NetBackup 7.6 Feature Briefing

Instant Recovery for VMware

Version number: 1.0

Issue date: 2nd August 2013

This document describes a feature introduced in NetBackup7.6 and available in this and higher releases.

If you have any feedback or questions about this document please email them to **IMG-TPM-Requests@symantec.com** stating the document title.

This document is provided for informational purposes only. All warranties relating to the information in this document, either express or implied, are disclaimed to the maximum extent allowed by law. The information in this document is subject to change without notice. Copyright © 2013 Symantec Corporation. All rights reserved. Symantec, the Symantec Logo, and the Checkmark Logo are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners.

Confidence in a connected world. Symantec.

Feature Description

When severe data loss happens, quickly regaining access to that information can be extremely important. The time required to access that data (or recovery time objective - RTO) depends heavily on the technology used to protect it. Clustering technologies provide the fastest possible RTO but are expensive, complex and require special skills to deploy and maintain. Standard backup technologies are simple to implement but the restore process can be extremely time consuming. Before data is user accessible, the entire OS image or data set must be restored. This restore process can take hours or even days. But what if the restore process could be completely reversed? What if you could first gain access to the data and then begin the restoration? This is exactly what the NetBackup Instant Recovery for VMware (IRV) feature does.

Developed in conjunction with the NetBackup for VMware data protection technology, IRV can instantly power on a VMware virtual machine (VM) from a full or Accelerator incremental disk based backup image (normal incremental backups cannot be used as they are not "whole" backup images). The VM can be made accessible in as little as 60 seconds. Once the VM is running, users can access it just as they would any other VM. Any subsequent changes made to the VM are 100% retained. From the user perspective the VM is fully functional. The user has no indication that the VM is powered on from a backup destination. The physical restore process can begin as soon as the VM is running and while it is in use.

To recover the full VM, VMware's Storage vMotion is used to copy the live VM image to a traditional ESXi Datastore. During the entire Storage vMotion restore process there is zero service interruption to this newly powered on VM.

If the requirement is simply to verify the backup is good or restore some data from the VM and not to recover the full VM vMotion is not required. The required data can simply be copied from the running VM on the backup storage and the VM can then be shut down again.

Note: The backup image itself is never altered during a recovery operation, all updates are written to a transaction log and only merged with the VM on the traditional ESXi Datastore once the vMotion operation is completed.

Business Value

Data protection technologies have always been a balance between cost and restore performance. Faster restores have traditionally required more hardware. But what if you could perform an extremely fast restore with no modifications to your backup infrastructure and no new additional and expensive hardware? That is exactly what IRV provides. Using currently existing NetBackup disk backup storage technologies, IRV "tricks" the VMware environment into treating the NetBackup standard disk or deduplication backup target(s) as VMware storage. The VM to be restored is automatically registered on the vCenter server and booted by IRV. At this point VMware's Storage VMotion migrates the VM files to the permanent ESXi storage with zero service disruption to the VM.

There are three powerful benefits of this feature:

1) **Inexpensive.** Everything required to enable IRV is developed in software. That means that no new hardware is required and no modifications to existing hardware or backup environment is needed.
2) **Simple.** Implementing this feature is as easy as upgrading to NetBackup 7.6. Nothing needs to be modified within vSphere. The VMware backup host simply needs to add NFS support.
3) **Instant.** By reversing the traditional restore process, lost data can be made available in seconds.

Besides providing a powerful instant DR capability, IRV can be flexibly repurposed to provide additional functionality including:

Single file restore from any OS – IRV can instantly provide file system access to VMs running any OS. Users have instant access to the booted VM and can extract any desired file or folder. This process requires minimal resources on the ESXi host. Because the boot process is so quick, restores are fast regardless of the size of the VM.

Non-disruptive DR testing – Testing DR with traditional recovery mechanisms is time-consuming, disruptive and commonly requires additional hardware. Traditional DR mandates that the entire VM first be restored and requires enough free disk space to store it. With IRV, NetBackup automates DR testing by powering on the VM from backup storage into a separate, isolated ESXi network. This allows VM testing without impacting a production instance or requiring additional storage.

Application and patch testing – Before performing a patch or application update, the update can be quickly tested using a current backup copy of the target VM. Once the test OS image is booted,

application/OS updates or patches can be installed and verified. The VM in production is never touched. Because IRV never modifies any backup image, the testing is completely safe and non-destructive. Since a copy of the VM is used for testing, this validation testing is 100% accurate.

Underlying principles

The key enabling technology for IRV is the NetBackup File System Daemon or NBFSD. NBFSD is not new and has been included as part of the NetBackup install for some time. Used as part of NetBackup application granular restores, NBFSD is repurposed by IRV to present a standard NetBackup disk based storage unit as an NFS Datastore to the ESXi host. IRV automatically provisions this NetBackup-based NFS Datastore and registers it on the ESXi host. This new Datastore shows up in the vSphere client like any other Datastore and is configured as "read only". This ensures that the existing NetBackup images are never modified.

As soon as the VM is booted, any changes that occur to it are temporarily written to a user defined Datastore located on the target ESXi host. This ensures that all modifications to the running VM are 100% retained. At this point VMware's Storage VMotion can be implemented to copy the VM's files to any destination Datastore. Once the Storage VMotion process is finished the NetBackup based image of the VM is deactivated.

None of these basic enabling technologies are new. NetBackup 7.6 brings NBFSD, NFS, Storage VMotion and ESXi Datastores together to provide a powerful virtual machine disaster recovery capability.

Test Drive

Implementing IRV – Introduced in the NetBackup 7.6 release, the "nbrestorevm" command is used to implement the IRV restore process. This CLI process has been simplified and only requires the use of few options as shown in Figure 1. Subsequent NetBackup releases will feature a GUI for the IRV process.

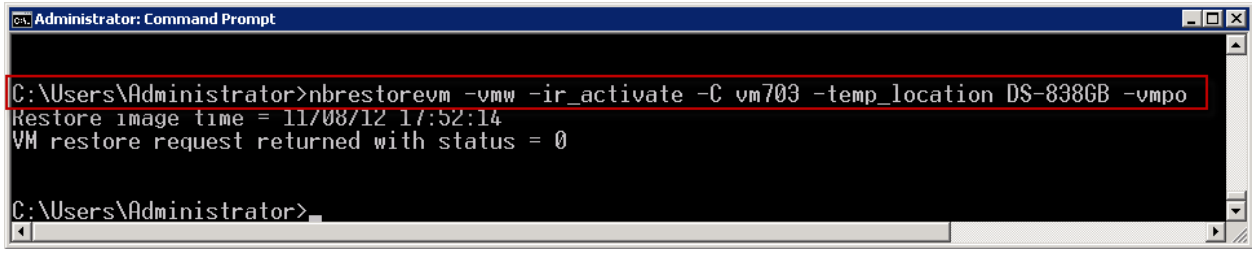

Figure 1 - IRV CLI Restore Options

Monitoring – Once the IRV process is initiated both the vSphere Client (Figure 2) and the NetBackup activity monitor (Figure 3) show the status of the VM being powered on.

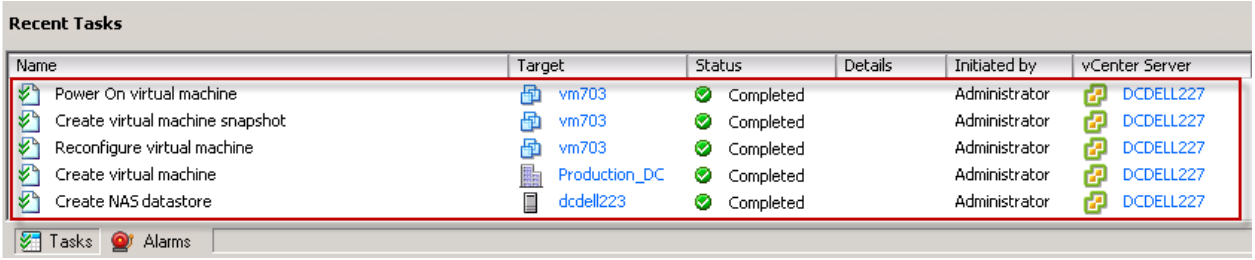

Figure 2 - IRV Restore process in vSphere Client

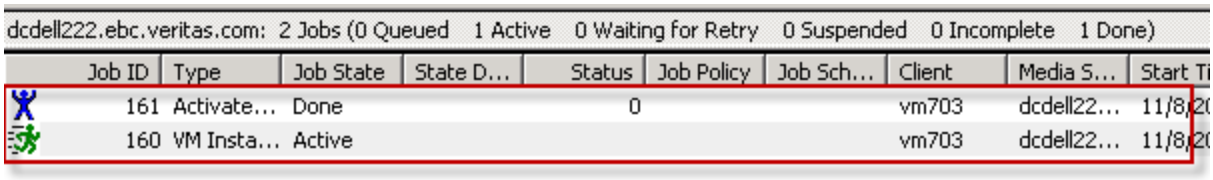

Figure 3 - IRV activation in NetBackup Activity Monitor

vSphere Client – The newly powered on VM can be viewed from the vSphere client just like any other VM and is 100% user accessible. Any of the extensive capabilities designed into vSphere (e.g. Storage VMotion) can be implemented on this VM.

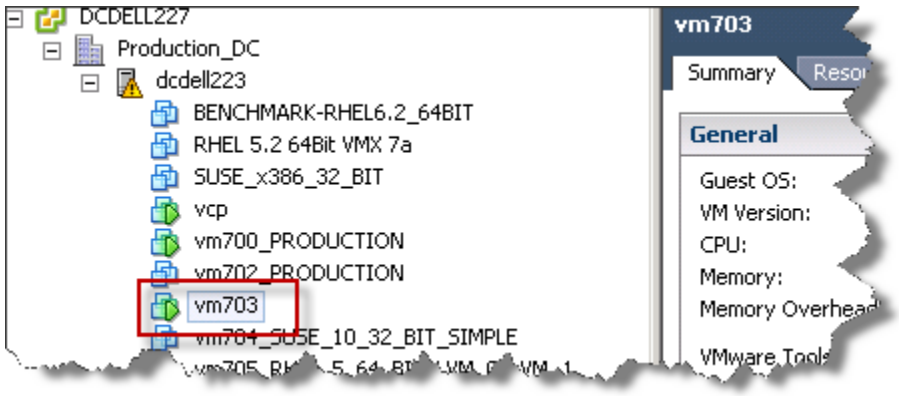

Figure 4 - IRV VM listed in vSphere Client

Temporary Datastore

Using NBFSD, IRV presents the NetBackup disk based storage unit as a "read only" Datastore to the selected ESXi host (Figure 5).

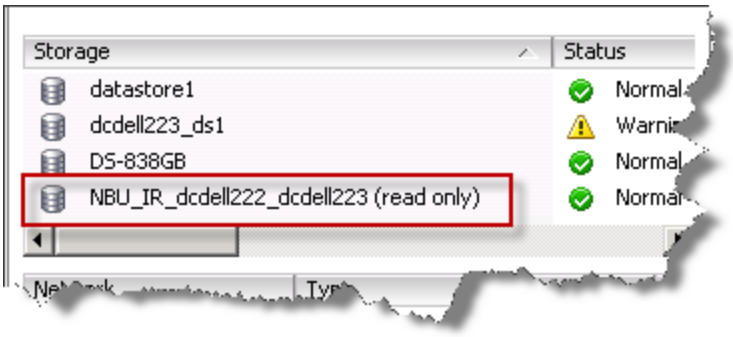

Figure 5 - NetBackup Disk Storage Unit Datastore

Restore Process

Now that the VM is in active use, the Storage VMotion restore process can be initiated (Figure 6). This copies the VM image from the NetBackup disk storage unit to the standard ESXi Datastore.

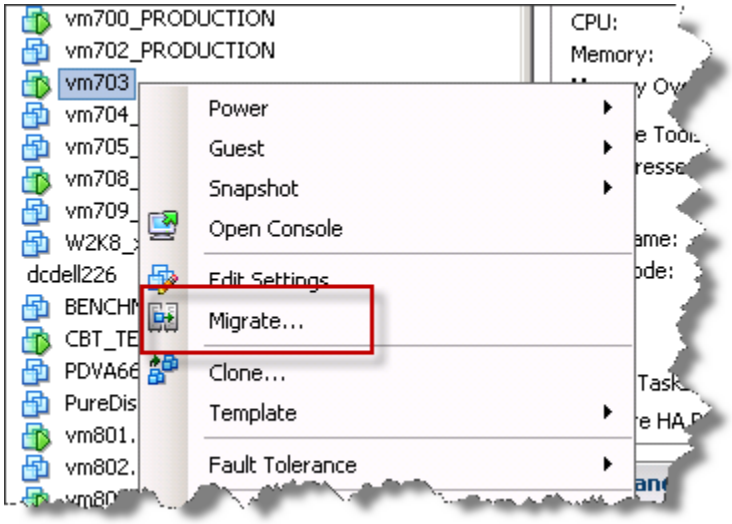

Figure 6 - Initiate Storage VMotion

Complete the IRV Process

Once the VM image has transitioned to the ESXi Datastore, the NetBackup IRV processes can be deactivated by canceling the VMware Instant Recovery job using the NetBackup activity monitor (Figure 7). At all times, the status of the IRV process can be monitored from NetBackup.

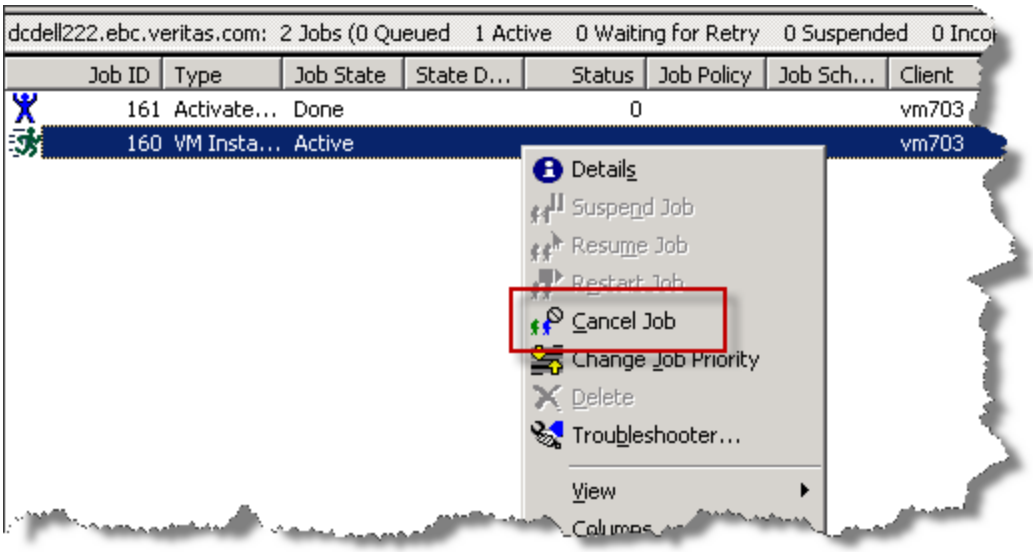

Figure 7 - Deactivating NetBackup IRV

Licensing and support considerations

The NetBackup IRV feature is included as part of the NetBackup Enterprise Client License. Only one Enterprise Client license is required per ESXi host regardless of the OS type and the number of virtual machines running on that ESXi host.

VMware's Storage VMotion technology is a licensed feature provided by VMware. Consult VMware for additional licensing considerations.

The NetBackup IVR feature requires a minimum vSphere version of 5.0. Where a UNIX or Linux NetBackup media server is used (including a 5200 series NetBackup appliance) a Windows proxy server is also required. However this Windows proxy server can be a VM (reducing the limitation).

The NetBackup IVR feature supports all VM guest operating systems supported by VMware.

Related Documents

NetBackup for VMware Guide

About Symantec:

Symantec is a global leader in providing security, storage, and systems management solutions to help consumers and organizations secure and manage their information-driven world. Our software and services protect against more risks at more points, more completely and efficiently, enabling confidence wherever information is used or stored.

Headquartered in Mountain View, Calif., Symantec has operations in 40 countries. More information is available at **www.symantec.com**.

For specific country offices and contact numbers, please visit our Web site: **www.symantec.com**

Symantec Corporation
World Headquarters
350 Ellis Street
Mountain View, CA 94043 USA
+1 (650) 527 8000
+1 (800) 721 3934

Copyright © 2013 Symantec Corporation. All rights reserved. Symantec and the Symantec logo are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners.