Symantec Backup Exec 2010 Agent for VMware Virtual Infrastructure FAQ

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Contents

Overview

1.   What is the Backup Exec 2010 Agent for VMware Virtual Infrastructure?

Answer-
Backup Exec 2010 Agent for VMware Virtual Infrastructure enables complete protection of your VMware Guest virtual machines alongside your physical systems all within Backup Exec. Originally introduced with Backup Exec 12.5, the Agent for VMware is improved in Backup Exec 2010 and introduces a new way to protect VMware environments based on the new VMware vStorage API for Data Protection. Backup Exec 2010's Agent for VMware leverages infrastructure components of VMware VI3 and vSphere 4.0, including vCenter, ESX/ESXi, and vStorage, to automatically discover, protect, and recover virtual machines and their data.

2.   What components of VMware does the Agent for VMware protect?

Answer-
The Backup Exec Agent for VMware provides protection for a number of your key VMware ESX 3.5 and vSphere 4.0 assets including;
  •   Online Guest virtual machines (including all .vmdk files) that make up the complete virtual machine)

- Offline Guest virtual machines (including all .vmdk files) that make up the complete virtual machine)
- Template Files (used to quickly create Guest virtual machines)

3. What is VMware "vStorage API's for Data Protection"?

Answer-
vStorage API for Data Protection (VADP) is the newest technology available from VMware to provide fast and efficient online backups of ESX 3.5 and vSphere 4.0 environments. It enables backup applications like Backup Exec 2010 to directly snapshot and process backups from ESX datastores over all supported types of storage, including, SAN, LAN, iSCSI, Fibre Channel, NFS, Gigabit Ethernet, etc**.** For complete details, please see the section of this document titled
VMware vStorage API for Data Protection Support

4. What are the main features of Backup Exec 2010 Agent for VMware?

Answer-
Backup Exec 2010 Agent for VMware for Virtual Infrastructure includes a number of features designed to solve the major problems affecting VMware virtual machine backup and recovery today, including:

- Protection of both physical and virtual system from a single application to eliminate the need for separate backup applications for physical and virtual machines.
- Built-in support of VMware's newest backup technology vStorage API's for Data Protection for fast snapshot-based image backup of online and offline Guest virtual machines without scripts, integration modules, or VCB installations.
- Protection of VMware Template files alongside Guest virtual machines.
- Block-level Incremental and Differential backup for dramatically reduced backup times of large virtual machines of only the changes since the last backup.
- Automated creation of virtualized synthetic Full backups from block-level Incremental and Differential backups to provide simplified and faster restores of virtual machines.
- Fast "single-pass" image backup of Guest virtual machines with multiple levels of restore using Backup Exec's Granular Recovery Technology for granular recovery of:
  - o Individual files from within a Windows Guest virtual machine
  - o Individual Exchange mailboxes, messages, calendar items, contacts, folders, etc
  - o Individual SQL databases with full SQL control of the recovery experience
  - o Individual Active Directory objects including OU's, user accounts, printer objects, even individual attributes of objects ***all without a reboot of Active Directory Domain Controllers***
- Dynamically includes newly created Guest virtual machines since the last backup.
- Reduces overall size of VMware backups using block-optimization during backup of Guest virtual machines .vmdk files to ensure only used portions of the disk are transferred to reduce backup time and storage space.
- Optionally includes or excludes powered off Guest virtual machines from backup to avoid unnecessary backups of non-production test or development Guest virtual machines.
- Registers a Guest virtual machine automatically with vCenter after a restore with the option to automatically start the virtual machine after recovery.
- Specify a new virtual machine name and a test or production network to assign the recovered virtual machine to during a restore.
- Redirection of a Guest virtual machine to an alternate location for recovery including alternate;
  - o ESX hosts

- o Datastores
- o Resource Pools
- o Resource Folders
- o Offline file system paths (e.g. F:\temp)

5. Does the Backup Exec Agent for VMware need to be installed on the ESX server?

Answer-
No, you do not have to install any Agent directly on the ESX host. The protection of your VMware Guest virtual machines and Template files is accomplished by Backup Exec 2010 Agent for VMware remotely. The VMware Agent is activated with a single license key on the Backup Exec 2010 server and completely managed from the Backup Exec 2010 console. All necessary communication occurs through VMware vCenter or directly to the ESX server without installing any Backup Exec Agent directly on it.

6. Do I have to install the Backup Exec Agent for Windows Systems or Linux inside of any Guest virtual machines?

Answer-
No, the Agent for VMware removes the need to install the Backup Exec Agents for Windows or Linux inside of a Guest virtual machine in most circumstances. The Backup Exec Agent for Windows or Linux can be optionally installed in a Guest virtual machine for the following advantages:

- Restoring individual files or folders directly to a running Guest virtual machine
- Improved Microsoft VSS support for snapshot backups of Guest virtual machines that are running applications such as Microsoft Exchange, SQL, and Active Directory
- Individual
- Protection of physical independent-mode RDM disks

7. Is there any licensing cost or fee for installing the Backup Exec Agent for Windows Systems or Linux inside of any Guest virtual machines?

Answer-
No, the Agent for VMware includes the license right to deploy the Agent for Windows Systems or Linux inside of any Guest virtual machines on an ESX host that has been properly licensed with an Agent for VMware license. Please see the ***Licensing*** section of this document for additional licensing information.

8. Is VMware's vCenter (formerly known as VirtualCenter) required to use the Agent for VMware?

Answer-
No, the Backup Exec 2010 Agent for VMware provides protection for Guest virtual machines running on single (standalone) ESX servers, ESXi servers, or ESX servers managed by vCenter.

vCenter simply provides Backup Exec with an additional central point of integration to automatically discover and protect Guest virtual machines across multiple ESX hosts even when Guest virtual machines are being relocated via vMotion during a backup between ESX hosts. This makes setting up and configuring backups of large numbers of Guest virtual machines easy regardless of which ESX server is currently hosting them.

If VMware VCenter is not installed in an environment, simply provide the IP addresses of the ESX/ESXi servers to Backup Exec to discover the ESX/ESXi servers and their Guest virtual machines.

9. Does Backup Exec 2010 support ESXi?

Answer-
Yes, Backup Exec 2010's Agent for VMware fully supports ESXi installations with all of the same features as ESX. However, **VMware** requires a minimum vSphere "Essentials" license to be installed in order to protect Guest virtual machines using the vStorage API for Data Protection. The vStorage API for Data Protection is disabled on the free versions of ESXi. This is a licensing requirement by VMware, not Symantec Backup Exec, and applies to all backup applications and free versions of ESXi.

Virtual Machine Backup

1. Can Backup Exec 2010's Agent for VMware backup Guest virtual machines while they are online and running?

Answer-
Yes, all Guest virtual machines (VM's) including Windows and Linux virtual machines can be protected while they are online and running. This allows both physical and virtual systems to be protected from a single backup and recovery solution; Backup Exec for Windows Servers 2010.

2. Can offline Guest virtual machines also be protected?

Answer-
Yes, both offline and online Guest virtual machines can be protected together in a single backup. VMware Template files can also be selected for backup alongside the Guest virtual machines in Backup Exec 2010.

Offline virtual machines can be automatically excluded in the Job Properties|VMware settings page inside of your backup jobs using the "Exclude offline virtual machines" check box. VMware Template files are always considered to be offline and do not honor this setting and will be automatically included in the backup job if selected regardless of the setting of the "Exclude offline virtual machines" check box.

3. How are Guest virtual machines protected?

Answer-
Backup Exec Agent for VMware provides Full backups of Guest virtual machines through vStorage API for Data Protection. All backups are performed at a complete image-level of the Guest virtual machine and can be done using the backup methods described above All necessary files of the Guest virtual machine are automatically protected.

4. Can I protect applications like Microsoft Exchange, SQL, and Active Directory running inside of Guest virtual machines?

Answer-
Yes, multiple methods can be used to protect applications inside of Guest virtual machines depending on the recovery needs. Please see the ***Database and Application Protection*** section

of this document for complete details on how to protect applications inside of Guest virtual machines.

5. **What methods of backup are currently supported with Backup Exec 2010's Agent for VMware**

Answer-
Backup Exec 2010 Agent for VMware supports all methods provided by the VMware vStorage API for Data Protection and allows the administrator to choose and prioritize the Transport Modes that are attempted during jobs. The current Transport Modes supported include:

- **SAN-based** (FibreChannel or iSCSI-based)
  - o Uses SAN infrastructure to backup the Guest virtual machines located on a shared VMFS SAN LUN.
  - o Provides the fastest backup and recovery times, in most cases.
- **Hot-Add**
  - o Virtualizes your Backup Exec 2010 server and all backup I/O on the ESX or vSphere host.
  - o Keeps all backup traffic local on the ESX or vSphere server.
  - o Provides better backup i/o rates than NBD/NBSSL, but at the expense of placing additional i/o loads on the production ESX or vSphere 4.0 server.
- **NBD**
  - o Provides simple LAN-based "over the IP network" backups
  - o Provides simple setup and configuration, but typically provides slower backup and restore performance than Hot-Add or SAN-based Transport Mode backups.
- **NBDSSL**
  - o Provides simple LAN-based "over the IP network" backups, but with SSL encryption added
  - o Provides added benefit of encryption.
  - o Provides slower backup and restore performance than NBD, Hot-Add or SAN-based Transport Mode backups, in most cases.

6. **How do I use the block-level Incremental and Differential backup features?**

Answer-
Backup Exec 2010 Agent for VMware leverages the vStorage API for Data Protection and the vSphere 4.0 changed-block tracking feature to provide fast block-level Incremental or Differential backup capability. The block-level Incremental and Differential backups are extremely efficient in providing Backup Exec only the changed regions of the virtual disks (.vmdk's) since the last backup. This allows Backup Exec to transfer much smaller amounts of data during daily backups and reduces backup windows of large numbers of virtual machines.

Incremental and Differential backups have certain requirements that must be met prior to use. These include:
- vSphere 4.0
- Hardware Version 7 virtual machine templates
- No pre-existing snapshots on the virtual machines
- No RDM disks in the virtual machine (virtual or physical compatibility mode disks are supported by VMware)

Incremental and Differential backups also require the use of Backup Exec Policies in order to be set up. Backup Exec Policies are similar to standard Jobs, but have the added benefit of

providing the ability to "chain" multiple jobs together for better automation. For VMware Incremental or Differential backups, Backup Exec Policies are used in order to ensure that the Full backup always occurs prior to the Incremental or Differential backup.

Backup Exec Policies can be configured on the Job Setup screen inside of the Backup Exec 2010 console. A default Policy for Incremental or Differential backups has automatically been created for you on the Job Setup screen and can be modified for your environment for ease of setup.

7. Does Backup Exec 2010 also support VMware vCenter vMotion during a backup?

Answer-
Yes, Backup Exec 2010 Agent for VMware backups are unaffected by the vMotion or DRS process and can continue to automatically protect Guest virtual machines if they move to another ESX host. The backup will complete normally during a vMotion event.

8. Are the .vmdk files space optimized or compressed during a backup?

Answer-
Yes, .vmdk files are automatically optimized and compacted during backup to ensure space savings. For example, if a 50GB .vmdk that contains only 20GB of actual data is being backed up, only the 20GB of actual data will be sent to the backup location by Backup Exec. If the backup target device supports compression, Backup Exec can further compress the data being protected to provide additional space savings of a Guest virtual machine backup.

9. Does the Backup Exec Continuous Protection Agent (CPA) support ESX environments?

Answer-
Yes, the Backup Exec 2010 Continuous Protection Agent is tested and supported running in Windows Guest virtual machines as part of the Backup Exec Agent for Windows Systems (AWS). The CPA can be installed on the Windows guest virtual machines, assuming the guest OS is supported. Continuous Protection is not supported for running directly on Linux or ESX servers. Please see the Backup Exec 2010 Software Compatibility List for details and any limitations

10. Can the Backup Exec 2010 Remote Agent for Linux and UNIX (RALUS) be used within the ESX service console to backup Guest virtual machines?
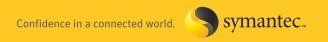
Answer-
Symantec recommends that you do not use the Agent for VMware with the Remote Agent for Linux and Unix Servers to protect online Guest virtual servers on the ESX server. The ESX servers must be shut down manually to ensure backup consistency and to avoid backup failure. Or, additional scripting must be done as a pre/post process to snapshot the running Guest virtual servers.

VMware vStorage API for Data Protection Support

1. How does Backup Exec 2010 take advantage of vStorage API's for Data Protection and provide additional new features for backup and restore?

Answer-
Backup Exec 2010 Agent for VMware Virtual Infrastructure fully integrates the latest version of vStorage API's for Data Protection and provides a number of new capabilities including:

- Overall better backup and restore performance, particularly in SAN-based environments.
- Changed-block tracking for fast block-level Incremental/Differential backup (requires vSphere 4.0 and Hardware Version 7-configured virtual machines).
- Thin-provisioned and Thick disk backup and recovery support.
- SAN-based restores of virtual machines.

2. How do I obtain vStorage API's for Data Protection?

Answer-
Simple, just install Backup Exec 2010 with a license for the Backup Exec Agent for VMware. All necessary components of the vStorage API for Data Protection will automatically be installed for you. There are **no** additional components, scripts, integration modules, or applications to download or install separately. Everything is included in Backup Exec 2010 for your convenience.

3. Are the vStorage API's for Data Protection backward compatible with ESX 3.5 installations?

Answer-
Yes, Backup Exec 2010 Agent for VMware Virtual Infrastructure supports the protection of existing ESX 3.5 Update 2 (and later) Guest virtual machines and vSphere 4.0 (including vSphere 4.0 Update1). You can even mix ESX 3.5 and vSphere 4.0 backups together in the same backup job without the need to modify any additional settings.

4. Does the vStorage API for Data Protection replace the older VMware Consolidated Backup (VCB) framework?

Answer-
Yes, the vStorage API for Data Protection completely replaces the VCB application from VMware. Backup Exec no longer needs VCB to protect ESX 3.5 Update 2 or vSphere 4.0 installations. For more information on the differences and advantages of the newer vStorage API's for Data Protection over VCB, please see the following section of this document titled ***VMware VCB vs. vStorage API***.

5. Is Backup Exec 2010 Agent for VMware tested and certified as *"VMware Ready for Data Protection"* by VMware?

Answer-

Yes, Backup Exec was the first application to receive this certification by VMware. Both the 12.5 and 2010 versions of Backup Exec are "VMware Ready for Data Protection" certified. Please see the VMware Partner Catalog for a listing of Backup Exec.
VMware Ready Certification Product Catalog

VMware VCB vs. vStorage API's for Data Protection

1. How are the vStorage API's for Data Protection different or better than VMware Consolidated Backup (VCB)?

Answer-
VCB was an application framework provided by VMware that allowed backup applications, such as Backup Exec 12.5, to access to VMware virtual disk files (.vmdk's) and snapshots. This was done via a VCB "Proxy Server" that held the copies of the virtual disk files temporarily during the

backup. Due to this "Proxy-based" architecture, VCB had several drawbacks to it. vStorage API's for Data Protection improves on VCB and eliminates many of the limitations including**:**

- The requirement to install and set up a specific VCB "Proxy Server" and storage for temporarily storing the .vmdk copies during the backup.
- The staging of the copies of the .vmdk files to the VCB "Proxy Server" for the backup instead of copying directly to the tape or disk-based backup target. Staging requires:
  - Additional disk space to temporarily store all .vmdk files.
  - Additional time during the backup to copy the .vmdk files to the "Proxy Server" and then from the "Proxy Server" to the Backup Exec disk or tape storage devices.
- The lack of SAN-based restore capability for fast recovery over a SAN infrastructure
- The inability to track changed blocks on the virtual disks (.vmdk) files that are used to perform high-speed block-based Incremental or Differential backups

2. **Some of the competitors to Backup Exec 2010 still rely on VCB, why has Backup Exec 2010 eliminated VCB support completely?**

Answer-
vStorage API's for Data Protection provide all of the capabilities of VCB, as well as a number of new capabilities over VCB, and even eliminates many of the shortcomings of the original VCB technology. Symantec has worked closely with VMware to integrate the vStorage API's for Data Protection into Backup Exec 2010 to ensure it meets the needs of our joint customers

3. **VCB provided "off-host" backup functionality to off-load I/O overhead on the ESX server to a "Proxy Server". Is this still needed with vStorage API's for Data Protection?**

Answer-
No, vStorage API's for Data Protection eliminate the need for a separate VCB "Proxy Server". Symantec and VMware have worked closely together to ensure that performance impacts during backup are minimal. Customers utilizing vStorage API's for Data Protection in Backup Exec 2010 can expect a significant performance improvement over VCB in both CPU and I/O impacts during backups. Typical CPU utilization during backup with vStorage API's for Data Protection ranges between 1-4% throughout the duration of the backup while maintaining constant I/O rates. Backups are based on temporary snapshots, which are low-impact and low in disk-space consumption. This helps to eliminate much of the I/O impact on production Guest virtual machines.

Database and Application Protection

1. **Do I still need to use separate Backup Exec Database or Application Agents for backups?**

Answer-
Yes, it is extremely important that Backup Exec Database or Application Agents continue to be licensed and installed inside of Guest virtual machines.

Backup Exec 2010 introduces a new industry-first technology for virtualized applications using its patented Granular Recovery Technology (GRT) in combination with the Agent for VMware Virtual Infrastructure.

This new virtualized application GRT capability removes the need for separate regular database or application level backups of virtualized applications such as:
- **Microsoft SQL Server** (2005-2008)
- **Microsoft Exchange Server** (2003-2010, please note that Exchange 2010 Distributed Availability Groups are not supported for virtualized application GRT restores
- **Microsoft Active Directory** (2003-2008 R2)

Backup Exec 2010 Agent for VMware can interact with these applications when the Backup Exec Agent for Windows Systems is installed inside of the Guest virtual machine and the appropriate Backup Exec Agent for SQL, Exchange, or Active Directory is licensed. This combination allows application object granular recovery and point-in-time recovery of the application itself all from a single pass backup of just the virtual machine. No separate Backup Exec Agent for SQL, Exchange, or Active Directory backup is required to be performed. For example, after installing the Backup Exec Agent for Exchange license on the Backup Exec 2010 server, and placing the Backup Exec Agent for Windows Systems inside of the Guest virtual machine, you can recover an individual Microsoft Exchange mailbox, message, contact, calendar item, or database just by backing up the Guest virtual machine containing Exchange.

Other applications are supported directly via Backup Exec Agents:
- Microsoft SharePoint
- Oracle
- Lotus Domino
- SAP
- Enterprise Vault
- IBM DB2

These applications and databases require regular log truncation, database maintenance, consistency checks, etc that are performed only as part of a regular Backup Exec database or application Agent-level backup. If these separate Database Agent-level backups are not performed regularly, application log files could continue to accumulate, eventually fill the entire disk, and cause application or database failure.

2. **How are virtualized applications, like Microsoft SQL, Exchange, and SharePoint, properly protected by Backup Exec?**

Answer-
Applications that utilize the Microsoft Volume Shadow Copy Service (VSS) framework on Windows 2003 and 2008 can be protected as part of a normal image-level backup of the entire Guest virtual machine with AGENT FOR VMWARE.

There are two options for obtaining a VSS "Requestor/Provider" for your Windows Guest virtual machines running Windows 2003 or later:

1. A generic version can be obtained as part of ESX 3.5 Update 2 from VMware and is automatically installed as part of the normal VMware Tools installation.
2. **(Recommended)** A VSS provider that is specific to Backup Exec can be installed inside of the Guest virtual machine to replace the default VMware version by simply installing the Backup Exec Agent for Windows Systems inside of the Guest virtual machine. Backup Exec 2010 will automatically detect the presence of the VMware Tools version and replace it with the correct Backup Exec version. Please see your Backup Exec 2010 Administrator's Guide for more details on how to install the Backup Exec Remote Agent for Windows Systems.

Each VSS Requestor/Provider from either VMware or Symantec should be installed separately and never on the same system at the same time. Please uninstall the Backup Exec Agent for Windows Systems if you are reinstalling the VMware Tools provided version.

3. How are applications that are not VSS-compliant protected?

Answer-
Applications installed in Windows or Linux Guest virtual machines that are not VSS-compliant, such as Lotus Domino, Oracle, SAP, DB2, etc, cannot be properly quieisced using the VMware or Backup Exec VSS Requestor/Provider. It is recommended that Backup Exec Database or Application Agents be used inside of the Guest virtual machine to protect these applications.

4. How are application transaction logs handled?

Answer-
Application transaction logs are an important element to protecting your virtualized applications. Backup Exec 2010 provides new capabilities to assist you in the proper protection of your virtualized applications and their transaction logs.

For this reason, it is recommended that the Backup Exec Agent for Windows Systems (also known as the Backup Exec Remote Agent) be installed inside of the Guest virtual machine with the appropriate Backup Exec Agent (SQL, Exchange, or Active Directory) license key installed on the Backup Exec 2010 server.

Exchange and Active Directory transaction logs will be properly truncated automatically as part of your normal backups of the Guest virtual machine.

SQL installations inside of Guest virtual machines will still require a separate Log-level backup to properly truncate the transaction log of SQL.

5. How do block-level Incremental or Differential backups affect applications running inside of protected Guest virtual machines?

Answer-
Backup Exec 2010 Agent for VMware can properly protect the Guest virtual machines and their applications during a block-level Incremental or Differential backup. These Incremental and Differential backup sets will appear in your Restore view normally next to your Full backups. Applications inside of the Guest virtual machines will be properly handled via the Backup Exec Agent for Windows Systems (also known as the Backup Exec Remote Agent). Exchange and Active Directory transaction logs will be properly truncated. SQL installations inside of Guest virtual machines will still require a separate Log-level backup to properly truncate the transaction log of SQL

6. How are Backup Exec 2010 Database and Application Agents licensed in Guest virtual machines?

Answer-
Existing Backup Exec Database and Application Agent licensing for physical systems also applies to virtual environments. Each Guest virtual machine running an application to be properly protected by Backup Exec requires Backup Exec Agent license for that application. Please see the *Licensing* section of this document above for specific information and examples.

Deduplication of VMware Data

1. Does Backup Exec 2010 support deduplication of VMware backups?

Answer-
Backup Exec 2010 also introduces a new option for data deduplication during your backups to further reduce backup windows and reduce storage space consumption by your backups. The Backup Exec Deduplication Option allows for three different types of deduplication from a single Backup Exec 2010 server:

- **Client/Source-side deduplication-** Deduplication is performed remotely on the protected system via the Backup Exec Agent for Windows Systems.
- **Media Server-side deduplication-** Deduplication is performed locally on the Backup Exec 2010 media server during the backup.
- **Appliance deduplication-** Deduplication is performed by a 3rd party hardware-based deduplication appliance from supported partners, such as Exagrid, Data Domain, and Quantum.

Backup Exec 2010 Agent for VMware supports each type of deduplication listed above differently once the Backup Exec 2010 Deduplication Option has been installed on the Backup Exec 2010 server. Deduplication results will vary by type of deduplication being performed and the amount of change happening inside of the Guest virtual machine in between backups.

For **client-side deduplication**, Backup Exec 2010 Agent for VMware provides the necessary license right per licensed ESX or vSphere host to deploy the Backup Exec Agent for Windows Systems inside of Guest virtual machines running Windows 2000-2008 R2 to perform client-side deduplication. Deduplication will occur across all Guest virtual machines that are using the Backup Exec Agent for Windows Systems. However, these backups must be set up and configured to run separately from the Backup Exec Agent for VMware backups of the entire Guest virtual machine.

For **media server-side deduplication,** Backup Exec 2010 can perform media server-side deduplication of Backup Exec Agent for VMware backups at the .vmdk level. Deduplication rates and ratios will vary greatly between virtual machine backups depending on the change rate of the data inside of each Guest virtual machine and the uniqueness of the data across multiple .vmdk files.

For **appliance-side deduplication,** Backup Exec 2010 leverages the Symantec Open Storage Technology (OST) to write data directly to a dedicated deduplication appliance. Each vendor's deduplication appliance will vary in its ability to deduplicate .vmdk file backups. Please consult your preferred vendor's web site for information on the appliance's capabilities to deduplicate VMware data before purchasing. For a complete list of supported deduplication appliances, please see the Backup Exec 2010 Hardware Compatibility List (HCL).
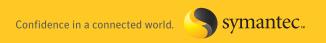 Backup Exec 2010 Hardware Compatibility List (HCL)

Virtual Machine Recovery

1. Do I have to recover the entire virtual machine?

Answer-
No, while backups of Guest virtual machines are done at full image-level of the entire Guest virtual machine, restores can be done at multiple levels including:

- The entire Guest virtual machine.
- Individual files and folders within a .vmdk file (Windows only)
- Individual Exchange mailboxes, messages, calendar items, contacts, folders, etc
- Individual SQL databases with full SQL control of the recovery experience
- Individual Active Directory objects including OU's, user accounts, printer objects, even individual attributes of objects **_all without a reboot of Active Directory Domain Controllers_**

Each of these individual objects requires a Backup Exec Agent to be installed in the Guest virtual machine that you are recovering these items to.

2. How can I use GRT to recover individual files and folders directly to Guest virtual machines?

Answer-
There are two possible methods for recovering individual files/folders directly to a Guest virtual machine with Backup Exec's GRT technology;

- Install a Backup Exec Agent for Windows Systems (AWS) into the Guest virtual machine and perform the restore like any other Backup Exec restore operation.
- If there is no desire to install a Backup Exec AWS into the Guest virtual machine just for restore purposes, files/folders can be redirected to be restored to the local Backup Exec server and copied manually to the Guest virtual machine using Windows Explorer.

3. How are individual files restored from within a .vmdk file?

Answer-
Backup Exec 2010 Agent for VMware allows for the recovery of individual files and folders from a complete single-pass backup of a Windows Guest virtual machine using Backup Exec's Granular Recovery Technology (GRT). GRT allows the Agent for VMware Virtual Infrastructure to catalog and open .vmdk files directly for restore purposes from within the Backup Exec console. No separate utilities or consoles are required to do this. From a single backup of a Windows Guest virtual machine, either individual files and folders or the complete virtual machine can be restored.

4. Does Backup Exec GRT work from tape and disk-based backups?
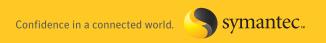
Answer-
Yes, both tape and disk-based backups are supported for GRT-enabled recoveries of Windows Guest virtual machines. For tape-based backups, the specific .vmdk file is automatically staged to a temporary disk location where the individual files and folders are recovered from it. The files and folders are deleted from the temporary staging location after the restore job completes.
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5. How are entire Guest virtual machines recovered?

Answer-
Restores of Guest virtual machines can be initiated from within the Backup Exec 2010 console's Restore view along with your traditional physical system backups. With AGENT FOR VMWARE's restore flexibility, Guest virtual machines can be restored to several different locations, including:

- Original locations on the ESX host
- Alternate ESX hosts

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- Alternate Datastores
- Alternate Resource Pools
- Alternate Resource Folders
- Alternate Offline file system paths (e.g. F:\temp)

7. How do block-level Incremental or Differential backups restored?

Answer-
This is another strong advantage of Backup Exec 2010 over competitive solutions for VMware backup and recovery. Incremental and Differential backups made with the Agent for VMware provide benefits at the time of restore as well. Backup Exec 2010 automatically and efficiently processes these backups in the proper order from the latest Incremental or Differential selected for restore in reverse order. Since Backup Exec automatically tracks the differences between each backup, only the needed blocks of data are restore from the latest incremental or differential backup all the way back to the original full backup. This ensures restore times and the amount of data moved across the network during a restore are minimized. Simply select the Incremental or Differential backup that you wish to restore your Guest virtual machine to and let Backup Exec handle the restore operation for you of all needed backup sets for a successful restore.

Supported Configurations

1. What versions of ESX and ESXi are supported with Backup Exec 2010 Agent for VMware

Answer-
Backup Exec 2010 Agent for VMware supports ESX 3.5 Update 2 and later, including vSphere 4.0 Update 1. Please see the official Backup Exec 2010 Software Compatibility List for the latest detailed information on specific versions supported and limitations here Backup Exec 2010 Software Compatibility List (SCL)

2. What Guest virtual machine OS's are supported for backup?

Answer-

Any Guest OS supported by VMware on ESX 3.5 and vSphere 4.0 is also supported by Backup Exec 2010 Agent for VMware Virtual Infrastructure.

3. What types of ESX storage and network types can the Agent for VMware support?

Answer-
Almost all ESX/ESXi storage types and network transports are supported, including:
- Fibre Channel SAN's
- iSCSI SAN's
- ESX Direct-Attached Storage (DAS)
- Network File System (NFS)

4. Are both tape and disk-based backup devices supported?

Answer-
Yes, both tape and disk devices are supported with Backup Exec 2010 AGENT FOR VMWARE. Disk-based backups work best and are generally recommended to be done as part of a disk-to-

disk-to-tape (D2D2T) backup strategy. Please ensure the tape device is a supported device on the Backup Exec 2010 Hardware Compatibility List. Backup Exec 2010 Hardware Compatibility List (HCL)

5. Are Guest virtual machines with "Raw Device Mapped (RDM)" disks supported?

Answer-
There are two types of RDM disks.

Physical compatibility mode (i.e. persistent-independent) bypasses the ESX storage infrastructure (vmfs file system) and thus cannot have a snapshot taken by vStorage API's for Data Protection. Physical compatibility mode RDM disks in this configuration are skipped automatically during the backup and logged by Backup Exec as unprotected. For Physical compatibility mode RDM disks, Backup Exec Remote Agents can be installed in the Guest virtual machine to backup their data using traditional backup methods.

Virtual compatibility mode RDM disks can be backed up but cannot be directly restored by Backup Exec to an ESX server or existing Guest virtual machine. Virtual compatibility mode RDM disks are included in the backup of the selected virtual machine automatically and will include ALL data located on the mapped LUN.

Neither physical nor virtual compatibility mode disks can be used with the Incremental or Differential backup capabilities. A Guest virtual machine configured with RDM disks will result in the entire virtual machine being unable to use Incremental or Differential backup settings.

To protect Virtual compatibility-mode or Physical independent-mode RDM disks, Symantec recommends that you install a Backup Exec Agent for Windows Systems or Agent for Linux inside of the Guest virtual machine and protect them as if they were physical systems.

6. Can Backup Exec 2010 Media Servers be installed on a Guest virtual machine running on an ESX server?

Answer-
Yes, Backup Exec 2010 media servers can be installed in a supported Guest virtual machine OS running on an ESX server to protect the entire server. However, the benefits of performing a SAN-based backup of virtual machines will not be realized if the Backup Exec server is virtualized and backup I/O is impacting the performance of the ESX server. In this configuration it is recommended that the "Hot Add" backup transport method be selected in the Backup Job Properties|VMware settings screen in Backup Exec 2010.

It should also be noted that VMware ESX support of local tape devices is limited to only certain SCSI hardware configurations. The directions for connecting a tape-based device to a virtual machine through the SCSI pass-through mechanism are detailed in the following VMware Knowledge Base article Configuring tape devices on ESX
   •   Fibre Channel attached tape devices are not supported by VMware
   •   Ensure the tape device is a supported device on the Backup Exec Hardware Compatibility List

While tape can be used with a virtualized Backup Exec media server, it is recommended that backup-to-disk (B2D) devices be used for backup targets for Backup Exec 2010 servers running inside of guest virtual machines on ESX.

Licensing

1. How is Backup Exec 2010 Agent for VMware Virtual Infrastructure licensed?

Answer-
Backup Exec 2010 Agent for VMware is licensed simply on a per-ESX server basis. There is no "per CPU", "per terabyte", or "per Guest virtual machine" licenses required. Simply count the number of ESX servers in the environment hosting the Guest virtual machines that need to be protected.

For example, three (3) ESX servers hosting ten (10) Guest virtual machines each to be protected would require:
- One (1) Backup Exec 2010 Media Server license
- Three (3) Backup Exec 2010 Agent for VMware Virtual Infrastructure licenses

2. How Are Backup Exec Remote Agents for Windows Systems and Linux/Unix Systems licensed with Agent for VMware?

Answer-
Each Backup Exec 2010 Agent for VMware license includes the licensed right to deploy Backup Exec Agent for Windows Systems (AWS) and Backup Exec Agent for Linux/Unix Servers (RALUS) to Guest virtual machines on an ESX host that has been licensed with the Agent for VMware. For example, if there are 10 Windows Guest virtual machines and 10 Linux Guest machines on an ESX server licensed with Agent for VMware, Backup Exec Agent for Windows Systems and Agent for Remote Linux and UNIX Servers can be installed in each Guest virtual machine if needed.

3. How are Backup Exec 2010 Database and Application Agents licensed in Guest virtual machines?

Answer-
Existing Backup Exec Database and Application Agent licensing for physical systems also applies to virtual environments. Each Guest virtual machine running an application to be protected will require a separate Backup Exec Database or Application Agent to be licensed and installed in it.

For example, one (1) ESX 3.5 server running three (3) Guest virtual machines each running Windows 2003 and Microsoft SQL 2005 to be protected would require:
- One (1) Backup Exec 2010 Media Server license
- One (1) Backup Exec Agent for VMware Virtual Infrastructure
- Three (3) Backup Exec 2010 Agent for Microsoft SQL Server licenses

4. How does vMotion between multiple ESX or vSphere hosts systems affect licensing of the Backup Exec Agent for VMware?

Answer-
The Backup Exec Agent for VMware fully supports vMotion between ESX or vSphere hosts. As a result, each ESX or vSphere host system must be licensed with a separate Backup Exec Agent for VMware Virtual Infrastructure license as any of the hosts may be used to process the backup or restore request.

Best Practices

1. How should my storage be configured for SAN-based backups?

Answer-
Configuring SAN-based backups with Backup Exec 2010 Agent for VMware Virtual Infrastructure
is relatively simple after following some basic guidelines:

- For performance reasons, it is recommended that only one Backup Exec server be zoned
  to see a set of VMFS LUN's at one time.
- Zone the LUN's containing the VMFS datastore so that the Backup Exec 2010 server can
  see and access them.
- On the Backup Exec 2010 server, ensure that the "**automount disable**" and
  "**automount scrub**" commands have been run to disable automatic drive letter
  assignment.
- As a result of the "automount disable" and "automount" scrub" commands having been
  run, the VMFS datastore LUN's should appear in Windows Disk Administrator as
  "**unknown". Do not attempt to mount, partition, or format these disks.**

2. What type of backup performance should I expect?

Answer-
Backup performance will be largely determined by the slowest component of the entire backup
data path from the ESX Server to the Backup Exec storage location (i.e Tape or Disk). These
components are:

- ESX server system resources: CPU (Ghz)
- ESX system disk I/O capabilities (Gbps)
- Network type (Fibre Channel 1/2/4/8GB, iSCSI, 1/10GB Ethernet, etc)
- Backup Exec 2010 server system resources

Here are some basic guidelines that should be followed when designing the VCB Backup Proxy
Server:

- Strongly consider installing Backup Exec on a physical machine.
- Size the ESX server and Backup Exec 2010 CPU to support 10 MHz of CPU available
  per 1 MB/second of data throughput in and out of the ESX server.
- The internal bus of the Backup Proxy should be fast enough to support the I/O devices
  connected to it. If multiple I/O ports are used, a system with multiple internal buses
  should be considered to support the additional I/O.
- Backup Exec server I/O performance is generally more important than CPU performance.
  For example, a 2 Gb Fibre connection should be able to transfer backup data at a
  nominal transfer rate of 140 MB/second. Backups over iSCSI or Gigabit Ethernet will
  likely be much slower, while 4/8 Gb FibreChannel connections should be significantly
  faster.
- Backup Exec server disk space for backup should be sized using the following equation:
  - Disk Size (GB) = (NUM_VM) x (AVG_SIZE)
    - Where: NUM_VM = Largest number of Guest virtual machines to be
      backed up simultaneously and AVG_SIZE = Average size of the largest
      Guest virtual machines to be backed up simultaneously.

- o For example, if five Guest virtual machines are to be backed up simultaneously, take the five largest VMs in the environment, calculate their average size, and use that number as (AVG_SIZE) in this equation.

3. **What type of restore performance can I expect?**

Answer-
Expect Guest virtual machine recoveries to take longer than backups when restoring via vCenter. VMware vStorage API's for Data Protection restores have shown to be significantly slower in writing virtual disk data across a SAN back to the VMFS storage than backups that are reading from it. This may be improved by VMware in future revisions of the vStorage API for Data Protection. Until then, it is recommended that restores over the SAN be done directly to ESX instead of through vCenter. For more information, please see the following Backup Exec Technote http://seer.entsupport.symantec.com/docs/346047.htm

4. **What is the recommended number of Guest virtual machines to protect with a single Backup Exec 2010 server?**

Answer-
There is no limit to the number of Guest virtual machines a single Backup Exec 2010 server can protect. This is highly dependent on the number of Guest virtual machines, the size of the .vmdk files for each Guest virtual machine, and the physical backup infrastructure.

5. **How often should I run a Full backup in between Incremental or Differential backups?**

Answer-
It is recommended that seven (7) day rotation be used with Incremental and Differential backups, where a Full backup is run on the 7th day to avoid long Incremental/Differential backup chains.

6. **Will there be any future enhancements for Backup Exec regarding the Agent for VMware Virtual Infrastructure?**

Answer-
Yes, absolutely. If you have suggestions on what features and functionality you would like to see for future versions, please feel free to submit your requests for Backup Exec at Backup Exec Ideas Forum