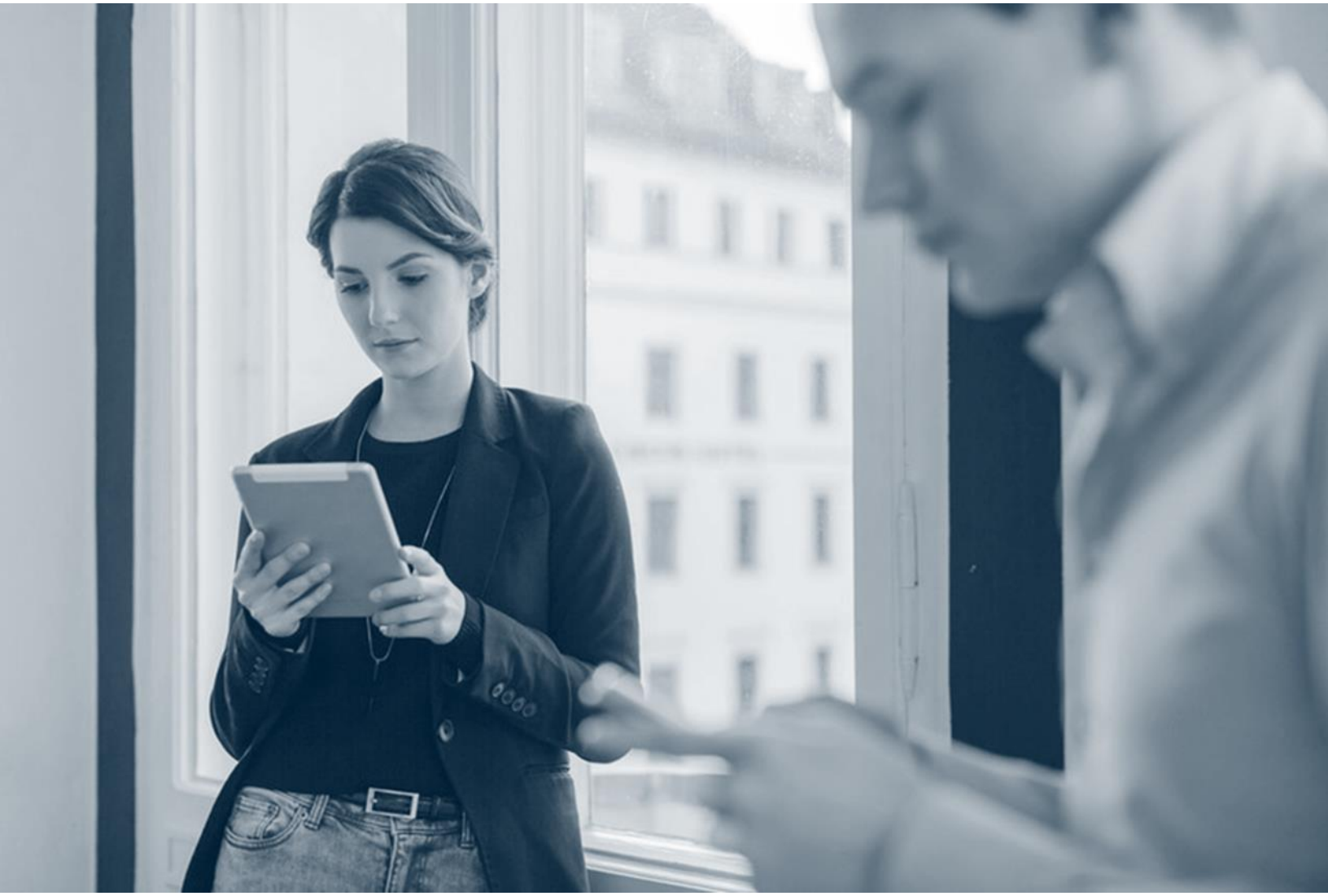

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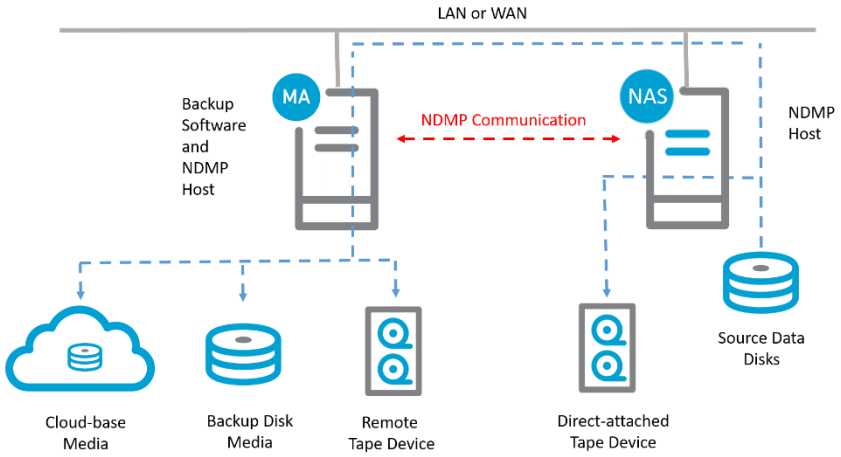
Overview

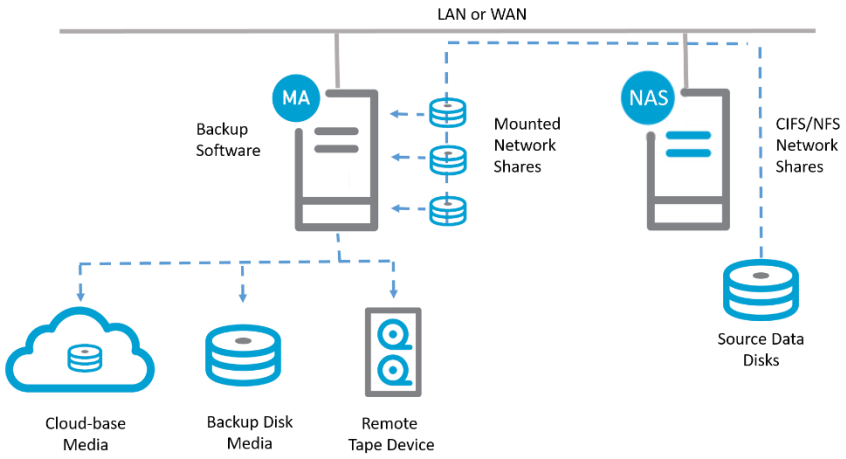
Backup and Archive support for Network Attached Storage (NAS) is still one of the most common customer requests to Commvault. As NAS data sets become larger, the need for both backup and restore performance become more critical.

Because NAS devices are dedicated file servers, they normally do not allow hosting of applications such as backup software. As such, most major NAS vendors support the use of the Network Data Management Protocol (NDMP) for backup.

NDMP is a common agent providing Application Programming Interfaces (APIs) which can be used to manage backup and restore of data on NAS file servers. NDMP APIs provides use of direct-attached tape devices or NDMP-enabled backup software hosts with alternative storage support.



All NAS vendors support the use of Common Internet File System (CIFS) or Network File System (NFS) transport protocols. Using either CIFS or NFS protocols, NAS volumes can be shared and made accessible to backup software hosts for data backup and restore.



Commvault offers both NDMP and Network Share (CIFS/NFS) scalable backup solutions for NAS devices.

Commvault NDMP support

Basic NDMP functionality provides for local (LAN-Free) backup and restore to an attached tape device. NDMP backups can also be written to a tape device attached to another NDMP host. Commvault greatly expands on this basic functionality by enabling a wide range of features and options.

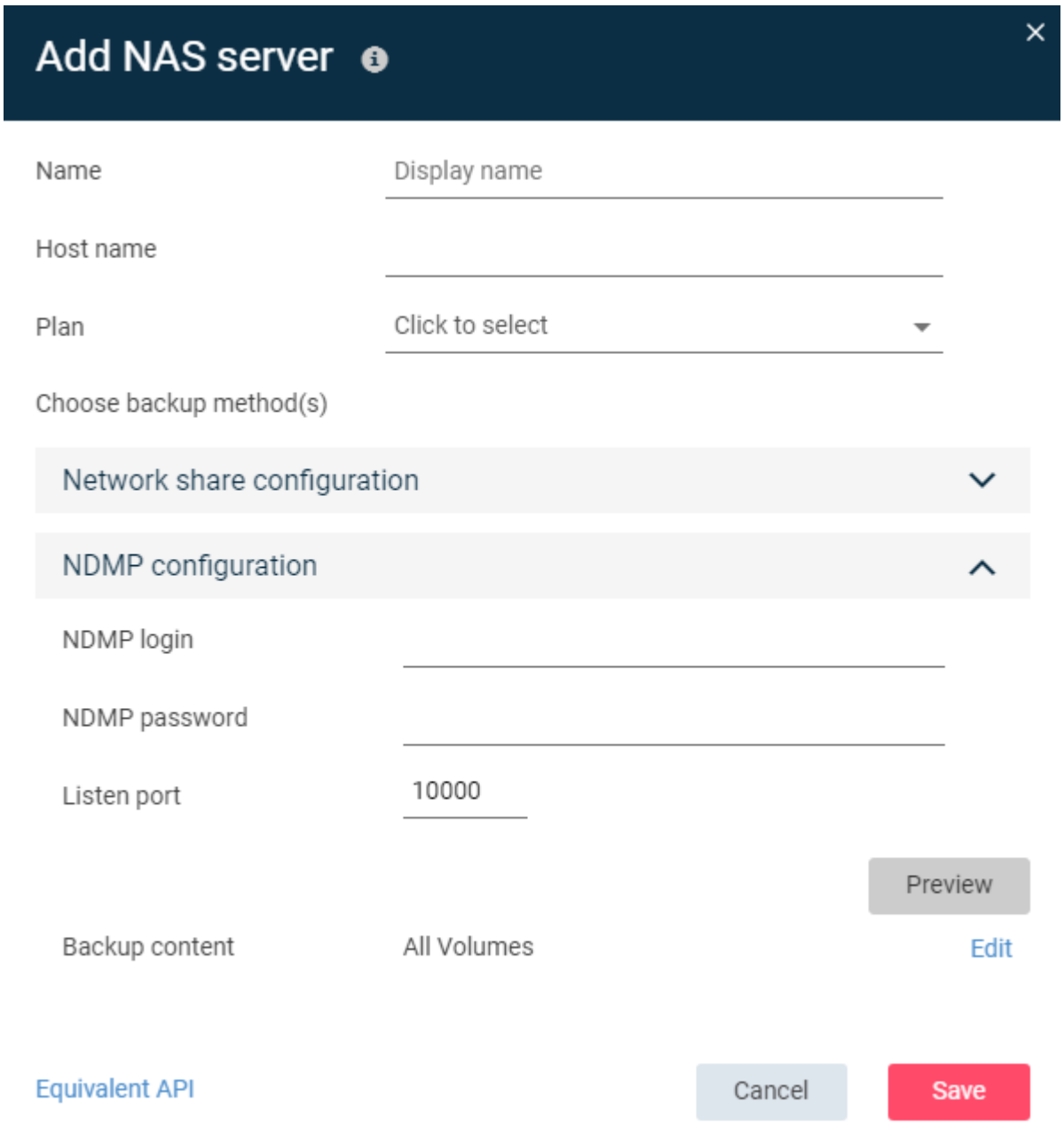
Implementation

Commvault NDMP support is implemented through the use of a MediaAgent host containing NDMP software with TCP/IP network connection to the NAS file server you want to protect. Every MediaAgent component contains all necessary software.

Configuration

To configure NDMP support, you just add a new NAS/Network Share Client to the CommCell environment. You need to provide a client name, host name (FQDN) and login credentials to access the NDMP software on the NAS file server, and the name of a MediaAgent host with TCP/IP connectivity to the NAS file server. NAS clients have a "detect" property which allows both the MediaAgent connection and NDMP credentials to be validated, and to automatically detect the file system content on the

NAS file server. The default subclient will include all volumes in the backup. User defined subclients can be created to meet different data management requirements and perform parallel backups and restores for better performance.



Advantages

Some advantages in using Commvault software's NAS client with NDMP support include:

- **Supports backup of mixed mode data and locked files.** Security descriptors for both Windows (ACL) and UNIX (Permissions) can be backed up and restored. Locked files are included in the backup providing crash-consistent backup support. With content indexing, end user specific access control to individual files can be provided via Commvault software's Web Console interface.
- **Wild card content support for choosing volumes to backup.** For example, you can use "/bizdata*" to backup all bizdata department volumes across multiple NAS virtual servers, or you can use "/bizdata_US_svm /Oct*" to back-up all the October volumes on the bizdata_US_svm virtual server.
- L**ess load on the file server and faster scan times for incremental backups.** The NAS file server recognizes and runs NDMP backup process at a lower priority effectively reducing impact to production users. NDMP backups are able to use the journaled file system on the NAS file server for faster identification of changed data needing to be backed up.
- **Cross platform restore.** NDMP backups can be restored to Windows or UNIX file system platforms. Consult Commvault documentation for supported NAS vendors.
- **Eliminates need for CIFS / NFS shares to be created on all the volumes with user configured access to the data.** Using a NAS client's NDMP agent with its single user credentials saves both administrative management time in creating and maintaining multiple network shares, and provides an increased level of security by reducing the need for multiple CIFS/NFS login credentials.
- **Content paths/volumes can be backed up in parallel for highest data rates.** Data transportation can be "multi-streamed" across a number of data paths and/or MediaAgents. A single subclient can have multiple streams by setting the number of data readers. A proxy client group of MediaAgents can be assigned to a subclient to allow load balancing and multi-node backups.
- **Support for NetApp and Dell Dell EMC Isilon's NDMP restart extension.** Allows resumption of interrupted NDMP backups from point of interruption.
- **Support for use of the Cluster Aware Backup NDMP extension** which minimizes data passed between physical nodes in the NetApp cluster. In addition to this extension, Commvault's cluster support can work with Individual virtual server (vserver) clients which do not need to have NDMP credentials. When a vserver's NDMP client credentials are not set, Commvault logs into the cluster and runs the NDMP backups or snap operations from the cluster. This configuration allows customer to setup vserver clients and set user permissions per vserver client while still allowing the backups to be run through the cluster interface. With a NetApp Metro Cluster configuration, a cluster may fail over to its partner. Commvault

detects when the failover has occurred and continuing data protection uninterrupted.

- **Support for Dell Dell EMC Isilon multi-stream NDMP.** On the NAS subclient you can specify multiple streams of data to back up concurrently.
- **Multi-Tenant/Managed Service Provider support.** In a multi-tenant environment, each tenant can back up to through one or more local proxy MediaAgent hosts for deduplication and encryption before being sent to the service provider's MediaAgents. This provides significantly more efficient use of bandwidth and a higher degree of security.
- **High deduplication ratio.** For most vendors Commvault can achieve a high deduplication rate.
- **Encryption, compression, data verification, content indexing, analytics, reporting, and auxiliary copy support.** Backing up data via a MediaAgent host allows Commvault to use numerous data management features to enhance storage, security, management, and data access options.

Commvault CIFS/NFS Support

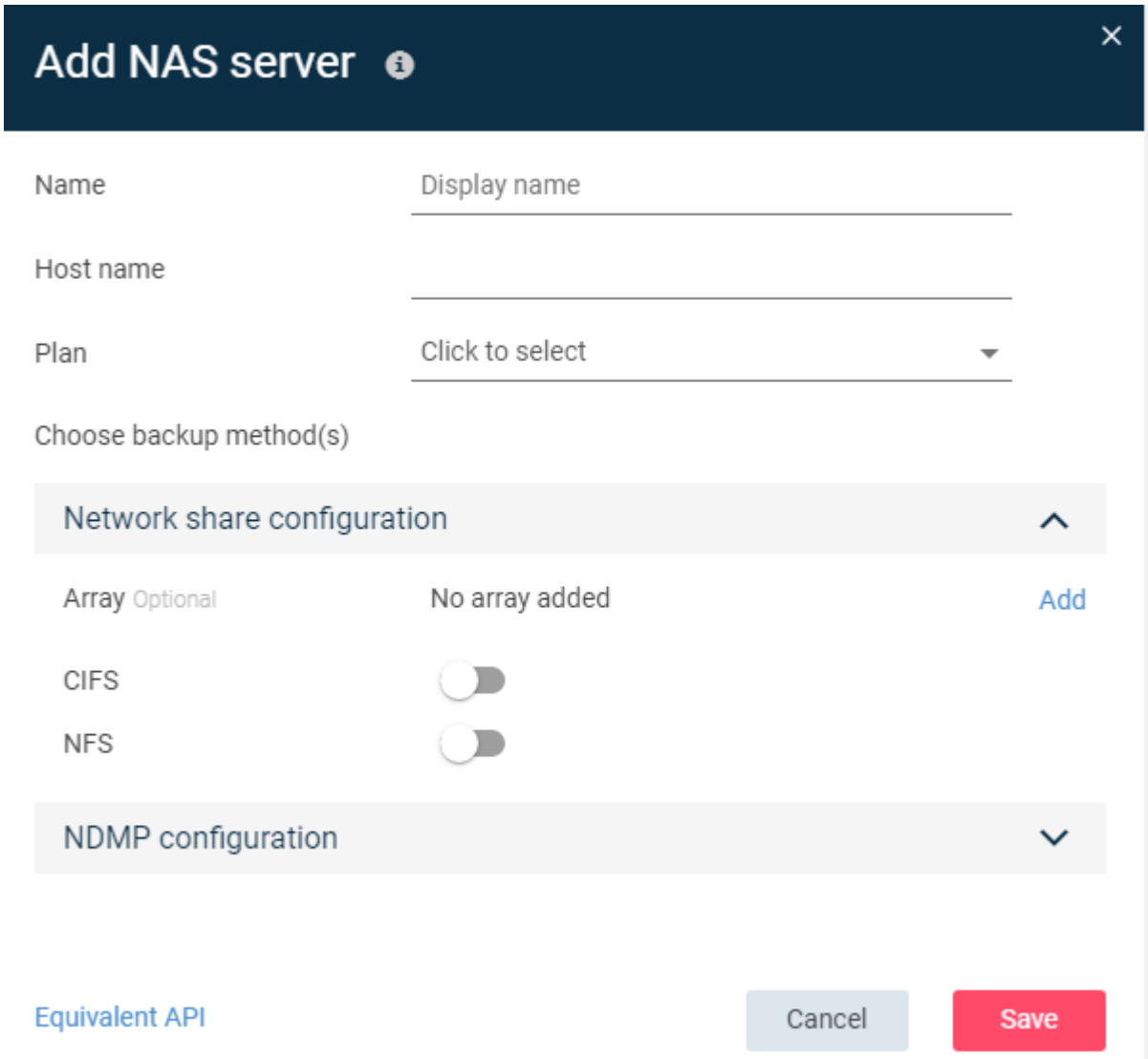
All NAS file servers support backup/restore via CIFS/NFS transport protocols. It's simply backing up data from a network share.

Implementation

Commvault CIFS/NFS support is implemented through the use of a Data Access node with TCP/IP network connection to the NAS file server you want to protect. A Data Access node is a Commvault File System Agent host.

Configuration

To configure CIFS/NFS support, you just add a new NAS/Network Share client to the CommCell environment. You provide a client name and select which transport protocol - Windows(CIFS) or Unix(NFS) you will be using. You can select both. A pseudo client with the selected file system agent will be created. Data Access nodes are configurable at the agent or subclient level with subclient level having override priority. For CIFS shares you would select clients with the Windows File System Agent installed. For NFS shares you would select clients with a Unix-like File System Agent installed. The ability to select more than one Data Access node provides for both scalability (multiple paths) and redundancy (failover/alternate paths).



Advantages

Some advantages in using Commvault software's NAS client with CIFS/NFS support include:

- **End user security support using backup of Windows (ACL) or UNIX (Permissions).** Appropriate end user permissions are necessary when browsing or restoring individual data files via Commvault's Web Console interface.
- **Multi-node backup/Multi-threaded scan:** This functionality allows load balancing, alternate data paths, and greatly increases the speed of the backups. Backup is performed on multiple access nodes and multi-threaded scan is performed on one access node.
- **Deduplication, Encryption, compression, data verification, content indexing, analytics, reporting, and auxiliary copy support.** Backing up data via data access nodes allows Commvault to use numerous data management features to enhance storage, security, management, and data access options.
- **Support for Incremental forever backups.** After an initial full backup, you can run just incremental backups to capture only changed data. Synthetic full backups are also supported.
- S**upport for restartable backups for either CIFS or NFS data.** Allows resumption of interrupted backups from point of interruption.

Commvault NAS Snapshot Support

Snapshot (Commvault IntelliSnap®) is supported for NAS clients using either NDMP or CIFS/NFS backup agents. Snapshots primarily provide for fast, point-in-time copies and restore. Multiple snapshot copies can be saved with minimal block base data usage.

IntelliSnap is supported for volumes on NetApp® storage servers, Dell EMC™ Celerra® (NDMP only), Isilon®, Unity™ VNX®, or VNXe® file servers, HNAS and Huawei® storage systems. NetApp also allows single file snap restore (SFSR) for fast block level restore for files.

Snapshots provide storage/backup administrators with numerous capabilities and options such as:

- Mounting a file server volume copy for test environment
- Defer or skip catalog from Snap copy to minimize impact on production users.
- Backup copy from Snap copy to minimize impact on production users.
- Live browse of Snap copy – including alphabetic listing for fast restores.
- Faster block level backups and restores.

NetApp storage servers make extensive use of snapshots for vault and mirror copy orchestration and Isilon SyncIQ for data replication. Commvault IntelliSnap software can help facilitate and manage the snapshot/replication process. Consult Commvault documentation for specific vendor support.

Summary

Some other vendors may say NDMP is a legacy software. And they are right – If all you are evaluating is the protocol's basic functionality. But Commvault software enhances NDMP and adds a wealth of features. Commvault software is a force multiplier for NDMP. Commvault has numerous clients with NAS storage servers where Commvault's NDMP backups are the best solution.

For CIFS/NFS – the universal backup method for all NAS storage servers – Commvault brings its entire range of data management features to bear and provides a highly scalable and high performance solution.

Commvault's IntelliSnap is a force multiplier to both NDMP and CIFS/NFS backups and provides numerous benefits to administrators, specifically when multiple copies, replication, and quick restores are needed. Check out Commvault documentation for more details.

Visit the Commvault Documentation website for complete documentation of Commvault products.