

# FlashNAS ZFS File System

*and*

## Database Backup

*using*

# CommVault Simpana Software

***Abstract***

This application note describes how to apply file-based backup on FlashNAS ZFS systems using the popular Simpana software suite from CommVault. All Winchester Systems FlashNAS ZFS storage systems offer compatibility with various third party software products to enhance usability. FlashNAS ZFS systems have been designed to make integration with third party software stable, while ensuring ease of use and convenience for customers.

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## **Products Covered by this Document**

These application notes refer to the following models:

- **All Winchester Systems FlashNAS ZFS Series Unified Storage Systems**

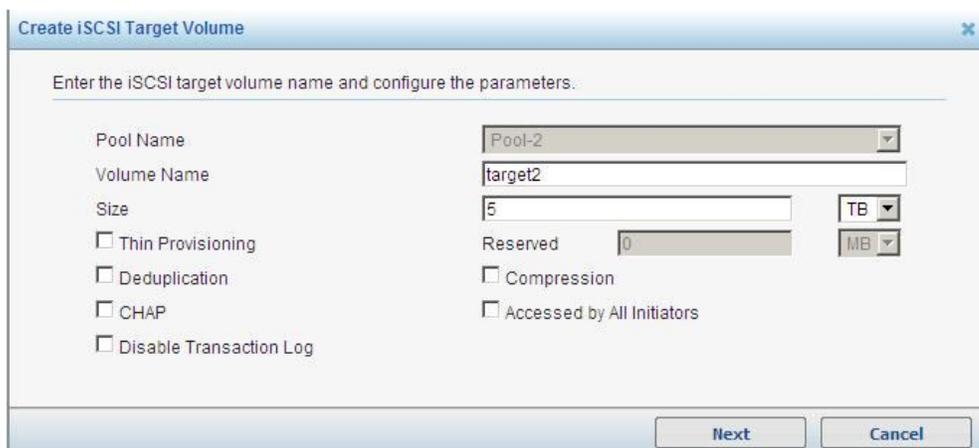
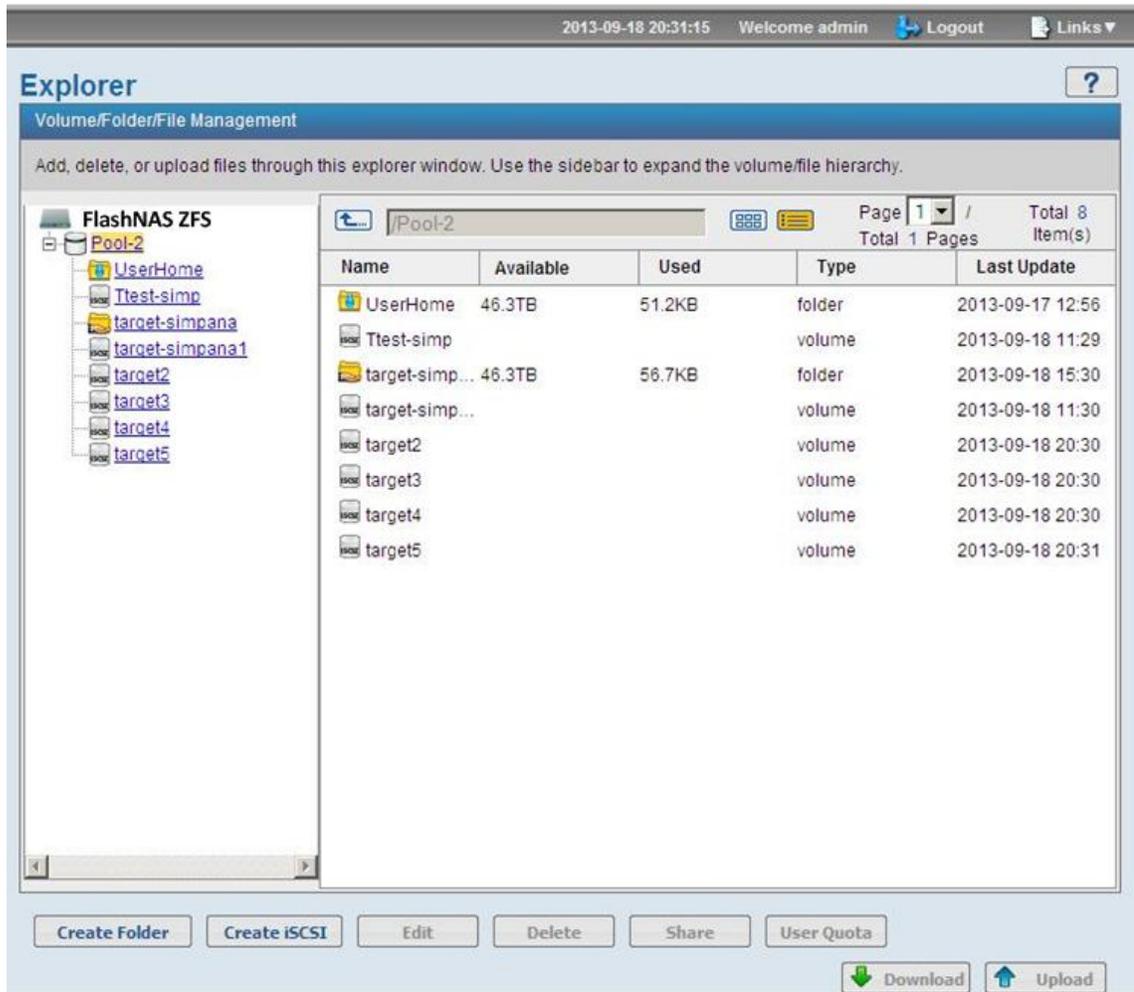
*For related information about subsystem configuration, check the user manual that came with your storage system or visit the Winchester Systems website: [www.winsys.com](http://www.winsys.com)*

## **Why CommVault Simpana?**

CommVault, the software maker that developed Simpana, is a modern and comprehensive suite of data management solutions that meet the backup and archival needs of enterprises. Collaboration between the two companies has resulted in a cost-effective host-based backup solution that maximizes various data reduction capabilities to free up storage space (including compression, deduplication, and more). Backup facilities also flexibly scale to meet the needs of demanding enterprise environments. With proper configuration and operation, users can easily build fast, reliable, and highly scalable storage systems.

## Best Practices for FlashNAS ZFS

- FlashNAS ZFS systems deliver excellent multitasking performance. This means backup jobs are best implemented on FlashNAS ZFS via iSCSI while connected to multiple clients.

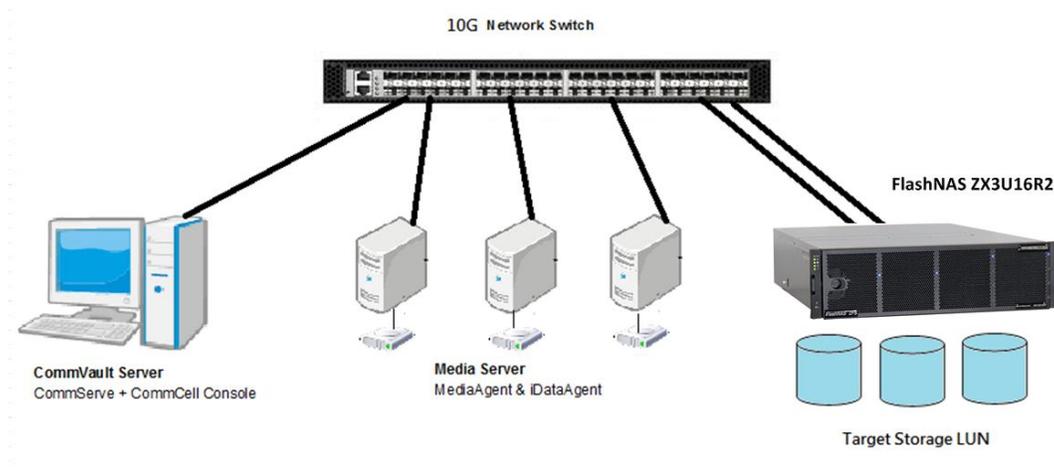


2. Separate pool and iSCSI LUN settings can provide better performance.  
In our test case, 24 x 3TB NL-SAS drives are divided into three pools. Each pool has eight drives in a RAID 5 configuration.
  
3. In the test case, the FlashNAS ZFS 10Gb/s iSCSI model can reach 600MB/s performance with three clients. Connecting more clients and executing more backup jobs simultaneously may require higher performance.

## System Topology

This section describes the proposed topology, including storage systems, host servers, and client computers. Users can combine more than just one of these elements, depending on actual usage environments.

Figure 1: integrated topology for a Winchester Systems FlashNAS ZFS storage system with CommVault Simpana software



### Server topology:

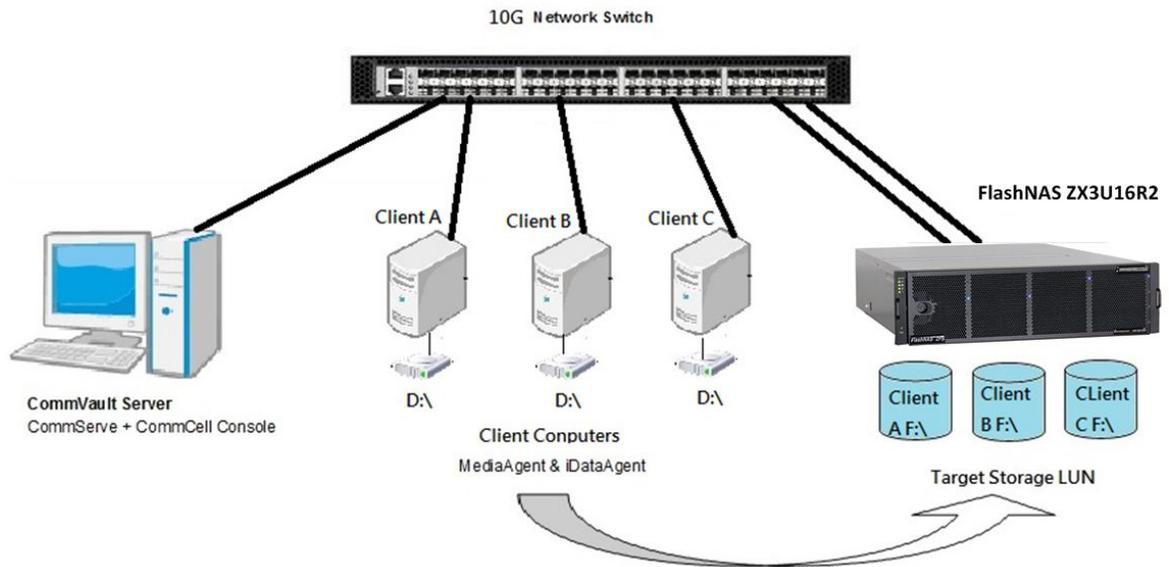
- CommVault Server: CommServe module (including CommServe Database Engine) and the CommCell backup management GUI console have been installed. The server is used to control all client computers, backup resources, and tasks.
- Media Server: the media server is connected to the storage system via direct connection or SAN, and uses capacity resources mapped from the storage system for media and as a backup destination.
- Laptops/desktops for backup: the CommVault server searches for computers (with agents installed) that can serve as backup sources in the same network environment as the server.

### Storage system topology:

The media server uses storage system capacity for applications such as Microsoft SQL Server databases. Therefore, several storage volumes are required in the topology. One is used as the destination for backup tasks and others are used for the media server mounted for the host file system, which is also used when installing database applications.

The file system in the media server uses the D drive for storing data. The media server can leverage the high performance and reliability provided by FlashNAS ZFS systems to protect files and databases and better serve host applications. The F drive is partitioned as the destination of backup copies created using CommVault Simpana.

Figure 2: proposed configuration of a Winchester Systems FlashNAS ZFS storage system



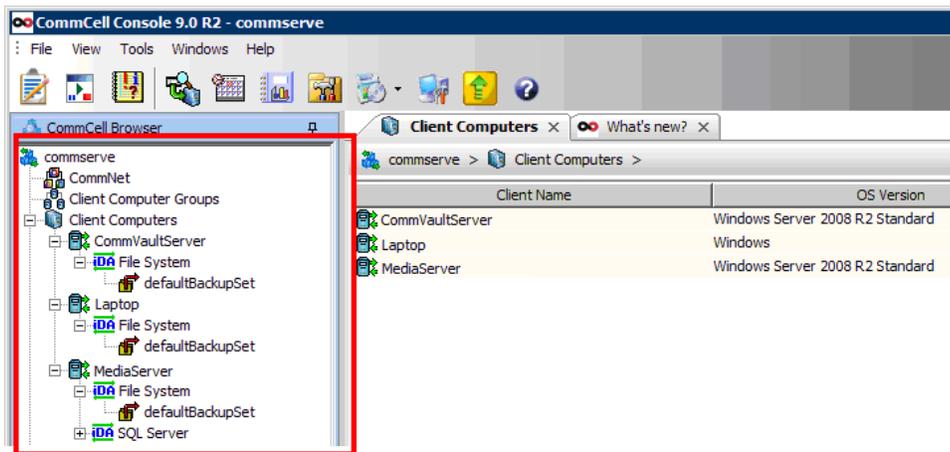
# File System and Database Backup via FlashNAS

## ZFS and CommVault Simpana

**Note:** the procedure described here follows the system topology shown in the previous section.

### **Step 1: preparing the environment**

1. Connect the server, storage system, backup computer, and disk drives to form a system topology, of which an example is shown in the previous section.
2. Install the CommVault Simpana software suite and/or its modules on the CommVault server, media server, and backup computers. For more details about Simpana software and its installation procedures refer to the CommVault website: [www.commvault.com](http://www.commvault.com).
3. Power up all devices, including the FlashNAS ZFS system.
4. Launch the CommCell Console in the CommVault server.
5. Check for client computers in the CommCell Browser panel. In this topology, several exist: CommVault Server (CommServe installed), Media Server (MediaAgent installed) and laptops/desktops for backup (iDataAgent installed).

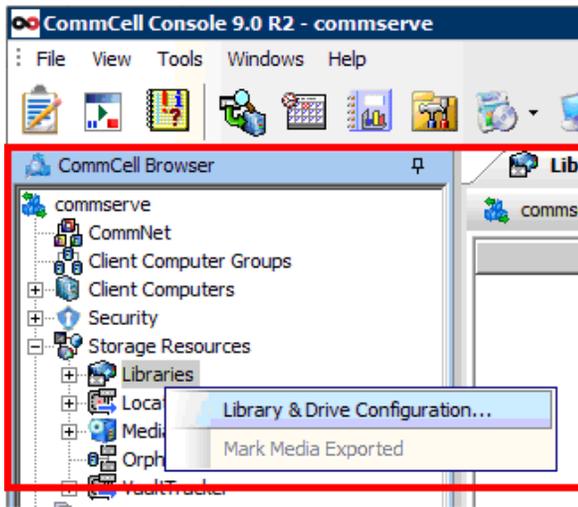


6. Check the MediaAgent node below the Storage Resource section to see if all settings have been properly configured and all software modules have been installed. If software modules are not found in the console despite already being installed, check if related services are running in the Service Control Manager.

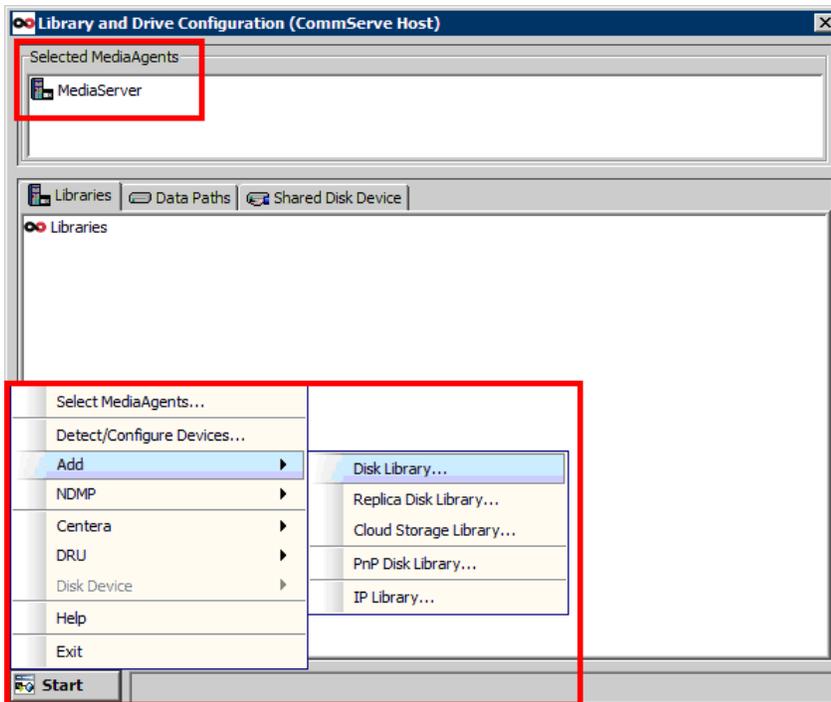
### Step 2: configuring new disk libraries

In this step, users add storage resources that are mapped from the storage system to management by Simpana software. There are several volumes configured for this practice, but only drive F is used as the destination for backup copies.

1. Right-click *Storage Resources > Libraries* in the CommCell Browser bar and select *Library & Drive Configuration* from the context menu.

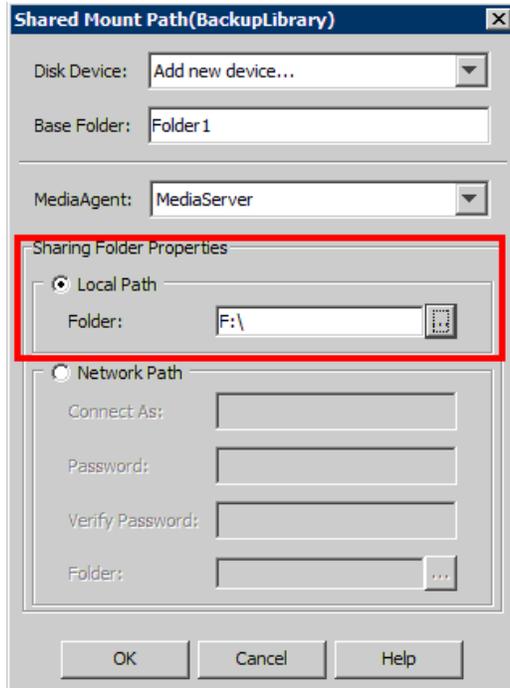


2. The Library and Drive Configuration screen appears. Confirm that MediaServer appears at the top as the selected MediaAgent, click the Start button and select *Add > Disk Library*.



3. Users may add a disk library by giving it a name and specifying the disk

device and base folder. Select the path (in this case, drive F) and click *OK*.

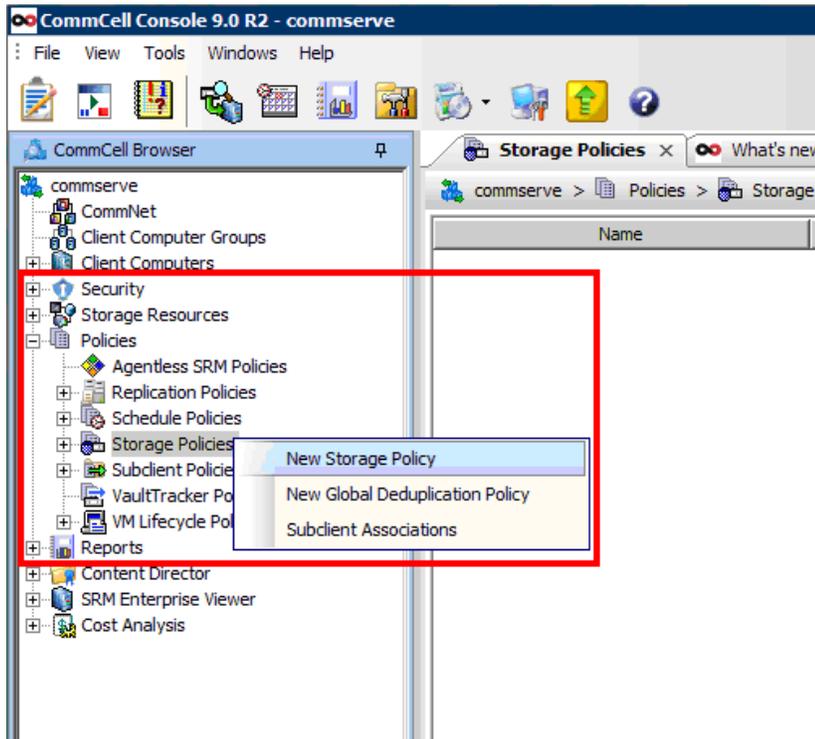


In the proposed topology, there should be only one library from partition 3 acting as a backup destination. Because partition 3 has been mapped to the host and mounted to drive F, its path is used as the backup target, which is mounted as a Simpana disk library.

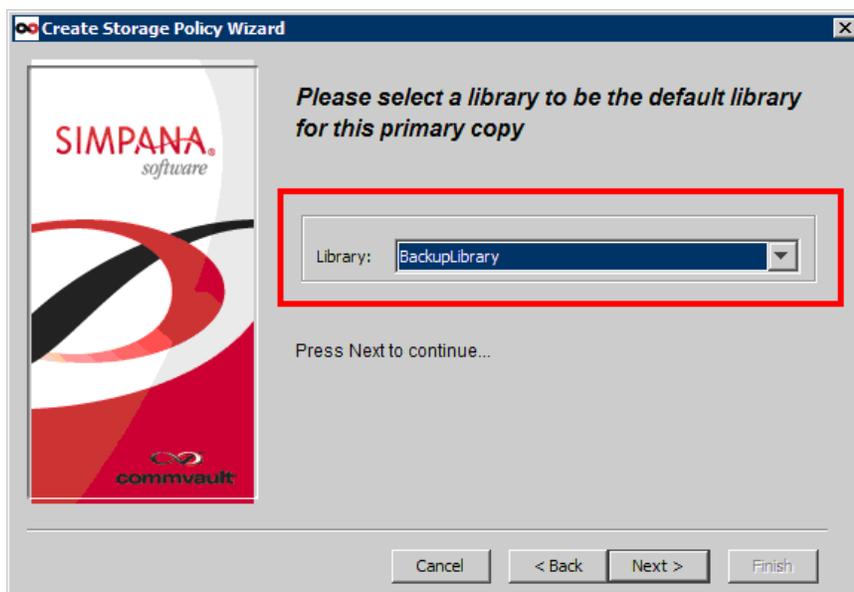
### Step 3: creating the storage policy

A storage policy is required to configure backup settings and leverage the new disk library from the storage system as a backup destination.

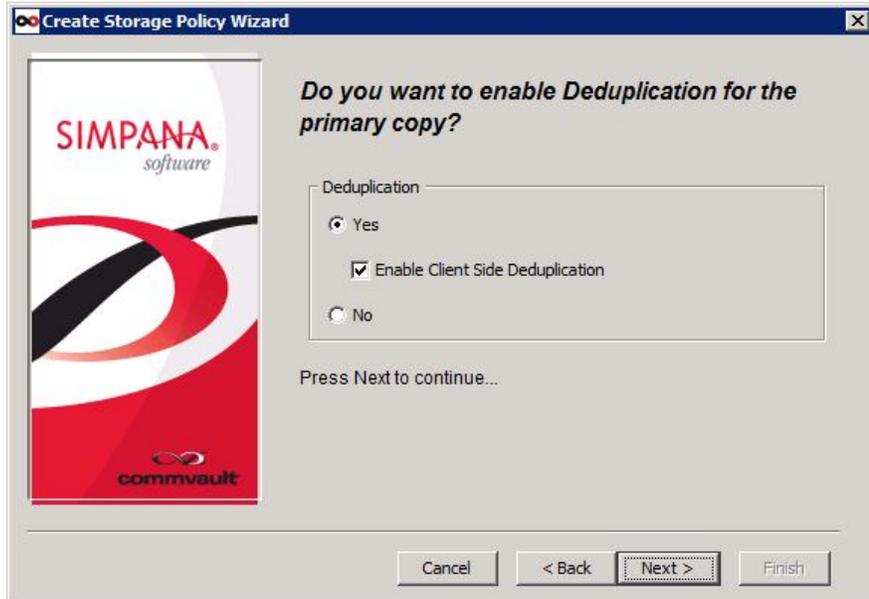
1. Right-click *Policies > Storage Policies* in the CommCell Browser and select *New Storage Policy* from the context menu.



2. The Storage Policy Wizard appears. Select BackupLibrary (the library created in the previous step) from the drop-down menu and click *Next*.



3. Select the policy type (for protection and archiving), backup name, default library, and media agent for this backup copy. Users can also specify the number of data streams for backups and the aging rule for copies.
4. You may enable deduplication, which optimizes storage capacity utilization but requires more processing time during backup tasks.

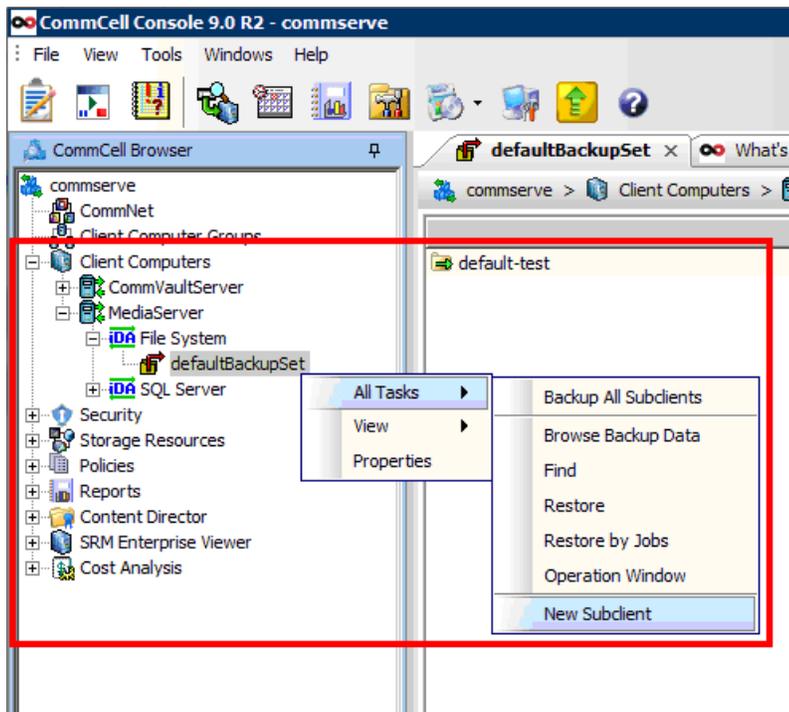


5. After reviewing settings for the newly-created policy, you can engage backup operations with FlashNAS ZFS as the backup target library.

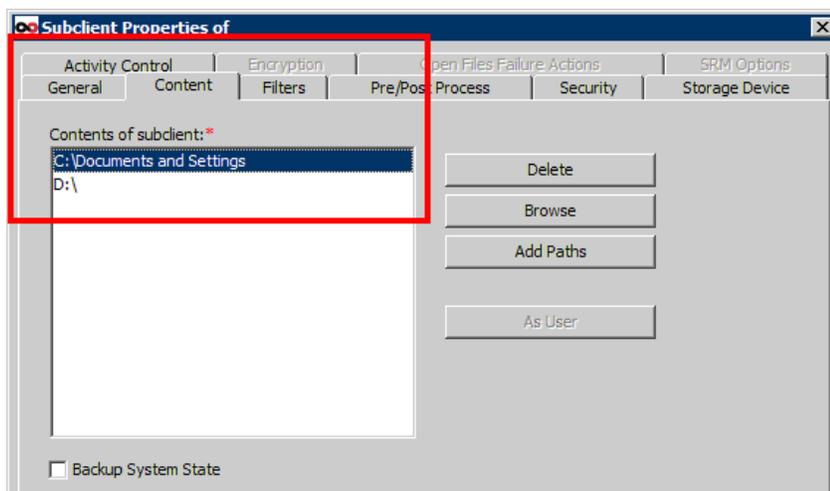
### Step 4: adding a sub-client for file system backup

In the proposed topology, two data volumes exist in the media server. One is used for file storage (drive D). In this step, the backup source for storing the whole file system is configured by leveraging the resources and policy that have been created in previous steps.

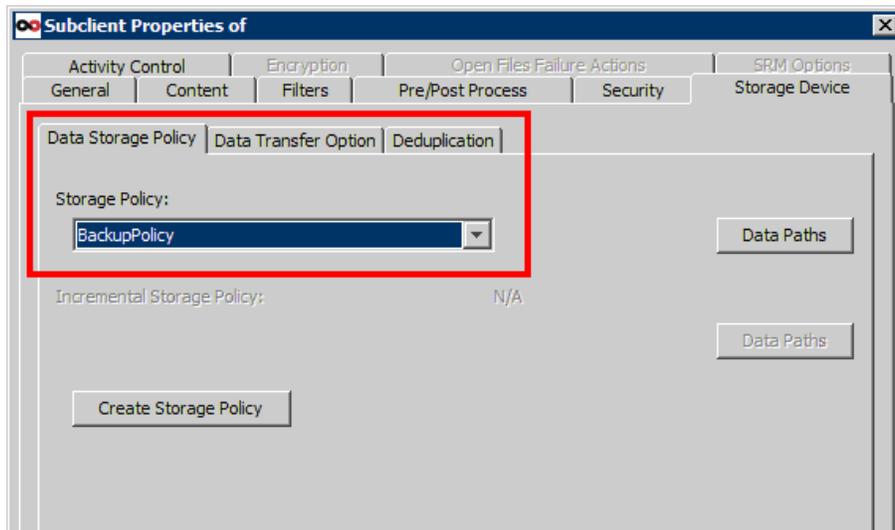
1. Right-click *Client Computers > Media Server > File System > defaultBackupSet* in the CommCell Browser bar and select *All Tasks > New Subclient* from the context menu.



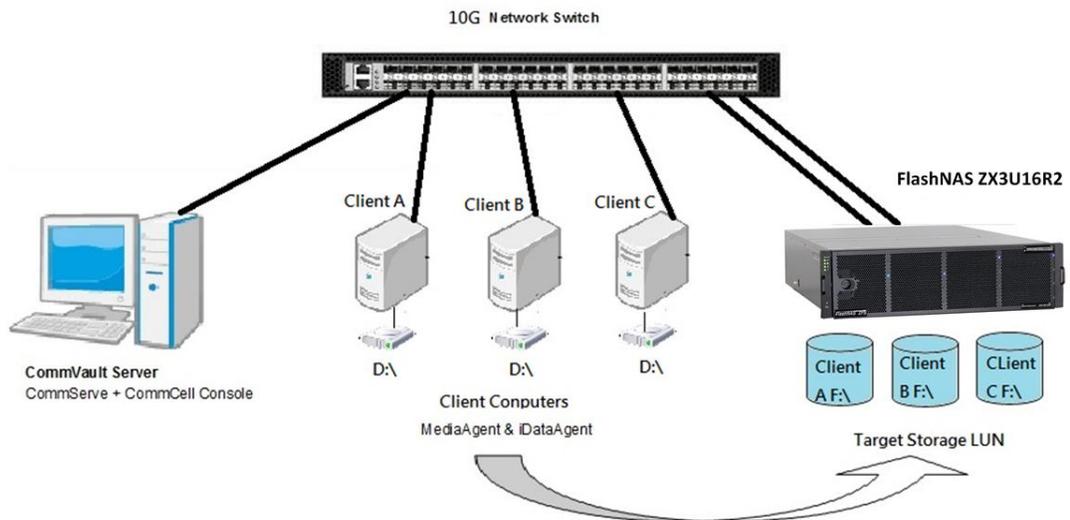
2. The sub-client properties window opens. After naming the sub-client, go to the *Content* tab and select contents: the entire drive or specific folders.



3. Go to the *Storage Device* tab, select *Data Storage Policy*, and choose the newly-created backup policy from the drop-down menu. Users may also create a new policy for this sub-client using the *Create Storage Policy* button.



4. The diagram below shows the current system topology.



**File backup for every client computer**

**Source:**

Each client's drive D:\

**Target:**

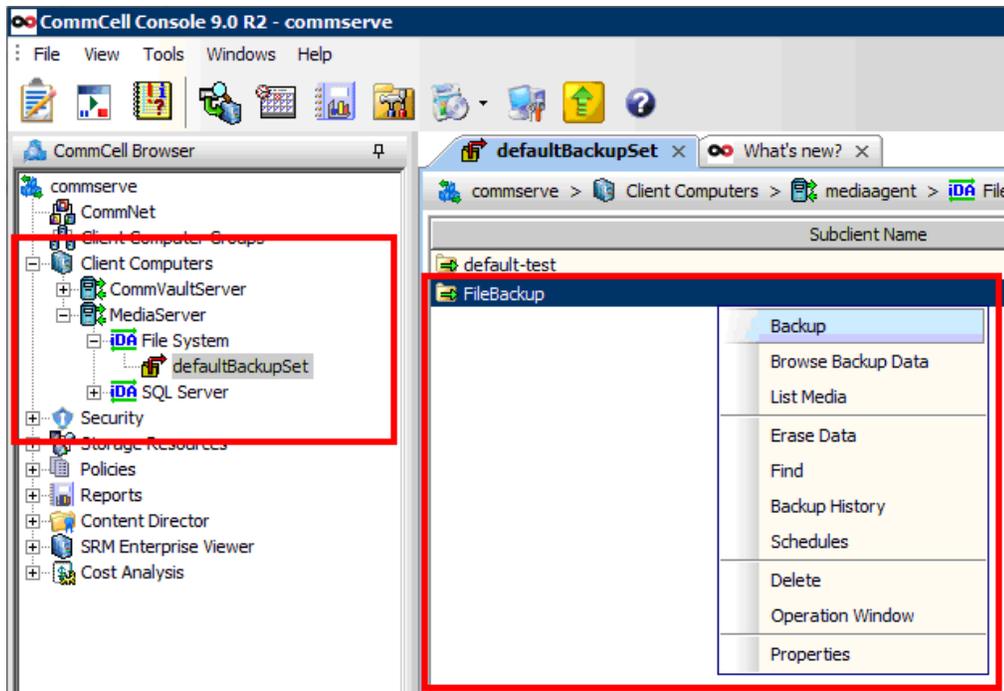
iSCSI storage LUN

(Disk library configured in storage policy stage)

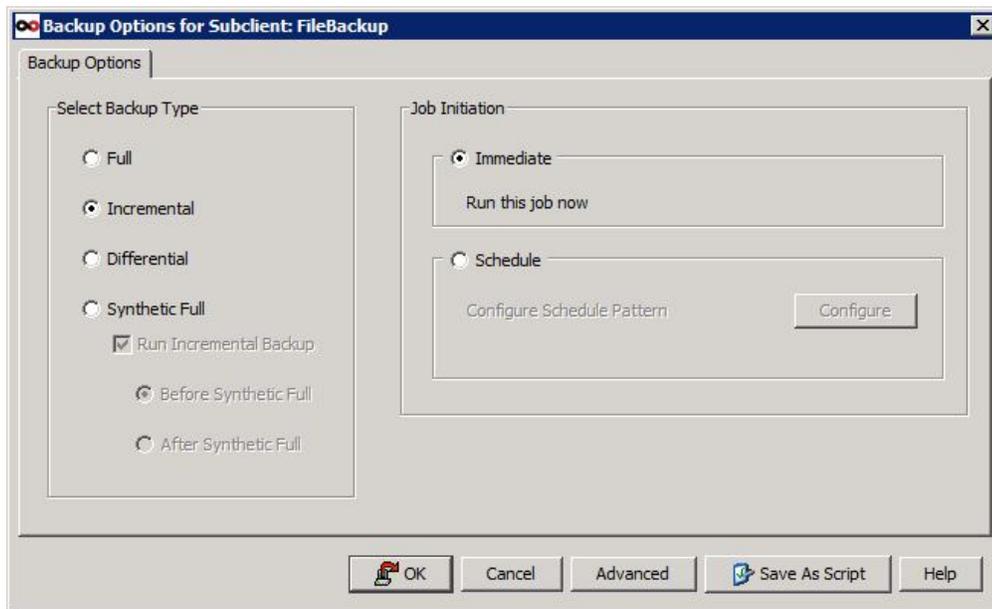
### Step 5: starting the backup job

One FlashNAS ZFS partition has been added as a disk library to be used as a storage resource for CommVault Simpana. The library policy and related settings (such as deduplication) have also been created. In the previous step, a sub-client for the host file system has been created and the disk drive/folder to be backed up was chosen. In this step, the newly-created sub-client starts the backup job.

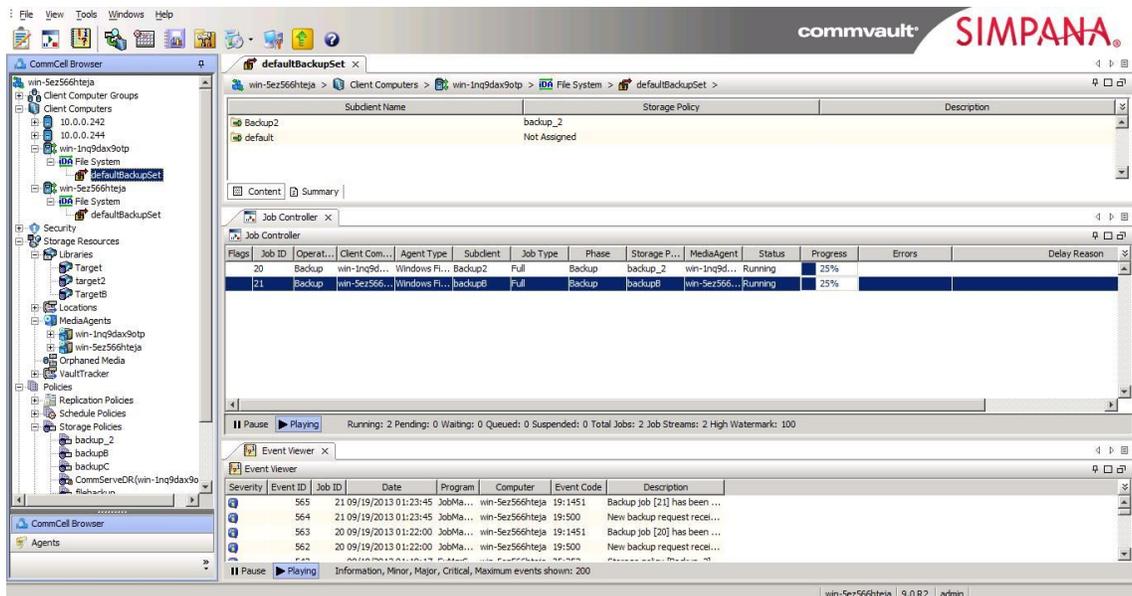
1. Select *Client Computers > Media Server > File System > defaultBackupSet* in the CommCell Browser bar. In the sub-client list that appears, right-click the newly-created sub-client (FileBackup in this case), and choose *Backup* from the context menu.



2. Select the backup type (full or incremental) and schedule (start immediately or at a specific time), and click *OK*.



3. The new backup job appears in the Job Controller section. Current backup status and progress also appear here.



A file system backup job to drive D has been created. Media server folders will also be backed up to the disk library (drive F), which contains the media server. In the proposed topology, users can make a backup copy from any client computer (such as a laptop) to the disk library in the media server by applying the same storage policy. This is done by simply creating another sub-client in the file system node of the computer and selecting the backup policy which specifies the same disk library as the backup destination.

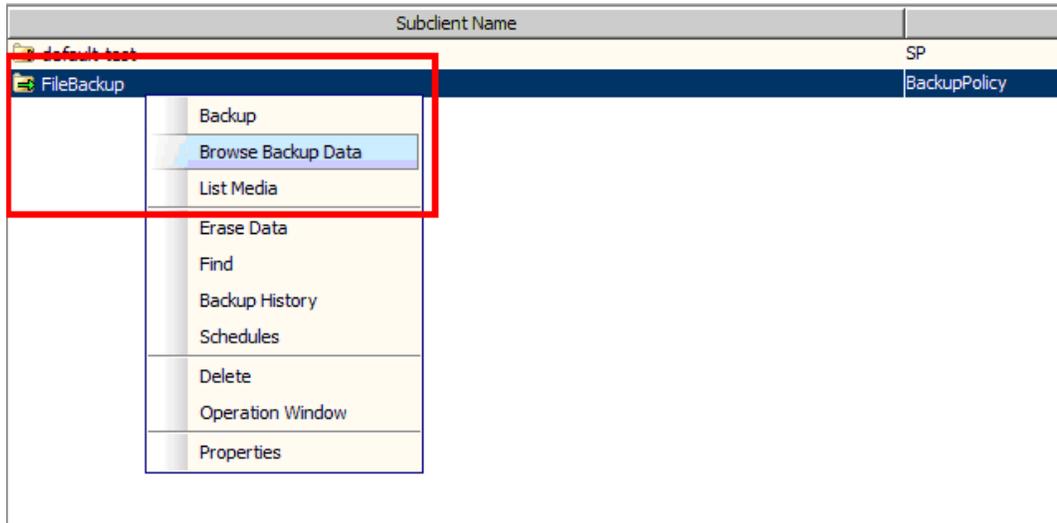
In short, data inside all client computers (which already contain agents) can be backed up to the same centralized backup management system that exists in

the subnet, while sharing the storage system mounted in the media server. System administrators can easily manage all backup tasks even in relatively large enterprises from one central supervision point.

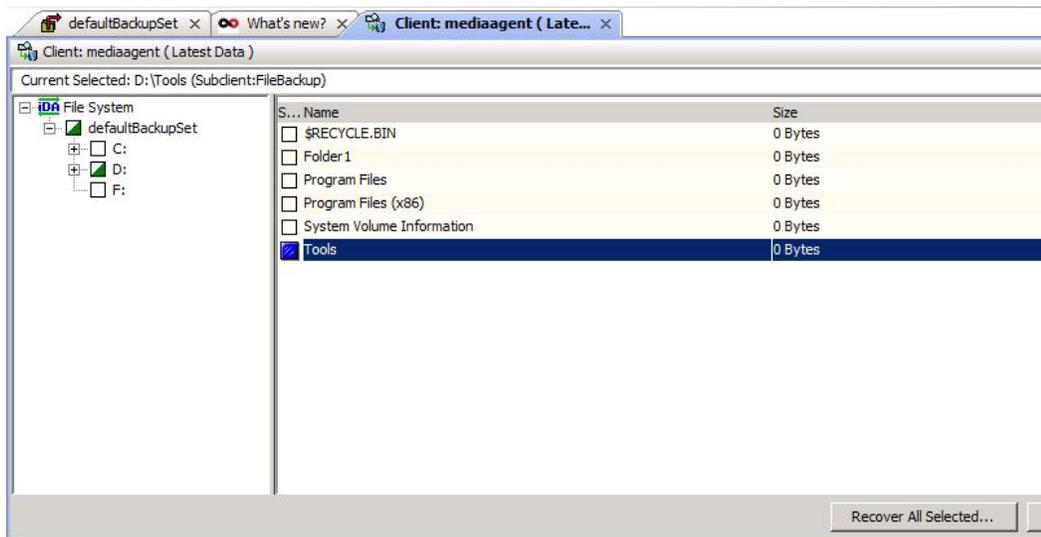
## Browsing Backup Archives and Restoring Data

When the backup job has been completed, users can browse backup data to verify results and to recover corrupted source data from the backup archive.

1. Right-click the newly-created sub-client (FileBackup in this case), then select *Browse Backup Data* from the context menu.



2. The contents of the backup archive appear in a new tab. Select the data you wish to recover.



## **Conclusions**

Simpana backup software from CommVault offers versatile capabilities that match the reliability, simplicity, and scalability of Infortrend storage systems well. CommVault and Winchester Systems together provide maximum optimization (deduplication and compression) of backup data in order to achieve minimal disk usage and lower bandwidth, which are crucial for efficient data replication.

System administrators can carry out backup operations more frequently without drastically increasing storage capacity or backup time, achieving better recovery point objective (RPO) capabilities. At the same time, the high performance and reliability of Winchester Systems FlashNAS ZFS systems allow administrators to deploy most applications and disk-based backup solutions available on the market while meeting stringent recovery time objective (RTO) requirements.

A backup solution built on CommVault and Winchester Systems technology offers capabilities that help customers effectively deal with robust protection requirements and unfettered enterprise data growth.