

NetBackup 7.6 Feature Briefing Replication Director

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This document describes features introduced to Replication Director in NetBackup 7.6 and available in this and higher releases.

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Feature Description

Replication Director was introduced in NetBackup 7.5 and has been enhanced in NetBackup 7.6. The initial release of Replication Director was for a NetApp Filer using NAS and file system data. Information about the previous release can be found in the initial Feature Briefing released with NetBackup 7.5. This document will cover the enhancements made to the product for 7.6 and does not include implementation details.

The enhancements to Replication Director are along the line of additional features on the existing hardware set. No new hardware options have been added in the 7.6 release. The new options are outlined below:

- Added the ability to snapshot block devices on NetApp hardware (feature only works with file system data in this release)
 - NetApp FAS
- Added the ability to protect Exchange and SQL data mounted on NetApp NAS using VMware (NAS mounted Datastores)
 - While Microsoft does not support Exchange and SQL DB's mounted on NAS, quite a few customers are doing it therefore this feature may help a wide range of customers protect their databases
 - The entire Exchange/SQL instance must be installed in the NAS Datastore
- Added the ability to protect Oracle physical servers with databases mounted on NetApp NFS (NAS) Storage
- Makes use of the new SLP Windows feature to allow for better scheduling of the steps after the initial snapshot (SLP Windows are discussed in another Feature Briefing)
- Makes use of the NDMP Wildcards directive
- Policy GUI has more intuitive options for making Replication Director configuration easier and more intuitive

A number of items are changing in the GUI which will be covered in the Test Drive section however the basic functionality of Replication Director between 7.5 and 7.6 will remain the same.

Business Value

Customers are finding that their data is growing rapidly and the traditional SLA's for data protection are getting shorter. Even client side dedupe options can present SLA issues in high profile environments. There is a move to snapshot technologies that provide near instant backup and recovery options - however with these new technologies come challenges - especially in environments that currently have NetBackup installed - since snapshots can be done using hardware outside of the control of NetBackup. This can decrease efficiency in the data protection environment by typically requiring two separate admin teams to manage data protection.

With Replication Director we are able to provide a "single pane of glass" option to manage NetApp snapshots which eliminates the need for the hardware team (in this case the NetApp Filer team) to create and manage snapshots and replication. By allowing NetBackup to perform and catalog the snapshots, overall workload is reduced. In addition, new recovery options using OpsCenter's "Operational Restore" feature make restores and searching for files needed for single file recovery much easier. This can improve RPO and RTO as well as provide better options for Disaster Recovery. This functionality is the only way to use a search function to find a single file. This eliminates the need to dig through the snapshot looking for a file. It cannot be accomplished using the BAR GUI or the Filer recovery option.

With the addition of block device support, the addition of support for VMware systems by integrating with VIP technology, the ability to protect Exchange and SQL databases on NAS, and the ability to protect Oracle physical machines with databases mounted on NAS, the Replication Director tool bag expands to cover more customers. The future of Replication Director is to be qualified for more types of snapshots and additional hardware vendors.

Underlying Principles

From a NetApp perspective, the filer arrays feature two replication engines for protecting data on a secondary system: SnapVault and SnapMirror. SnapVault is designed for high speed disk-to-disk backup, enabling an administrator to keep a few Snapshot copies on primary storage for near term recovery and replicate snapshot copies to a secondary system for longer term, high speed recovery. SnapMirror is designed for disaster recovery and makes an exact replica of all application data as well as Snapshot copies on a secondary system providing multiple recovery points to failover to in the event of an outage.

When SnapMirror is used, the replicated copy expires when the primary snapshot expires, whereas SnapVault copies can have a different retention time.

SnapVault and SnapMirror offer powerful data protection options, but have been traditionally managed from an independent interface or the command line on the filers. This means that backups administered from the traditional backup application and array snapshots (used as part of a backup strategy) are administered and monitored separately.

This is where the Symantec NetBackup OpenStorage API (OpenStorage) comes into play. Replication Director uses OpenStorage to access NetApp volumes via the NetApp OnCommand Server. Working with OnCommand, NetBackup instructs the OnCommand server to create a snapshot, then replicate that snapshot to secondary storage if desired. Additionally the NetApp Snapshot copies can be replicated to multiple array volumes or duplicated to any supported tertiary storage such as a deduplication target, cloud based storage or a tape drive. When the images are sent to a tape/disk device they are “indexed” which creates the NetBackup “dotf” file. This step can also be accomplished using an SLP step called “Index from Snapshot”. Once this step has been completed, Operational Restore using OpsCenter can be used to search for file names. This restore enhancement is what sets Replication Director apart from other snapshot solutions. An environment that has millions of files and thousands of directories in the tree makes finding a file very difficult. Searching for a file name simplifies the process. .

Like a number of other NetBackup features, Replication Director is being developed in phases. The initial foundation that was created in 7.5 was needed to be able to build upon. New features are being developed that build on that foundation and extend the feature set further. Future releases will continue to encompass the environments that many customers are using so the hope is that customers will adopt the existing functionality now to protect file systems on NAS/Block and then be in a position at a later date to add the more important aspects to their data protection solution. By doing this, the customer will learn Replication Director and be better able to update their environments based on their requirements as the new features are added. If the customer waits until the feature combination they need is available, even though they could be using Replication Director to protect – for example – their NAS shares, then there is a learning curve at a critical time.

Test Drive

Basic installation and configuration for Replication Director is not included here. What is shown here are some of the changes that have been made to the 7.6 GUI code to make it easier to install and configure Replication Director. One thing to note – most of the configuration must be done on the NetApp side of the feature. Things like configuring aggregates, putting the aggregates into a Resource Pool, setting up the permissions on the DFM server so it can talk to the filer etc. All of these things must be completed before NetBackup can control the environment. Configuration of these features can be completed by consulting a number of documents as noted in the Related Documents section. Additional documentation is being created for the 7.6 release to make the configuration of the NetApp environment clearer.

New GUI Look and Feel

In Replication Director 7.6 a number of options have been combined into simple GUI steps that make it much easier to configure Replication Director protection. These changes are noted in the following screen shots.

In response to customer feedback, configuration is much more intuitive. The credentialing of the storage server now only provides the options that are installed. OpenStorage

Note: The EMC ECOM server option shown in Figure 1 below will be functional in a post 7.6 release.

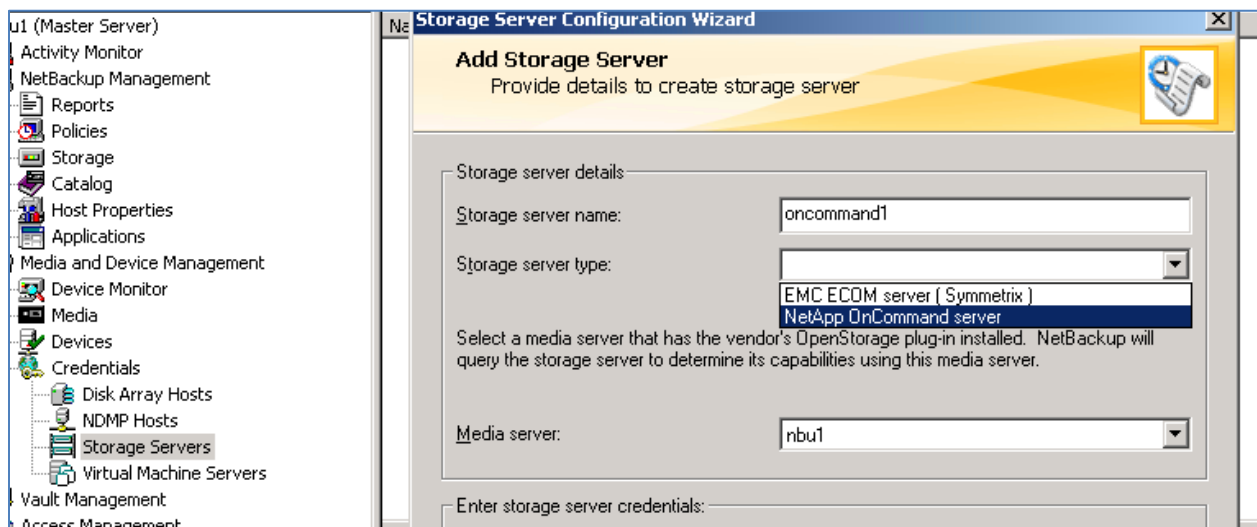


Figure 1 - Credential Server Configuration Options

The next change comes when configuring the Disk Pool. In this environment the only OpenStorage option installed is NetApp for Replication Director, therefore when the Disk Pool configuration wizard is run, the option is preselected as “Network_NTAP”. This no longer needs to be typed in manually as shown in Figure 2.

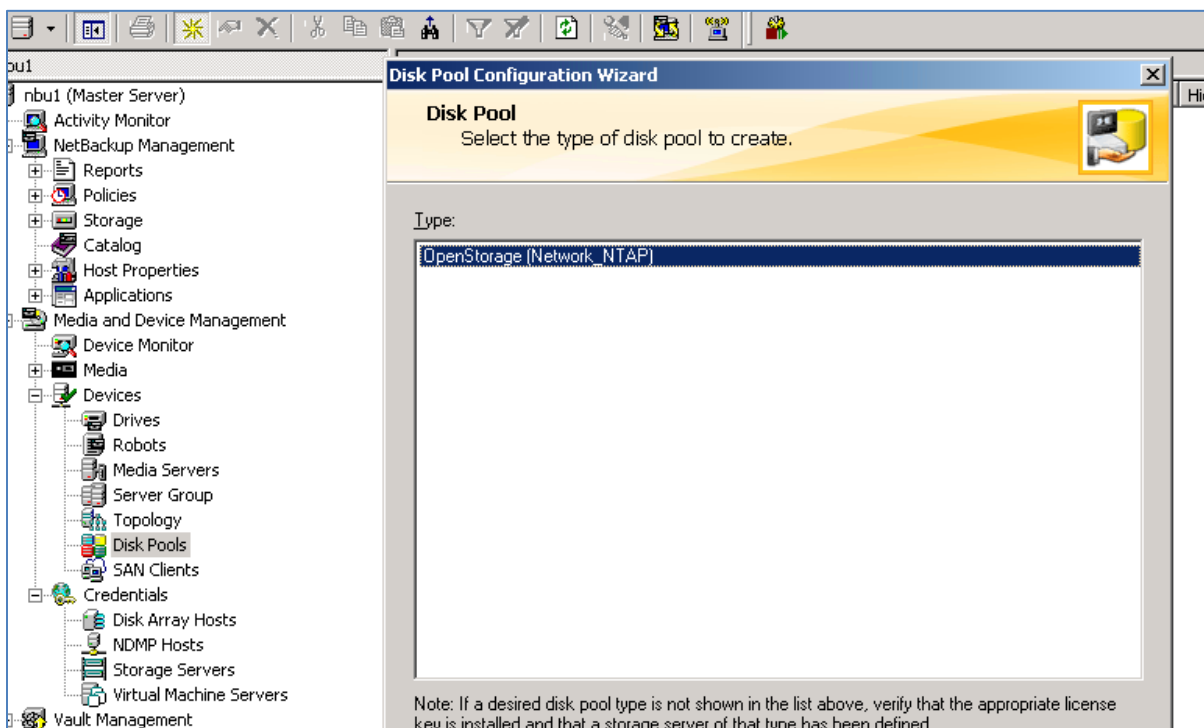


Figure 2 – Disk Pool Configuration Option

One of the frequently asked questions with regards to Replication Director is “how do you choose between SnapMirror and SnapVault and why are both licenses required”. This choice is based on the replication retention option chosen in the SLP. When “Mirror” is chosen (highlighted below in Figure 3), SnapMirror is used and the replicated copy expires when the snapshot expires. When “Fixed” or “Expire after copy” retention is selected, SnapVault is used and the replicated copy expires independent of the snapshot. This isn’t a change in 7.6 however it was not well understood so it is included here.

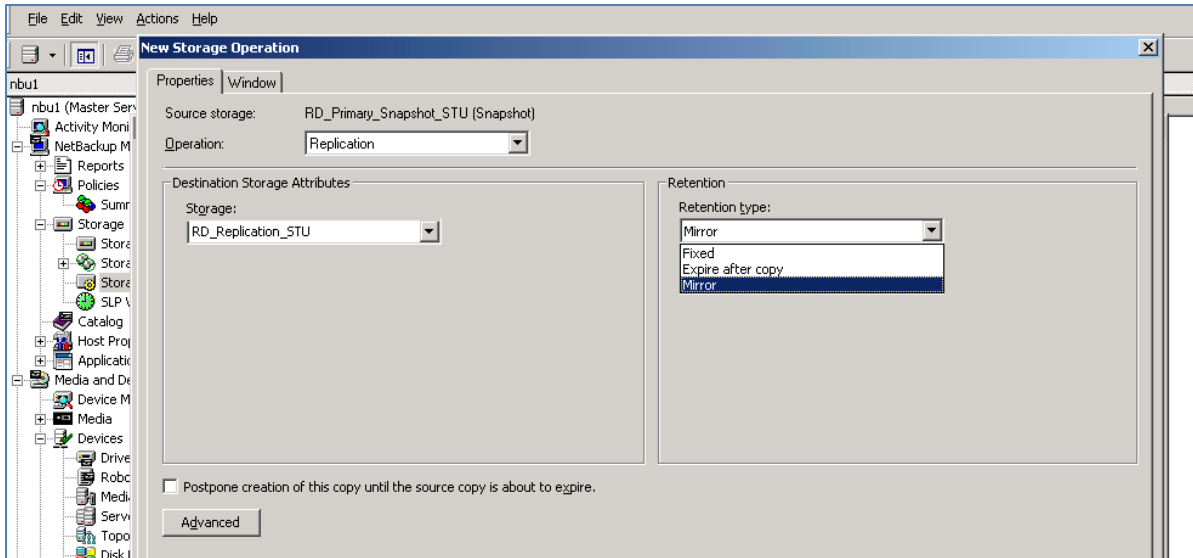


Figure 3 – SLP Operation and use of SnapMirror/SnapVault

There are some changes made to the Policy GUI. A checkbox for “Use Replication Director” makes this much more intuitive and, once selected, avoids the need to select the Advanced Options to choose which type of OpenStorage interface is needed (Figure 4).

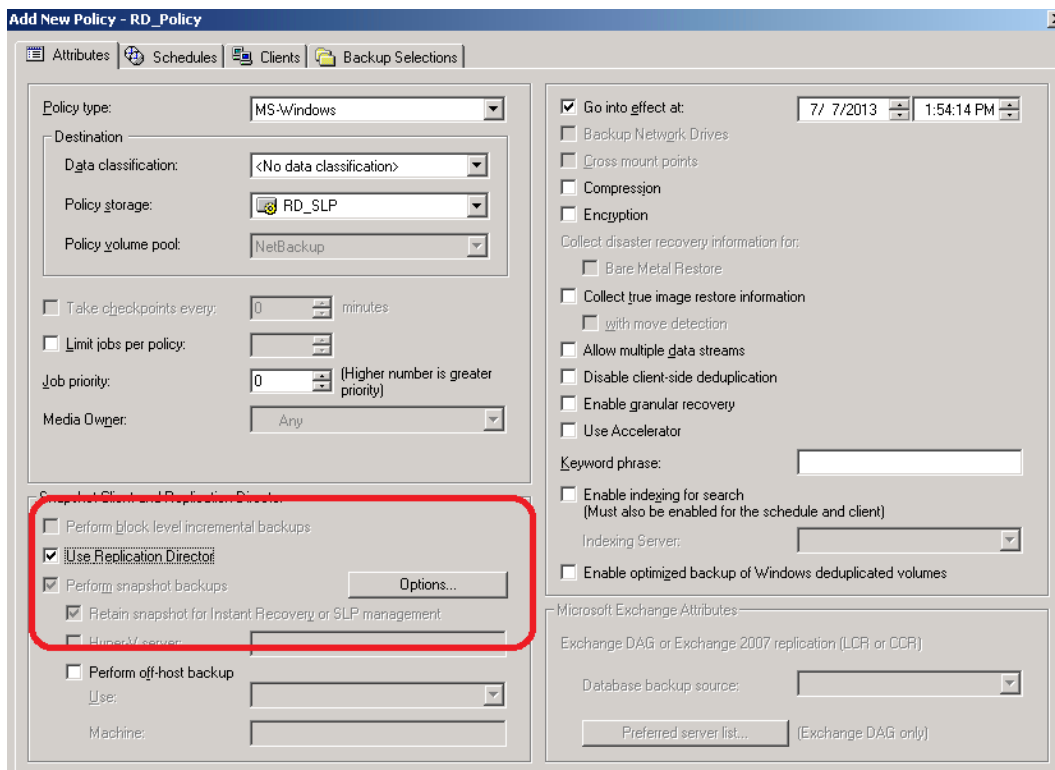


Figure 4 – New Policy Configuration for Replication Director

In the SLP when configuring Snapshots the number of snapshots allowed (before they start expiring) is configured as “maximum allowed”. To set the number of snapshots allowed, go to the Options button in the Policy and type in a new number (Figure 5).

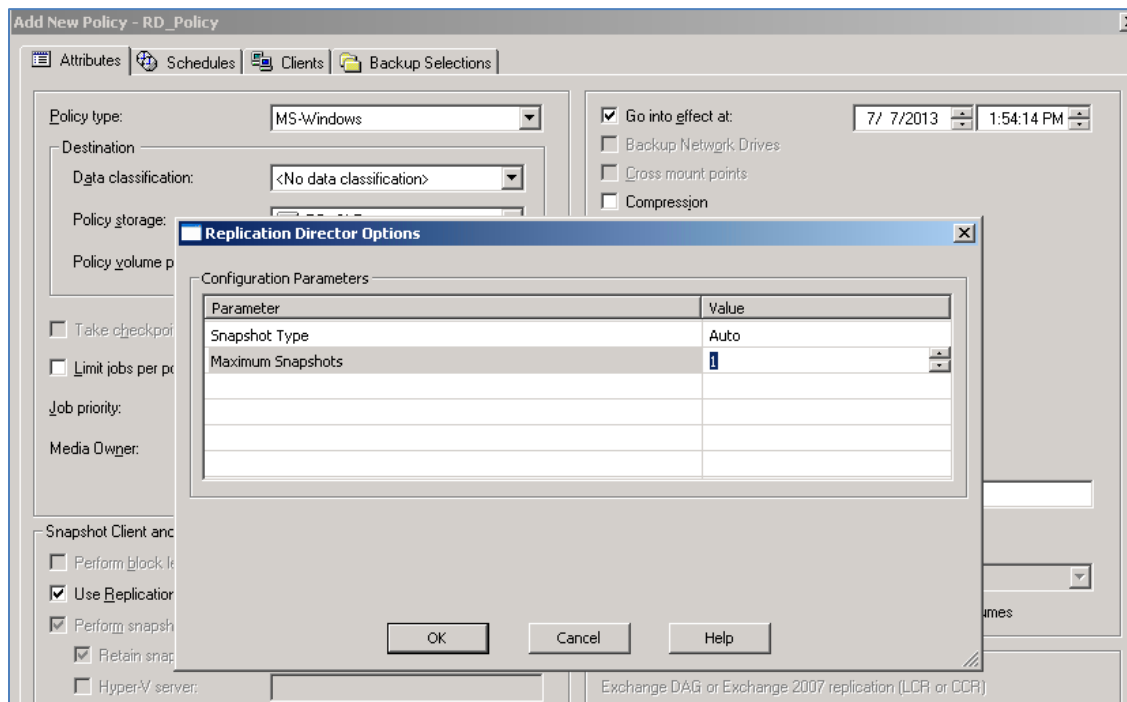


Figure 5 – How to set the maximum number of snapshots allowed

When a Policy is configured, Replication Director has always validated the options in the Policy. This step – if successful – provides the best indication that Replication Director has been configured correctly and that the Policy will run correctly. If this check fails, Replication Director will not work. In 7.6 a new Validation Checkbox has been added that allows the user to either do a complete check – one that tries to validate the OnCommand Server and filer communication, or a Basic check that will look at the filers but not go beyond validating the basic topology. Finally, you can bypass this check completely. The Complete check is highly recommended. If this fails, Replication Director is not properly configured (Figure 6). Since much of the configuration for Replication Director is done on the Filers and OnCommand Server before NetBackup configuration is started, customers should be encouraged to run the complete validation to help ascertain if the NetApp environment has been properly configured.

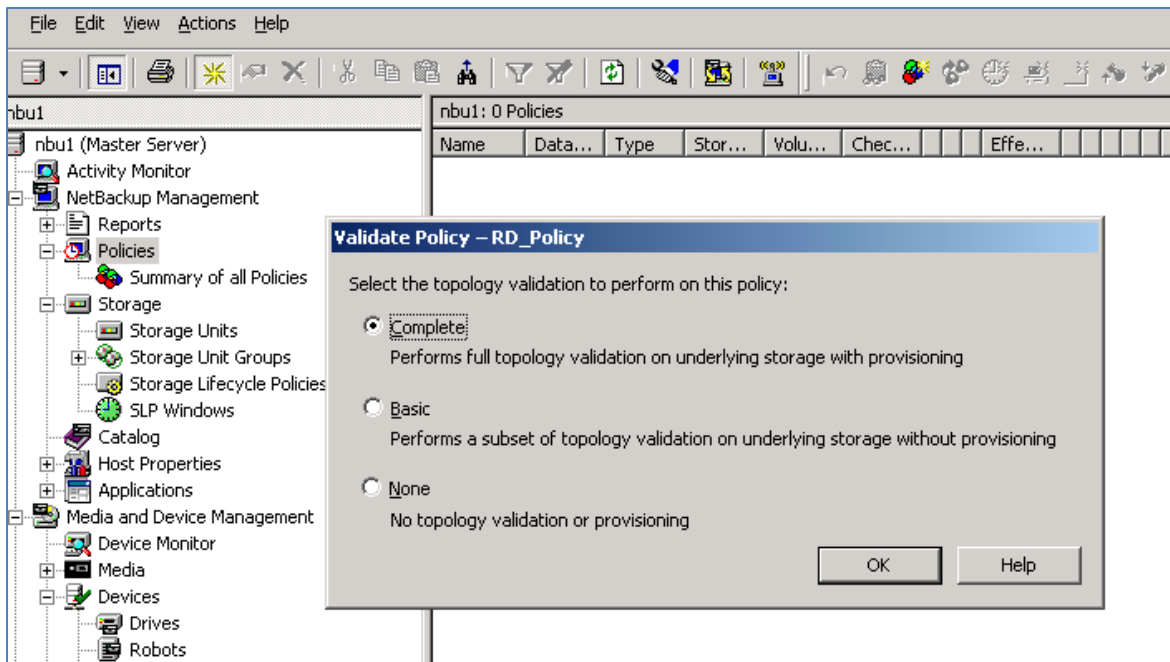


Figure 6 – Policy Validation pop up

There are a number of other options available when using Replication Director in NBU 7.6 however they don't change the basic functionality of Replication Director.

Replication Director and VMware Protection

One of the enhancements in Replication Director 7.6 is the ability to provide hardware snapshots and replicate those snapshots under the control of Replication Director. This is done using the existing (and enhanced) VMware Intelligent Policy. All configuration steps are the same as when creating normal VIP backups, however the "Use Replication Director" button must then be checked. This assumes that the data that has been configured for backup using the VIP has been created in a NetApp NAS Datastore. Since we are taking a hardware snapshot of the NAS Datastore, this can include Applications such as Exchange and SQL if the machines have been installed on the Datastore.

The feature uses all of the enhancements to the VMware Intelligent Policy that are discussed in another feature briefing. Once the VIP parameters have been set, checking the "Use Replication Director" box changes the methodology for the backup to a hardware snapshot as seen in Figure 7 below. Once checked, some defaults are clicked and greyed out (they cannot be changed). This includes Retain Snapshot for Instant Recovery or SLP Management and Perform Offhost backup.

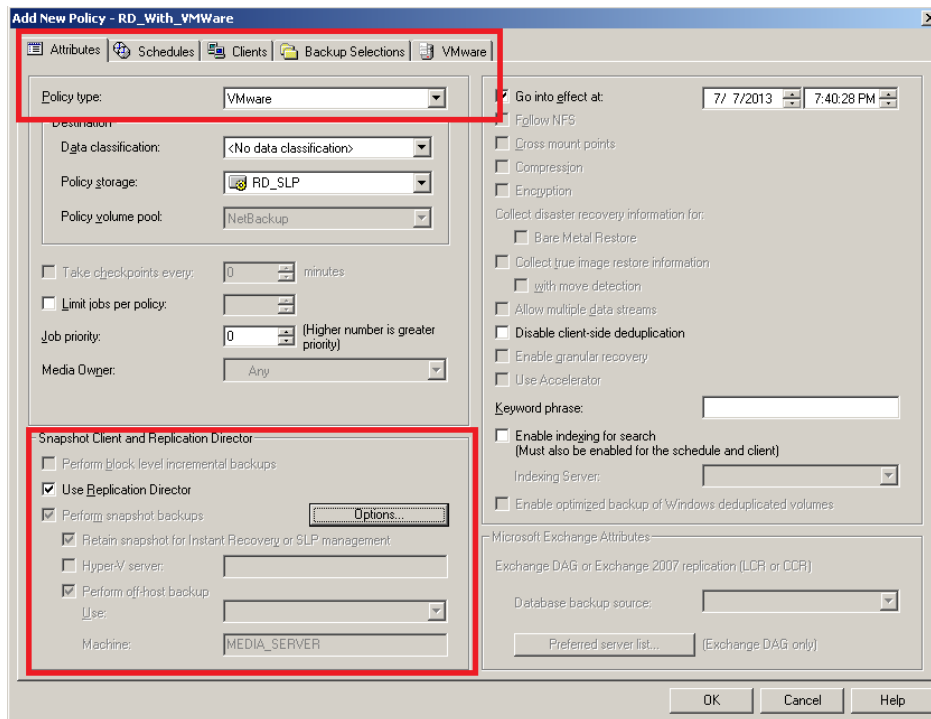


Figure 7 – Replication Director with VMware Intelligent Policy

This ability to create hardware snapshots while using the enhanced VMware Policy capability could be a game changer for customers who use VM backups and want to do the much faster hardware snapshots. In a demonstration we were able to create “300 snapshots in 300 seconds”.

Exchange and SQL in a Virtual Server Protection

Added to this release is the ability to protect Exchange and SQL servers that have been installed in a Virtual Server on a NetApp NFS mounted datastore. The entire application must be installed on the datastore, not just the database files. The hardware snapshot is quick, and due to the use of the VMware API’s there is no overhead on the Exchange or SQL machine itself. SLP’s are used the same as other RD operations which allows for greater control over scheduling the snapshot and subsequent replication and/or backup steps.

Restores can be completed using the same snapshot live browse capability and can be either the entire VM, the entire database or down to the mailbox level from any of the copies that have been made.

This does require the same NetBackup components that are used for a physical Exchange or SQL backup – the NetBackup Client installed on the VM along with an Exchange or SQL Agent (and the associated

NetBackup Agent License key). This is what allows Replication Director to quiesce the database long enough to get the snapshot.

From a configuration perspective, the VMware Policy type is chosen (not the MS-Exchange-Server or MS-SQL-Server Policy type) and a number of check boxes have been added as noted in Figure 8 below. While it has been noted that installing Exchange or SQL on a NAS Datastore is not supported by Microsoft, many customers are doing this as it is a cheap and easy way to create an Exchange Server in a small to medium sized environment. Additional steps are outlined in the manual for the Policy configuration which should be reviewed prior to installation.

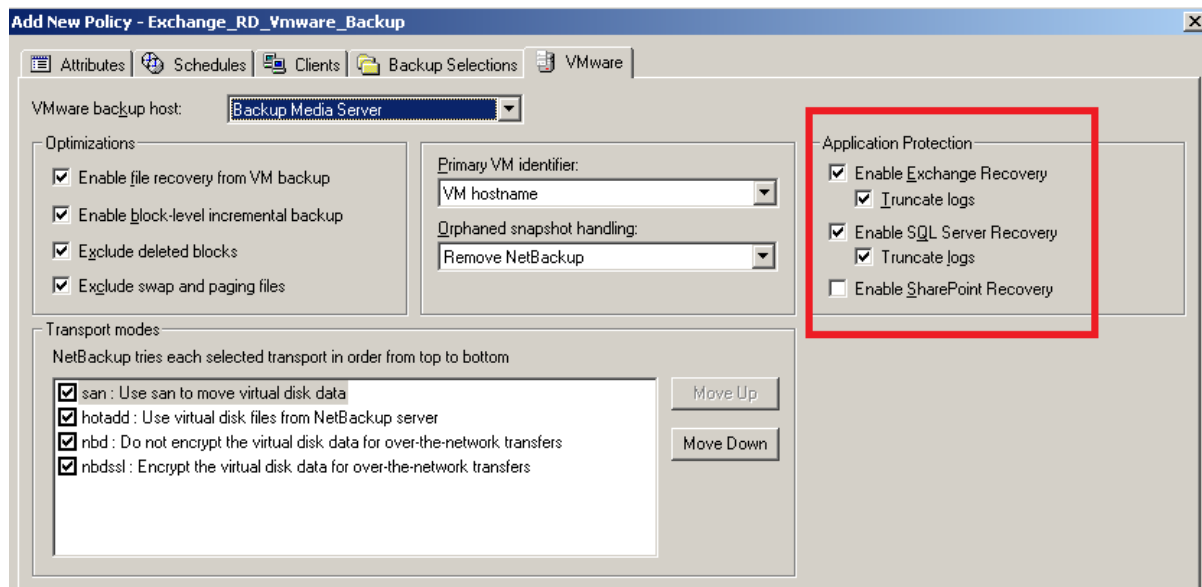


Figure 8 – Exchange and SQL on VMware – Policy Configuration

Oracle and Replication Director

The new Oracle Intelligent Policy can also make use of hardware snapshots using Replication Director. In this case, the Oracle machine must be a physical machine (**not virtual**) and the database must be NFS mounted on NetApp storage. In this case, the Oracle Policy type is chosen which changes the options available for the basic backup (new tabs – covered in a separate Feature Briefing) and to enable Replication Director snapshots of the database simply check the Use Replication Director as shown in Figure 4 above – similar to the VMware Policy configuration. This triggers the backup type to a Snapshot. All other options selected with the new Oracle Intelligent Policy are still valid, but instead of sending the data to a disk or tape as a streaming backup, a Snapshot will be created.

Block Device Support for NetApp

Current functionality of Replication Director requires a NFS or CIFS mount from a NetApp Filer. In 7.6 the ability to snapshot and replicate from a filer includes the addition of block device support. Now Fiber Attached Storage (FAS) can be used for file data protection. From a Replication Director and configuration perspective, nothing changes. The work is done on the NetApp side where the storage is created. The Replication Director Policy can then use the backup selection to snapshot the FAS data.

Other Minor Enhancements

In addition to the topics mentioned above, other enhancements to Replication Director include the ability to use SLP Windows to better schedule the replication and other copies of the data and NDMP Wildcard usage in the Policy.

Licensing and support considerations

Replication Director is a separately licensed NetBackup feature. It is included with a capacity model. NetApp requires a number of licenses for performing the various functions of the filer including:

- SnapMirror
- SnapVault ONTAP primary
- SnapVault ONTAP secondary
- SnapRestore
- FlexClone
- CIFS
- NFS
- iSCSI
- NDMP
- SnapDrive for Windows Client license if using block storage on Windows

Some of the licenses are optional depending on what the customer wants to do.

Related documents

[NetBackup Replication Director Solutions Guide](#)

[The Replication Director Digest](#)

Note: It is beyond the scope of this Feature Briefing to provide links to the relevant NetApp documentation. Information can be found on the NetApp NOW site. This site requires a login.

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