Support for NetBackup 7.x and 8.x in virtual environments

Introduction

This tech note (http://www.veritas.com/docs/000006177) describes the general support guidelines for NetBackup 7.x and 8.x in virtual environments. It also provides notes on NetBackup 7.x and 8.x support for VMware and Hyper-V.

For detailed information on supported VMware and Hyper-V environments, refer to the "Virtual Systems Compatibility" section of the *NetBackup Software Compatibility List* (SCL), available from this location:

NetBackup Master Compatibility List

Veritas 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 Veritas account representative for assistance.

http://www.netbackup.com

Recent changes to this tech note

Table 1 Recent changes to this tech note

Description of changes	Publication date for this change
Added support details on NetBackup 8.0 for Hyper-V and VMware. See "Supported guest operating systems for VMware" on page 20. See "Supported file systems for VMware" on page 22. See "Notes on the new Hyper-V features in NetBackup 8.0" on page 33. See "Supported guest operating systems for Hyper-V" on page 35.	December 5, 2016
Added Windows 10 and SUSE 12 to the list of VMware guest operating systems supported for file-level recovery. See "Supported guest operating systems for VMware" on page 20.	February 4, 2016
Updates for NetBackup 7.7.2: ■ BMR client for VMware and Hyper-V adds support for Windows 10 and SUSE 12. ■ BMR client for VMware adds support for ESX 6.0. ■ BMR client for Xen adds support for Oracle Enterprise Linux 6. ■ BMR direct VM conversion into VMware adds support for Windows 10 with VMware ESX/vCenter 6.0. See "Bare Metal Restore (BMR) for virtual environments" on page 7.	January 30, 2016
Updates for NetBackup 7.7.1: ■ BMR client for IBM PowerVM adds support for AIX 6.1 TL9 and AIX 7.1 TL3. See "BMR client support for IBM PowerVM (NetBackup 7.x)" on page 17.	January 30, 2016

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 2 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 (VM)	The emulation of a single physical machine within a hypervisor.

General guidelines for support

Veritas 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.veritas.com/docs/000033647

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 Veritas. 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, Veritas 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 NetBackup Software Compatibility lists for supported NetBackup master server platforms:

http://www.veritas.com/docs/000033647

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 3.
- Media Server Deduplication Pool (MSDP)
  For MSDP requirements, see the *NetBackup Deduplication Guide* and the following deduplication tech note:
  http://www.veritas.com/docs/000041111
- OpenStorage, where the Data Interface is Ethernet.
  For details on OpenStorage device compatibility, see the *NetBackup Hardware Compatibility List* (HCL):
  http://www.veritas.com/docs/000033647

For a list of supported NetBackup media server platforms, see the *NetBackup Software Compatibility List* (SCL):

http://www.veritas.com/docs/000033647

Table 3 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.veritas.com/docs/000082814
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.veritas.com/docs/000082815
Hitachi Virtage LPARs	Dedicated or shared hardware path.	The following document contains details on NetBackup support for Hitachi virtual LPARs: http://www.veritas.com/docs/000094965

Table 3 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: For NetBackup 7.x and 8.x: http://www.veritas.com/docs/000082869 For NetBackup 6.5: http://www.veritas.com/docs/000036273

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 NetBackup *Application/Database Agent Compatibility List* for a list of supported NetBackup database agent platforms:

http://www.veritas.com/docs/000033647

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:

https://access.redhat.com/articles/340293

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:

See "Support for VMware raw device mapping (RDM)" on page 30.

Consult the NetBackup *Snapshot Client Compatibility List* to determine which off-host combinations are supported:

http://www.veritas.com/docs/000033647

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

See "NetBackup for VMware Compatibility" on page 20.

Support for Hyper-V

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

See "Support for Hyper-V pass-through disks" on page 40.

Consult the NetBackup *Snapshot Client Compatibility List* to determine which off-host combinations are supported:

http://www.veritas.com/docs/000033647

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

See "NetBackup for Hyper-V Compatibility" on page 32.

Bare Metal Restore (BMR) for virtual environments

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 listed below.

Note: For general BMR support details such as the minimum NetBackup level required for the BMR client OS, see the Bare Metal Restore section of the NetBackup *Software Compatibility List* (SCL) available here:

http://www.veritas.com/docs/000033647

- VMware: The BMR master server, BMR boot server, and BMR client are supported on VMware guest operating systems.

See "BMR client support for VMware" on page 8.
See "BMR Direct VM Conversion support" on page 17.

- Windows Hyper-V: The BMR master server, BMR boot server, and BMR client are supported on Hyper-V guest operating systems.
  See "BMR client support for Hyper-V" on page 11.
- Xen Hypervisor: For NetBackup 7.x, the BMR master server, BMR boot server, and BMR client are supported on Xen guest operating systems.

  Note: Starting at NetBackup 8.0, BMR for Xen is no longer supported.

  See "BMR client support for Xen (NetBackup 7.x)" on page 16.
- IBM PowerVM: For NetBackup 7.x, the BMR master server, BMR boot server, and BMR client are supported on guest operating systems.

  Note: Starting at NetBackup 8.0, BMR for IBM PowerVM is no longer supported.

  See "BMR client support for IBM PowerVM (NetBackup 7.x)" on page 17.

BMR client support for VMware

NetBackup supports BMR protection for guest operating systems running on VMware ESX 4.1, 5.0, 5.1, 5.5, and 6.0 servers. The following tables describe support for the BMR client on VMware in NetBackup 8.x and 7.x, respectively.

NetBackup 8.x: VMware guest operating systems supported for BMR client

Table 4 NetBackup 8.x: VMware guest operating systems supported for BMR client

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

Table 4 NetBackup 8.x: VMware guest operating systems supported for BMR client *(continued)*

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Windows Server 2008 R2 (64-bit)	Same as Windows Server 2008 SP1	Yes	
Windows Server 2012 (64-bit)	Same as Windows Server 2008 SP1	Yes	
Windows Server 2012 R2 (64-bit)	Same as Windows Server 2008 SP1	Yes	
Windows 7 (64-bit)	Same as Windows Server 2008 SP1	No	
Windows 8 (64-bit)	Same as Windows Server 2008 SP1	No	
Windows 8.1 (64-bit)	Same as Windows Server 2008 SP1	No	
Windows 10 (64-bit)	Same as Windows Server 2008 SP1	No	
Red Hat Enterprise Linux 5, 6, 7 (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 BMR Dissimilar System Restore for UNIX tech note: DSR for UNIX	Yes	8.0 for BMR client for RHEL 7.0, 7.1, and 7.2 guest operating systems on virtual machines that have EFI firmware.
Oracle Enterprise Linux 5, 6, 7 (64-bit)	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 11 SP3	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 12 GA and SP1	Same as Red Hat	Yes	
Solaris 10 Update 8, 9, 10, 11 (64-bit)	Same as Red Hat	Yes	

NetBackup 7.x: VMware guest operating systems supported for BMR client

Table 5 NetBackup 7.x: VMware guest operating systems supported for BMR client

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Windows Server 2003 (32-bit and 64-bit)	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore	Yes	
Windows Server 2008 SP1, SP2 (32-bit and 64-bit)	Same as Windows Server 2003	Yes	
Windows Server 2008 R2 (64-bit)	Same as Windows Server 2003	Yes	
Windows Server 2012 (64-bit)	Same as Windows Server 2003	Yes	
Windows Server 2012 R2 (64-bit)	Same as Windows Server 2003	Yes	
Windows 7 (32-bit and 64-bit)	Same as Windows Server 2003	No	
Windows 8 (32-bit and 64-bit)	Same as Windows Server 2003	No	
Windows 8.1 (32-bit and 64-bit)	Same as Windows Server 2003	No	
Windows 10 (32-bit and 64-bit)	Same as Windows Server 2003	No	7.7.2
Red Hat Enterprise Linux 4, 5, 6, 7 (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 BMR Dissimilar System Restore for UNIX tech note: DSR for UNIX	Yes	7.7 for RHEL 7
Oracle Enterprise Linux 4, 5, 6, 7 (64-bit).	Same as Red Hat	Yes	7.7.3 for Oracle Linux 7, Update 1 and Update 2

Table 5 NetBackup 7.x: VMware guest operating systems supported for BMR client *(continued)*

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
SUSE Linux Enterprise Server 10 SP3, SP4	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 11 GA and SP1, SP2, SP3	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 12	Same as Red Hat	Yes	7.7.2
Solaris 10 Update 8, 9, 10, 11 (64-bit)	Same as Red Hat	Yes	

The following section contains information on BMR Direct VM conversion for VMware:

See "BMR Direct VM Conversion support" on page 17.

BMR client support for Hyper-V

NetBackup supports BMR protection for guest operating systems running on Windows 2008, 2008 R2, 2012, and 2012 R2 Hyper-V servers.

Note: BMR protection for guests on Hyper-V server 2012 begins at NetBackup 7.7.

Note: BMR protection for guests on Hyper-V server 2012 R2 begins at NetBackup 7.6.1.1.

The following tables describe support for the BMR client on Hyper-V in NetBackup 8.x and 7.x, respectively.

NetBackup 8.x: Hyper-V servers and guest operating systems supported for BMR client

Table 6 NetBackup 8.x: Hyper-V servers and guest operating systems supported for BMR client

Guest OS	Hyper-V server	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Windows Server 2003 R2 (32-bit and 64-bit)	Windows 2008 Windows 2008 R2 Windows 2012 Windows 2012 R2	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore	Yes	
Windows Server 2008 SP1, SP2 (32-bit and 64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	Yes	
Windows Server 2008 R2 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	Yes	
Windows Server 2012 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	Yes	
Windows Server 2012 R2 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	Yes	
Windows 7 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	No	
Windows 8 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	No	
Windows 8.1 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	No	
Windows 10 (64-bit)	Same as Windows Server 2003 R2	Same as Windows Server 2003 R2	No	

Table 6 NetBackup 8.x: Hyper-V servers and guest operating systems supported for BMR client *(continued)*

Guest OS	Hyper-V server	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Red Hat Enterprise Linux 5, 6, 7 (64-bit)	Same as Windows Server 2003 R2	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 BMR Dissimilar System Restore for UNIX tech note: DSR for UNIX	Yes	8.0 for BMR client for RHEL 7.0, 7.1, and 7.2 guest operating systems on virtual machines that have EFI firmware.
Oracle Enterprise Linux 5, 6, 7 (64-bit)	Same as Windows Server 2003 R2	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 11 SP3	Same as Windows Server 2003 R2	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 12 GA and SP1	Same as Windows Server 2003 R2	Same as Red Hat	Yes	
Solaris 10 Update 8 (64-bit)	Windows 2008 Windows 2008 R2	virtual-to-virtual self restore virtual-to-virtual DDR restore	Yes	

NetBackup 7.x: Hyper-V servers and guest operating systems supported for BMR client

Table 7 NetBackup 7.x: Hyper-V servers and guest operating systems supported for BMR client

Guest OS	Hyper-V server	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Windows Server 2003 (32-bit and 64-bit)	Windows 2008 Windows 2008 R2 Windows 2012 Windows 2012 R2	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore	Yes	
Windows Server 2003 R2 (32-bit and 64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	Yes	
Windows Server 2008 SP1, SP2 (32-bit and 64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	Yes	
Windows Server 2008 R2 (64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	Yes	
Windows Server 2012 (64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	Yes	7.7
Windows Server 2012 R2 (64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	Yes	
Windows 7 (32-bit and 64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	No	
Windows 8 (32-bit and 64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	No	
Windows 8.1 (32-bit and 64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	No	
Windows 10 (32-bit and 64-bit)	Same as Windows Server 2003	Same as Windows Server 2003	No	7.7.2

Table 7 NetBackup 7.x: Hyper-V servers and guest operating systems supported for BMR client *(continued)*

Guest OS	Hyper-V server	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Red Hat Enterprise Linux 4, 5, 6, 7 (64-bit)	Same as Windows Server 2003	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 BMR Dissimilar System Restore for UNIX tech note: DSR for UNIX	Yes	7.7 for RHEL 7
Oracle Enterprise Linux 4, 5, 6, 7 (64-bit)	Same as Windows Server 2003	Same as Red Hat	Yes	7.7.3 for Oracle Linux 7, Update 1 and Update 2
SUSE Linux Enterprise Server 10 SP3, SP4	Same as Windows Server 2003	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 11 GA, SP1, SP2, SP3	Same as Windows Server 2003	Same as Red Hat	Yes	
SUSE Linux Enterprise Server 12	Same as Windows Server 2003	Same as Red Hat	Yes	7.7.2
Solaris 10 Update 8 (64-bit)	Windows 2008 Windows 2008 R2	virtual-to-virtual self restore virtual-to-virtual DDR restore	Yes	

For the guest operating systems that Hyper-V supports, consult the following:

Hyper-V on Windows Servers

BMR client support for Xen (NetBackup 7.x)

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

Note: Starting at NetBackup 8.0, BMR for Xen is no longer supported.

Table 8 NetBackup 7.x: Xen guest operating systems supported for BMR client

Guest OS	Type of restore supported	BMR client supported as boot server running in guest OS?	Minimum NetBackup level
Windows 2003 (32-bit and 64-bit)	virtual-to-virtual self restore virtual-to-virtual DSR restore virtual-to-physical DSR restore physical-to-virtual DSR restore	Yes	
Windows 2008 SP1, SP2 (32-bit and 64-bit)	Same as Windows 2003	Yes	
Windows 2008 R2 (64-bit)	Same as Windows 2003	Yes	
Red Hat Enterprise Linux 4, 5, 6, 7 (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 Dissimilar System Restore for UNIX tech note: DSR for UNIX NetBackup 7.6.0.2 adds support for the xvda disk format.	Yes	7.7 for RHEL 7
Oracle Enterprise Linux 4, 5, 6 (64-bit)	Same as Red Hat	Yes	7.7.2 for Oracle Enterprise Linux 6
SUSE Linux Enterprise Server 11 GA, SP1	Same as Red Hat	Yes	

Table 8 NetBackup 7.x: 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?	Minimum NetBackup level
Solaris 10 Update 8 (64-bit)	virtual-to-virtual self restore virtual-to-virtual DDR restore	Yes	

BMR client support for IBM PowerVM (NetBackup 7.x)

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

Note: Starting at NetBackup 8.0, BMR for IBM PowerVM is no longer supported.

Table 9 NetBackup 7.x: 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?	Minimum NetBackup level
AIX 6.1 TL6	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 Dissimilar System Restore for UNIX tech note: DSR for UNIX	Yes	
AIX 6.1 TL9	Same as AIX 6.1 TL6	Yes	7.7.1
AIX 7.1 TL0	Same as AIX 6.1 TL6	Yes	
AIX 7.1 TL3	Same as AIX 6.1 TL6	Yes	7.7.1

BMR Direct VM Conversion support

BMR Direct VM Conversion support has been explicitly qualified within specific virtualization environments as listed in this section.

Note: BMR Direct VM Conversion support starts at NetBackup 7.6.

For general BMR support details such as the minimum NetBackup level required for the BMR client OS, see the Bare Metal Restore section of the NetBackup *Software Compatibility List* (SCL) available here:

http://www.veritas.com/docs/000033647

Support for BMR Direct VM conversion into VMware virtual environments

The following table describes NetBackup 7.x and 8.x support for BMR Direct VM conversion into VMware.

Table 10 NetBackup 7.x and 8.x support for BMR Direct VM conversion into VMware

Hypervisor type and version	BMR client OS version	Minimum NetBackup level
VMware ESX/vCenter 4.1	Windows 2003, 2003 R2, 2008, 2008 R2, and Windows 7	
VMware ESX/vCenter 5.0	Windows 2003, 2003 R2, 2008, 2008 R2, and Windows 7	
VMware ESX/vCenter 5.1	Windows 2003, 2003 R2, 2008, 2008 R2, 2012, 2012 R2, and Windows 7 and 8	Support for 2012 R2 starts at NetBackup 7.6.1.2.
VMware ESX/vCenter 5.5	Windows 2003, 2003 R2, 2008, 2008 R2, 2012, 2012 R2, and Windows 7 and 8	Support starts at NetBackup 7.6.0.2. Support for 2012 R2 starts at NetBackup 7.6.1.2.
VMware ESX/vCenter 6.0	Windows 2003, 2003 R2, 2008, 2008 R2, 2012, 2012 R2, and Windows 7, 8, 8.1, and 10	Support starts at NetBackup 7.7. Support for Windows 10 starts at NetBackup 7.7.2.

Note: Starting at 7.6.0.2, NetBackup Windows x86-32 clients cannot be used as Virtual Instance Converters (VICs) for BMR physical to virtual (P2V) conversions. VMware VDDK 5.5 and later libraries do not support the Windows x86-32 bit platform.

Note: BMR Direct VM Conversion does not support conversion for a Windows client that has a GPT disk or Storage Spaces configured.

Other NetBackup options

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

- NetBackup OpsCenter (formerly NOM and VAR.)

Veritas professional services

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

http://www.netbackup.com

Links to related information

See the following Veritas documents for support and configuration information.

Table 11 Veritas documents related to virtualization

Document	Description and link
Main listing of NetBackup compatibility lists	Includes links to a range of NetBackup hardware and software compatibility documents. http://www.veritas.com/docs/000033647
NetBackup for VMware Administrator's Guide	Describes how to configure and use NetBackup for VMware to protect VMware virtual machines. Available from the following location: http://www.veritas.com/docs/000003214
NetBackup Plug-in for VMware vCenter Guide	Describes how to use the NetBackup plug-in in vSphere Client to monitor virtual machine backups and recover virtual machines. Available from the following location: http://www.veritas.com/docs/000003214
NetBackup Plug-in for VMware vSphere Web Client Guide	Describes how to use the NetBackup plug-in in the vSphere Web Client interface to monitor virtual machine backups and recover virtual machines. Available from the following location: http://www.veritas.com/docs/000003214

Table 11 Veritas documents related to virtualization *(continued)*

Document	Description and link
NetBackup for Hyper-V Administrator's Guide	Describes how to configure and use NetBackup for Hyper-V to protect Hyper-V virtual machines. Available from the following location: http://www.veritas.com/docs/000003214
NetBackup Add-in for Microsoft SCVMM Console Guide	Describes how to configure and use the NetBackup Add-in in the Microsoft System Center Virtual Machine Manager (SCVMM) console. Available from the following location: http://www.veritas.com/docs/000003214

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.

Supported VMware versions and backup host operating systems

The information on supported VMware versions has moved to the "Virtual Systems Compatibility" section of the *NetBackup Software Compatibility List*, available from this location:

http://www.veritas.com/docs/000033647

Supported guest operating systems for VMware

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.

VMware guest operating systems supported for file-level recovery

Note: NetBackup does not support file-level recovery from a virtual disk on Storage Spaces. When you use the Backup, Archive, and Restore interface to browse for the files, the files do not appear. To restore the files, restore the entire virtual machine.

NetBackup for VMware supports file-level recovery from a virtual machine backup on the following guest operating systems. For guest operating systems not listed in this table, you can recover the entire virtual machine but not individual files.

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

VMware guest OS	Notes
Windows 10 (32-bit/64-bit)	Requires NetBackup 7.5.0.6 or later. See the note on Storage Spaces above this table.
Windows 8 (32-bit/64-bit)	Requires NetBackup 7.5.0.6 or later. See the note on Storage Spaces above this table.
Windows 7 (32-bit/64-bit)	
Windows Vista (32-bit/64-bit)	
Windows XP (32-bit/64-bit)	Windows XP 64-bit requires VMware Tools 3.0.1 (not supported with 3.0.2).
Windows 2000 (32-bit)	
Windows Server 2016 (64-bit)	Requires NetBackup 8.0 or later. Same restrictions as for Windows Server 2012.
Windows Server 2012 R2 (64-bit)	Requires NetBackup 7.5.0.6 or later. Same restrictions as for Windows Server 2012.
Windows Server 2012 (32-bit/64-bit)	Requires NetBackup 7.5.0.6 or later. Note the following: ■ Does not support the ReFS file system. You can back up and restore the entire VM, but files cannot be individually restored to a ReFS file system. **Note:** File-level recovery is supported for NTFS and FAT files, but NTFS and FAT files cannot be restored to ReFS. ■ Does not support files that use Microsoft data deduplication. ■ See the note on Storage Spaces above this table.
Windows Server 2008 R2 (64-bit)	Supported for vStorage but not for VCB.
Windows Server 2008 (32-bit/64-bit)	
Windows Server 2003 R2 (32-bit/64-bit)	

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

VMware guest OS	Notes
Windows Server 2003 (32-bit/64-bit)	
RHEL 7 (64-bit)	Requires NetBackup 7.6.0.2 or later. **Note:** File-level recovery is supported for virtual machines that use the 32-bit version of the ext4 file system. Support for file-level recovery of the ext4 64-bit file system starts at NetBackup 8.0.
RHEL 6 (32-bit*/64-bit)	Requires NetBackup 7.5 or later.
RHEL 5 (32-bit*/64-bit)	
RHEL 4 (32-bit*/64-bit)	
SUSE 12 (32-bit*/64-bit)	Requires NetBackup 7.6.0.2 or later. **Note:** File-level recovery is supported for virtual machines that use the 32-bit version of the ext4 file system. Support for file-level recovery of the ext4 64-bit file system starts at NetBackup 8.0.
SUSE 11 (32-bit*/64-bit)	
SUSE 10 (32-bit*/64-bit)	

* 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.

Supported file systems for VMware

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

File system	"Enable file recovery from VM backup" option supported	Notes
ReFS (Windows 2012)		Planned for a future release.
NTFS (Windows 2012 with Data Deduplication disabled)	Yes	Requires NetBackup 7.5.0.6 or later.

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

File system	"Enable file recovery from VM backup" option supported	Notes
NTFS (Windows 2012 with Data Deduplication enabled)	No	Requires NetBackup 7.5.0.6 or later.
NTFS (Windows NT)	No	
NTFS (Windows 2000 and later)	Yes	Supports these partition tables: ■ Master Boot Record (MBR) ■ Extended Boot Record (EBR) ■ GUID Partition Table (GPT) **Note:** Granular recovery (GRT) of Exchange or SharePoint data that resides on a GPT disk is not supported from a backup image created for a VMware backup. ■ Logical Disk Manager - dynamic (LDM) **Note:** Availability of the partition table type depends on the particular Windows OS. Check your Microsoft documentation.
FAT (all Windows versions)	Yes	
ext2, ext3, ext4	Yes	Support for the GUID Partition Table (GPT) starts at NetBackup 7.6.0.2. **Note:** Granular recovery (GRT) of Exchange or SharePoint data that resides on a GPT disk is not supported from a backup image created for a VMware backup. LVM2 volume manager is also supported. Support for ext4 starts at RHEL 5.4 and SUSE 11. Support for file-level recovery for ext4 64-bit starts at NetBackup 8.0, at RHEL 7 and SUSE 12.
Btrfs		Planned for a future release.

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

File system	"Enable file recovery from VM backup" option supported	Notes
XFS		Planned for a future release.
Other (any VMware guest OS)	No	

Note: Starting with NetBackup 7.7, NetBackup for VMware no longer supports the FlashBackup-Windows policy type.

Requirements for the NetBackup plug-in for vSphere Web Client

Table 14 describes the requirements for the NetBackup plug-in.

Table 14 Requirements for the NetBackup plug-in for vSphere Web Client

Requirement	Details
Common requirements for monitoring VM backups or recovering VMs	NetBackup 7.7 and later. vCenter Server 5.0 and later. vSphere Web Client 5.5 and later **Note:** The plug-in supports any web browser that the vSphere Web Client supports. **Note:** The NetBackup master server's operating system must be set to the UTC time zone.
NetBackup master server platforms that are supported for recovering VMs	For the NetBackup Recovery Wizard, these NetBackup master server platforms are supported: ■ Windows ■ Red Hat ■ SUSE ■ Solaris SPARC ■ Solaris x86 For the OS levels and versions that are supported for master server, refer to the *NetBackup Software Compatibility List* available from the following location: NetBackup Master Compatibility List

Table 14 Requirements for the NetBackup plug-in for vSphere Web Client *(continued)*

Requirement	Details
Requirements for instant recovery of virtual machines	NetBackup master server 7.7 and later. vCenter Server 5.5 and later. ESX server 6.0 and later. **Note:** For monitoring the instant recovery, the backup host version should be 7.7 or later.

Requirements for the NetBackup plug-in for vCenter

The NetBackup plug-in for vCenter is provided as a virtual appliance. The requirements depend on which component of the plug-in you want to use.

The following tables describe the requirements:

Table 15 describes the requirements that are common to both monitoring virtual machine backups and to recovering virtual machines.

Table 16 describes the requirements that apply only to monitoring virtual machine backups.

Table 17 describes the requirements that apply only to recovering virtual machines with the NetBackup Recovery Wizard. This wizard is not required for monitoring virtual machine backups.

Table 15 Common requirements for the NetBackup vCenter plug-in virtual appliance

Requirement	Details
VM hardware	For the vCenter plug-in virtual appliance: 2 vCPU Minimum 4 GB vRAM Minimum 24 GB of disk space on the datastore
Network access	The vSphere Client host must have access to the vCenter server where the virtual appliance is installed.

Table 15 Common requirements for the NetBackup vCenter plug-in virtual appliance *(continued)*

Requirement	Details
VMware versions	vCenter Server version 4.0 and later vSphere Client version 4.0 and later ESXi version 4.0 U4 and later. (Note that ESXi version 4.1 U3 is not supported.) For a list of ESX versions that VMware supports for CentOS 6.4, refer to VMware documentation. (CentOS 6.4 is the guest OS of the vCenter plug-in virtual appliance.) For a list of VMware versions that NetBackup supports, see the *NetBackup Software Compatibility List* available from the following location: NetBackup Master Compatibility List
Web browser in vSphere Client	Internet Explorer version 7 or later.
Windows 2003 hot fix	For the vCenter systems that run on Windows 2003, it may be necessary to install a Windows hot fix. Without the hot fix, you may not be able to access the vCenter plug-in and the message "Action Canceled" appears. You can download the hot fix from the following Microsoft support article: http://support.microsoft.com/kb/968730

Table 16 Requirements for monitoring virtual machine backups

Requirement	Details
NetBackup versions	NetBackup 7.5 and later.

Table 17 Requirements for recovering virtual machines with the NetBackup Recovery Wizard

Requirement	Details
NetBackup versions	NetBackup 7.6 and later.

Table 17 Requirements for recovering virtual machines with the NetBackup Recovery Wizard *(continued)*

Requirement	Details
NetBackup master server platforms	■ Windows ■ Red Hat ■ SUSE ■ Solaris SPARC ■ Solaris x86 For the OS levels and versions that are supported for master server, refer to the *NetBackup Software Compatibility List* available from the following location: NetBackup Master Compatibility List

Notes on support for vSphere 6.0

NetBackup 7.6.1.1 adds support for vSphere 6.0, using VDDK 5.5.4.

NetBackup 7.7 uses VDDK 6.0 to support additional vSphere 6.0 functionality.

Note the following about NetBackup and vSphere 6.0.

For ESXi 6.0, backups that use VMware Change Block Tracking (CBT) may fail

This topic applies to NetBackup 7.6.1.1 and later.

By default, a NetBackup VMware policy selects the **Enable block-level incremental backup** option on the policy's **VMware** tab. That option uses VMware's Change Block Tracking (CBT). Because of a VMware issue, a backup of an ESXi 6.0 VM may fail if the backup uses Change Block Tracking (CBT).

See the following VMware article for more information:

When Changed Block Tracking is enabled, backing up the virtual machine fails

---

Note: This CBT problem is fixed in VMware ESX 6.0 patch release ESXi600-201505001 (Build 2715440). See the following VMware article for more information:

VMware ESXi 6.0, Patch Release ESXi600-201505001 (2116125)

When using Storage vMotion to migrate a VM to a different vCenter, backup of the VM is not supported

This topic applies to NetBackup 7.6.1.1 and later.

NetBackup does not support backup of a VM that is migrating to a different vCenter through Storage vMotion. The backup or restore job starts but then waits for the migration to complete. When the migration is complete, NetBackup tries to take a snapshot of the virtual machine but cannot find it at its original location in vSphere. The following error messages appear in the job's detailed status tab. The backup eventually fails with status 156.

```
04/01/2015 12:32:02 - snapshot backup of client flvm1 using method
VMware_v2
04/01/2015 12:41:25 - Info bpbrm (pid=7872) INF - vmwareLogger:
RetrieveObjPropertiesEx: for mor = vm-24 failed, SYM_VMC_ERROR:
SOAP_ERROR
04/01/2015 12:41:25 - Info bpbrm (pid=7872) INF - vmwareLogger:
SOAP 1.1 fault: "":ServerFaultCode [no subcode]
04/01/2015 12:41:25 - Info bpbrm (pid=7872) INF - vmwareLogger:
getObjectProperty: Could not get property summary for, mor=<vm-24>
<VirtualMachine>
04/01/2015 12:41:25 - Info bpbrm (pid=7872) INF - vmwareLogger:
getObjectProperty: SYM_VMC_ERROR:  FAILED_TO_GET_OBJECT_PROPERTY
04/01/2015 12:41:25 - Info bpbrm (pid=7872) INF - vmwareLogger:
CreateSnapshotExAPI: SYM_VMC_ERROR:  FAILED_TO_GET_OBJECT_PROPERTY
04/01/2015 12:41:35 - Info bpbrm (pid=7872) INF - vmwareLogger:
RetrieveObjPropertiesEx: for mor = vm-24 failed, SYM_VMC_ERROR:
SOAP_ERROR
```

As a workaround, do the following:

1. Make sure that NetBackup has credentials for the original vCenter and for the vCenter where the VM now resides. In the NetBackup Administration Console, click **Media and Device Management > Credentials > Virtual Machine Servers**.

   If the VM was selected manually in the policy, the next run of the policy should locate the VM and back it up. If the policy cannot locate the VM, edit the policy by browsing for the VM in its new location.

2. If the policy uses automatic selection of VMs (VMware Intelligent Policy), revise the policy as follows:

   - On the NetBackup policy's **Clients** tab, refresh the discovery cache by means of the **Reuse VM selection query results for** option. You can set the option to 0, or run the backup after the timeout has occurred for the discovery cache.
   - Make sure that the Query Builder rules can find the VM in its new location. Click **Test Query** to test for discovery of the VM. Revise the rules as needed.

If the policy is correctly revised, the next backup of the VM should succeed. For more details on VMware Intelligent Policy, see the NetBackup for VMware Administrator's Guide.

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 18 NetBackup support for vSphere and vCloud Director

NetBackup feature	vSphere	vCloud Director
NetBackup for VMware, including VMware 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
NetBackup Plug-in for vSphere Web Client	Yes	No
Instant Recovery for VMware	Yes	No
VM recovery command (nbrestorevm)	Yes	Yes

Guidelines for using NetBackup with vCloud Director

NetBackup can protect virtual machines that are provisioned by vCloud Director (vCD).

For a list of the vCloud Director versions that NetBackup supports, see the "Virtual Systems Compatibility" section of the *NetBackup Software Compatibility List*, available from this location:

http://www.veritas.com/docs/000033647

NetBackup for VMware supports the use of load balancers to manage multiple cells (nodes) in a vCloud environment. To configure NetBackup credentials for a vCloud environment that uses a load-balancer, see “Adding NetBackup credentials for VMware” in the *NetBackup for VMware Administrator’s Guide* for 7.6 or later:

http://www.veritas.com/docs/000003214

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

Table 19 Guidelines for using NetBackup with vCloud Director

NetBackup operation	Description and notes
Backup	■ 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. For NetBackup 7.6 and later recovery procedures, see the vCloud Director topics in the *NetBackup for VMware Guide*. ■ 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.

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*.

Notes on Replication Director for virtual machines

NetBackup 7.6 and later supports Replication Director for protecting virtual machines in a snapshot and replication environment.

Note the following about Replication Director:

- Supports vCenter version 4.0 and later. Earlier vCenter versions are not supported.

- Supports NFS datastores only. Does not support replication solutions that are deployed with RDM or VMFS datastores.

  To protect virtual machines on unsupported datastores, do one of the following:

  - Use the NetBackup policy type **VMware** but without Replication Director.
  - Use Replication Director and install a NetBackup client in each virtual machine.

    With a client in the virtual machine, you can use Replication Director to protect each virtual machine as though it is a physical computer, with a policy type other than **VMware**.

Minimum permissions for the NetBackup account that performs VMware backup and restore

The account that NetBackup uses to access the VMware vCenter requires privileged roles with particular rights for backup and restore operations. That account is specified in the NetBackup Administration Console under **Media and Device Management > Credentials > Virtual Machine Servers**.

The following tech note lists the permissions that the NetBackup account needs to perform backup and restore:

http://www.veritas.com/docs/000007351

Hotadd backup issues caused by Windows disk signature collisions

For the hotadd transport mode with a backup host on Windows 2008 server or earlier, a Windows disk signature collision may cause the following problems:

- At NetBackup 7.0 and later: A backup using the hotadd transport mode may change a VM's disk signature in the backup image if multiple VMs are backed up simultaneously and some of their disks have the same Windows disk signature. This problem can occur in any of the following cases:
  - One or more of the VMs in the backup is a clone of another VM that is backed up simultaneously by the same backup host.
  - VMs that are backed up simultaneously are linked clones that share disks with the same parent.
  - A VM in the backup is a clone of the backup host.

  In any of these cases, file-level recovery from the VM's file systems may not succeed.

In addition: If the guest OS of the backed up VM is Windows Server 2008, the recovered virtual machine may fail to start. In that case, the disk signature issue on the recovered VM must be fixed. See the following Veritas article: http://www.veritas.com/docs/000095000

- At 7.6.0.1 and later: If the backup was made with the Accelerator feature, a VM disk signature collision may cause a hotadd backup to fail with status 84, “media write error.”

Workaround: Use a different transport mode (not hotadd), or avoid simultaneous backup of the VMs. If a VM in the backup is a clone of the backup host, use a different backup host that is not a clone of the VM.

For further information on this issue, see “Windows proxy HotAdd can cause differing disk signatures” in the following VMware article:

https://www.vmware.com/support/developer/vddk/vddk-550-releasenotes.html

Note: These issues do not apply if the backup host is Windows Server 2008 R2 or later.

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 Hyper-V components and versions (VSS backup method)

NetBackup for Hyper-V supports the following components.

Note: This information applies only to the VSS backup method, not to WMI.

Table 20 Components supported for Hyper-V (VSS)

Components	What is supported
Failover Cluster	Windows Server 2008, 2008 R2, 2012, 2012 R2, 2016. Support for Windows Server 2012 begins at NetBackup 7.5.0.6. Support for Windows Server 2012 R2 begins at NetBackup 7.6.0.2.
VSS providers	NetBackup for Hyper-V has an open support policy for VSS providers, as described in the *NetBackup Snapshot Client Compatibility List*, available from this location: http://www.veritas.com/docs/000033647 NetBackup for Hyper-V is supported on the Windows versions that are listed in the "Virtual Systems Compatibility" section of the *NetBackup Software Compatibility List* (SCL). Any vendors that support VSS snapshot providers on those versions are supported for NetBackup for Hyper-V.
CSV-based virtual machine backups	NetBackup for Hyper-V has an open support policy for CSV-based virtual machine backups. Any vendors that support CSV-based virtual machine backup on the Windows versions listed in the "Virtual Systems Compatibility" section of the *NetBackup Software Compatibility List* (SCL) are supported for NetBackup for Hyper-V.

Notes on the new Hyper-V features in NetBackup 8.0

NetBackup 8.0 adds features for faster backup and recovery of Hyper-V virtual machines on Windows Server 2016.

- For a description of those features, see the *NetBackup for Hyper-V Administrator's Guide* for 8.0, available here:
  http://www.veritas.com/docs/000003214
- For detailed information on supported Hyper-V environments, see the "Virtual Systems Compatibility" section of the *NetBackup Software Compatibility List (SCL)* for 8.0, available here:
  NetBackup Master Compatibility List

Note the following additional points.

Table 21 Requirements for the new Hyper-V features in NetBackup 8.0

Requirement	Supported versions
NetBackup servers and clients	The following must be at NetBackup 8.0 or later: The NetBackup master server, and the NetBackup client (installed on all Hyper-V servers and SCVMM servers).

Additional notes about the new Hyper-V features in NetBackup 8.0:

- The following is due to a Microsoft limitation: The WMI backup method does not support user-created checkpoints. The VM is backed up but any user-created checkpoints of the VM are omitted from the backup. As a result, the user-created checkpoints cannot be restored from the backup.
- For VMs in a cluster, SAN Client is not supported with the WMI backup method. Clustered VMs are supported with the VSS backup method by means of a Hyper-V Intelligent Policy.
- The policy Advanced Attributes (available from the **Hyper-V** tab) include a **Consistency level** parameter. Note these prerequisites for the **Application consistent** option of that parameter:
  - The latest version of Hyper-V integration services must be installed and running inside the VM.
  - The Hyper-V integration services must be enabled in the VM settings.

Support for Hyper-V on Windows 2012

Note the following about NetBackup support for Hyper-V on Windows 2012 and 2012 R2:

- For NetBackup 7.6.0.2, file-level recovery from a Hyper-V backup is not supported if the files are in a VM (any guest OS) that resides on a Hyper-V 2012 R2 server with the Windows Server 2012 R2 update of April 2014.
  For more information on the update, see the following Microsoft article:
  http://support.microsoft.com/kb/2919355

  Note: This file-level recovery issue with the Windows Server 2012 R2 update of April 2014 is fixed in NetBackup 7.6.0.3. For NetBackup 7.6.0.2, it is fixed in the following EEB: NB_7.6.0.2_ET3500731_1.zip. For more information on that EEB, see the following Veritas article:

  http://www.veritas.com/docs/000021851

- Backup of virtual machines within Cluster Shared Volumes (CSV) is supported. In Hyper-V Server 2008 R2, CSV has a limitation that requires serialized backups. In Hyper-V Server 2012, CSV supports concurrent backups without that limitation. Consequently, the CSV timeout setting in the NetBackup Hyper-V policy is only used in Hyper-V Server 2008 R2 deployments.

Supported guest operating systems for Hyper-V

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 Microsoft topics available here:

Hyper-V on Windows Servers

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

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

Table 22 Hyper-V guest operating systems supported for file-level recovery

Hyper-V guest OS	Notes
Windows 10	Requires NetBackup 8.0 or later.
Windows 8	Requires NetBackup 7.5.0.6 or later. Support has the same limitations as for Windows 2012. See “Support for Hyper-V on Windows 2012” on page 34.
Windows 7	Requires NetBackup 7.0.1 or later.
Windows Vista (32-bit/64-bit)	
Windows XP (32-bit/64-bit)	
Windows Server 2016 (64-bit)	Requires NetBackup 8.0 or later.
Windows Server 2012 R2 (64-bit)	Requires NetBackup 7.6.0.2 or later. See “Support for Hyper-V on Windows 2012” on page 34.
Windows Server 2012 (64-bit)	Requires NetBackup 7.5.0.6 or later. See “Support for Hyper-V on Windows 2012” on page 34.
Windows Server 2008 R2 (64-bit)	
Windows Server 2008 (32-bit/64-bit)	
Windows Server 2003 R2 (32-bit/64-bit)	
Windows Server 2003 (32-bit/64-bit)	

Table 22 Hyper-V guest operating systems supported for file-level recovery *(continued)*

Hyper-V guest OS	Notes
RHEL 6 (32-bit*/64-bit)	ext2, ext3, ext4 file systems, LVM2 volume manager. Requires NetBackup 7.5 or later. Support for ext4 64-bit requires NetBackup 8.0 or later.
RHEL 5 (32-bit*/64-bit)	ext2, ext3, ext4 file systems, LVM2 volume manager. Support for ext4 starts at RHEL 5.4 and requires NetBackup 7.5 or later. Support for ext4 64-bit requires NetBackup 8.0 or later.
SUSE 11 (32-bit*/64-bit)	ext2, ext3, ext4 file systems, LVM2 volume manager. Support for ext4 starts at SUSE 11 and requires NetBackup 7.5 or later. Support for ext4 64-bit requires NetBackup 8.0 or later.

* NetBackup no longer includes Linux 32-bit clients. Consequently, file-level restore directly to a 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 Intelligent Policy

NetBackup 7.7 and later can automatically select virtual machines for backup by means of the search filters that are specified in the policy. The policy **Clients** tab includes a **Query Builder** for creating the filters. This feature is called Hyper-V Intelligent Policy.

Note the following requirements.

Table 23 Support for Hyper-V Intelligent Policy starting in NetBackup 7.7

Components	Notes
Hyper-V	Windows Server 2012 R2 or later.

Table 23 Support for Hyper-V Intelligent Policy starting in NetBackup 7.7 *(continued)*

Components	Notes
Hyper-V server configuration	NetBackup requires the following roles and features as part of Hyper-V server configuration: ■ Windows PowerShell 3.0 or later. ■ Hyper-V cmdlets in the Windows PowerShell. ■ Failover cluster cmdlets in the Windows PowerShell for Hyper-V clusters. ■ .NET Framework 4.5 or later. **Note:** These roles and features are available with both Windows Server Core and Windows Server with GUI installation. The administrator enables these roles and features when setting up Hyper-V and failover clustering on the Windows server.

Hyper-V online backups with VSS require the proper version of Hyper-V integration services in the VM

To allow online backups of Hyper-V virtual machines using the VSS backup method, the proper version of the Hyper-V integration services must be installed in the virtual machines. Without the proper version, online backup may not succeed (NetBackup status 4201). The following may appear in the job's detailed status log:

```
2/17/2014 1:39:17 PM - Critical bpbrm(pid=7492) from client RHEL_60_GPT:
FTL - snapshot processing failed, status 4201
2/17/2014 1:39:17 PM - Critical bpbrm(pid=7492) from client RHEL_60_GPT:
FTL - snapshot creation failed, status 4201
```

Note: The WMI backup method (for Hyper-V Server 2016 and later) does not employ online vs. offline backups. For more information on the WMI method, see the *NetBackup for Hyper-V Administrator's Guide* for 8.0, available here:

http://www.veritas.com/docs/000003214

Table 24 describes the required versions of the integration services.

Table 24 Hyper-V integration services required in the VM for online backups (VSS method)

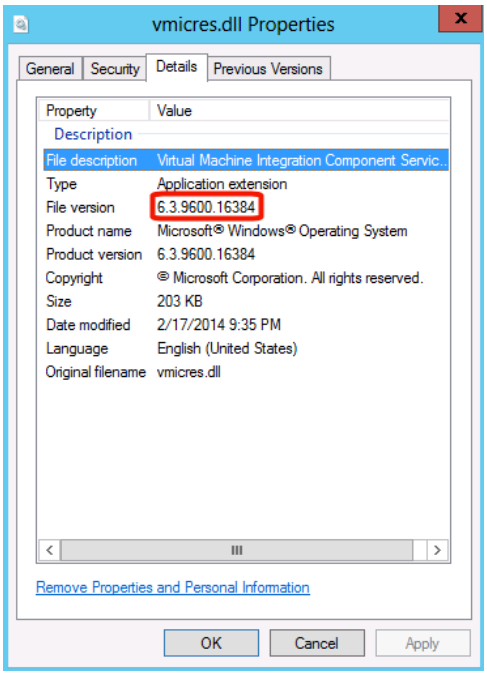
Guest OS	Notes and requirements on the integration services in the VM
Windows 2008, 2008 R2, 2012, 2012 R2, 2016	Required minimum versions of integration services: ■ Hyper-V server 2016: Integration services are automatically updated. ■ Hyper-V server 2012 R2: Integration services 6.3.9600.16384. ■ Hyper-V server 2012: The integration services are built in to the Windows 2012 guest OS. For other guest operating systems, see "Software requirements (for supported guest operating systems)" in the following Microsoft TechNet article: http://technet.microsoft.com/library/hh831531 ■ Hyper-V server 2008 R2: Integration services 6.1.7600.16385 ■ Hyper-V server 2008: Integration services 6.0.6001.18016. To upgrade the integration services, see the TechNet article "Install Hyper-V and create a virtual machine:" http://technet.microsoft.com/en-US/library/hh846766
RHEL, SUSE	Required minimum version of Linux integration services: ■ Hyper-V server 2016: Linux Integration Services 4.1. ■ Hyper-V server 2012 R2: Linux Integration Services 3.5. ■ Hyper-V server 2012: Microsoft does not support online backup of Linux VMs on Windows 2012 Hyper-V hosts. ■ Hyper-V server 2008 / 2008 R2: 2008 and 2008 R2 do not support Linux Integration Services in the VM. **Note:** Linux Integration Services is not built in to the RHEL VM. You may have to download and install the services in the VM. For assistance downloading and installing Linux Integration Services, see the TechNet "Linux Integration Services 3.5 Announcement:" http://blogs.technet.com/b/virtualization/archive/2014/01/02/linux-integration-services-3-5-announcement.aspx For further information on Linux 3.5 Integration Services, see the TechNet article "Linux Integration Services Version 3.5 for Hyper-V:" http://www.microsoft.com/en-us/download/details.aspx?id=41554

To determine the current integration services version in a Windows VM

- In the VM, right-click on the following file and click **Properties > Details**:

  drive_letter\Windows\System32\vmicres.dll

  This file is the integration services running in the virtual machine.



  It should be the same version as the following file on the Hyper-V server:

  drive_letter\Windows\System32\vmms.exe

To determine the current integration services version in a Linux VM

- In the VM, enter the following:

  ```
  /sbin/modinfo hv_vmbus
  ```

  Example output:

  ```
  filename:    /lib/modules/2.6.32-71.el6.x86_64/extra/microsoft-
     hyper-v/hv_vmbus.ko
  version:     3.5
  license:     GPL
  srcversion:  ACE0AA64B58744D00E54C12
  alias:       acpi*:VMBus:*
  alias:       acpi*:VMBUS:*
  depends:
  vermagic:    2.6.32-71.el6.x86_64 SMP mod_unload modversions
  ```

  For assistance with downloading and installing the service, see the following Microsoft article:

  Linux Integration Services 3.5 Announcement

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*.

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.
- Make sure to install the VSS provider on the Hyper-V servers and on any off-host servers (alternate client hosts).

Red Hat Enterprise Linux 6.4 VM may need OS updates

The RHEL 6.4 guest OS may be missing a Hyper-V package. As a result, you cannot add a RHEL 6.4 VM as a client to a Hyper-V policy by its host name. To solve this issue, install all the necessary RHEL OS updates that are listed in the following Red Hat article:

redhat-release enhancement update for Red Hat Enterprise Linux 6.4

The following Red Hat article contains the bug details:

Bug 883306 -[Hyper-V]Hypervkvpd is not in the RHEL6.4 install group

You can work around this issue by adding the VM to the policy using either the VM display name or UUID, under the **Primary VM identifier** option.