Support for NetBackup 7.x in virtual environments

Introduction

This tech note (TECH127089) describes support for NetBackup in virtual environments.

Symantec Corporation is committed to serving the virtualization and hypervisor market by offering our customers the benefits of NetBackup Enterprise data protection solutions. We welcome your feedback. Please contact your Symantec account representative for assistance.

http://www.netbackup.com

General NetBackup support in virtual environments

Ideally, every NetBackup configuration supported in a traditional physical environment would also be supported in any virtual environment without qualification. While that is our mission, it is not always possible.

Therefore, the purpose of this section is to:

■ Clarify differences between NetBackup support in physical vs. virtual environments.

■ Describe general guidelines for support in virtual environments.

■ Describe the impact of a virtual environment on specific NetBackup components, such as clients, servers, and other options.

■ Provide notes on virtualization technologies and links to related tech notes.

Terminology

The following terms are used in this document.

Table 1   Terminology

Term	Definition
Guest OS	The operating system that is installed in a virtual machine.
Hypervisor	The software platform running on a physical server that hosts one or more virtual machines.
Virtual machine	The emulation of a single physical machine within a hypervisor.

General guidelines for support

Symantec provides support for NetBackup within a virtual environment. For the purpose of this document, a "virtual environment" is defined as: any on-site, off-site, or public cloud IaaS virtualization solution where NetBackup can be installed into a supported guest operating system.

NetBackup has an open support policy for virtualization platforms, as follows:

■ NetBackup is qualified on physical configurations.

■ If the same configuration can be virtualized, it is supported without explicit qualification on the virtualization platform (unless otherwise noted in this document).

The published NetBackup software and hardware compatibility listings reflect this support policy. The listings are available here:

http://www.symantec.com/docs/TECH59978

Note the following limitations of NetBackup support within a virtual environment:

■ Support of hardware or software as published in the NetBackup compatibility listings is subject to mutual support by the hardware/software vendor and the hypervisor vendor.

Specifically:

■ The hardware/software vendors must support their products within the hypervisor.

■ The hypervisor vendor must support use of the hardware/software product within the hypervisor.

Such hardware/software products include operating systems, cluster servers, peripherals, drivers, patches, databases, applications, and so forth.

- When operating NetBackup within a virtual machine, the hypervisor may introduce conditions (such as contention for shared resources or other interruptions) that were not present during standard qualification. Additional tuning may be required to address any resulting delay, retry, or timeout conditions. Contact the hypervisor vendor first for tuning suggestions.

- NetBackup may experience lesser performance within the hypervisor. It may be necessary to increase system resources to address a performance issue.

- Using a hypervisor vendor's interface to suspend, resume, or otherwise disrupt execution of NetBackup is not supported. The impact upon NetBackup operations and data is unknown. Only NetBackup management interfaces are supported for NetBackup control.

- Using NetBackup within VM high availability, replication, or transfer solutions is supported but not qualified by Symantec. Examples of such solutions are vSphere HA, host-based replication, vMotion, and Storage vMotion (but not limited to VMware). As a virtualized application, NetBackup is unaware of being deployed within a VM, and support for such operations is provided by the hypervisor vendor.

- In the event of a support escalation, NetBackup technical support will make every reasonable attempt to resolve the issue within the virtual environment. In rare circumstances, Symantec reserves the right to qualify, limit, exclude, or discontinue implicit support for a NetBackup configuration due to unforeseen incompatibilities within the hypervisor environment. In the rare case of a NetBackup failure due to a hypervisor operation, it may be necessary to recover from a backup.

Virtual master server

The NetBackup master server is supported within a virtual machine, under the limitations described in the "General guidelines for support."

Refer to the following NetBackup Operating System compatibility document for a list of supported NetBackup 7.x master server platforms:

http://www.symantec.com/docs/TECH76648

Virtual media server

The NetBackup media server is supported within a virtual machine, under the limitations described in the "General guidelines for support."

The following storage units are supported within a virtual machine:

- Basic Disk

- AdvancedDisk

- Media Manager (tape storage units)
  For details on the supported virtualization technologies, see Table 2.

- Media Server Deduplication Pool (MSDP)
  For MSDP requirements, see the *NetBackup Deduplication Guide* and the
  following deduplication tech note:
  http://www.symantec.com/docs/TECH77575

- PureDisk Deduplication Pool (PDDO) including the Symantec NetBackup 5000
  Series Appliances.

- OpenStorage, where the Data Interface is Ethernet.
  For details on OpenStorage device compatibility, see the NetBackup 7.x
  Hardware Compatibility List:
  http://www.symantec.com/docs/TECH76495

For a list of supported NetBackup 7.x media server platforms, see the NetBackup
7 Operating System Compatibility List:

http://www.symantec.com/docs/TECH76648

Table 2   Virtualization technologies supported for Media Manager storage
units

Virtualization technology	Tape support	Notes
IBM virtual machines	Shared with driver, or dedicated hardware path.	The following document contains details on NetBackup support for IBM virtual machines: http://www.symantec.com/docs/TECH162738
HP-UX Integrity virtual machines and vPars	Shared with driver, or dedicated hardware path.	The following document contains details on NetBackup support for HP-UX Integrity virtual machines and vPars: http://www.symantec.com/docs/TECH162739
Hitachi Virtage LPARs	Dedicated or shared hardware path.	The following document contains details on NetBackup support for Hitachi virtual LPARs: http://www.symantec.com/docs/TECH199103

Table 2   Virtualization technologies supported for Media Manager storage units *(continued)*

Virtualization technology	Tape support	Notes
Oracle Solaris Logical Domains (LDOMs) and zones	See links under Notes.	The following documents contain details on NetBackup support for LDOMs and zones: http://www.symantec.com/docs/TECH162994 (for NetBackup 7) http://www.symantec.com/docs/TECH65627 (for NetBackup 6.5)

Hard partitioning physically segments a server, by taking a single large server and separating it into distinct systems. Each separated system acts as a physically independent, self-contained server, with its own CPUs, operating system, separate boot area, memory, input/output subsystem, and network resources.

Virtual clients and database agents

NetBackup operating system clients and database agents are supported within a virtual machine, under the limitations described in the "General guidelines for support."

Refer to the following NetBackup 7 Database Agent compatibility document for a list of supported NetBackup database agent platforms:

http://www.symantec.com/docs/TECH126904

Support for Red Hat Enterprise Virtualization

NetBackup can be used to protect virtual machines within Red Hat Enterprise Virtualization (RHEV) deployments and the RHEV Manager. For more information, see the following Red Hat Reference Architecture document:

Red Hat Enterprise Virtualization backup and recovery using NetBackup 7.5

Virtual PureDisk Remote Office Edition

The PureDisk operating system (PDOS) and PureDisk Remote Office Edition are supported within a virtual machine, under the limitations described in the "General guidelines for support."

Note:

■ Refer to the following for a list of supported NetBackup PureDisk Remote Office Edition platforms:

http://www.symantec.com/docs/TECH60158

■ For information on a VMware virtual machine that has PureDisk Remote Office Edition pre-installed, refer to the *Symantec NetBackup PureDisk Virtual Appliance Guide*.

Virtual Snapshot Client

This section describes the use of Snapshot Client when installed in a virtual machine.

Note however that NetBackup has special backup agents for VMware and Hyper-V that do not require installation of a client on virtual machines. See the NetBackup for VMware and NetBackup for Hyper-V sections in this document.

Support for VMware

NetBackup Snapshot Client can be used within a VMware virtual machine in conjunction with Raw Device Mapping (RDM) to provide off-host backup capabilities. Because of RDM limitations, other backup methods are not supported at this time. The following section contains more information:

Support for VMware raw device mapping (RDM)

Consult the following NetBackup 7.x Snapshot Client compatibility listing to determine which off-host combinations are supported:

http://www.symantec.com/docs/TECH126901

See also the following section for support information on NetBackup for VMware:

NetBackup for VMware Compatibility

Support for Hyper-V

NetBackup Snapshot Client can be used within a Hyper-V virtual machine in conjunction with Hyper-V pass-through disks to provide off-host backup of snapshots. The following section contains more information:

Support for Hyper-V pass-through disks

Consult the following NetBackup 7.x Snapshot Client compatibility listing to determine which off-host combinations are supported:

http://www.symantec.com/docs/TECH126901

See also the following section for support information on NetBackup for Hyper-V:

NetBackup for Hyper-V Compatibility

Support for Citrix XenServer

NetBackup supports backup and recovery of virtual machines in a Citrix XenServer virtualized environment, by means of a Snapshot Client off-host backup method. For a description of this backup approach, see the following document:

http://support.citrix.com/article/CTX122191

Bare Metal Restore

Due to the inherent physical dependencies in the Bare Metal Restore (BMR) option, BMR is not covered by the "General guidelines for support" section. Instead, BMR is explicitly qualified and supported within specific virtual environments, as noted below.

Note: BMR support for Windows 2008, 2008 R2, SLES 10, and SLES 11 began with NetBackup BMR 7.0.1.

- VMware: the BMR master server and boot server are supported on a guest OS. The BMR client is also supported on a guest OS.
  See "BMR client support details for VMware" on page 7.

- Windows Hyper-V: the BMR master server and boot server are supported on a Hyper-V guest OS. The BMR client is also supported on a guest OS.
  See "BMR client support details for Hyper-V" on page 8.

- Xen Hypervisor: the BMR master server and boot server are supported on a guest OS. The BMR client is also supported on a guest OS.
  See "BMR client support details for Xen" on page 9.

- Solaris Logical Domains (LDOMs): the BMR master server is supported in the LDOM Control Domain and on guest domains. The BMR client is supported on an LDOM guest domain that has UFS attached.
  See "BMR client support details for Oracle VM Server for SPARC" on page 10.

- IBM PowerVM: the BMR master server, boot server, and BMR client are supported on a guest OS.
  See "BMR client support details for IBM PowerVM" on page 11.

BMR client support details for VMware

The following table describes NetBackup 7.x support for the BMR client on VMware.

Table 3		VMware guest operating systems supported for BMR client

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?
Windows 2003 (32 and 64 bit) Windows 2008 SP1, SP2 (32-bit and 64-bit) Windows 2008 R2 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore	Yes
Red Hat Enterprise Linux 4 (64 bit) Red Hat Enterprise Linux 5 (64-bit) Red Hat Enterprise Linux 6 (64-bit) Oracle Enterprise Linux 4 (64-bit) Oracle Enterprise Linux 5 (64-bit) Oracle Enterprise Linux 6 (64-bit) SLES 10 SP3, SP4 SLES 11 GA and SP1	virtual-to-virtual self restore virtual-to-virtual DDR restore Support for physical-to-virtual DSR and virtual-to-physical DSR is subject to the conditions specified in the following BMR UNIX DSR tech note: http://www.symantec.com/docs/TECH62678	Yes
Solaris 10 Update 8, 9, and 10 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DDR restore Support for physical-to-virtual DSR and virtual-to-physical DSR is subject to the conditions specified in the following BMR UNIX DSR tech note: http://www.symantec.com/docs/TECH62678	Yes

BMR client support details for Hyper-V

The following table describes NetBackup 7.x support for the BMR client on Hyper-V.

Table 4   Hyper-V guest operating systems supported for BMR client

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?
Windows 2003 (32-bit and 64-bit) Windows 2008 SP1, SP2 (32-bit and 64-bit) Windows 2008 R2 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore Please refer to the following tech note before restoring Windows clients in Hyper-V environments: http://www.symantec.com/docs/TECH159025	Yes
Red Hat Enterprise Linux 4 (64-bit) Red Hat Enterprise Linux 5 (64-bit) Oracle Enterprise Linux 4 and 5 (64-bit) SLES 10 SP3 SLES 11 GA	virtual-to-virtual self restore virtual-to-virtual DDR restore Support for physical-to-virtual DSR and virtual-to-physical DSR is subject to the conditions specified in the following BMR UNIX DSR tech note: http://www.symantec.com/docs/TECH62678	Yes
Solaris 10 Update 8 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DDR restore	Yes

BMR client support details for Xen

The following table describes NetBackup 7.x support for the BMR client on Xen.

Table 5   Xen guest operating systems supported for BMR client

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?
Windows 2003 (32-bit and 64-bit) Windows 2008 SP1, SP2 (32-bit and 64-bit) Windows 2008 R2 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore	Yes

Table 5	Xen guest operating systems supported for BMR client *(continued)*	

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?
Red Hat Enterprise Linux 4 (64-bit) Red Hat Enterprise Linux 5 (64-bit) Oracle Enterprise Linux 4 and 5 (64-bit) SLES 11 GA and SP1	virtual-to-virtual self restore virtual-to-virtual DDR restore Support for physical-to-virtual DSR and virtual-to-physical DSR is subject to the conditions specified in the following BMR UNIX DSR tech note: http://www.symantec.com/docs/TECH62678	Yes
Solaris 10 Update 8 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DDR restore	Yes

BMR client support details for Oracle VM Server for SPARC

The following table describes NetBackup support for Oracle VM Server and BMR clients on Solaris 10 LDOM.

Table 6	BMR client support details for Oracle VM Server for SPARC (Solaris 10 LDOM)

NetBackup release	Support details
NetBackup 7.1	You can restore BMR clients configured on Solaris 10 LDOM as follows: ■ You can restore a BMR client that is installed on an LDOM guest domain that has UFS attached. ■ An LDOM guest domain that has UFS attached can be restored on another LDOM guest domain that is in the same primary domain. Note however that you can restore the backup of an LDOM guest domain only on a new LDOM guest domain that BMR has not already backed up. ■ An LDOM guest domain that has UFS attached can be restored on another LDOM guest domain in the DR site.

Table 6   BMR client support details for Oracle VM Server for SPARC (Solaris 10 LDOM) *(continued)*

NetBackup release	Support details
NetBackup 7.5	You can back up and restore BMR clients configured on Solaris 10 LDOM as follows: ■ You can back up and restore a BMR client that is installed on a LDOM guest domain that has UFS attached. ■ An LDOM guest domain that has UFS attached can be restored on another LDOM guest domain that is in the same primary domain. Note however that you can restore the backup of an LDOM guest domain only on a new LDOM guest domain that BMR has not already backed up. ■ An LDOM guest domain that has UFS attached can be restored on another LDOM guest domain in the DR site.

Please refer to the following tech note to import the original LDOM guest domain configuration:

Transferring Bare Metal Restore (BMR) data to an AIR/DR site

http://www.symantec.com/docs/HOWTO65776

BMR client support details for IBM PowerVM

The following table describes NetBackup 7.x support for the BMR client on IBM PowerVM (on IBM AIX guest operating systems).

Table 7   IBM AIX guest operating systems supported for BMR client

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?
AIX 6.1 TL6 AIX 7.1 TL0	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore is subject to the conditions specified in the following BMR UNIX DSR tech note: http://www.symantec.com/docs/TECH62678	Yes

Other NetBackup options

The following NetBackup options or features are supported in a virtual machine.

■ NetBackup OpsCenter (formerly NOM and VAR.)

Symantec professional services

Symantec professional services can be hired for qualification of a specific configuration of NetBackup within a hypervisor. Contact your Symantec account representative for assistance, or go to the following:

http://www.symantec.com/services

Links to related information

See the following Symantec documents for support and configuration information.

Table 8   Symantec documents related to virtualization

Document	Description and link
Main listing of NetBackup compatibility lists	Contains the entire listing for all NetBackup Server, NetBackup Enterprise Server, and NetBackup PureDisk Remote Office Edition compatibility lists available for 6.x and 7.x. Includes compatibility for hardware, operating systems, and agents and options, such as NDMP, databases, snapshots, and desktop/laptop. http://www.symantec.com/docs/TECH59978
NetBackup 7.1 for VMware Administrator's Guide	Describes how to configure and use NetBackup 7.1 for VMware to protect VMware virtual machines. http://www.symantec.com/docs/DOC3663
NetBackup 7.5 for VMware Administrator's Guide	Describes how to configure and use NetBackup 7.5 for VMware to protect VMware virtual machines. http://www.symantec.com/docs/DOC5162
NetBackup 7.1 for Hyper-V Administrator's Guide	Describes how to configure and use NetBackup 7.1 for Hyper-V to protect Hyper-V virtual machines. http://www.symantec.com/docs/DOC3662
NetBackup 7.5 for Hyper-V Administrator's Guide	Describes how to configure and use NetBackup 7.5 for Hyper-V to protect VMware virtual machines. http://www.symantec.com/docs/DOC5161

Table 8   Symantec documents related to virtualization *(continued)*

Document	Description and link
Citrix XenServer: Virtual Machine Backup	Describes a method of Windows virtual machine backup using NetBackup and the Citrix XenServer VSS Provider, which is supported by both Symantec and Citrix: http://support.citrix.com/article/CTX122191

NetBackup for VMware Compatibility

The following topics describe NetBackup for VMware support. NetBackup for VMware protects VMware virtual machines by integrating with VMware vStorage APIs for Data Protection.

Support for updates to vSphere and vCloud Director

VMware updates to vSphere 4 and 5 are supported, unless otherwise noted.

vCloud Director 5.1.x updates are supported, unless otherwise noted.

NetBackup feature support for vSphere and vCloud Director

The following table describes NetBackup support for vSphere and vCloud Director on a feature-by-feature basis.

Table 9   NetBackup support for vSphere and vCloud Director

NetBackup feature	vSphere	vCloud Director
NetBackup for VMware, including VM Intelligent Policy and all forms of recovery (VM, file, database, granular).	Yes	Yes
Accelerator for VMware	Yes	Yes
Replication Director for VMware	Yes	Yes
NetBackup Plug-in for vCenter	Yes	No
Instant Recovery for VMware	Yes	No
VM recovery command (nbrestorevm)	Yes	Yes

Support for vSphere 5.1 in NetBackup 7.5.0.5

NetBackup 7.5.0.5 supports backup and recovery of vSphere 5.1.

Note: vSphere 5.1 adds guest operating system support for Windows 8 and Windows Server 2012. In 7.5.0.5, NetBackup supports recovery of the entire virtual machine for those guest operating systems. File-level and application-level recovery will be supported in a future release.

Support for vSphere 5.1 in NetBackup 7.5.0.4

NetBackup 7.5.0.4 supports backup and recovery of vSphere 5.1.

The following issues will be resolved in a future release:

■ VM hardware version 9

In vSphere 5.1, the latest virtual machine hardware version is 9. NetBackup 7.5.0.4 does not recognize version 9, as follows:

■ When restoring to vCenter 5.1, virtual machines with hardware version 9 are restored with hardware version 8. To restore to version 9, use a VMware interface after recovery to upgrade the virtual machine to version 9.

■ When restoring to vCenter 5.1, virtual machines with hardware version 7 or earlier are restored with hardware version 8 if you do not select the NetBackup **Retain original hardware version** option. To restore to version 9, use a VMware interface after recovery to upgrade the virtual machine to version 9.

■ When building a query for automatic selection of virtual machines in the NetBackup VMware policy, the virtual machine version "vmx-09" is not recognized. As a workaround, use a query that specifies vmx-08, such as `VMVersion Greater "vmx-08"`.

For a description of VMware version numbers, see the section on virtual machine compatibility in the following VMware document:
What's New in VMware vSphere 5.1 – Platform
The VMware document explains how to set a default virtual machine compatibility level (for a hardware version other than 9).

■ Windows 8 and Windows Server 2012 guest operating systems
vSphere 5.1 adds guest operating system support for Windows 8 and Windows Server 2012. At this time, NetBackup supports recovery of the entire virtual machine for those guest operating systems. File-level and application-level recovery will be supported in a future release.

Support for vSphere 5.0 in NetBackup 7.1.0.3 and later

NetBackup 7.1.0.3 adds support for vSphere 5.0, including support for datastore clusters. This feature also includes support for Linux vCenter 5.0.

For a vSphere 5 environment, you must upgrade your VMware backup hosts (NetBackup clients) to 7.1.0.3 or later.

Phasing out support for VCB in NetBackup 7.5

For NetBackup 7.5 environments (master server, media server, and backup host all at 7.5), VCB backups are not supported. VCB backups are supported only when the backup host (NetBackup client) is 7.1 or earlier. For VCB-based backups with 7.1 or earlier backup hosts, you can use the FlashBackup-Windows policy type as described in the *NetBackup for VMware Administrator's Guide*, version 7.1 or 7.0.

VCB restores are still supported for 7.5 clients, but will be discontinued in a future release.

NetBackup will discontinue all VCB support in a future release. Upgrading to vStorage is recommended.

Phasing out support for VCB file-level backups in NetBackup 7.5

VCB supports the ability to back up individual files in a Windows virtual machine. NetBackup no longer supports backup of individual files, as part of phasing out VCB support.

A NetBackup 7.1 (or earlier) Windows client can be used as the backup host to support file-level backup of a Windows virtual machine. Or, a NetBackup 7.5 Windows client can be installed in the Windows virtual machine to perform file-level backup.

Support for vStorage APIs for Data Protection (VADP)

NetBackup 7.x for VMware includes vStorage, and automatically uses the vStorage APIs.

Table 10   VMware versions that NetBackup 7.x supports

NetBackup release	Range of VMware versions supported **All versions in the range are supported**
7.0, 7.0.1, 7.1	ESX 3.5 U2 to ESX/ESXi 4.x VirtualCenter 2.5 U1 to vCenter Server 4.x

Table 10   VMware versions that NetBackup 7.x supports *(continued)*

NetBackup release	Range of VMware versions supported **All versions in the range are supported**
7.1.0.3 or later	ESX 3.5 U2 to ESXi 5.0 VirtualCenter 2.5 U1 to vCenter Server 5.0
7.5, 7.5.0.x	ESX 3.5 U2 to ESXi 5.0 VirtualCenter 2.5 U1 to vCenter Server 5.0
7.5.0.4, 7.5.0.5	ESX 3.5 U2 / VirtualCenter 2.5 U1 to vSphere 5.1

Note the following:

- For vSphere 4.1, NetBackup 7.0.1 does not support the NBDSSL transport type. NetBackup 7.0.1 does not support hotadd backup or restore with ESX/ESXi 4.1.

- VMware version information was obtained from the VMware Product Interoperability Matrix, and is subject to change by VMware. For the latest information, see the following:
  http://www.vmware.com/resources/compatibility/sim/interop_matrix.php

- Unless otherwise stated, NetBackup for VMware supports VMware updates.

Supported platforms for the VMware backup host and backup media server

NetBackup for VMware requires a NetBackup client installed on the backup host and on the optional backup media server. The same requirement applies to the NetBackup restore host.

Only the following platforms are supported for the backup host and backup media server.

Note: In a future vSphere release, VMware will no longer support 32-bit Windows platforms as a backup host or backup media server.

Table 11   Supported platforms for backup host and backup media server

Platform	Notes
Windows Server 2003 (32 and 64 bit)	
Windows Server 2003 R2 (32 and 64 bit)	

Table 11   Supported platforms for backup host and backup media server *(continued)*

Platform	Notes
Windows Server 2008 (32 and 64 bit)	
Windows Server 2008 R2 (64 bit)	
Windows Server 2012 (64bit)	Support is planned for the NetBackup 7.6 release.
RHEL 5.5 (64bit) RHEL 6.3 (64bit)	Requires NetBackup 7.5.0.5 or later.
SUSE 10 SP4 (64bit) SUSE 11 (64bit) SP1 and SP2	Requires NetBackup 7.5.0.3 or later. See "NetBackup appliance as backup host" on page 20.

Note: NetBackup supports installation of the backup host in a virtual machine (VMware "hotadd"). The guest operating systems that NetBackup supports for hotadd are the same as the above.

Supported VMware guest operating systems

NetBackup for VMware supports virtual machine backup and recovery on all guest operating systems supported by VMware. To check VMware support for a particular operating system, consult the VMware Compatibility Guide:

http://www.vmware.com/resources/compatibility/search.php?deviceCategory=software

Note also that NetBackup for VMware supports file-level recovery from a virtual machine backup on the following guest operating systems.

Table 12   VMware guest operating systems supported for file-level recovery

VMware guest OS	Notes
Windows 7 (32bit/64bit)	
Windows Vista (32bit/64bit)	
Windows XP (32bit/64bit)	Windows XP 64 bit requires VMware Tools 3.0.1 (not supported with 3.0.2).
Windows 2008 R2 (64bit)	Supported for vStorage but not for VCB.

Table 12   VMware guest operating systems supported for file-level recovery
(continued)

VMware guest OS	Notes
Windows 2008 (32bit/64bit)	
Windows 2003 R2 (32bit/64bit)	
Windows 2003 (32bit/64bit)	
Windows 2000 (32bit)	
RHEL 4 (32bit*/64bit)	
RHEL 5 (32bit*/64bit)	
RHEL 6 (32bit*/64bit)	Requires NetBackup 7.5 **Note:** File-level recovery is not supported for virtual machine disks that are partitioned with the GUID Partition Table (GPT).
SUSE 10 (32bit*/64bit)	
SUSE 11 (32bit*/64bit)	

* NetBackup 7.x no longer includes Linux 32-bit clients. Consequently, file-level restore directly to the Linux 32-bit virtual machine is not possible. As an alternative, you can perform a file-level restore to network shared storage. Recovery of the entire virtual machine is supported for both 32-bit and 64-bit Linux virtual machines.

For guest operating systems not listed in the table, you can recover the entire virtual machine but not individual files.

Supported file systems for VMware

NetBackup 7.5 contains a new policy type called **VMware**. The NetBackup **VMware** policy type presents all backup options on a new **VMware** tab.

Note: On the **VMware** tab, the older **Full VM backup** and **Mapped full VM backup** options in NetBackup 7.1 are combined in a single option: **Enable file recovery from VM backup**. Selecting this option is the equivalent of the **Mapped full VM backup** option in NetBackup 7.1.

The following tables list the supported file systems, by policy type.

Table 13   Supported file systems for the VMware policy type (requires NetBackup 7.5 master server)

File system	"Enable file recovery from VM backup" option supported	Notes
ReFS (Windows 2012)		Planned for a future release
NTFS (Windows NT)	No	
NTFS (Windows 2000 and later)	Yes	Supports these partition tables: ■ Master Boot Record (MBR) ■ GUID Partition Table (GPT)
FAT (all Windows versions)	Yes	
ext2, ext3, ext4	Yes	Does not support GUID Partition Table (GPT). LVM2 volume manager is also supported. Support for ext4 starts at RHEL 5.4 and SUSE 11.
Other (any VMware guest OS)	No	

Table 14   Supported file systems for the FlashBackup-Windows policy type

File system	Supported backup types	Notes
ReFS (Windows 2012)		Planned for a future release
NTFS (Windows 2000 and later)	**Full backup with file level incremental**, **Full VM backup**, **Mapped full VM backup**.	All features of NetBackup for VMware are supported. Supports these partition tables: ■ Master Boot Record (MBR) ■ GUID Partition Table (GPT)
NTFS (Windows NT)	**Full VM backup**.	

Table 14   Supported file systems for the FlashBackup-Windows policy type
(continued)

File system	Supported backup types	Notes
FAT (all Windows versions)	**Full VM backup**, **Mapped full VM backup**.	**Mapped full VM backup** is supported on Windows 2000 and later.
ext2, ext3, ext4	**Full VM backup**, **Mapped full VM backup**	Does not support GUID Partition Table (GPT) LVM2 volume manager is also supported. ext4 requires NetBackup 7.5. Support for ext4 starts at RHEL 5.4 and SUSE 11.
Other (Any VMware guest OS)	**Full VM backup**.	

Note: The policy backup selections must specify ALL_LOCAL_DRIVES. However, if a NetBackup client is installed in the virtual machine, you have the option of backing up individual drives.

NetBackup appliance as backup host

Starting with the NetBackup appliance version 2.5, the appliance is supported as the VMware backup host. A separate Windows host is not required for the backup host.

For further information on the appliance as backup host, see the *NetBackup for VMware Administrator's Guide 7.5.0.x*:

http://www.symantec.com/docs/DOC5605

Note the following:

- The appliance must be version 2.5 or later. If the master server is on a separate host (not on the backup host), the master server must use NetBackup 7.5.0.1 or later.

- On the host that runs the NetBackup Administration Console or the Backup, Archive, and Restore interface, NetBackup must be at 7.5.0.1 or later.

- You must use the VMware policy type. The FlashBackup-Windows policy type is not supported.

■ The appliance does not support iSCSI connections.

NetBackup for VMware on a Linux backup host does not support multipathing with SAN transport

NetBackup for VMware on Windows supports multiple SAN paths between the vSphere ESXi storage and the NetBackup for VMware agent (backup host). Multiple paths can provide SAN I/O high-availability and higher backup throughput.

With a Linux backup host, NetBackup for VMware is unable to support multipathing, because of incompatibilities in the following: the Linux operating system, VMware vStorage APIs for Data Protection, and vendor-specific DMP solutions.

As a result, NetBackup for VMware cannot support multipathing with a Linux backup host that is on any of the following platforms:

■ NetBackup 52x0 Appliance

■ NetBackup for VMware on SLES

■ NetBackup for VMware on RHEL

Support for multipathing with Linux backup hosts may be included in a future release.

Note the following:

■ This issue does not affect NetBackup support for VMware's Native Multipathing (NMP). NMP is multipathing between the ESXi host and storage.

■ This issue does not affect NetBackup for VMware on Windows backup hosts. The Windows OS has integrated multipathing support. The following Microsoft guide contains more information:
http://microsoft.com/mpio

Guidelines for using NetBackup with vCloud Director

NetBackup 7.x can protect virtual machines that are provisioned by vCloud Director (vCD). At present, NetBackup is not directly integrated with vCloud Director, but NetBackup can back up and recover vCloud virtual machines within vSphere.

To protect virtual machines that are provisioned by vCloud Director, NetBackup 7.1.0.4 or later is required.

Follow these guidelines to protect virtual machines within the vCloud provider's vSphere infrastructure:

| | Table 15 | Guidelines for using NetBackup with vCloud Director |

NetBackup operation	Description and notes
Backup	■ NetBackup 7.1: In the NetBackup policy, set the **Client name selection** option to **VM display name**. NetBackup 7.5: In the NetBackup policy, set the **Primary VM identifier** option to **VM display name**. ■ When you create a virtual machine in a vApp, enter complete, descriptive names for the virtual machine. Do not rely on the GUID-based template names. A detailed name makes it easier to identify a particular virtual machine. ■ vCloud organizations map to vSphere resource pools. This mapping may influence your backup selections in the NetBackup policy.
Restore	■ Use the NetBackup Backup, Archive, and Restore interface to recover the virtual machine to an alternate location. See "Recovering virtual machines provisioned by vCloud Director" on page 22. ■ When you restore virtual machines previously associated with a linked clone, the restored image does not take advantage of linked clones or shadow copies. As a result, the restored image may require more storage than the original image.

Note: A future release of NetBackup will integrate directly with vCloud Director (plans are subject to change).

Recovering virtual machines provisioned by vCloud Director

The following procedure ensures that vCloud Director is aware of the recovered virtual machine.

To recover virtual machines provisioned by vCloud Director

1   Use the NetBackup Backup, Archive, and Restore interface to restore the
    virtual machine to a vCenter server accessible to the vCloud Director
    infrastructure.

    On the Recovery Destination dialog, under **Recover virtual machine to**, select
    Alternate location. Do not restore the virtual machine to its original location.
    vCloud cannot import a virtual machine from that location.

    Note: Restore the virtual machine to a datastore that was configured for the
    provider vDC on which the organization vDC is based.

    For complete instructions on how to restore virtual machines to an alternate
    location, see the *NetBackup for VMware Administrator's Guide*.

2   Log into vCloud Director as the vCloud administrator.

3   Go to your Organization vDC and import the virtual machine as a new vCloud
    vApp from the **Import from vSphere** icon.

    Select **Move VM**. (Do not select **Copy VM**: that option leaves a copy of the
    virtual machine in the source vSphere.)

    Note: Do not try to overwrite the original virtual machine. To replace the
    corrupt virtual machine, use the following steps.

    ---

4   Make a note of the name and network settings of the corrupt virtual machine
    and delete it from the vApp.

5   Move the recovered virtual machine from the newly created vApp to the
    original vApp.

6   Set the appropriate virtual machine name and network details in the Move
    Virtual Machine wizard.

7   You can now delete the newly created vApp.

NetBackup support for automatic virtual machine selection

NetBackup 7.1 and later can automatically select virtual machines for backup by
means of rules configured in the policy. The NetBackup policy Clients tab includes
a Query Builder for creating the rules.

Note the following requirements:

■ NetBackup 7.1 or later is required for the master server, media server, and the VMware backup host.

■ Automatic virtual machine selection is not supported in VCB environments. vStorage is required.

■ To function correctly, certain **Field** keywords in the Query Builder require vSphere version 4.0 or later. These keywords were added in NetBackup 7.5. See the following table.

Table 16   Minimum vSphere version for Query Builder keywords added in NetBackup 7.5

Field keywords in Query Builder	Minimum version of vSphere required
DatastoreFolder	vSphere 4.0
DatastoreNFSHost	
DatastoreNFSPath	
DatastoreType	
NetworkFolder	
VMXDatastoreFolder	
VMXDatastoreNFSHost	
VMXDatastoreNFSPath	
VMXDatastoreType	
DatastoreCluster	vSphere 5.0

All other keywords have the same vSphere requirements as NetBackup for vStorage.

See "Support for vStorage APIs for Data Protection (VADP)" on page 15.

Support for ESX and ESXi

NetBackup for VMware supports both ESX and ESXi servers. In this document, any reference to ESX also refers to ESXi. Note however that VMware no longer supports ESX in the latest versions of vSphere.

Because NetBackup for VMware leverages vStorage APIs for Data Protection, there are no NetBackup support restrictions for ESX or ESXi servers.

Support for configuring thin provisioned virtual disks on restored virtual machines

NetBackup 7.1 includes a restore option called **Create thin provisioned disks**.

In NetBackup 7.5, this option is named **Thin provisioning**.

This option configures the restored virtual machine with thin provisioned disks, even if the original virtual machine used thick provisioning at the time of the backup. The ability to create thin provisioned disks depends on the release level of the VMware server on which the virtual machine is restored, as described in the following table.

Table 17   NetBackup support for creation of thin provisioned virtual disks in restored virtual machine

Release level of destination server for restore	Can configure restored virtual machine to have thin provisioned virtual disks
vCenter server 4.0 or later with any version of ESX	Yes
VirtualCenter server 2.5 with ESX 3.5	Yes
VirtualCenter server 2.5 with ESX 3.0.2	Yes
ESX 4.0 or later (*standalone)	Yes
ESX 3.5 (*standalone)	Yes
ESX server earlier than 3.5 (*standalone)	No. Thin provisioning requires vStorage, which does not work with standalone ESX servers older than 3.5.

*standalone means the ESX server is not managed by a vCenter or VirtualCenter server.

Support for VMware raw device mapping (RDM)

Raw device mapping allows a non-VMDK disk to be accessed by the guest OS. To back up a raw mapped device (RDM), you must install NetBackup client software in the virtual machine. Any device that NetBackup supports in a physical (non hypervisor) environment is supported for RDM, provided that the device vendor supports the device in a virtual environment.

For environments that require VCB: with versions of VCB that are earlier than 1.5, a NetBackup backup of a virtual machine fails if the virtual machine uses raw

device mapping. At VCB 1.5, NetBackup can back up the virtual machine successfully, but the raw mapped device is not included in the backup.

For more information on using NetBackup to back up a disk in RDM mode, refer to the "Backup of VMware raw devices (RDM)" appendix of the *NetBackup for VMware Administrator's Guide*.

Backup of the ESX host by means of the ESX console is not supported

NetBackup 6.x supported the backup of the ESX host by means of a NetBackup Linux client installed on the ESX host. Since VMware is discontinuing this capability, NetBackup 7.x does not support backup of the ESX host in this manner.

To back up VMware virtual machines, you can use either of the following:

■ NetBackup for VMware, as described in the *NetBackup for VMware Administrator's Guide*.

■ As an alternative, you can install NetBackup clients in the virtual machines.

NetBackup 7.0.1 for VMware supports vSphere 4.1 but not the NBDSSL transfer type

NetBackup 7.0.1 adds support for VMware vSphere 4.1 but does not support the NBDSSL transfer type.

You can select NBDSSL as the transfer type in the NetBackup 7.0.1 graphical interfaces. However, support for NBDSSL varies, as follows:

■ Backup of a virtual machine that is earlier than VMware 4.1 is supported with the NBDSSL transfer type.

■ Backup of a 4.1 or later virtual machine is not supported with the NBDSSL transfer type (the backup fails).

■ Restore of a virtual machine (any VMware level) with the NBDSSL transfer type is not supported (the restore fails).

Note: For full support of vSphere 4.1 (including the NBDSSL transfer type), you should upgrade to NetBackup 7.1.

NetBackup 7.0 and 7.0.1: Hotadd backup or restore fails if the backup or recovery host (virtual machine) is hosted on ESX/ESXi 4.1

A backup or restore using the hotadd transfer type fails if the ESX/ESXi server is 4.1. (Hotadd transfer is used when the VMware backup host or restore host is

installed in a virtual machine.) VMware has reported this problem in SR# 1557258751.

The hotadd backup or restore fails with NetBackup status code 23. The detailed status log includes a message similar to the following:

```
ERR -Error opening the snapshot disks using given
transport mode: Status 23
```

As a workaround, use a backup or restore host that resides on an ESX/ESXi server at 4.0 or earlier.

In NetBackup 7.1, hotadd backups and restores with ESX/ESXi 4.1 work correctly.

Support for VMware VCB and vCenter Converter

Note: Support for VCB will be discontinued in the next major release of NetBackup. vStorage replaces VCB.

NetBackup 7.x attempts to use VMware Consolidated Backup (VCB) and Converter when operating with the following:

■ ESX Server versions earlier than 3.5, or

■ VirtualCenter Server versions earlier than 2.5

Table 18   NetBackup 7.x support for VMware VCB

Earliest VMware version supported	Latest VMware version supported	Notes
VCB 1.5 U1 ESX 3.5 U5 vCenter Server 2.5 U6 Converter standalone 3.0.2 U1	VCB 1.5 U2 ESX 4.1 vCenter Server 4.1 Converter standalone 4.3	Both ESX and ESXi are supported

Note: VMware version information was obtained from the following VMware document:

http://www.vmware.com/pdf/vsphere4/r40/vsp_compatibility_matrix.pdf

Important notes on VCB

■ Consult the VMware VCB release notes for compatible versions of VMware ESX Server and VirtualCenter Server:

http://www.vmware.com/download/vi/

Note, for example, that VCB 1.5 is not compatible with ESX 3.0.1 and earlier.

■ Before VCB 1.5 Update 1, VMware classifies VCB on Windows 2008 as "experimental."

■ Since NetBackup for VMware can use the VCB framework for creating snapshots, all VCB-specific limitations in creating snapshots apply to NetBackup for VMware as well.

For a list of these limitations, refer to the *Virtual Machine Backup Guide* from VMware:

http://www.vmware.com/pdf/vi3_35/esx_3/r35/vi3_35_25_vm_backup.pdf

Important notes on Converter

Note the following VMware compatibility issues:

■ VMware Converter 3.0.3 should not be used for automated restore: version 3.0.3 returns successful status even if the restore failed.

■ VMware Converter 4.0 is not compatible with VCB backups and should not be used.

■ For automated restore: A backup of a virtual machine that was on an ESX 3.5 server cannot be restored with VMware Converter 4.0.1. You must use VMware Convertor 3.0.2 Update 1. This restriction applies to the automated restore option on the NetBackup Restore Marked Files dialog: **Restore all virtual machine files to a virtual machine server automatically using VMware Converter**.

■ A backup of an ESX 3.5 or 4.0 virtual machine can be restored directly to the same ESX server (bypassing the VMware VirtualCenter). You can specify either the ESX server or the VirtualCenter as the **Virtual machine server** on the NetBackup Restore Marked Files dialog. To restore directly to the ESX server, you must use VMware Converter 3.0.2 Update 1.

NetBackup VCB-based file-level backups may fail

Due to an error identified by VMware, NetBackup VCB file-level backups may fail in the following case:

■ The guest OS is not installed on the virtual machine's first virtual hard disk.

■ The NetBackup Virtual machine backup option is **File level snapshot using VCB** or **Full backup with file level incremental**.

The backup job fails with status 156 (snapshot creation failed), and the following error may appear in the NetBackup bpfis log:

```
'vcbMounter' 636 error] Error: Cannot query guest OS information.
The mount directory path is invalid.
```

Note: The NetBackup Release Notes for 7.0.1 incorrectly state that this issue is limited to the Windows 2008 R2 or Windows 7 guest operating systems. The issue can occur with any operating system.

For more details on this issue from the VMware perspective, refer to the following VMware VCB documentation:

http://www.vmware.com/support/vsphere4/doc/vsp_vcb_15_u1_rel_notes.html

http://www.vmware.com/support/vsphere4/doc/vsp_vcb_15_u2_rel_notes.html

NetBackup for Hyper-V Compatibility

This section provides support information on NetBackup for Hyper-V. NetBackup for Hyper-V provides snapshot-based backup of virtual machines that run on Windows Hyper-V Server.

Note: Before configuring NetBackup for Hyper-V, make sure that you have Windows and the Hyper-V role installed correctly. Refer to your Windows and Hyper-V documentation and Hyper-V release notes for requirements and installation instructions.

Supported components and versions

NetBackup for Hyper-V supports the following environments.

Table 19　　　　Components supported for Hyper-V

Components	What is supported
Hyper-V	Windows Server 2008, Windows Server 2008 R2.
Failover Cluster	Windows Server 2008, Windows Server 2008 R2

Table 19   Components supported for Hyper-V *(continued)*

Components	What is supported
VSS providers	NetBackup for Hyper-V has an open support policy for VSS providers, as described in the NetBackup Snapshot Client Compatibility Listing: http://www.symantec.com/docs/TECH126901 NetBackup for Hyper-V is supported on the Windows versions noted in this table. Any vendors that support VSS snapshot providers on those versions are supported for NetBackup for Hyper-V.
CSV-based virtual machine backups	Certified with "System Provider."

Supported Hyper-V guest operating systems

NetBackup for Hyper-V supports virtual machine backup and recovery on all guest operating systems supported by Hyper-V. For a list of operating systems that Hyper-V supports, consult the following:

http://support.microsoft.com/kb/954958

Note also that NetBackup for Hyper-V supports file-level recovery from a virtual machine backup on the following operating systems.

Table 20   Hyper-V guest operating systems supported for file-level recovery

Hyper-V guest OS	Notes
Windows 7	Support for Windows 7 begins at NetBackup 7.0.1.
Windows Vista (32bit/64bit)	
Windows XP (32bit/64bit)	
Windows 2008 R2 (64bit)	
Windows 2008 (32bit/64bit)	
Windows 2003 R2 (32bit/64bit)	
Windows 2003 (32bit/64bit)	
Windows 2000 (32bit)	

Table 20   Hyper-V guest operating systems supported for file-level recovery *(continued)*

Hyper-V guest OS	Notes
RHEL 4 (32bit*/64bit)	ext2, ext3 file systems, LVM2 volume manager
RHEL 5 (32bit*/64bit)	ext2, ext3, ext4 file systems, LVM2 volume manager. Support for ext4 starts at RHEL 5.4 and requires NetBackup 7.5.
RHEL 6 (32bit*/64bit)	Same as RHEL 5. RHEL 6 requires NetBackup 7.5.
SUSE 10 (32bit*/64bit)	Same as RHEL 4.
SUSE 11 (32bit*/64bit)	Same as RHEL 5. Support for ext4 starts at SUSE 11 and requires NetBackup 7.5.

* NetBackup 7.x no longer includes Linux 32-bit clients. Consequently, file-level restore directly to the Linux 32-bit virtual machine is not possible. As an alternative, you can perform a file-level restore to network shared storage. Recovery of the entire virtual machine is supported for both 32-bit and 64-bit Linux virtual machines.

Support for Hyper-V pass-through disks

To back up Hyper-V pass through disks, you must install NetBackup client software in the virtual machine. You can perform the backup with or without the features of Snapshot Client.

Any device that NetBackup supports in a physical (non hypervisor) environment is supported for pass through disks, provided that the device vendor supports the device in a virtual environment. For a hardware snapshot of an array configured as a pass-through device, only off-host alternate client backup is supported (requires Snapshot Client).

Note: NetBackup does not support point in time rollback for arrays that are configured as pass-through devices.

For more information on using NetBackup to back up Hyper-V pass through disks, refer to the "Hyper-V pass-through disks" appendix of the *NetBackup for Hyper-V Administrator's Guide*.

Use of a volume GUID path requires NetBackup 7.0.1 or later

NetBackup 7.0.1 adds support for volume GUID paths. The following is an example of a volume GUID path:

```
\\?\Volume{26a21bda-a627-11d7-9931-806e6f6e6963}\
```

To back up volume GUID paths that exist in your Hyper-V environment, you must install NetBackup 7.0.1 or a later release.

Note on VSS and disk arrays

To use a hardware array snapshot, make sure that the hardware array's VSS provider supports snapshots that involve the Hyper-V writer. Check the release notes of the array vendor or VSS provider.