VEEam

Veeam Backup & Replication for VMware

Version 8.0

Evaluator's Guide May, 2015

#1 for Virtualization[™] Management and Data Protection **Microsoft Partner** Gold Application Development Gold Management and Virtualization VMWARE PARTNER TECHNOLOGY ALLIANCE

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GETTING STARTED

About Veeam Backup & Replication

Veeam[®] Backup & Replication[™] is a data protection and disaster recovery solution for virtual environments of any size and complexity. Veeam Backup & Replication provides fast, flexible, and reliable recovery of virtualized applications and data. It unifies backup and replication in a single solution, increases the value of backup and reinvents data protection for VMware vSphere and Microsoft Hyper-V virtual environments. Veeam Backup & Replication supports your entire virtual infrastructure with industry leading features such as instant file-level recovery and streamlined VM recovery, scalability, 2-in-1 backup & replication, built-in de-duplication, centralized management and many more.

About This Guide

This guide will help you become familiar with Veeam Backup & Replication and evaluate its capabilities. This guide explains the primary features of Veeam Backup & Replication and will help you begin using the product, regardless of your previous experience with the product.

Intended Audience

The document is intended for IT professionals who are looking to deploy Veeam Backup & Replication to protect their VMware virtual environment. This guide will be of interest to novices to the product and to VMware administrators, consultants and analysts who have used previous versions of Veeam Backup & Replication and want to evaluate new features in Veeam Backup & Replication.

Document Structure

The guide provides a set of self-guided evaluation exercises that you should follow to familiarize yourself with Veeam Backup & Replication. Each evaluation exercise provides a short feature overview, an evaluation case and evaluation procedure, as well as comments on validation of the exercise results.

The guide is comprised of four major parts:

- **Reference Environment**. This section describes requirements for a test lab that you need to provision to successfully perform evaluation tasks and outlines a sample test lab used in this evaluator's guide.
- **Backup Infrastructure Setup**. This section describes Veeam Backup & Replication installation and deployment steps that need to be completed before you can start evaluating the product.
- **Data Protection and Disaster Recovery**. This section describes evaluation cases covering the most typical data protection and disaster recovery tasks that you can perform with Veeam Backup & Replication.
- **Distributed Backup Infrastructure Management**. This section describes how you can manage a distributed backup infrastructure using Veeam Backup Enterprise Manager.

Help and Support

This guide provides a high-level overview of primary features in Veeam Backup & Replication and should be regarded as a supplement to existing technical documentation. The complete set of documentation can be found on the *Resources* web page at: www.veeam.com/documentation-guides-datasheets.html.

For technical support and assistance, use the following resources:

- Veeam Community Forums: http://forums.veeam.com
- **Customer Support Portal**: cp.veeam.com. Should you have a product issue, suggestion or question, please visit our Customer Center to open a case, search our knowledge base, reference documentation, manage your license or obtain the latest product release.

Revision #	Date	Change Summary
Revision 1	06/11/2014	Initial version of the document for the Veeam Backup & Replication 8.0.
Revision 2	06/05/2014	 Added scenarios: Backing up and Restoring Microsoft SQL Server Databases, Performing Self-Restore of VM Guest OS Files and Restoring Data from Encrypted Backup File Without Password. System Requirements section updated.

Document Revision History

SYSTEM REQUIREMENTS

To learn about system requirements, required ports and permissions, see Release Notes for Veeam Backup & Replication 8.0 or http://helpcenter.veeam.com/backup/80/vsphere/requirements.html .

BACKUP INFRASTRUCTURE SETUP

This section describes Veeam Backup installation and deployment steps that need to be completed before you can start evaluating the product.

Insight into Veeam Backup Infrastructure

The backup infrastructure is a framework that comprises a set of components needed to perform data protection and disaster recovery tasks. A typical Veeam backup infrastructure includes the following components:

- Veeam backup server: a physical or virtual machine running Veeam Backup & Replication. The Veeam backup server performs the role of the main management component: it is the configuration and control center of the backup infrastructure.
- Virtual infrastructure servers: ESX(i) hosts used as the source and the target for backup and replication.
- **Backup proxy**: a "data mover" component that retrieves VM data from the source storage, processes it and transfers to the destination.
- Backup repository: a location used to store backup files, VM copies and auxiliary replica files.

To perform evaluation exercises, you can use a simple deployment scenario or a distributed deployment scenario (recommended). The choice depends on your test lab environment. If you have a very small test lab and there is no possibility of allocating dedicated servers that will perform the roles of a backup proxy and backup repository, you can use a simple deployment scenario to evaluate the product. However, whenever possible, it is recommended that you use a distributed deployment scenario. This will help you gain insight into the new architecture of the backup infrastructure, evaluate its benefits and increase your experience in deploying backup infrastructure components.

Simple deployment

In a simple deployment scenario, components of the backup infrastructure perform several roles at a time. The backup infrastructure includes the following components:

- Veeam backup server
- Source ESX(i) host
- Target ESX(i) host (used for a replication scenario)

In the simple deployment scenario, the Veeam backup server performs three roles:

- It is the "control center" of the backup infrastructure, coordinating job performance and other administrative activities.
- It is the default backup proxy. When you perform backup, replication or VM copy, VM data is
 processed directly on the Veeam backup server and then moved to the target. All services
 necessary for backup proxy functioning are installed locally on the Veeam backup server.
- It is the default backup repository: all backups, VM copies and auxiliary replica backup files are stored on the Veeam backup server, in the Backup folder on the volume with the most amount of free disk space.



Distributed deployment

In the distributed deployment scenario, Veeam backup server, backup proxy and backup repository roles are assigned to dedicated servers. This type of deployment enables efficient data transfer and use of resources in your backup infrastructure because you move the data processing load from the Veeam backup server to a dedicated backup proxy and store data to a dedicated backup repository.

Depending on your production environment and the backup and replication scenarios you plan to use, the distributed backup infrastructure may include a number of dedicated backup proxies and backup repositories, both onsite and offsite, controlled by a single Veeam backup server. Use of multiple backup proxies and repositories allows for dynamic assignment of jobs and intelligent load balancing across the backup infrastructure.

To evaluate the product using this guide, it is sufficient to deploy one backup proxy and one backup repository locally in your test lab. Therefore, the backup infrastructure will consist of the following components:

- Veeam backup server
- Backup proxy
- Backup repository
- Virtual infrastructure servers



Exercise List

Exercise	Description	Time Estimates
Installing Veeam Backup & Replication	Install Veeam Backup & Replication on a physical or virtual machine.	5-10 minutes
Connecting virtual infrastructure servers	Add to the Veeam Backup & Replication console the hosts that you want to use as the source and target for backup and replication.	5-7 minutes
Configuring a backup proxy	Add to the Veeam Backup & Replication console the server that you want to use as a backup proxy and assign the role of the backup proxy to it. This exercise should be performed only if you decide to follow the distributed deployment scenario.	5-7 minutes
Configuring a backup repository	Add to the Veeam Backup & Replication console the server or that you want to use as a backup repository and assign the role of a backup repository to it. This exercise should be performed only if you decide to follow the distributed deployment scenario.	5-7 minutes

To deploy the backup infrastructure, perform the following exercises:

Installing Veeam Backup & Replication

You should install Veeam Backup & Replication on a Windows-based machine, either physical or virtual, that meets the system requirements.

Evaluation Case

In this exercise, you will install Veeam Backup & Replication. By installing Veeam Backup & Replication, you configure the Veeam backup server — the core component in the backup infrastructure that controls all other components.

Prerequisites

- Your test lab must meet the system requirements.
- You must have *Local Administrator* permissions on the server where Veeam Backup & Replication will be installed.
- You must have a valid trial license or full paid license for Veeam Backup & Replication.
- Veeam Backup & Replication uses a Microsoft SQL Server instance installed locally or remotely and requires .NET Framework 4.0. In case you do not have these, the setup wizard will automatically install Microsoft SQL Server 2012 Express and .NET Framework 4.0.

Procedure

To install Veeam Backup & Replication:

- 1. Download the latest version of Veeam Backup & Replication for your version of Microsoft Windows from www.veeam.com/downloads.
- 2. Mount the installation image using disk image emulation software, or burn the downloaded ISO image file to a blank CD/DVD or. If you are installing Veeam Backup & Replication on a virtual machine, use built-in tools of the virtualization management software to mount the installation image to the virtual machine.
- 3. After you mount or insert the disk with Veeam Backup & Replication setup, Autorun will open a splash screen with installation options. If Autorun is not available or disabled, run the Setup.exe file from the CD/DVD disk. Alternatively, you can right-click the new disk in My Computer and select Execute Veeam Backup & Replication Autorun or simply double-click the new disk to launch the splash screen.



- 4. Click the **Install** link in the **Veeam Backup & Replication** section of the splash screen. On the **Welcome** step of the wizard, click **Next** to start the installation.
- 5. At the **Provide License** step of the wizard, specify the path to the license file you obtained after you downloaded the product from the web site.
- 6. At the **Default Configuration** step of the wizard, specify if you want to use default installations settings or specify installation settings on your own. In the latter case, the setup wizard will include additional steps for configuring the necessary settings.
- 7. If you have selected to specify custom installation settings, pass through the next wizard steps and specify the required settings manually. If you have selected to use default installations settings, click **Install** to begin the installation process.
- 8. When the installation process is complete, click **Finish** to close the wizard.

Validation

Select **Programs** > **Veeam** > **Veeam Backup & Replication** from the **Start** menu to make sure that Veeam Backup & Replication has been installed successfully.

Connecting Virtual Infrastructure Servers

To connect virtual infrastructure hosts to the Veeam backup server, you need to add them to the Veeam Backup & Replication console.

You can connect ESX(i) hosts that will be used as source and target for backup and replication. If you plan to use an ESX(i) host that is a part of the vCenter Server hierarchy, it is recommended that you add the vCenter Server instead of separate hosts as this will provide more flexibility at work.

Evaluation Case

In this exercise, you will connect to the Veeam backup server vCenter Server and/or ESX(i) hosts that you plan to use as the source and target for backup and replication.

Prerequisites

- You must decide which hosts you want to use as source and target for backup and replication.
- The Veeam backup server must have access to all hosts you plan to use for backup and replication.
- Make sure that all necessary ports are open.

Procedure

To add vCenter Server or ESX(i) hosts, do the following:

- 1. Run Veeam Backup & Replication: from the **Start** menu, select **Programs** > **Veeam** > **Veeam Backup & Replication**.
- 2. Open the **Backup Infrastructure** view.
- 3. Right-click the **Managed servers** node in the inventory pane and select **Add Server**.

Server Tools	Veeam Backup & Replication
Home Server	0
Add Edit Remove Rescan Upgrade	
Server Server	
Manage Server Storage Updates	
Backup Infrastructure	^
Backup Repositories Managed Managed Micro Rescan Rescan Upgrade Servers	VMware vSphere Connect to your vSphere infrastructure by adding a vCenter Server (4.x or later) or standalone vSphere Hypervisor (ESX/ESXi 4.x or later). We recommend adding vCenter Servers rather than standalone hosts, as this provides vMotion awareness.
	VMware vCloud Director Connect to your vCloud infrastructure by adding a VMware vCloud Director Server (5.x). Registering vCloud Director Servers enables creation of vCloud-aware backup jobs that back up vCloud metadata such as vApp settings, in addition to actual VMs.
	Microsoft Hyper-V Connect to your Hyper-V infrastructure by adding a System Center Virtual Machine Manager (SCVMM) Server, Hyper-V cluster or standalone host (Windows Server 2008 R2 SP1 or later).
	Microsoft SMB3 storage Add a SMB3 server cluster or standalone SMB3 server to enable change block tracking for VMs running on SMB3. Storage must be Microsoft Windows Server-based storage; third-party storage that implements the SMB3 protocol is not supported.
Backup Infrastructure Bistory	Microsoft Windows server Add a Microsoft Windows server (Windows Server 2003 or later). Windows servers can be used to run various Veeam backup infrastructure components and roles in a distributed deployment.
» •	< · · · · · · · · · · · · · · · · · · ·
1 server	Enterprise Edition Evaluation: 274 days remaining VEEAD

4. In the Add Server window, select VMware vSphere.

	Add Server X
	type of server you want to register with backup infrastructure. All registered n be found under the Managed servers node on the Infrastructure tab.
vm	VMware vSphere Adds vCenter Server (recommended), or standalone vSphere Hypervisor (ESX/ESXi). (^{(h})
	VMware v⊆loud Director Adds VMware vCloud Director 5.x server.
Hyper-V	Microsoft <u>H</u>yper-V Adds SCVMM server, Hyper-V cluster, or standalone host (2008 R2 or later).
	Microsoft <u>S</u>MB3 Adds SMB3 server cluster, or standalone SMB3 server.
	Microsoft <u>W</u>indows Adds Microsoft Windows server (Windows XP/2003 or later).
	Linux Adds Linux server (must have SSH and Perl).
	Cancel

5. Specify a DNS name or the IP address of the server.

	New VMware Server	x
Name Specify DNS name	or IP address of VMware server.	
Name	DNS name or IP address:	
Credentials	vc-prod.veeam.local	
	Description:	
SSH Connection	Production vCenter Server	٦
Summary		
		_
	< Previous Next > Finish Cancel	

6. Enter credentials for the user account with administrator access permissions to the added server: click **Add** on the right of the **Credentials** field and specify the user name and password to connect to the added server. For vCenter Server, credentials must be specified in the *DOMAIN\USERNAME* format.

	New VMware Server	x
Type in s	tials server administrator's credentials. If required, specify additional connection settings including web-service port num	ıber.
Name	Type in an account with local administrator privileges on the server you are adding. Use DOMAIN\USER format for domain accounts, or HOST\USER for local accounts.	
Credentials	Credentials	
SSH Connection Summary	Username: VEEAM\Administrator Browse Add Password: ••••••••• • • Description: VEEAM\Administrator VEEAM\Administrator OK Cancel	
	Default VM ware web services port is 443. If connection cannot be established, check for possible port customization in the vCenter Server or ESX(i) server settings. Port: 443 -	

- 7. Click Next, then click Finish.
- 8. Repeat the procedure for all servers that you want to add.

Validation

- 1. Open the **Backup Infrastructure** view.
- 2. Click the Managed servers node in the inventory pane.
- 3. Make sure that the added vCenter Server or ESX(i) host is available in the working area.



Insight into Backup Proxy

In the backup infrastructure, a backup proxy is a "data mover" component responsible for handling jobs and transferring VM data. During backup, replication or VM copy activities, the backup proxy retrieves VM data from the source datastore, processes it and transfers to the destination storage. The backup proxy is also used to write data back to the source datastore during full VM restore and VM disk restore.

The role of a backup proxy should be assigned to a Microsoft Windows machine (physical or virtual) that meets the system requirements.

To retrieve VM data from the source datastore and write it back to the datastore during restore, the backup proxy can use one of the following modes:

- Direct SAN Access in this mode, the backup proxy copies VM data directly through the SAN, bypassing the LAN.
- **Virtual Appliance** in this mode, the backup proxy retrieves VM data directly from storage through the ESX(i) I/O stack, instead of transporting it over the network.
- **Network** in this mode, the backup proxy retrieves VM data from the ESX(i) host through the LAN.

You can explicitly select the transport mode that a backup proxy will use or let Veeam Backup & Replication automatically choose the most appropriate mode.

The backup proxy should provide an optimal route for VM data traffic. When configuring a backup proxy, you need to analyze the connection between the source datastore and a backup proxy. Consider the following recommendations:

- If you use FC SAN, assign the role of a backup proxy to a physical server with direct FC access to the SAN to enable LAN-free data retrieval.
- Otherwise, assign the role of a backup proxy to a VM on an ESX(i) host connected the source storage. This type of a backup proxy enables LAN-free data retrieval during backup and replication and LAN-free writing of data back to the storage during full VM restore. Moreover, it does not require you to provision a dedicated physical server.

Evaluation Case

In this exercise, you will configure a backup proxy. Configuration of a backup proxy is performed in two stages:

- 1. You should add to the Veeam Backup & Replication console a server that will perform the role of a backup proxy.
- 2. You should assign the role of a backup proxy to the added server.

Prerequisites

- You should have a dedicated Microsoft Windows physical or virtual machine that will perform the role of a backup proxy.
- The machine must have access to the Veeam backup server, source datastore and backup repository (for the backup and restore scenarios) and additionally access to the target ESX(i) host (for the replication scenario).
- Make sure that all necessary ports are open.

Procedure

To configure a backup proxy:

- 1. Open the **Backup Infrastructure** view.
- 2. Right-click the **Managed servers** node in the inventory pane and select **Add Server**.

Server Tools		Veeam Backup & I	Replication		>	x
Home Server						0
Add Edit Remove Rescan Upgrade						
Add Edit Remove Rescan Upgrade Server Server						_
Manage Server Storage Updates						
Backup Infrastructure	D Type in an object name	e to search for			1	ж
Backup Repositories Backup Repositories Backup Repositories Service providers Service providers Service providers Service providers Service providers Add Server Managed servers Rescan Upgrade Servers Backup & Replication Backup Infrastructure Virtual Machines Storage Infrastructure	Name This server	Type Microsoft Windows Server VMware vCenter Server	Description Production vCenter St	rver		
Carl Tape Infrastructure						
ji ries						
1 server		Er	nterprise Edition	Evaluation: 274 days remaini	ıg (VEE аП	۱.:

3. In the Add Server window, select Microsoft Windows.

	Add Server
	type of server you want to register with backup infrastructure. All registered n be found under the Managed servers node on the Infrastructure tab.
	<u>V</u>Mware vSphere Adds vCenter Server (recommended), or standalone vSphere Hypervisor (ESX/ESXi).
	VMware v<u>C</u>loud Director Adds VMware vCloud Director 5.x server.
Hyper-V	Microsoft <u>H</u>yper-V Adds SCVMM server, Hyper-V cluster, or standalone host (2008 R2 or later).
Ę,	Microsoft <u>S</u>MB3 Adds SMB3 server cluster, or standalone SMB3 server.
Ţ	Microsoft <u>W</u>indows Adds Microsoft (^h)dows server (Windows XP/2003 or later).
	Linux Adds Linux server (must have SSH and Perl).
	Cancel

4. Specify a DNS name or the IP address of a Microsoft Windows server.

	New Windows Server	x
Name Specify DNS name	or IP address of Microsoft Windows server.	
Name	DNS name or IP address:	
Credentials	172.16.13.45	
Review	Description: Backup proxy on host esx01.veeam.local	_
Apply	Dackop proxy of host escol, vecan, ocal	
Summary		
	< Previous Next > Finish Cancel	

5. Enter credentials for the user account with administrator access permissions to the added server: click **Add** on the right of the **Credentials** field and specify the user name and password to connect to the added server. If you have specified credentials before, you can simply select them from the **Credentials** list. Note that credentials must be specified in the *DOMAIN\USERNAME* format.

	New Windows Server	x
Credent Specify s	tials server credentials	
Name Credentials	Type in an account with local administrator privileges on the server you are adding. Use DOMAIN/USER format for domain accounts, or HOST/USER for local accounts.	
Review Apply Summary	Add Add Add Password: Description: 171.16.13.45\Administrator OK Cancel	
	Click Ports to customize network ports to be used by individual components Ports	
	< Previous Next > Finish Cancel	

6. Follow the next steps of the wizard. At the last step of the wizard, click **Finish** to add the server.

Now you should assign the role of a backup proxy to the added server.

- 1. Open the **Backup Infrastructure** view.
- 2. Right-click the **Backup Proxies** node in the inventory pane and select **Add VMware Backup Proxy**.

Proxy	Tools	Veeam Backup & Replication	_ 🗆 X
Home Backup	Proxy		0
Add Edit Disable Remov Proxy - Proxy Proxy Proxy			
Manage Proxy	Upgrade		
Backup Infrastructure		Type in an object name to search for	×
 Backup Proxies Backup Repositories WAN Accelerators Service providers ▲ SureBackup ▲ Application Groups Wrtual Labs ▲ Managed servers ▶ W VMware vSphere ➡ Microsoft Windows 		Add VMware Backup Proxy Host A Description Add VMware Backup Proxy Add Hyper-V Off-Host Backup Proxy This server Created by Veeam Backup & Replicati	on
Backup & Replication			
🗊 Backup Infrastructure			
Virtual Machines			
🙀 Storage Infrastructure			
🚘 Tape Infrastructure			
📄 Files			
	Da		
1 ргоху		Enterprise Edition Evaluation: 274 days	remaining (VEEAM :

3. From the **Choose server** list, select the Microsoft Windows server that you have added.

	New VMware Proxy
Server Choose server for nu which are not proxie	ew backup proxy. You can only select between Microsoft Windows servers added to the managed servers is already.
Server	Choose server:
Traffic Bules	172.16.13.45 V Add New
riancinules	Proxy description:
Summary	Proxy server in a VM
	Transport mode:
	Automatic selection Choose Connected datastores:
	Automatic detection (recommended) Choose
	Max concurrent tasks:
	< Previous Next > Finish Cancel

- 4. In the **Transport mode** field, leave the **Automatic selection** option selected. Veeam Backup & Replication will analyze the backup proxy configuration, define to which datastores it has access and automatically select the best transport mode depending on the type of connection between the backup proxy and the source datastore.
- 5. In the **Connected datastores** field, leave the **Automatic detection** option selected. If you use SAN storage, Veeam Backup & Replication will automatically detect all datastores that the backup proxy can access via the *Direct SAN Access* mode.
- 6. Go through the next steps of the wizard without changing default settings. At the last step of the wizard, click **Finish** to finalize configuration of the backup proxy.

Validation

- 1. Open the **Backup Infrastructure** view.
- 2. In the inventory pane click the **Backup Proxies** node.
- 3. Make sure that the added backup proxy is available in the working area.

Proxy Tools		Veenm	Backup & Replication		_ D X
Home Backup Proxy		vecanni	Backup & Replication		0
TPBX R					
Add Edit Disable Remove Upgrade					
Proxy - Proxy Proxy Proxy					
Manage Proxy Upgrade					
Backup Infrastructure	D Type in an object nam	e to search for			×
Backup Proxies	Name	Туре	Host	Description	
Backup Repositories	172.16.13.45	VMware	172.16.13.45	Proxy server in a VM	
wAN Accelerators	VMware Backup Proxy	VMware	This server	Created by Veeam Backup & Replication	
Service providers					
SureBackup Application Groups					
Application croups					
⊿ (Managed servers					
VMware vSphere					
Microsoft Windows					
]				
Backup & Replication					
Backup Infrastructure					
_					
VM Virtual Machines					
😭 Storage Infrastructure					
🝋 Tape Infrastructure					
📄 Files					
🗟 *					
2 proxies	<u>.</u>		Enterprise Edition	Evaluation: 274 days remai	ining (VEEam

Insight into Backup Repository

Backup repository is a location to which created backup files, VM copies and auxiliary replica files are stored. You can use the following types of backup repositories:

- Microsoft Windows-based server with local or directly attached storage
- Linux-based server with local, directly attached or mounted NFS storage
- CIFS share
- Deduplication storage appliance*

* This guide describes backup repository configuration on Microsoft Windows, Linux servers and SMB shares. To learn about using deduplication storage appliances with Veeam Backup & Replication, see Veeam Backup & Replication User Guide at http://www.veeam.com/documentation-guides-datasheets.html.

Evaluation Case

In this exercise, you will configure a backup repository in which backup files, VM copies and auxiliary replica files will be stored.

Prerequisites

- You should have a Microsoft Windows server with a local or directly attached storage, Linuxbased server with a local, directly attached or mounted NFS storage, CIFS share or deduplicating storage appliance that will perform the role of a backup repository.
- If a Microsoft Windows- or Linux-based server is used as a backup repository, these servers
 must have access to the Veeam backup server and the server that will perform a role of the
 backup proxy. In case of a CIFS share, make sure that you have an account with the *Full
 Control* permissions on the share to be able to connect to it.
- Make sure that all necessary ports are open.

Procedure

To configure a backup repository:

- 1. Open the **Backup Infrastructure** view.
- 2. If you plan to use a CIFS share as a backup repository, go to step 7 of this procedure.

If you plan to use a Microsoft Windows-based or Linux-based server as a backup repository, right-click the **Managed servers** node in the inventory pane and select **Add Server**.

	erver Tools			Veeam Backup 8	& Replication		_ 🗆 X
Home	Server						0
	-23						
Add Edit Remove Server Server Server	Rescan	Upgrade					
Server Server Server Manage Server	Storage	Updates					
Backup Infrastruct			O Type in an object name	to search for			×
Backup Provies Backup Provies WAN Accelerators Service provides Application Gr Winual Labs Characteristics De Winual Labs Characteristics De Winual Labs Characteristics De Winual Labs Characteristics De Winual Labs Characteristics De Winual Labs Microsoft Winn Backup & Replicta Backup Infrastru Winual Machines Characteristics	ies s soups dows f ation cture	Rescan	Name This server vc-prod.veeam.local	Type Microsoft Windows Server Microsoft Windows Server Wilware vCenter Server	Description Backup proxy on host Production vCenter So		*
🔛 Tape Infrastructu	ure						
📄 Files		₿,					
3 servers					Enterprise Edition	Evaluation: 274 days remaini	ng VEEAM .::

3. In the Add Server window, select the server type: Microsoft Windows or Linux.

	Add Server										
	Select the type of server you want to register with backup infrastructure. All registered servers can be found under the Managed servers node on the Infrastructure tab.										
v m	VMware vSphere Adds vCenter Server (recommended), or standalone vSphere Hypervisor (ESX/ESXi).										
	VMware v<u>C</u>loud Director Adds VMware vCloud Director 5.x server.										
Hyper-V	Microsoft <u>H</u>yper-V Adds SCVMM server, Hyper-V cluster, or standalone host (2008 R2 or later).										
Ę,	Microsoft <u>S</u>MB3 Adds SMB3 server cluster, or standalone SMB3 server.										
	Microsoft <u>W</u>indows Adds Microsoft Windows server (Windows XP/2003 or later). (^{நி} ர										
	Linux Adds Linux server (must have SSH and Perl).										
	Cancel										

4. Specify a DNS name or the IP address of the Microsoft Windows- or Linux-based server that you want to use as a backup repository.

	New Windows Server	x
Name Specify DNS name	or IP address of Microsoft Windows server.	
Name	DNS name or IP address:	
Credentials	172.16.13.97	
Review	Description: Microsoft Windows-based backup repository	
Apply		
Summary		
	< Previous Next > Finish Cancel	

5. Enter credentials for the user account with administrator access permissions to the added server: click **Add** on the right of the **Credentials** field and specify the user name and password to connect to the added server. If you have specified credentials before, you can simply select them from the **Credentials** list. Note that credentials must be specified in the *DOMAIN\USERNAME* format.

	New Windows Server	x
Credent Specify s	tials server credentials	
Name	Type in an account with local administrator privileges on the server you are adding. Use DOMAIN\USER format for domain accounts, or HOST\USER for local accounts.	
Credentials	Credentials	
Review	Username: 172.16.13.97\Administrator Browse	
Apply		
Summary	Description: 172.16.13.97\Administrator OK Cancel	
	Click Ports to customize network ports to be used by individual components < Previous	

- 6. Follow the next steps of the wizard. At the last step of the wizard, click **Finish** to add the server.
- 7. Right-click the **Backup Repositories** node in the inventory pane and select **Add Backup Repository**.

Repository Tools		Veeam Bac	Backup & Replication					
Home Backup Repository							0	
Add Edit Remove Rescan Uj Repository Repository Repository	pgrade							
Manage Repository Tools								
Backup Infrastructure	✓ Type in an object name to se	arch for					×	
Backup Proxies Backup Provises Backup Repositories Add Backup Repositories SureBackup Application Groups Virtual Labs Managed servers B2 Minare VSphere B2 Microsoft Windows	Name Pository	Type Windows	Host This server	Path C:\Backup	Capacity Fre	e Description B Created by Vee	am Backup	
Backup & Replication Backup Infrastructure Virtual Machines								
G Storage Infrastructure								
Tape Infrastructure								
1 repository			Enterprise	Edition	Evaluation: 274	days remaining	veeam	

8. Specify a name for the added backup repository.

	New Backup Repository
Name Type in a name and	description for this backup repository.
Name	Name:
Туре	Backup Volume 01
	Description:
Server	Microsoft Windows-based repository
Repository	
vPower NFS	
Review	
Apply	
	< Previous Next > Finish Cancel

9. Select the type of backup repository: **Microsoft Windows server**, **Linux server** or **Shared folder**.

	New Backup Repository
Choose type of bac	kup repository you want to create.
Name Type Server Repository vPower NFS Review Apply	 Microsoft Windows server (recommended) Microsoft Windows server with internal or directly attached storage. Data mover process running directly on the server allows for improved backup efficiency, especially over slow links. Linux server (recommended) Linux server with internal, directly attached, or mounted NFS storage. Data mover process running directly on the server allows for more efficient backups, especially over slow links. Shared folder CIFS (SMB) share. When backing up over slow links, we recommend that you specify a gateway server located in the same site with the shared folder. Deduplicating storage appliance Advanced integration with EMC Data Domain, ExaGrid and HP StoreOnce. For basic integration, use the Shared folder option above.
	< Previous Next > Finish Cancel

10. For a Microsoft Windows- or Linux-based repository, select the server that you have added.

For a CIFS share, specify a UNC path to the shared folder that will be used as a backup repository and enter credentials of an account with administrative privileges on the share.

	New Backup Repos	itory		x					
Server Choose server backing your repository. You can select server from the list of managed servers added to the console.									
Name	Repository server:								
Туре	172.16.13.97 (Microsoft Windows-based ba	ackup repository)	~	Add New					
	Path	Capacity	Free	Populate					
Server	C:\	99.7 GB	83.0 GB						
Repository									
vPower NFS									
Review									
Apply									
, AAL,									
	< Prev	ious Next >	Finish	Cancel					

- 11. Specify a path to the folder to which backups and auxiliary replica files will be stored.
- 12. Click **Populate** to see how much space is available on your backup repository.

	New Backup Repository							
Repository Type in path to the	folder where backup files should be stored, and set repository load control options.							
Name	Location							
Туре	Path to folder: C:\Backups Browse							
Server	Capacity: 99.7 GB Populat	te						
Repository	Free space: 83.0 GB							
vPower NFS	Load control							
Review	Running too many concurrent jobs against the same repository reduces overall performance, an may cause storage I/O operations to timeout. Control repository saturation with the following	ıd						
Аррју	Limit maximum concurrent tasks to: Limit combined data rate to: MB/s							
	Click Advanced to customize repository settings Advance	:d						
	< Previous Next > Finish Cancel							

13. Go through the next steps of the wizard without changing default settings. At the last step of the wizard, click **Finish**.

Validation

- 1. Open the **Backup Infrastructure** view.
- 2. Click the Backup Repositories node in the inventory pane.
- 3. Make sure that the added backup repository is available in the working area.

		Repository	Tools				Veea	m Backup & Rep	lication			-	. 🗆 🗌	x
	Home	Backup Rep	ository											0
Add Repository R Mana	age Repos	itory	Resca Reposit	ory Tools	grade									
Backup In						e in an object name to	search for							×
	up Proxie:				Name		Туре	Host	Path	Capacity	Free	Description		
📑 Back	up Repos					kup Volume 01 ault Backup Repository	Windows Windows	172.16.13.97 This server	C:\Backups C:\Backup	99.7 GB 200.0 GB	83.0 GB	Microsoft Wind Created by Ve		
A Generation A Generation	Application firtual Lab: aged serve /Mware vS dicrosoft V p & Repl p Infrast	Groups s rs jphere /indows ication ructure												
	ge Infras													
🝋 Tape I	infrastru	cture												
📄 Files														
			G	è ÷										
1 repository	selecter	1						Enterpris	e Edition	Evaluatio	on: 274 da	ys remaining	veean	n:

DATA PROTECTION AND DISASTER RECOVERY TASKS

This section describes a set of exercises that you can perform to get to know the product functionality. Each exercise covers one of the most typical data protection or disaster recovery tasks and enables you to evaluate primary features of Veeam Backup & Replication.

Exercise List

To evaluate the key possibilities of Veeam Backup & Replication, perform the following exercises:

Exercise	Description	Time Estimates	
Performing backup	Configure a backup job.	5-10 minutes	
	Run the backup job to create a full image-level backup.	Varies*	
	Run the backup job again to create an incremental backup.	Varies*	
Backing up and restoring Microsoft SQL Server databases	Back up a virtualized Microsoft SQL Server and restore a database to a specific transaction.	Varies*	
Restoring a full VM	Restore a full VM from the image-level backup.	Varies*	
Restoring guest OS files	Restore specific guest OS files from the created image-level backup.	5-7 minutes	
Restoring VM disks	Restore a VM drive from the image-level backup, and attach it to another VM.	Varies*	
Restoring VM files	Restore a VM configuration file (VMX) from the image-level backup.	5-7 minutes	
Creating a backup copy	Create a copy of a backup file and store it on the secondary backup repository.	Varies*	
Performing replication	Configure a replication job.	5-10 minutes	
	Run the replication job to create a VM replica on the target host.	Varies*	
	Run the replication job once again to create a restore point for a VM replica.	Varies*	
Failing over a VM replica	Fail over to the VM replica from the original VM.	3-5 minutes	
Failing back to a primary VM	Fail back to the original VM from the VM replica.	Varies*	

* The actual time required to perform this exercise depends on your test lab configuration, the hardware and software being used and the size of processed VMs.

Performing Backup

Insight into Veeam Backup

Designed specifically for virtual environments, Veeam Backup & Replication performs image-level backup of VMs.

Veeam Backup & Replication backs up a VM image as a whole: it copies VM data at a block level unlike traditional backup tools that process guest OS files separately. Veeam Backup & Replication retrieves VM data from the source storage, compresses and deduplicates it and writes to the backup repository in Veeam's proprietary format. You can use the image-level backup for all types of data restore scenarios: perform Instant VM Recovery*, restore a full VM, separate guest OS files, VM files and VM virtual disks from the same backup file.

To produce a backup, Veeam Backup & Replication leverages VMware snapshot capabilities. When you need to perform backup, Veeam Backup & Replication triggers VMware vSphere to create a snapshot, a cohesive point-in-time copy of a VM that Veeam Backup & Replication can access to retrieve VM data. The VMware snapshot technology lets you back up VMs without suspending them: this is also knows as online hot backup.

In Veeam Backup & Replication, backup is job-driven: to perform backup, you need to configure a backup job. A backup job defines when, what, how and where to back up. One backup job can be used to process one or several VMs.

Veeam Backup & Replication conducts both full and incremental backup. During the first run of a backup job, Veeam Backup & Replication creates a full VM backup (VBK). All subsequent job cycles produce incremental backups:

- VIB if forward incremental or forever forward incremental backup is used.
- VRB if reversed incremental backup is used.

The number of increments kept on disk depends on retention policy settings.

The backup technology is a great choice for VMs with lower RTOs: typically, these are VMs running tier 2 applications. When the primary VM fails, you need some time to restore VM data from a compressed and deduplicated backup file. With Veeam's Instant VM Recovery*, however, this time is reduced to the minimum. At the same time, due to compression and deduplication, backup files require less disk space and can be saved to inexpensive storage.

* To learn about the Instant VM Recovery scenario, see Veeam Backup & Replication User Guide.

Evaluation Case

In this exercise, you will create backup of VM(s). You will configure a backup job and run it twice to create full and incremental backups.

It is recommended that you create a backup job for at least two VMs: one Microsoft Windows-based VM and one running OS other than Microsoft Windows, for example, Linux, Unix, BSD or MacOS. This will let you follow the two guest OS recovery scenarios afterwards: restoring guest OS files from a Windows-based VM and restoring guest OS files with multi-OS restore wizard.

Prerequisites

- All backup infrastructure components that will take part in the backup process should be added to the Veeam Backup & Replication console. These include an ESX(i)host on which VM(s) reside or vCenter Server to which this ESX(i) host is connected. If you plan to use a distributed architecture scenario, you should also have a backup proxy and a backup repository.
- [Optional] To receive an email notification when a backup job completes, specify global email notification settings. To do that, select **Options** from the main menu of Veeam Backup & Replication and specify necessary settings on the **Email Settings** tab.
- [Optional] To evaluate the application-aware image processing feature and the file indexing feature, make sure that at least one of backed up VMs runs the following OS'es:
 - Microsoft Windows Server 2003
 - Microsoft Windows Server 2008
 - Microsoft Windows Server 2008 R2
 - Microsoft Windows 7
 - Microsoft Windows 8
 - Microsoft Windows 8.1
 - Microsoft Windows 2012 Server
 - Microsoft Windows 2012 R2 Server

Procedure

To perform backup of VMs, follow the next steps.

Step 1. Create a backup job

1. On the **Home** tab, click the **Backup Job** button.

			Veeam Back	up & Replicat	ion			-	D X
Home	View								0
Backup Job Job	Backup VM File Copy Copy Copy	Restore Import Backup	Failover Plan						
Job Job	Auxiliary Jobs	Restore	Failover Plans						
Backup & Rep								ж	
🙀 Jobs		Name	Туре	Status	Last result	Next run	Target	Objects in job	
Backup & Re	plication								
Virtual Machines									
Giffer Storage Infrastructure									
🔚 Tape Infrast	ructure								
📄 Files									
	Da	* *							
0 jobs					Enterprise Ec	lition	Evaluation	274 days remaining 🚺	Æeam

2. Specify a name for the created backup job.

	New Backup Job	x
Name Type in a name and	description for this backup job.	
Name Virtual Machines Storage Guest Processing Schedule Summary	Name: Evaluation backup job Description: Backup job created for evaluation purposes	
	< Previous Next > Finish Cancer	el

Step 2. Add VMs to the backup job

You can back up individual VMs or VM containers: folders, resource pools, clusters, vApps, datastores and so on. Jobs with VM containers are dynamic in nature: if a new VM is added to the container after the backup job is created, the job is automatically updated to include the new VM.

If you have connected vCenter Server rather than a standalone ESX(i) host to the Veeam backup server, VMs added to the job will be backed up even if they are vMotioned to another host.

- 1. At the Virtual Machines step of the wizard, click Add.
- 2. To quickly find a VM or VM container, enter the name of the object that you want to find in the search field and click the **Start search** button on the right. Select a VM or VM container in the displayed list and click **Add**.

	Add Objects X	x
Virtual Mac Select virtual as you add n	Select objects:	hat automatically changes
Name	Windows VM Virtual Machine	
Virtual Machines		Add
Storage		
Guest Processing		Exclusions
Schedule		1 Up
Summary		- Down
		Recalculate
	*- windows vm ×	0.0 KB
	Add Cancel	h Cancel

Step 3. Exclude VMs and VM disks

If you create a backup job for a VM container, you can exclude specific VMs or VM containers from the backup job. You can also select which VM disks to back up.

Note that Veeam Backup & Replication automatically excludes VM log files from backups to make the backup process faster and reduce the size of the backup file.

- 1. At the Virtual Machines step of the wizard, click Exclusions.
- 2. Use the **VMs** tab to exclude VMs or VM container from a backup job. Click **Add** and select VMs and VM containers that must be excluded. To quickly find a VM or container, enter the name of the object you want to find in the search field and click the **Start search** button on the right.
- 3. Click the **Disks** tab. Select a VM and click **Edit** to select disks that must be backed up. This functionality is useful, for example, if you want to back up only VM system drives.
- 4. To exclude disks of a VM added as part of a container, click **Add** on the right to include the VM in the list as a standalone instance.

	Select Disks X	x
Virtua Select as you	VM disks to process: O All disks	pmatically changes
	IDE disks	
Name	☑ IDE (0:0) Select All	
Virtual Machines	✓ IDE (0:1)	Add Remove
Storage		Tiemove
Guest Processing		Exclusions
Schedule		t Up
Summary		+ Down
		Recalculate
	OK Cancel	
	Consider using this option to be able to restore, replicate or copy vinito a location where excluded disks are not accessible with the original paths.	Total size: 60.0 GB
	Otherwise, VM will fail to power on without manual VM configuration edits. OK Cancel	Cancel

5. If you exclude some VM disks from the backup, select the **Remove excluded disks from VM configuration** check box to automatically modify the VMX file with regard to the selected VM disks. With this option selected, you will be able to power on a restored VM without having to edit its configuration.
| Select Disks | x |
|---|--|
| VM disks to process:
All disks
Disk 0:0 only (typically, system disk) | pmatically changes |
| Selected disks: IDE (0:0) IDE (0:1) Demons | Add |
| | Exclusions |
| | ↓ Up ↓ Down |
| | Recalculate |
| Remove excluded disks from VM configuration
Consider using this option to be able to restore, replicate or copy VM to a
location where excluded disks are not accessible with the original paths.
Otherwise, VM will fail to power on without manual VM configuration edits. OK Cancel | Total size:
60.0 GB
Cancel |
| | VM disks to process: All disks Disk 0:0 only (typically, system disk) Selected disks: IDE (0:0) IDE (0:1) Add Remove |

- 6. Click **OK**.
- 7. Click **Recalculate** to see the total size of selected objects.

Step 4. Define the VM backup order

If you have included a number of VMs or VM containers to the backup job, you can specify the order in which VMs should be processed. This will help you make sure that the most important VMs in the job are processed first – for example, if you must fit into the backup window and you are unsure how much time VM processing will take.

- 1. At the Virtual Machines step of the wizard, select the added VM in the list.
- 2. Use the **Up** and **Down** buttons on the right to move the VM higher or lower in the list. The higher is VM in the list, the higher its priority. If you added a VM container as a single instance, VMs inside the container will be processed at random.

	New	Backup Job		X
Virtual Machin Select virtual ma as you add new	nes achines to process via container, or <u>o</u> VM into container.	granularly. Container provides d	ynamic selection that	automatically changes
Name	Virtual machines to backup:			
	Name	Туре	Size	Add
Virtual Machines	📫 Linux VM	Virtual Machine	80.0 GB	Remove
Storage	👘 Windows VM	Virtual Machine	80.0 GB	Remove
Guest Processing				Exclusions
Schedule				+ ye
Summary				+ Down
				Recalculate
				Total size: 60.0 GB
		< Previous Nex	st > Finish	Cancel

Step 5. Select a backup proxy and backup repository

If you use a distributed deployment scenario, you must point the created job to the backup proxy that will process VM data and to the backup repository to which VM backups must be stored.

- At the Storage step of the wizard, view the Backup proxy field and make sure that Automatic selection is specified there. Veeam Backup & Replication will check the settings of available backup proxies and select the most appropriate one for the job: the backup proxy that will enable the most efficient data retrieval from the source datastore. Veeam Backup & Replication first attempts to choose a backup proxy that uses the *Direct SAN Access* mode, then the backup proxy that uses the *Virtual Appliance* mode. If such backup proxy that uses the *Network* mode.
- 2. From the **Backup repository** list, select the backup repository that you have configured. Backup files created by the job will be written to this backup repository.
- 3. Define the number of restore points that should be kept. By default, Veeam Backup & Replication keeps 14 restore points.

	New Backup Job
	proxy server to be used for source data retrieval, backup repository to store the backup files produced by this dvanced job settings if required.
Name Virtual Machines	Backup proxy: Automatic selection Choose
Storage	Backup repository: Backup Volume 01 (Microsoft Windows-based repository)
Guest Processing Schedule	83.0 GB free of 99.7 GB Map backup
Summary	Retention policy Restore points to keep on disk:
	Configure secondary destinations for this job Copy backups produced by this job to another backup repository, or to tape. Best practices recommend maintaining at least 2 backups of production data, with one of them being off-site.
	block size, notification settings, automated post-job activity and other settings. Advanced < Previous Next > Finish Cancel

Step 6. Specify advanced backup settings

At the Storage step of the wizard, click Advanced to specify additional backup settings.

- 1. On the **Backup** tab, you can select the mode in which you want to perform backup: forever forward incremental, forward incremental or reverse incremental.
 - The forever forward incremental backup method produces a backup chain that consists of the first full backup and a set of forward incremental backups following it. To use this backup method, select **Incremental** and do not enable active full and/or synthetic full backup.
 - The forward incremental backup method produces a backup chain that consists of the first full backup and a set of forward incremental backups following it. Additionally, the forward incremental backup chain contains synthetic full and/or active full backups that "split" the backup chain into shorter series. To use this backup method, select **Incremental** and enable active full and/or synthetic full backup.
 - The reverse incremental backup method produces a backup chain that consists of the last full backup and a set of reverse incremental backups preceding it. To use this backup method, select **Reverse incremental**.
- 2. If you have selected to use forward incremental backup, select **Enable synthetic fulls** and specify a day on which a new full backup file should be created. This option is very useful if your corporate policies require you to periodically create full backups. To create a synthetic full backup, Veeam Backup & Replication uses full and incremental backup files that already reside on the backup repository (instead of retrieving VM data from the production storage). Synthetic full backups do not impact your virtual infrastructure or primary storage.
- 3. With synthetic backup scheduled, you will have a number of full backups on disk a full backup created at the first run of the backup job and those create according to the synthetic backup schedule. To save the disk space, you can select the **Transform previous full backup chains into rollbacks** check box. In this case, Veeam Backup & Replication will transform all previous full backup chains to a reversed incremental backup sequence. This option allows you to keep only one full backup image on disk and so reduce the amount of space required to store backups.



- 2. Click the **Storage** tab. Leave the **Enable inline data deduplication** check box selected. Veeam Backup & Replication deduplicates identical blocks of data when backing up multiple VMs in one job and eliminates empty space on logical disks of VMs. Use of deduplication dramatically reduces storage costs: you can reduce the backup size up to 90% when backing up VMs created from the same template.
- 3. Make sure the **Exclude swap file blocks from processing** check box is selected. Swap files are dynamic and change intensively between runs of a backup job. Veeam Backup & Replication will identify data blocks of the Microsoft Windows pagefile in the VM guest OS and exclude them from processing, which will result in increased performance and smaller increments.
- 4. To reduce the size of a backup file, Veeam Backup & Replication offers 5 compression levels: None, Dedupe-friendly, Optimal, High and Extreme, that provide different compression ratios to meet the needs of your environment. For this evaluation exercise, make sure that the Optimal compression level is selected.
- 5. Veeam Backup & Replication lets you encrypt backup files and restore data from encrypted backups even if you have lost a password. To enable backup file encryption, select the **Enable backup file encryption** check box and click **Add** on the right to choose the necessary password.

Veeam Backup & Replication lets you decrypt backup files even if you have lost or forgotten the password. To learn more, see the Restoring Data from Encrypted Backup File Without Password scenario.

	Advanced Settings	×
Storage Specify pro job and cu	Backup Storage Notifications vSphere Storage Integration Advanced	up files produced by this
Name Virtual Machines	 Enable inline data deduplication (recommended) Exclude swap file blocks from processing (recommended) Compression level: 	Choose
Storage	Optimal (recommended) Optimal compression provides for best compression to performance ratio, and lowest backup proxy CPU usage.	~
Guest Processing Schedule	Storage optimization:	скир
Summary	Best performance at the cost of lower deduplication ratio and larger incremental backups. Recommended for SAN, DAS or local target.	
	Encryption ✓ Enable backup file encryption Password: My favorite book (Password age: less than 1 day; ✓ Add ▲ Loss protection disabled <u>Manage passwords</u>	Best practices em being off-site.
		🎡 Advanced
	Save As Default OK Cancel	Cancel

6. Click the **Notifications** tab. Select the **Send email notifications to the following recipients** check box. When the job completes, you will receive a notification with details on the job performance. You will be able to receive email notifications only if you specify global email settings. To specify email settings, select **Options** from the main menu.

	Advanced Settings	x
Storage Specify pro job and cu	Backup Storage Notifications vSphere Storage Integration Advanced ✓ Send SNMP notifications for this job	up files produced by this
Name Virtual Machines	 Send email notifications to the following recipients: administrato@veeam.com Use global notification settings 	Choose
Storage Guest Processing	O Use custom notification settings specified below: Subject:	
Schedule	[%JobResult%] %JobName% (%VmCount% VMs) %Issues%	
Summary	Notify on warning Notify on error Suppress notifications until the last retry Set successful backup details to this VM attribute: Notes	Best practices em being off-site.
	Append to the existing attribute's value Save As Default OK Cancel	Advanced

- **Note:** Make sure that you specify your email address once: either in the **To** field in general notification settings or in job notification settings. If you specify both, you will receive two identical notifications when the job is completed.
 - 7. Click the **vSphere** tab.
 - 8. If you back up a VM that is not VSS-aware, for example, a Linux-based VM, make sure that the **Enable VMware tools quiescence** check box is selected. This option helps create transactionally consistent backups of such VMs.
 - 9. Make sure that the Use changed block tracking data check box is selected. For VMware VMs with hardware version 7 or later, Veeam Backup & Replication employs VMware vSphere Changed Block Tracking (CBT). Instead of scanning VMFS to know which data blocks have changed since the previous job run, Veeam Backup & Replication queries the CBT module to get the list of changed blocks. Use of CBT increases the speed and efficiency of block-level incremental backups. For example, if only 5% of a VM changed since the last backup, incremental backup will be performed 20 times faster.
 - 10. Make sure that the **Enable changed block tracking for all processed VMs** check box is selected. This option forces use of CBT even in case it is switched off at the level of the ESX(i) host.

	Advanced Settings X	x
Storage Specify pro job and cu	Backup Storage Notifications VSphere Storage Integration Advanced	up files produced by this
Name Virtual Machines Storage Guest Processing Schedule Summary	 Enable VMware Tools quiescence Native quiescence is only used for virtual machines with application-aware image processing disabled. Changed block tracking Use changed block tracking data (recommended) Enable CBT for all protected VMs automatically Changed block tracking (CBT) allows for fast incremental backup and replication of VMs with virtual hardware version 7 or later. For CBT to be enabled, VM must have no existing snapshots. 	Choose Choose
		Best practices em being off-site.
	Save As Default OK Cancel	Cancel

Step 7. Specify additional guest OS processing options

At the **Guest Processing** step of the wizard, you can enable additional options for VM guest OS processing:

- Application-aware image processing, which will ensure proper restore of VSS-aware applications. To back up running VMs with VSS-aware applications, Veeam Backup & Replication uses application-aware image processing based on Microsoft VSS. Jobs with application-aware image processing produce transactionally consistent backups, that, unlike crash consistent backups, ensure proper recovery of virtualized applications without any data loss.
- Guest OS file indexing, which will enable you to search for guest OS files in backed up VMs and restore files in 1 click. With this option selected, Veeam Backup & Replication creates a catalog (or index) of VM guest OS files. To learn about the 1-click restore scenario, see the Searching for Guest OS Files and Performing 1-Click Restore section.

To enable application-aware image processing and indexing:

- 1. At the **Guest Processing** step of the wizard, select the **Enable application-aware image processing** check box.
- 2. Select the Enable guest file system indexing check box.
- 3. Specify credentials for the user account with Local Administrator privileges on all VMs included into the job: click **Add** on the right of the **Credentials** field and specify the user name and password. If you have specified credentials before, you can simply select them from the **Credentials** list. OS credentials are required to install, start and remove Veeam's runtime process that coordinates indexing and VSS activities inside the VM.

	New Backup Job
Guest Processing Choose additional p	g rocessing options available for Microsoft Windows guests.
Name	Enable application-aware processing
Virtual Machines	Quiesces applications using Microsoft VSS to ensure transactional consistency, performs transaction logs processing, and prepares application-specific VSS restore procedure.
Storage	Customize application handling options for individual VMs and applications Applications.
Guest Processing	Enable guest file system indexing
Schedule	Creates catalog of guest files to enable browsing, searching and 1-click restores of individual files. Indexing is optional, and is not required to perform instant file level recoveries.
Summary	Customize advanced guest file system indexing options for individual VMs
-	Guest OS credentials
	Credentials: 🛛 🛃 VEEAM \Administrator (VEEAM \Administrator, last edited: 🗸 🛛 Add
	Manage accounts
	Customize guest OS credentials for individual VMs and operating systems
	Test Now
	< Previous Next > Finish Cancel

By default, the specified guest OS credentials are used for all VMs processed by the backup job. If you back up several VMs that use different guest OS credentials, click **Credentials**. Select a VM in the list and click **Set User** > **Windows credentials/Linux credentials**. Then enter guest OS credentials with Local Administrator privileges for this specific VM. Repeat the procedure for all VMs in the job.

	New Backup Job
	est Processing oose additional processing options available for Microsoft Windows quests. Guest OS Credentials
Name Virtual Mach	Specify guest OS credentials for individual VMs: Add ns Object Account Add ns Image: Direct VM <default> Image: Direct VM Add</default>
Storage Guest Proce	Windows VM <default> Set User pplications.</default>
Schedule Summary	Credentials: A VEEAM Administrator (VEEAI V Add ndexing ndexing
	Add Cancel Add redentials
	Test Now Cancel

- 4. To specify advanced options for VSS processing, click **Applications**. Select a VM in the list and click **Edit**.
- 5. On the **General** tab, select the **Try application processing, but ignore failures** option to continue the backup job even if VSS errors occur. If application-aware image processing fails during the job, Veeam Backup & Replication will try to create a transactionally consistent backup with VMware Tools quiescence.
- 6. Make sure that the **Process transaction logs with this job** option is selected to correctly handle transaction logs after the backup job is completed. In this case, if the backup job finishes successfully, Veeam Backup & Replication will truncate transaction logs so that they do not overflow storage space. If together with Veeam Backup & Replication you use a third-party backup tool that maintains consistency of transaction logs, select the **Perform copy only** option to prevent possible conflicts.

	New Backup Job	2	x
Guest Proce	Linux VM Processing Settings		
N Specify application Object Vi Direct VM St G St St St	General SQL Scripts Applications Application-aware processing logic quiesces applications using Microsoft VSS, and configures them to perform required VSS restore steps during next VM boot. Require successful processing (recommended) Image: Try application processing, but ignore failures Disable application processing Transaction logs Choose whether this job should process transaction logs upon successful backup. Logs pruning is supported for Microsoft Exchange and Microsoft SQL servers. Image: Process transaction logs with this job (recommended) Perform copy only (lets another application use logs)	X Add Edit Remove]
	OK Cancel	ish Cancel]

- **Note:** If you add a virtualized Microsoft SQL Server to the backup job, you can configure the job to copy transaction logs. To learn more, see Backing up and Restoring Microsoft SQL Server Databases.
 - Click Indexing, select the necessary VM in the list and click Edit > Windows indexing or Linux indexing. Select Index everything to perform indexing of the entire guest file system.

		New Backup Job	x
G	uest Processin	g	
	hoose additional	Windows VM Windows indexing settings	x
Name	Specify gue Object	Guest file system indexing mode: O Disable indexing	Add ns
Virtual Mach	Linux V	Index everything	Edit pplications.
Storage	- Window	Index everything except: Folder Add	Remove
Guest Proce		%windir% %ProgramFiles%	vidual files.
Summary		%ProgramFiles(x86)% %Program\u/£/22% ✓ Default	ndexing
		Index only following folders: Folder Add	
		Remove	Add
		OK Cancel	redentials Cancel
l			Test Now
		< Previous Next >	Finish Cancel

Step 8. Specify job scheduling settings

A backup job can be scheduled or run manually. To schedule a backup job:

- 1. At the **Schedule** step of the wizard, select the **Run the job automatically** check box. If you do not select this check box, the job will be saved and you will have to run it manually.
- 2. Select the schedule type: daily, monthly, periodically or continuously. You can also chain the jobs so that they run one after another.
- 3. Make sure the **Retry failed VM processing** check box is selected. During the retry cycle, only VMs that failed during the main backup cycle will be processed.
- 4. Select the **Terminate job if it exceeds allowed backup window** check box and click **Window**. Define the backup window for your environment. In case the created job overlaps the specified window, it will be automatically terminated not to produce additional overhead on your virtual environment.
- 5. Click Create.

	New Backup Job
Specify the job sch	eduling options. If you do not set the schedule, the job will need to be controlled manually.
Name	✓ Run the job automatically
Virtual Machines	● Daily at this time: 10:00 PM 文 Everyday V Days
Storage	O Monthly at this time: 10:00 PM 💭 Fourth ∨ Saturday ∨ Months
Guest Processing	O Periodically every: 1 V Hours V Schedule
Schedule	O After this job:
Summary	Automatic retry ✓ Retry failed VMs processing: 3 ♀ times Wait before each retry attempt for: 10 ♀ minutes Backup window If the job does not complete within allocated backup window, it will be terminated to prevent snapshot commit during production hours. Window
	< Previous Create Finish Cancel

Step 9. Review job settings and start the job

- 1. Review the summary of backup job settings.
- 2. Select the **Run the job when I click Finish** check box and click **Finish**. The job will start.

	New Backup Job	x
Summary The job's settings ha	ve been saved successfully. Click Finish to exit the wizard.	
Name Virtual Machines Storage Guest Processing Schedule Summary	Summary: Name: Evaluation backup job Target Path: C:\Backup Enable application-aware processing Enable guest file system indexing Source items: Linux VM (vc-prod.veeam.local) Windows VM (vc-prod.veeam.local) Command line: "C:\Program Files\Veeam\Backup and Replication\Backup \Veeam.Backup.Manager.exe" backup 75f0e088-2fb5-4513-bfe8-7a58c4087ef8	_
	J ☑ Run the job when I click Finish	
	< Previous Next > Finish Cancel	
		x
	New Backup Job	^
Summary The job's settings ha	ve been saved successfully. Click Finish to exit the wizard.	^
		-
The job's settings had Name Virtual Machines Storage Guest Processing Schedule	ve been saved successfully. Click Finish to exit the wizard. Summary: Name: Evaluation backup job Target Path: C:\Backups Type: Hyper-V Backup Enable application-aware processing Enable guest file system indexing Source items: Linux VM (172.16.13.45) Target repository Backup Volume 01 Target repository backup Volume 01 Target repository backup 21.12.16.13.97 Target repository path: C:\Backups Command line: ''C:\Program Files\Veeam\Backup and Replication\Backup	

Step 10. Monitor job performance in real time

When the job is running, you can view job statistics in the real-time mode. Job statistics provide detailed data on the job: job progress, duration, processing rate, performance bottlenecks, the amount of data processed, read and transferred and other details of the job performance. Beside general job statistics, you can view detailed data for each VM or VM container processed by the job.

- 1. Open the **Backup & Replication** view.
- 2. Select the **Jobs** node in the inventory pane.
- 3. Click the job in the working area to open the lower pane with job statistics. Now you can track the job performance as the job runs.
- 4. Select the name of a specific VM or a VM container to view detailed statistics for this specific object only. Note that Veeam Backup & Replication processes all VMs and VM containers in the job in parallel.

Job Tools		Veeam Backu	p & Replication			- • ×
Home View Job						0
Start Stop Retry Active Statistics SQL	Report SQL Edit Clone	Disable Delete				
Full Statistic	Report					
Job Control Detai	ils Man	age Job				
Backup & Replication	🔎 Type in an object name t	o search for				*
⊳ 🙀 Jobs	Name 🔷	Type State	s Last result	Next run	Target	Objects in job
⊿ 🔓 Backups 😤 Disk	Evaluation backup job	VMware Ba 0% o	omplet	11/11/201 8	Backup Volume 01	2
	Job progress:					0 of 2 VMs
Backup & Replication	Summary	Data		Status		Throughp
🗃 Backup Infrastructure	Duration: 0:00:55	Processed:	0.0 KB (0%)	Success:	0	
~	Processing rate: 0 KB/s	Read:	0.0 KB	Warnings:	0	
Virtual Machines	Bottleneck: Detecting	Transferred	0.0 KB	Errors:	0	
😭 Storage Infrastructure	VM name Status	Action				Duration
	Linux VM 💽 0%		or processing at 11/11/2014 backup infrastructure resour		ned	
👔 Files		VM proces	sing started at 11/11/2014 6.0 GB (15.5 GB used)		,	
1 job selected			Enterprise Edition	Euclustic	ın: 274 days rema	1/662PD

5. Wait for the job to complete. Note that the job must complete with the *Success* or at least the *Warning* status. If the job completes with the *Failed* status, the backup file will not be created and you will not be able to perform restore operations.

Step 11. Perform incremental backup

To perform incremental backup of a VM, do the following:

- 1. Open the Backup & Replication view.
- 2. Select the **Jobs** node in the inventory pane.
- 3. Right-click the job in the working area and select **Start**. Wait for the job to complete. Note that the job must complete with the *Success* or at least the *Warning* status.

	Job Tools		Veeam B	ackup & Re	plication	_ D X
Home	View Job					0
چ 🛃	📥 🖬	âe (*				
Backup Replication Job Job	Backup VM File Copy Copy Copy	Restore Import Failover Backup Plan				
Primary Jobs	Auxiliary Jobs	Restore Failover Plans				
Backup & Repl	lication	O Type in an object name	to search for			×
⊳ 🎲 Jobs		Name	Туре	Status	Last re Next run Target	Objects in job
⊿ 鞼 Backups		Evaluation backup job	VMware Backup	Stopped	Start # 1 Backup Vol	lume 01 2
b 🗟 Disk ⊉ 🖓 Last 24 hours					Stop	
p Ligi Last 24 rious	8				🐼 Retry	
					Active Full	
					1 Statistics	
					Report	
					Disable	
					Clone	
					Delete	
					Fdit	
					Eur	
🚡 Backup & Re	plication					
📻 Backup Infra	structure					
Virtual Machi	ines					
ன Storage Infra						
🔚 Tape Infrasti	ructure					
📄 Files						
	G	»				
1 job selected				Enterpr	ise Edition Evaluation: 274 d	ays remaining VEEAM

Validation

After a backup job completes, the resulting backup file is stored to the backup repository that you have selected as a backup target. Veeam Backup & Replication creates a full backup file, VBK, during the first run of a backup job. During every next job run, it copies changes that were made to the VM since the last backup, whether full or incremental.

Depending on the backup mode you selected, Veeam Backup & Replication handles incremental changes differently:

- If you use the incremental backup mode (forever forward incremental or forward incremental), Veeam Backup & Replication saves incremental changes to the VIB file next to the VBK file on the backup repository.
- If you use the reversed incremental backup mode, Veeam Backup & Replication injects copied changes to the full backup file and saves replaced blocks of data as a reversed increment file, VRB, next to the VBK file on the backup repository.

Additionally, next to backup files, Veeam Backup & Replication creates a backup metadata file, VBM, that contains information on the backup job, VMs in the backup, number and structure of backup files, restore points and so on. This metadata file facilitates import of backups and mapping of backup jobs to existing backups.

To check backup results:

- 1. Open the **Files** view.
- 2. In the inventory pane, expand the backup repository file tree.
- 3. Open the target folder on the backup repository. In this folder, find the subfolder with the backup job name and open it. Make sure that it contains a VBK, .VIB/VRB and VBM files.

👪 l 💽 👪 👳 l		Evaluation back	up job	_ □	x
File Home Share	View				~ 😮
⋲ 💿 🔻 🕇 퉬 « Back	ups 🕨 Evaluation b	ackup job	v ¢	Search Evaluation backup job	Q
★ Favorites ■ Desktop ↓ Downloads ₩ Recent places					
 ibraries ibraries ibraries ibraries ibraries ibraries ibraries ibraries ibraries 	Evaluation backup job	Evaluation backup job2014-11-11T0 43853	Evaluation backup job2014-11-11T0 44504		
👰 Computer					
🙀 Network					
3 items 1 item selected 30.	1 MB				:==

- 4. Open the Backup & Replication view.
- 5. Select the **Jobs** node in the inventory pane. Double-click the backup job in the working area. Check the job results.
- 6. If you have selected to receive an email message once the job is completed, open your email client and check the *Inbox* folder. Make sure that you have two incoming emails with job results: one for the full backup and one for the incremental backup.

Backing up and Restoring Microsoft SQL Server Databases

To protect a virtualized Microsoft SQL Server, you can configure a backup job that will create imagelevel VM backups and, in addition, copy database transaction logs. Image-level backups will capture the VM state at specific points in time. Transaction logs will keep records of all transactions performed against protected databases since the moment of the last backup. If a Microsoft SQL Server VM fails, you can recover the VM from the necessary restore point and then apply transaction logs to get databases on the Microsoft SQL Server to the required state between backups.

To configure a backup job that copies transaction logs, you must create a regular backup job and specify advanced settings for transaction logs shipping. In these settings, you define:

- How often you want to back up transaction logs
- How transaction logs must be shipped to the destination
- How long transaction logs must be retained

With these settings enabled, Veeam Backup & Replication actually creates two jobs linked with each other:

- A regular backup job responsible for creating image-level backups
- An auxiliary job responsible for shipping database transaction logs

The regular backup job runs by the defined job schedule. It creates image-level backups and saves them on the backup repository. After the image-level backup has been successfully created, Veeam Backup & Replication truncates transaction logs on the virtualized Microsoft SQL Server.

The auxiliary backup job runs continuously. The job copies transaction logs accumulated between VM restore points at scheduled intervals, for example, every 15 minutes. As a result, on the backup repository you will have a chain of restore points and a set of transaction logs that cover intervals between these restore points.

Veeam Backup & Replication ships transaction logs to the backup repository and saves them in files of VBL format next to VM image-level backups. To ship transaction logs from the virtualized Microsoft SQL Server to the backup repository, Veeam Backup & Replication uses log shipping servers — Microsoft Windows machines added to the backup infrastructure. You can select explicitly what log shipping servers you want to use, or let Veeam Backup & Replication assign log shipping servers automatically.

For restore operations, Veeam Backup & Replication offers a special tool — Veeam Explorer for Microsoft SQL Server. Veeam Explorer for Microsoft SQL Server is integrated with Veeam Backup & Replication. The explorer is installed automatically when you deploy Veeam Backup & Replication.

Veeam Explorer for Microsoft SQL Server supports a number of restore scenarios:

- You can restore a Microsoft SQL Server to a specific point in time or to a specific transaction.
- You can restore the database to a specific point in time or transaction and export it to the necessary location.

Evaluation Case

In this exercise, you will back up a Microsoft SQL VM and restore a database on the Microsoft SQL Server to a specific transaction using the created backup. To do this, you will perform the following actions:

- Configure a backup job that will create a Microsoft SQL VM backup and copy transaction logs.
- Use the created VM image-level backup and transaction logs to recover a database on the Microsoft SQL Server to a specific transaction with Veeam Explorer for Microsoft SQL Server.

It is strongly recommended that you use a non-production Microsoft SQL Server with a sample database for this exercise.

Prerequisites

Make sure that the *Full* or *Bulk-logged* recovery model is enabled for the database on the Microsoft SQL Server that you plan to back up. If the recovery model is set to *Simple*, Veeam Backup & Replication will not detect and process transaction logs.

Procedure

Step 1. Configure the backup job for a Microsoft SQL VM

- 1. In Veeam Backup & Replication, configure a backup job that processes a Microsoft SQL Server VM (see the Performing Backup exercise).
- 2. At the **Guest Processing** step of the **New Backup Job** wizard, select the **Enable applicationaware processing** check box. In the **VM Guest OS credentials** section, specify a user account to connect to the VM guest OS. The user account must have the sysadmin privileges on the Microsoft SQL Server. In the opposite case, Veeam Explorer for Microsoft SQL Server will fail to automatically identify Microsoft SQL databases in the created VM backup.
- 3. Click Applications.
- 4. Select the Microsoft SQL Server VM in the list and click Edit.
- 5. In the **Transaction logs** section, make sure that the **Process transaction logs with this job** option is selected.

_	New Backup Job	x
Guest Proce	sqI02 Processing Settings	
Choose additic	General SQL Scripts Applications	x
Vi B sql02	Application-aware processing logic quiesces applications using Microsoft VSS, and configures them to perform required VSS restore steps during next VM boot. Require successful processing (recommended)	Add Edit
G	 Try application processing, but ignore failures Disable application processing 	Remove
Si	Transaction logs Choose whether this job should process transaction logs upon successful backup. Logs pruning is supported for Microsoft Exchange and Microsoft SQL servers.	
	 Process transaction logs with this job (recommended) Perform copy only (lets another application use logs) 	
		Cancel
	OK Cancel	ish Cancel

- 6. Click the **SQL** tab.
- 7. Select the **Backup logs periodically** option.
- In the Backup logs every <N> minutes field, specify how often you want to ship transaction logs from the Microsoft SQL Server VM to the backup repository. By default, Veeam Backup & Replication ships transaction logs every 15 minutes.
- 9. In the **Retain logs** section, specify the retention policy for transaction logs. You can store them for a specific number of days or until a preceding image-level backup is removed from the backup chain.

10. In the **Log shipping servers** section, leave the **Automatic selection** option selected. Veeam Backup & Replication will automatically identify the least loaded Microsoft Windows server in your backup infrastructure and use this server to ship transaction logs to the backup repository.

	r	New Backup Job		x
	Guest Proce	sqI02 Processing Settings		
	Choose additic Specify application Object	General SQL Scripts Choose how this job should process Microsoft SQL Server transaction logs. Truncate logs (prevents logs from growing forever) Do not truncate logs (prevents simple recovery model) Backup logs periodically	Add	
G		Backup logs every: 15 🗘 minutes	Remove	
S		Retain logs: According to the corresponding image-level backup Keep only last 15 days Log shipping servers: Automatic selection Choose	Cancel	
			ish Cancel	

- 11. At the **Schedule** step of the wizard, define scheduling settings for the job. If you do not specify that the job must run automatically by the defined schedule, the backup job will be unable to ship transaction logs to the backup repository.
- 12. Finish working with the wizard and run the job to produce an image-level backup of the Microsoft SQL Server VM.
- 13. When you create a backup job that processes a Microsoft SQL Server VM and enable transaction log shipping, Veeam Backup & Replication creates two jobs: one processing the Microsoft SQL Server VM and the other one shipping transaction logs. In the inventory pane of the **Backup & Replication** view, expand the **Last 24 hours** node to see the created jobs.

	Veeam E	ackup & Replic	ation		_ 🗆 X
Home View					0
Backup Replication Job Job Copy Copy Copy Copy Copy Copy Copy Copy					
Backup & Replication	D Type in an object name to search	h for			×
⊿ 🛱 Jobs	Job Name	Session Type	Status	Start time 🔻	
Backup	🞝 Microsoft SQL Backup SQL Backup	SQL Log Backup	Working	11/11/2014 5:54 AM	
⊿ 🛅 Backups	🞝 Microsoft SQL Backup (Full)	Backup	34% completed	11/11/2014 5:54 AM	
📥 Disk					
⊿ 🗋 Last 24 hours					
🖒 Running (2)					
Backup & Replication Backup Infrastructure Wu Virtual Machines Storage Infrastructure Tape Infrastructure					
Files					
₿ *					
2 sessions			Enterprise Edition	Evaluation: 274 days rem	aining (VEEAM

- 14. After the image-level backup has been created, perform some transaction on the database on the Microsoft SQL Server VM that you have backed up. For example, if you use a test database, you can manually run a simple Microsoft SQL script to insert a record into the database or drop a record.
- 15. Wait for the period of time that you have defined in the **Backup logs every <N> minutes** field. After this period has expired, Veeam Backup & Replication will ship transaction logs and store them in a file of VBL format on the target backup repository, next to the image-level backup of the Microsoft SQL Server VM.

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File Home Share	View		~ ?
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🛠 Favorites	Name	Туре	Size
Desktop	📑 Microsoft SQL Backup	Veeam Backup & Replication backup chain metadat	ta 37 KB
🚺 Downloads	🧧 Microsoft SQL Backup	Veeam Backup & Replication full backup file	9,109,538 KB
🔛 Recent places	Microsoft SQL Backup	VLB File	30,894 KB
Ibraries Image: Documents Image: Dictures Image: Pictures Image: Videos Image: Computer Image: Network			
3 items			:==

Step 2. Recover a database to a specific transaction

- 1. Open the **Backup & Replication** view.
- 2. In the inventory pane, click the **Backups** node.
- In the working area, expand the backup job processing the Microsoft SQL Server VM, rightclick the Microsoft SQL Server VM and select Restore application items > Microsoft SQL Server databases.

		Backup) Tools						Veeam Backup	& Replicati	on				x
- E -	Home	Bac	kup												
Instant VM Recovery	Entire VM		Guest Files -	Applic Iten		Remove from Disk									
vPower		Re	store			Actions									
Backup &		ication	ı	[О Ту	pe in an obj	iect name to se	arch for							×
👂 🙀 Jobs					Job na				reation time	Restore point			Platform		
⊿ 🔓 Back						Microsoft SQ	L Backup	1	1/11/2014 5:54 AM		Default Backup	Repository	VMware		_
i last						🗗 sql02 🏠 Transacti	on log backup		Instant VM recov Restore entire VM Restore VM files Restore VM hard Restore guest file Restore applicati	- 1 disks s ▶	Default Backup		SQL Server		
								-			Microsoft S(QL Server datal	pases		
Ggj Backu		plication structur nes							Remove from dis	K					
~		structu	re												
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1 backup se	elected									Enterprise E	dition	Evaluation:	274 days remainii	ng (VEE	am:

- 4. Pass through the steps of the Microsoft SQL Server Database Restore wizard: select a restore point and specify a restore reason. At the last step of the wizard, click Finish to start the recovery process. Veeam Backup & Replication will automatically mount the Microsoft SQL Server VM file system to the Veeam backup server, locate the Microsoft SQL database and attach it to a staging Microsoft SQL Server Microsoft SQL Server on which the Veeam Backup & Replication database is deployed. After that, Veeam Backup & Replication will automatically open the database in Veeam Explorer for Microsoft SQL Server.
- 5. In the left pane of Veeam Explorer for Microsoft SQL Server, right-click the necessary database and select **Restore point-in-time state to <Microsoft SQL Server\Instance Name>**.

👌 Veeam Explorer for N	Microsoft SQL :	Server		_ D X
Home				
	estore Restor abases - Databas Restore		port abase •	
SQL02 GLOCALDB#6BFD80 GOCALDB#6BFD80 GOSQLEXPRESS GCRM Database		Database Info Name:	Customers	
Customers Locations Warehouse	Restore stat Restore poir Restore to a Restore to a Export state Export point	it in time state to SQL02\S nother server e of Tuesday 11/11/2014 -in-time state to Desktop other folder c::program Files virice Secondary database ar c::Program Files Wice Available Restore	4, 5:54 AM to Desktop\Customers \Customers osont sql: server\MSSQLTI.SqLEXPRESS\MSSQ nd log files osoft SQL Server\MSSQL11.SQLEXPRESS\MSSQ	

- 6. Veeam Backup & Replication will launch the **Restore** wizard. At the **Specify restore point** step of the wizard, select **Restore to a point in time**. Use the slider below to define the exact point in time to which you want to restore the database.
- 7. Select the **Perform restore to the specific transaction** check box and click **Next**.

為	Restore Wizard
	Specify restore point
1	Specify point in time you want to restore the database to:
	 Restore to the current restore point
	Restore to a point in time
	5:54 AM 6:10 AM 6:10 AM 11/11/2014
	Tuesday, November 11, 2014 6:10 AM
	Perform restore to the specific transaction
	Enables you to review major database transactions around the selected time, and restore the database to the moment in time right before the unwanted change.
	Back Next Cancel

8. At the **Fine-tune the restore point** step of the wizard, select a transaction to which you want to restore the database and click **Restore**.

2			Restore Wi	zard		x
	Fine-tune the res Select the undesired of to transaction involvin	peration in the li		databas	e will be restored to the state pric	ır
	Time	Operation	Object	Туре	Account	
	11/11/2014 6:05 AM	Row inserted	Customers	Table	S-1-5-21-529020523-209147833	
	11/11/2014 6:05 AM	Row inserted	Customers	Table	S-1-5-21-529020523-209147833	
		h3				
				Back	Restore Cancel	

10. Veeam Backup & Replication will start restoring database to the selected transaction. When the restore process is complete, Veeam Explorer for Microsoft SQL Server will display a popup message to notify you of the restore operation results.

Validation

Check the state of the restored database on the Microsoft SQL Server VM and make sure it has been restored to the necessary state.

Insight into Full VM Restore

If a production VM has failed and you need to recover it from the backup, you can use one of the two options that Veeam Backup & Replication offers:

- Instant VM Recovery*, which uses the vPower technology to start a VM directly from a compressed and deduplicated backup file. Instant VM Recovery creates a "temporary spare" of the original VM and provides the minimum restore time possible (several seconds to several minutes).
- Full VM recovery, which actually recovers a full VM from the backup file and registers it on the target host. Though full VM recovery takes more time than Instant VM Recovery as you have to extract the VM image to the production storage, it actually recovers a failed VM on the production storage and provides full disk I/O performance.

You can restore a single VM or a multiple VMs at once, both to the original location or to a new location. VM(s) can be recovered to the latest state or any valid point in time.

When Veeam Backup & Replication creates a backup of a VM, it additionally stores information about the initial VM location to the backup file. As all initial VM settings are available, restore of a VM to the original location is extremely fast: you can do it basically in one click. Restore to the original location mitigates the risk of operator's errors: you do not have to provide any VM data during the restore process, so the chance to specify wrong settings is minimal.

* To learn about the Instant VM Recovery scenario, see Veeam Backup & Replication User Guide.

Evaluation Case

In this exercise, you will restore a VM from the backup to its original location and power it on on the ESX(i) host.

Prerequisites

- You can restore a VM from any backup that has been successfully run at least once. Open the Backup & Replication view, select the Backups node in the inventory pane. Then expand the backup job and verify that there is at least one restore point available for the VM.
- VMs with Virtual Hardware version 8 are supported only by ESX(i) 5.x or later.

Important! When you restore a VM to the original location, Veeam Backup & Replication automatically deletes the initial VM. For safety's sake, make sure that you use a non-production VM for this exercise.

Procedure

To restore a full VM to its original location, do the following:

- 1. Open the **Backup & Replication** view.
- Select the Backups > Disk node in the inventory pane. Expand the backup job in the working area, right-click the necessary VM in the corresponding backup job and select Restore entire VM.

Backup Tools	Veeam Backup & Replication	_ 🗆 X
Home Backup Home Backup Instant VM Recovery VPower Restore	Remove from Disk Actions	۷
Backup & Replication	O Type in an object name to search for	×
 Jobs Backups Last 24 hours Backup & Replication Backup Infrastructure Storage Infrastructure Tape Infrastructure Files	3 Ob name Creation time Restore points Repository Platform	
La Cà		
1 backup selected	Enterprise Edition Evaluation: 274 days remaining	ng (VEEAM:

3. At the **Virtual Machines** step of the wizard, select the VM in the list, click **Point** on the right and choose the necessary restore point. If you select an incremental restore point, Veeam Backup & Replication will automatically restore data blocks from the full backup file and the chain of incremental backup files.

	Full VI	M Restore Wizard	x
7		estore Points	x
Ч	Available restore points for Windows VM:	1 Turne	
1.8.4	Job A 😂 Evaluation backup job	Туре	
Virtual	🕑 11/11/2014 4:45:32 AM	Increment	
Restor	J1/11/2014 4:39:51 AM	Full	
Reaso			M
Summa			
			ve
	L	ОК Са	ncel
			el

- 4. At the **Restore mode** step of the wizard, select **Restore to the original location**.
- 5. Click the **Pick proxy to use** link and make sure that **Automatic selection** is specified there. Veeam Backup & Replication will check settings of available proxies and select the most appropriate one for the job — the backup proxy that will enable the most efficient data transport to the source datastore. Veeam Backup & Replication first attempts to choose a backup proxy that uses the *Direct SAN Access* mode, then the backup proxy that uses the *Virtual Appliance* mode. If such proxies are not available, Veeam Backup & Replication selects the least loaded backup proxy that uses the *Network* mode.
- 6. Select **Quick restore**. Veeam Backup & Replication will perform incremental VM restore retrieve from the backup file only those data blocks that have changes since the selected restore point was created and write these data blocks to the source datastore. This option lets you significantly speed up the restore process.

	Full VM Restore Wizard
Restore Mode Specify whether se	lected VMs should be restored back to the original location, or to a new location or with different settings.
Virtual Machines Restore Mode Reason Summary	 Restore to the original location Quickly initiate restore of selected VMs to the original location, and with the original name and settings. This option minimizes the chance of user input error. Restore to a new location, or with different settings Customize restored VM location, and change its settings. The wizard will automatically populate all controls with the original VM settings as the default settings. Quick rollback (restore changed blocks only) Allows for quick VM recovery in case of guest OS software problem, or user error. Do not use this option when recovering from disaster caused by hardware or storage issue, or power loss. Pick proxy to use
	< Previous Next > Finish Cancel

7. At the **Reason** step of the wizard, specify the reason for restoring the VM.

	Full VM Restore Wizard
Reason Type in the reason reference.	for performing this restore operation. This information will be logged in the restore sessions history for later
Virtual Machines Restore Mode	Restore reason: Evaluating full VM restore
Reason	
Summary	
	Do not show me this page again
	< Previous Next > Finish Cancel

8. At the last step of the wizard, select the **Power on VM after restoring** check box; then click **Finish**.

Validation

Open the vSphere Client and make sure that the restored VM is running on on the original host.



Insight into Guest OS Files Restore

Together with full VM restore, Veeam Backup & Replication offers Instant File-Level Restore (IFLR) that lets you recover guest OS files and folders from the VM backup. In contrast to competitive solutions, IFLR does not require a specific file-level backup. Restore of guest OS files, as well as all other restore options, is available from the same image-level backup. Neither should you extract the VM image from the backup prior to restore: VM guest OS files can be recovered on-the-fly, directly from a regular backup or from a VM replica. This makes the restore process extremely fast and does not require you to provision additional storage resources.

Veeam Backup & Replication provides three options for guest OS files recovery:

- Recovery from Windows-based file systems (FAT, NTFS and ReFS)
- Recovery from 15 most used file systems (including Linux, Unix, BSD and soon) with the multi-OS restore wizard
- Universal File-Level Recovery* for any OS or file system through leveraging the Instant VM Recovery technology*

You can recover VM guest OS files to the latest state or any valid point in time.

* To learn about the Instant VM Recovery scenario, see Veeam Backup & Replication User Guide.

Evaluation Case

In this exercise, you will recover guest OS files and folders from the image-level VM backup and save them to the C:\backup\restored folder on the Veeam backup server.

The exercise covers two evaluation scenarios:

- Scenario 1: Recovering guest OS files from the backup of a Windows-based VM
- Scenario 2: Recovering guest OS files from the backup of a Linux-based VM or other non-Windows VM with the help of the multi-OS recovery wizard

Scenario 1. Restoring VM Guest OS Files (FAT, NTFS, ReFS)

When you recover guest OS files from Windows-based VMs, Veeam Backup & Replication mounts the content of a backup file directly to the Veeam backup server and displays the file tree in the built-in file browser. You can copy the files you need and save them locally or anywhere on the network. You can even point applications to restored files and work with these files as usual.

Prerequisites

- You can restore VM guest OS files from any backup that has been successfully run at least once. Open the **Backup & Replication** view, select the **Backups** node in the inventory pane. Then expand the backup job and check if there is at least one restore point available for the VM.
- Windows file restore mode supports Microsoft Windows file systems only (FAT, NTFS and ReFS). To restore files from VMs running other file systems, use the multi-OS file restore wizard.
- You cannot restore files from a VM if it is currently being backed up or replicated.

Procedure

To restore guest OS files from a Microsoft Windows VM:

- 1. Open the **Backup & Replication** view.
- Click the Backups > Disk node in the inventory pane. Expand the backup job in the working area, right-click a necessary VM in the corresponding backup job and choose Restore guest files > Microsoft Windows.

		Backup	Tools							Veeam Backup 8	k Replica	ation	1			-		x
- -	Home	Back	up															0
Instant VM	Entire		S uest	Application	Remove													
Recovery	VM		iles 🗸		from Disl													_
vPower		Res	tore		Actions													
Backup 8	Repli	cation			D Ty	pe in	an obje	ect nan	ne to s	earch for								ж
⊳ 😳 Jobs					Job na					Creation time	Resto	re poi			Platform			
⊿ 🔓 Back 📥 [Disk					Lin	ation ba iux VM		Ь	11/11/2014 4:38 AM 11/11/2014 4:45 AM	2		Backup Volum	ne 01	VMware			
⊳ 🏠 Last	24 hours					Wi	ndows \	/M		Instant VM recovery]						
									-	Restore entire VM								
									*	Restore VM files								
🔓 Backu	ıp & Rep	olication							<u>کے</u>	Restore VM hard disk Restore guest files		ē ;	Microsoft Wind	lows				
🗃 Backu	ıp Infras	tructure	2						E	Remove from disk		₹3	Linux and othe	r				
VM Virtua	al Machi	nes																
😭 Stora	ge Infra	structur	e															
🝋 Tape I	Infrastr	ucture																
📄 Files																		
				<table-cell> 💫</table-cell>														
1 backup se	lected										Enterprise	Editi	ion	Evaluation: 2	274 days rema	ining (VEE	э т :

3. At the **Restore Point** step of the wizard, select the necessary restore point.

	File Level Restor	е	X
Restore Point Select the restore point	int to restore guest OS files from.		
Restore Point	VM name: Windows VM		Original host: vc-prod.veeam.local
Reason	VM size: n/a		
Summary	Available restore points:		
Summary	Date	Туре	Backup
	11/11/2014 Tuesday 4:45:32 AM	Increment	
	11/11/2014 Tuesday 4:39:51 AM	Full	Evaluation backup job
	< Prev	ious N	lext > Finish Cancel

- 4. At the **Reason** step of the wizard, specify the reason for future reference.
- 5. Click Next. Then click Finish.

6. Veeam Backup & Replication will display a file browser with the file system tree of the VM. Right-click the necessary file or folder, select **Copy To** and enter C:\backup\restored in the **Choose folder** field.

2	Backup Browser (Windows VM at 1	.1/11/2014 4:49 AM	1	_ 🗆 X
	en In Exchange SharePoint Jorer Items Items Actions			
	Name Administrator	Type Size Folder	Creation Date 10/30/2013 1:3 x 9 10:0	
 Documents and Settings inetpub PerfLogs Program Files Program Files (x86) Recovery System Volume Information Users Windows (E:) 	Choose folder: C:\backup\restored	DK Canc	9 8:20 9 10:0 9 8:20 9 9:57	7/13/2009 10:0 7/13/2009 9:57 7/13/2009 9:57
6 objects				0.0 KB

Validation

- 1. Open the **Files** view.
- 2. In the inventory pane, expand the file tree under **This server**.
- 3. Select the C:\backup\restored folder and make sure that the restored files or folders are available there.

	File Tools			Veeam Ba	ackup & Replication				. 🗆	x
н н	lome File									0
Copy Paste	Rename Delete	Open Edit Properties	Add to File Copy Job + Jobs							
Files			Name	•	Туре	Size	Modified			
b b b b b b d	Infrastructure 1achines Infrastructure	backup job		ments and Settings	Folder					
		Liĝi	÷				E 1 4 534		1000	_
1 object					Enterprise Edition		Evaluation: 274 d	lays remaining	VEEC	
1 object				No serve De	Enterprise Edition		Evaluation: 274 d			
	File Tools			Veeam Ba	Enterprise Edition		Evaluation: 274 d		- 🗆	x
		Open Edit Properties Edit	Add to File Copy Job + Jobs	Veeam Ba			Evaluation: 274 d			
Copy Paste	iome File		Add to File Copy Job + Jobs Name	•	ackup & Replication	Size	Evaluation: 274 d			x
	Infrastructure	Edit Daßfe1bc5 backup job 3 Settings	Add to File Copy Job Jobs		ackup & Replication	Size				x
Restance of the second	Infrastructure	Edit Da6fe1bc5 backup job	Add to File Copy Job Jobs	•	ackup & Replication	Size			- 0	x @

Scenario 2. Restoring VM Guest Files (Linux, Unix and so on)

While most of backup tools offer file-level recovery for a very small number of file systems, typically, Windows and rarely Linux, Veeam's multi-OS restore wizard enables you to recover guest OS files from 15 file systems such as Linux, Unix, BSD, MacOS and many others.

For file-level recovery, Veeam Backup & Replication uses a special FLR helper — a small virtual appliance based on the stripped-down Linux kernel. Whenever you perform file-level restore, Veeam Backup & Replication automatically starts the appliance and mounts VM disks to the FLR appliance as virtual hard drives. Virtual disks are mounted directly from backup files, without prior extraction of the backup content, which makes the restore process much faster in comparison with competitive solutions. You can then copy individual files and folders from VM disks to your local machine drive or a network share.

You can also let the FLR appliance function as an FTP server. In this case, users will be able to access restored files on the FTP using the IP address of the FLR appliance. Bear in mind that users will be able to access restored files on the FTP only while the file browser with restored files remains open on the Veeam backup server. Once the file browser is closed, the FLR appliance will be powered off.

Prerequisites

- You can restore VM guest files from any backup that has been successfully run at least once. Open the **Backup & Replication** view, select the **Backups** node in the inventory pane. Then expand the backup job and check if there is at least one restore point available for the VM.
- Encrypted LVM volumes are not supported.

Procedure

To restore guest OS files from the backup of a Linux-based VM or other non-Windows VM:

- 1. Open the **Backup & Replication** view.
- Select the Backups > Disk node in the inventory pane. Expand the backup job in the working area, right-click the necessary VM in the corresponding backup job and choose Restore guest files > Linux and other.

Backup Tools	Veeam Backup & Replication	_ 🗆 X
Home Backup		0
Instant VM Recovery VPower VPower		
Backup & Replication	C Type in an object name to search for	*
Jobs Jobs Jobs Jobs Jobs Jobk Jok Jok	Job name Creation time Restore points Repository Platform	
l≩ ÷		
1 backup selected	Enterprise Edition Evaluation: 274 days remaining	veeam

3. At the **Restore Point** step of the wizard, select the necessary restore point.

£		File Lev	el Restore Wizard	x
	e store Point noose the restore point you w	ould like to resta	ore files from.	
	Available restore points: Date 11/11/2014 4:45:32 AM 11/11/2014 4:39:53 AM	Type Increment Full	Summary Virtual machine: Source host: Restore point:	Linux VM vc-prod.veeam.local 11/11/2014 4:45:3
			< Back	Next > Cancel

- 4. At the **Reason** step of the wizard, specify the reason for future reference.
- 5. At the last step of the wizard, click **Customize** to specify settings for the FLR appliance. Select an ESX(i) host, resource pool and the network on which the FLR appliance will run.
- 6. If you are restoring files from the NSS file system, select the **Restore from Novell Storage Services (NSS) file system** check box.

FLR Appliance Co	nfiguration x
Specify ESX(i) server, resource pool and helper appliance. Be sure to choose the you are restoring files to is located.	
Host	
esx01.veeam.local	Choose
Statistics	
VMs: 7 total	
6 running	
Resource pool:	
Resources	Choose
Network:	
VM Network	Choose
 Obtain an IP address automatically Use the following IP address: IP address: Subnet mask: 	· · ·
Default gateway:	
 Enable FTP server on appliance (ad Restore from Novell Storage Service 	ŕ

7. Click **Finish**. Note that the FLR appliance may take 30–40 seconds to boot.

- 8. Veeam Backup & Replication will display a file browser with the file system tree of the VM. Right-click a file or folder, select **Copy To** and enter C:\backup\restored in the **Choose** folder field.
- 9. If you are restoring files to the original Linux host, select the **Preserve permissions and ownership** check box so that all user access permissions for the file are preserved in the restored copy.
- 10. Click Restore.

ŝ	File Level Restore (a	pache at 8/30/2014 6:31:52 AM)				_ D X
Home						
🕞 🕞 📴 🛄						
	Copy Restore					
Up 👻	To 👻					
Navigation	Action					
🛚 🐣 dcb-linux.vmdk	Name ^	Size Date Modified	Permissions	Owner	Group	
👌 🧼 sda1		7/3/2013 7:56 AM	rwxr-xr-x	root	root	
1 📴 LVM	Copy To	6/26/2013 5:23 AM	r-xr-xr-x	root	root	
⊳ 🧼 dm-0	📄 boo Restore 🕨	Overwrite 2013 4:24 AM	rwxr-xr-x	root	root	
▶ 🥯 dm-1	C cgroup	Preserve 2011 10:16 AM	rwxr-xr-x	root	root	
🔟 Log	🗀 dev	ογεογ2013 4:24 AM	rw×r-×r-×	root	root	
	i i i i i i i i i i i i i i i i i i i	10/18/2013 2:49 AM	rwxr-xr-x	root	root	
	i i i i i i i i i i i i i i i i i i i	6/26/2013 4:24 AM	rw×r-×r-×	root	root	
	ib 🔁	6/26/2013 4:27 AM	r-×r-×r-×	root	root	
	🗀 lib64	6/26/2013 5:23 AM	r-×r-×r-×	root	root	
	Contemporaries and the second	6/26/2013 4:24 AM	rwx	root	root	
	🗀 media	9/23/2011 4:50 AM	rwxr-xr-x	root	root	
	i misc	9/3/2013 10:19 AM	r-xr-xr-x	root	root	
	i i i i i i i i i i i i i i i i i i i	9/23/2011 4:50 AM	rwxr-xr-x	root	root	
	🚞 net	9/3/2013 10:19 AM	r-×r-×r-×	root	root	
	📄 opt	9/23/2011 4:50 AM	rwxr-xr-x	root	root	
	📄 proc	6/26/2013 4:24 AM	rwxr-xr-x	root	root	
	i i i i i i i i i i i i i i i i i i i	7/15/2013 12:20 PM	r-xr-x	root	root	
	🚞 sbin	6/26/2013 4:31 PM	r-xr-xr-x	root	root	
	🛅 selinux	6/26/2013 4:24 AM	rwxr-xr-x	root	root	
	🛅 srv	9/23/2011 4:50 AM	rwxr-xr-x	root	root	
	a svs	6/26/2013 4:24 AM	rwxr-xr-x	root	root	

Validation

- 1. Open the **Files** view.
- 2. In the inventory pane, expand the file tree under **This server**.
- 3. Select the C:\Backups\restored folder and make sure that the restored files or folders are available there.

	File Tools			Veeam Backup	& Replication		X
Copy Paste	Rename Delete		Add to File Copy Job - Jobs				۲
A Contraction of the second se	A Replication	backup job ents and Settings RVER	Name Concernents and Sett	ings Folder Folder	Size	Modified	
2 objects		-18F •			Enterprise Edition	n Evaluat	tion: 274 days remaining VEEAM

Insight into VM Virtual Disk Restore

Veeam Backup & Replication enables you to recover individual virtual disks of a VM. Recovered virtual disks can be attached to the original VM or to any other VM. This recovery option can be helpful if a VM virtual disk becomes corrupted for some reason, for example, with a virus.

A VM virtual disk can be recovered to the latest state or any valid point in time. You can preserve the format of a recovered virtual disk, or convert it to thin or thick on the fly.

Evaluation Case

In this exercise, you will recover a corrupted virtual disk of a VM and attach it to another VM as a new drive.

Prerequisites

- You can restore VM virtual disks from any backup that has been successfully run at least once.
 Open the **Backup & Replication** view, select the **Backups** node in the inventory pane. Then expand the backup job and check if there is at least one restore point available for the VM.
- During the virtual disk restore, Veeam Backup & Replication turns off the target VM (the VM to which you plan to attach the restored virtual disk) to reconfigure its settings and connect restored disks. For this reason, it is recommended to stop all active processes on the VM for the restore period.

Procedure

To restore a VM virtual disk:

- 1. Open the **Backup & Replication** view.
- Select the Backups > Disk node in the inventory pane. Expand the backup job in the working area, right-click a necessary VM in the corresponding backup job and choose Restore VM hard disks.



3. At the **Restore Point** step of the wizard, select the necessary restore point. If you select an incremental restore point, Veeam Backup & Replication will automatically restore data blocks from the full backup file and the chain of incremental backup files.

	Hard Disk Restore Wizard	x
Restore Point Select the desired re	estore point.	
Virtual Machine	VM name: Windows VM Original host vc-prod.veeam.local	
Restore Point	VM size: 40.0 GB	
Disk Mapping	Available restore points:	_
Reason	Date Type 11/11/2014 Tuesday 4:45:32 AM Increment	-
Summary	11/11/2014 Tuesday 4:39:51 AM Full	
	< Previous Next > Finish Cancel	

- 4. At the **Disk Mapping** step of the wizard, click **Browse** and select the VM to which the restored hard disk should be attached.
- 5. Select a check box next to the virtual hard disk that you want to restore.
- 6. To change the disk format, select the required option from the **Restore disks** list: same as on the original VM, force thin or force thick.

	Hard Disk	Restore Wizard		x	
Disk Mapping Map virtual disks from	backup to virtual device node:	s on target VM.			
Virtual Machine	Virtual machine name:				
Bestore Point	Windows VM Browse			Browse	
Trestore Fornt	Virtual disk	Virtual Device Node	Datastore	Change	
Disk Mapping	Vindows VM. vmdk	SCSI 0:0	datastore4		
Reason					
Summary					
	Restore disks:				
	As on original VM (recommer	nded)	×		
	🔲 Quick rollback (restore ch	anged blocks only)			
			itware problem, or user error. Do r ware or storage issue, or power k		
		< Previous	Next > Finish	Cancel	

7. Select the VM disk in the list and click **Change**. From the **Virtual device node** list, select a node that is not occupied yet. Click **OK**.

	Hard Disk Restore Wizard
Disk Mapping Map virtual disks	Virtual Disk Properties
Virtual Machine Restore Point	Datastore: datastore4 Datastore info Capacity: 1.8 TB Capacity: 1.8 TB Capacity: 1.8 TB Capacity: 1.8 TB
Disk Mapping Reason	Capacity. 1.0 FB Free space: 343.4 GB Virtual device node:
Summary	SCSI 0:1 Device statistics Virtual Device Node: SCSI 0:1 Disk File: Capacity:
	Virtual disk restore result: Virtual disk will be added to VM. OK Cancel r error. Do not use this , or power loss.

- 8. At the **Reason** step of the wizard, specify the reason for future reference.
- 9. At the last step of the wizard, select the **Power on VM after restoring** check box. Then click **Finish**.

Validation

Open the vSphere Client and make sure that the target VM is powered on and a new hard disk is attached to it.
Restoring VM Files

Insight into VM Files Restore

Veeam Backup & Replication lets you restore the VM as the whole or restore specific VM files: VMDK, VMX and others. The latter recovery scenario can be used, for example, if one of your VM files is missing or is corrupted and you need to bring it back. With Veeam Backup & Replication, you can restore the required VM file directly from the image-level backup, without prior de-staging of the VM image from the backup file.

VM files can be recovered to the latest state or to any valid point in time; you can bring them to the original location or to a new location.

Evaluation Case

In this exercise, you will recover a VM configuration file, VMX, and store to the C:\backup\restored folder on the Veeam backup server.

Prerequisites

You can restore VM files from any backup that has been successfully run at least once. Open the **Backup & Replication** view, select the **Backups** node in the inventory pane. Then expand the backup job and check if there is at least one restore point available for the VM.

Procedure

To restore a VM configuration file, do the following:

- 1. Open the **Backup & Replication** view.
- Select the Backups > Disk node in the inventory pane. Expand the backup job in the working area, right-click a necessary VM in the corresponding backup job and choose Restore VM files.

Instant VM Recovery Restore Remove from Diak Actions Backup & Replication Image: Creation time Restore points Restore points Repository Platform P @ Jobs Job name Creation time Restore points P @ Jobs Job name Creation time Restore points P @ Jobs Job name Creation time Restore points P @ Jobs Job name Creation time Restore points P @ Jobs Job name Creation time Restore points P @ Jobs Job name Creation time Restore points
Instant WM Entre WM Guest Application Remove vPower Restore Actions Backup & Replication Type in an object name to search for > @ Jobs Job name Creation time Restore points Repostory
Dob name Creation time Restore points Repository Platform
Disk 1) / 11/2014 4:45 AM 2 Disk 1) / 11/2014 4:45 AM 2 Disk 1) / 11/2014 4:45 AM 2 Instant VM recovery Restore entire VM Restore entire VM Restore YM files Restore guest files Restore guest files Remove from disk Storage Infrastructure Files
Image: backup selected Enterprise Edition Evaluation: 274 days remaining VEEGIM

3. At the **Restore Point** step of the wizard, select the necessary restore point. If you select an incremental restore point, Veeam Backup & Replication will automatically restore data blocks from the full backup file and the chain of incremental backup files.

l	Restore Wizard	x
Restore Point Select the restore point to restore VM from.		
VM name: Windows VM VM size: 40.0 GB Available restore points:	Original host: vc-prod.veeam.lo	cal
Date 11/11/2014 Tuesday 4:45:32 AM 11/11/2014 Tuesday 4:39:51 AM	Type Increment Full	
	< Back Next >	Cancel

- 4. At the **Restore Destination** step of the wizard, select **This server**. Use the **Host Summary** button to view information on storage resources.
- 5. Specify a path to the folder on the selected host where files should be restored, for example: C:\backup\restored.
- 6. In the VM files to restore section, select a check box next to the VMX file.

	Restore Wizard	x
Restore Destination Choose server and folder where VM files sh		
Destination: This server (Microsoft Windows Server) Path to folder: C:\Backup\restored VM files to restore:	✓ Host Summary	Browse
Name Vindows VM.vmx Vindows VM.vmxf Vindows VM.nvram Vindows VM.nvram Vindows VM.vmdk Vindows VM-flat.vmdk	Size 2.7 KB 0.3 KB 8.5 KB 0.6 KB 40.0 GB	Select All Clear All
	< Back Next >	Cancel

- 7. At the **Reason** step of the wizard, specify the reason for future reference and click **Next**.
- 8. Click **Finish** to restore the VM file.

Validation

- 1. Open the **Files** view.
- 2. In the inventory pane, expand the file tree under **This server**.
- 3. Select the C:\backup\restored folder and make sure that the restored VMX file is available there.

	File Tools			1	/eeam Backup 8	& Replication				x
He He	ome File									
Copy Paste	Rename Delete		erties	Add to File						
copy roote		open Lost riop		Copy Job +						_
Clipboard	File	Edit		Jobs						
Files			Name	^	Туре	Size	Modified			
			Do	ocuments and Settings	Folder					
	🛅 1aa103f1444fd	Uable1bc5 ^		WSERVER	Folder					
	🛅 Backups		📄 Wi	indows VM.vm×	AWX	2.7 KB	11/11/2014 5:2			
	▷ È Logia Evaluation	backup job								
	⊿ in restored	ents and Settings								
	D Docum									
	Documents and Documents and									
<	III	>								
🚡 Backup 8	& Replication									
🗊 Backup I	nfrastructure									
VM Virtual M	1achines									
😭 Storage	Infrastructure									
🝋 Tape Infi	rastructure									
Files										
		🍃 🖏								
3 objects						Enterprise Editi	on Evalua	tion: 274 days remaining	VEE	am:

Creating Backup Copy

According to the 3-2-1 backup rule, you must adhere to the following requirements when building your backup plan:

- You must have at least three copies of data in different locations: production data, backup and its copy.
- You must use two different types of media to store your data, for example, disk storage and tape.
- You must keep at least one copy of your data offsite, for example, in the cloud or in the remote site.

With the backup copying capability in Veeam Backup & Replication, you can create several instances of the same backup file and copy them to secondary backup repositories that perform the role of the long-term storage. Secondary backup repositories can be located in the same site as the source one or can be created offsite. The backup copy file has the same format as the primary backup so you can restore necessary data directly from it in case a disaster strikes.

During the backup copying process, Veeam Backup & Replication does not simply copy a backup file from one backup repository to another. Instead, Veeam Backup & Replication retrieves data blocks necessary to create a restore point as of the latest point in time and copies this data to the target backup repository. The backup chain produced on the target backup repository is forever forward incremental: the first restore point in the chain is a full backup and all subsequent restore points are incremental backups.

The backup copy process is job-driven. When you create a backup copy job, you define what backup file you want to copy, the target repository for storing the copy, retention policy and other settings for the copying process. The backup copy job supports the GFS retention scheme, allowing you to design a long-term archiving plan.

Unlike the backup job that typically runs on a specific schedule, the backup copy job runs continuously, in cycles. By default, a new backup copy cycle begins every day; however, you can specify any time interval needed. At the beginning of every backup copy interval, Veeam Backup & Replication checks the source backup repository: if a new restore point has been added to the primary backup chain, Veeam Backup & Replication automatically copies it to the target backup repository. After that, the backup copy job is put on hold until a new backup copy interval begins and a new point appears on the source backup repository.

Evaluation Case

In this exercise, you will create a copy of the backup file that has been created in the Performing Backup exercise with the evaluation backup job. The backup file will be copied from the source backup repository and written to the target backup repository created onsite.

Prerequisites

- The source and target backup repositories that will take part in the backup copy process should be added to the Veeam Backup & Replication console.
- The primary backup job must be completed with the *Success* or *Warning* status and the resulting backup file that you plan to copy must reside on the source backup repository.

Procedure

To create a copy of the backup file:

- 1. Open the Backup & Replication view.
- 2. On the **Home** tab, click the **Backup Copy Job** button.

	b Tools		Veeam B	ackup & F	Replication			- • ×
Home View	Job							0
Backup Replication Backup VM	File Restore Import	Failover						
Job Job Copy Copy		Plan						
Primary Jobs Auxiliary :		Failover Plans						
Backup & Replication		ne to search for						×
▷ Dobs	Name	Туре	Status	Last re	Next run	Target	Objects in job	
	Evaluation backup job	VMware Backup	Stopped	Success	11/11/2014 1	Backup Volume 01	2	
 Last 24 hours Backup & Replication Backup Infrastructure Virtual Machines Storage Infrastructure Tape Infrastructure Files 								
₽ ÷								
1 job selected				Enter	prise Edition	Evaluatio	ın: 274 days remaini	ng (VEEAM :

- 3. Specify a name for the created backup copy job.
- 4. In the **Copy every** field, specify a synchronization time interval, or the length for the backup copy cycle. At the beginning of every synchronization interval, Veeam Backup & Replication checks the source backup repository. If a new restore point has appeared, Veeam Backup & Replication copies this restore point to the target backup repository.

	New Backup Copy Job
	iciently creates local and remote copies of your backups, making it easy to maintain multiple copies of your e and description for the job, and specify backup copy interval.
Job Virtual Machines Target Data Transfer Schedule Summary	Name: Evaluation backup copy job Description: Pilot backup copy Copy every: 1 ◆ Day ▼ starting at 12:00 AM ◆ Controls how often backup copies are created. Backup Copy job creates a new backup file for each copy interval, and starts copying the most recent restore point of each processed VM into this backup file immediately, or as soon as the new restore point appears in the source backup repository.
	< Previous Next > Finish Cancel

5. At the Virtual Machines step of the wizard, click Add and select From Jobs.

6. In the list of jobs, select the backup job that is used to create the backup you want to copy. Veeam Backup & Replication will monitor the source backup repository on which the backup job stores the resulting backup file. If Veeam Backup & Replication detects a new restore point on the source backup repository at the beginning of a new synchronization interval, Veeam Backup & Replication will automatically trigger a new backup copy cycle and copy a new restore point to the target backup repository.

	Backups Browser	
	Select virtual machine:	x
	Job name Last restore point VM count Restore points count ▷ ▲ Evaluation backup job 11/11/2014 4:45:04 2	ic selection
Job Virtual Mac Target Data Trans		Add Remove
Schedule Summary		Up Down
	Prove Type in an object name to search for O	calculate I size: KB Cancel
	Add Cancel	

- 7. At the **Target** step of the wizard, select the target backup repository from the **Backup** repository list.
- 8. In the **Restore points to keep** field, specify the number of restore points you want to retain. By default, Veeam Backup & Replication keeps 7 restore points on the target backup repository.

	New Backup Copy Job	x
	ackup repository, amount of most recent restore points to keep, and retention policy p functionality to seed the backup files.	for full backups. You
Job	Backup repository:	
Virtual Machines	Default Backup Repository (Created by Veeam Backup)	×
· · · · ·	82.0 GB free of 99.7 GB	Map backup
Target	Restore points to keep: 7	
Data Transfer		
Schedule	Keep the following restore points for archival purposes	
Summary	Weekly backup: 4 🐥 Sunday 22:00	Schedule
	Monthly backup: 0 🔁 First Sunday of the month	
	Quarterly backup: 0 文 First Sunday of the quarter	
	Yearly backup: 0 🔶 First Sunday of the year	
	Advanced settings include health check and compact schedule, notifications settings, and automated post-job activity options.	🕸 Advanced
	< Previous Next > Finish	Cancel

9. During the backup copying process, backup data can be transferred directly, from the source backup repository to the target backup repository, or via a pair of WAN accelerators. The latter scenario is recommended for copying backups offsite or over slow network connections. To learn more about WAN acceleration, see Veeam Backup & Replication User Guide.

In this exercise, both backup repositories are located onsite: for this reason, you will use the direct data transfer path. Leave the **Direct** option selected.

	New Backup Copy Job	x
Data Transfer Choose how VM da	ta should be transferred from source to target backup repository.	
Job Virtual Machines Target Data Transfer Schedule	 Direct VM data will be sent directly from source to target repository. This mode is recommended for copying backups on-site, and off-site over a fast connection. Through built-in WAN accelerators VM data will be sent to target repository through WAN accelerators that must be deployed in both source and target sites. This mode provides for significant bandwidth savings. Source WAN accelerator: 	
Summary	Target WAN accelerator:	
	< Previous Next > Finish Cancel	

10. At the **Schedule** step of the wizard, define the period of time when the backup copy job is allowed to transport data over the network. The backup copy window can be helpful if you do not want the backup copy job to produce unwanted overhead for the production environment or do not want the job to overlap the production hours.

	New Backup Copy Job
	b is allowed to transfer data over the network. Backup copy jobs run continuously, starting data transfers terval and/or as the new VM restore points appear.
Job Virtual Machines Target Data Transfer Schedule Summary	This job can transfer data: Any time (continuously) During the following time periods only: 12 · 2 · 4 · 6 · 8 · 10 · 12 · 2 · 4 · 6 · 8 · 10 · 12 All Sunday Monday Tuesday Thursday Friday Saturday Monday through Friday from 5:00 AM to 7:59 PM
	< Previous Create Finish Cancel

- 11. Click Create.
- 12. At the last step of the wizard, select the **Enable the job when I click Finish** check box and click **Finish**. The job will start running in the continuous mode.
- 13. To monitor the job performance, click the **Backup Copy** node under Jobs in the inventory pane. Double-click the created backup copy job in the working area: now you can monitor the job performance in the real-time mode.

Validation

- 1. Open the **Files** view.
- 2. Expand the file tree of the target backup repository.
- 3. Find a subfolder with the backup copy job name and make sure a full backup file is available in it.
- 4. Open the **Backup & Replication** view.
- 5. Click the **Backup Copy** node under **Jobs** in the inventory pane. Double-click the backup copy job in the working area to view its statistics.

Insight into Veeam Replication

With Veeam, you can not only back up, but also replicate your VMs. When you replicate a VM, Veeam Backup & Replication creates an exact copy of a production VM in the native VMware format on a spare ESX(i) host and maintains this copy in sync with the original VM.

Replication provides the best RTOs and RPOs as you actually have a copy of your VM in a ready-to-start state. If the primary VM goes down for some reason, you can immediately fail over to the VM replica and restore critical services with minimum downtime. Subsequently, replication is most commonly used for VMs running tier 1 applications.

Replication is a job-driven process. During the first run of a replication job, Veeam Backup & Replication copies the whole VM image and registers a replicated VM on the target ESX(i) host. During next cycles of a job, Veeam Backup & Replication copies only incremental changes and creates restore points for a VM replica so you can recover your VM to the necessary state. Every restore point is in fact a usual VMware snapshot. When you perform incremental replication, data blocks that have changed since the last replication cycle are written to the snapshot delta file next to a full VM replica. The number of restore points in the chain depends on your retention policy settings.

To provide extremely fast incremental replication, Veeam Backup & Replication uses the vSphere functionality, ESX Changed Block Tracking (or CBT). With CBT, you can replicate much faster and can schedule replication jobs as often as every few minutes. So you get near-CDP at only a fraction of the cost of traditional CDP solutions.

With Veeam Backup & Replication, you can perform both onsite replication for HA and offsite replication for DR scenarios. For replication over WAN or slow links, Veeam Backup & Replication provides a number of means to optimize data transmission: it performs inline deduplication and compresses replica traffic. You can also configure network throttling rules to prevent replication jobs from consuming the entire bandwidth of your environment and perform replica seeding.

Evaluation Case

In this exercise, you will create a replica of a VM on the target host, and create one restore point next to a full VM replica.

Please note that this guide describes replication to a local target host located in the same network. To learn about replicating offsite, see Veeam Backup & Replication User Guide.

Prerequisites

- All backup infrastructure components that will take part in the replication process should be added to the Veeam Backup & Replication console. These include a source and target ESX(i) hosts, a backup proxy (used as a data mover) and a backup repository (used for storing auxiliary replica files). The latter two components are required for a distributed architecture scenario only.
- [Optional] To receive an email notification when a replication job completes, specify global email notification settings. To do that, select **Options** from the main menu of Veeam Backup & Replication and specify necessary settings on the **Email Settings** tab.

- [Optional] To evaluate the application-aware image processing feature, make sure that at least one of replicated VM runs the following OS'es:
 - Microsoft Windows Server 2003
 - Microsoft Windows Server 2008
 - Microsoft Windows Server 2008 R2
 - Microsoft Windows 7
 - Microsoft Windows 8
 - Microsoft Windows 8.1
 - Microsoft Windows 2012 Server
 - Microsoft Windows 2012 R2 Server

Procedure

To replicate a VM:

Step 1. Create a replication job

1. On the **Home** tab, click the **Replication Job** button.

	ckup Copy Tools Backup Copy		Veean	n Backup	& Replication	1		- - X
Backup Replication Job Primary Jobs	File Copy Backup	Failover Plan						
Backup & Replication	D Type in an object name to	search for						×
Action Series Action S	Name Evaluation backup copy job	Type VMware Backup VMware Backup	Status Idle Stopped	Last re Success	Next run <continuous> 11/11/2014 1</continuous>	Target Default Backup R Backup Volume 01	Objects in job 2 2	
Backup & Replication								
Virtual Machines Image: Storage Infrastructure Image: Tape Infrastructure								
Files				Enter	prise Edition	Evaluatio	n: 274 days remainin	ng (VEEAM :

2. Specify a name for the created replication job.

	New Replication Job	x
Specify the name and	nd description for this job, and provide information on your DR site.	
Name Virtual Machines Destination Job Settings Data Transfer Guest Processing Schedule Summary	Name: Evaluation replication job Description: Pilot replication Describe your DR site: Low connection bandwidth (enable replica seeding) Separate virtual networks (enable network remapping) Different IP addressing scheme (enable re-IP)	
	< <u>Previous</u> <u>N</u> ext > <u>Finish</u> Cancel]

Step 2. Add VMs to the replication job

You can replicate individual VMs or VM containers: folders, resource pools, clusters, vApps, datastores and so on. Jobs with VM containers are dynamic in nature: if a new VM is added to the container after the replication job is created, the job is automatically updated to include the new VM.

If you have connected vCenter Server rather than a standalone ESX(i) host to the Veeam backup server, VMs added to the job will be replicated even if they are vMotioned to another host.

- 1. At the Virtual Machines step of the wizard, click Add.
- 2. To quickly find a VM or VM container, enter the name of the object that you want to find in the search field and click the **Start search** button on the right. Select a VM or VM container in the displayed list and click **Add**.

	Add Objects	x
Virtual Mac Select one or	Select objects:	from replication.
Name	Name Type Windows VM Virtual Machine	
Virtual Machines		Add
Destination		
Job Settings		Exclusions
Data Transfer		
Guest Processing		the transmission of transmission of the transmission of t
Schedule		↓ Down
Summary		Recalculate
		Total size: 0.0 KB
	* - windows VM ×	0.0 KB
	Add Cancel	sh Cancel

The object will appear in the Virtual machines to replicate list.

Step 3. Exclude VMs and VM disks

If you create a replication job for a VM container, you can exclude specific VMs or VM containers from the replication job. You can also select which VM disks to replicate.

Veeam Backup & Replication automatically excludes VM log files from replicas to make the replication process faster and reduce the size of the replica.

- 1. At the Virtual Machines step of the wizard, click Exclusions.
- 2. On the **VMs** tab, click **Add**. Select VMs that should be excluded. To quickly find a VM or VM container, enter the name of the object you want to find in the search field and click the **Start search** button on the right.
- 3. On the **Disks** tab, select a VM and click **Edit** to select disks that should be replicated. This functionality is useful, for example, if you only want to replicate VM system drives.

If you want to exclude disks of a VM added as part of a container, click **Add** on the right to include the VM in the list as a standalone instance.

Г	Select Disks	
Virtua Select	VM disks to process: O All disks	plication.
	IDE disks X	
Name	☑ IDE (0:0) Select All	
Virtual Machines	✓ IDE (0:1) Clear All	Add Remove
Destination		
Job Settings		Exclusions
Data Transfer		Source
Guest Processing		
Schedule		➡ Down
Summary		
		Recalculate
	OK Cancel	
		Total size: 65.0 GB
	0K Cancel	Cancel

- 4. Click **OK**.
- 5. Click **Recalculate** to see the total size of replicated objects.

Step 4. Define the VM replication order

If you have included a number of VMs or VM containers in the replication job, you can specify the order in which VMs should be processed. This will help you make sure that the most important VMs in the job are processed first, for example, if you must fit into the backup window and you are not sure how much time VM processing will take.

- 1. At the Virtual Machines step of the wizard, click the added VM in the list.
- 2. Use the **Up** and **Down** buttons on the right to move the VM higher or lower in the list. The higher is the VM in the list, the higher its priority. If you added a VM container as a single instance, VMs inside the container will be processed at random.

	New Re	eplication Job		X
Select one or more	VMs to replicate. Use exclusion s	ettings to exclude specific VMs	and virtual disks fro	m replication.
Name	Virtual machines to replicate:			
Virtual Machines	Name	Туре	Size	Add
Virtual Machines	👘 Windows VM	Virtual Machine	50.0 GB	Remove
Destination	🖆 Linux VM	Virtual Machine	16.0 GB	Teniove
Job Settings				Exclusions
Data Transfer				Source
Guest Processing				↑ Up
Schedule				↓ ∕Down
Summary				Recalculate
				Total size: 65.0 GB
		< Previous Nex	t > Finish	Cancel

Step 5. Select replica destination

At the **Destination** step of the wizard, specify the target for a replicated VM.

- 1. Click **Choose** next to the **Host** or **Cluster** field and select a host on which the VM replica should be registered.
- 2. Click **Choose** next to the **Resource pool** field and select the destination resource pool.
- 3. Click **Choose** next to the VM folder field and select a folder to which a replicated VM should be placed.
- 4. Click **Choose** next to the **Datastore** field and select a datastore where VM replica files should be stored.

	New Replication Job	×
Destination Specify where re	eplicas should be created in the DR site.	
Name Virtual Machines	Host or cluster: esx02.veeam.local	Choose
Destination	Resource pool:	
Job Settings	Resources	Choose
Data Transfer	Pick resource pool for selected replicas	
Guest Processing	VM folder:	Choose
Schedule	Pick VM folder for selected replicas	Choose
Summary	Datastore:	
	datastore2 [796.6 GB free] Pick datastore for selected virtual disks	Choose
	< Previous Next > Finish	Cancel

Step 6. Specify general settings for the replication job

A replication job must be pointed to a backup repository. The backup repository stores replica metadata (checksums of read data blocks) required to streamline incremental passes of the job.

- 1. At the **Job Settings** step of the wizard, from the **Repository for replica metadata** list, select the backup repository that you have configured. A metadata file created by the job will be stored to this backup repository.
- 2. In the **Replica's name suffix** field, enter a suffix to append to the name of the replica. Veeam Backup & Replication will use the name of the primary VM with the suffix appended to register a VM replica on the target host.
- 3. Select the maximum number of restore points that you want to keep on disk. By default, Veeam Backup & Replication keeps 14 restore points.

	New Replication Job
Job Settings Specify backup rep advanced job settin	ository located in the source site to host metadata in, replica suffix and retention policy, and customize gs if required.
Name Virtual Machines Destination Job Settings Data Transfer Guest Processing Schedule Summary	Repository for replica metadata: Backup Volume 01 (Microsoft Windows-based repository) Image: Stress of 99.7 GB Replica settings Replica settings Replica name suffix:
	settings, automated post-job activity and other options. Advanced Advanced Previous Next > Finish Cancel

Step 7. Specify advanced replica settings

At the **Job Settings** step of the wizard, click **Advanced** to specify additional settings for the replication job.

- 1. Make sure the **Exclude swap file blocks from processing** check box is selected. Swap files are dynamic and change intensively between runs of a replication job. With this option selected, Veeam Backup & Replication will identify data blocks of the Microsoft Windows pagefile in the guest OS and exclude them from processing, which will result in increased performance and a smaller size of increments.
- 2. When VM data is transferred between two backup proxies, Veeam Backup & Replication compresses VM data to reduce load on the network. Veeam Backup & Replication offers 5 compression levels that provide different compression ratios to meet the needs of your environment: *None, Dedupe-friendly, Optimal, High* and *Extreme*.

In this exercise, one backup proxy is used as a source and target proxy. For this reason, no compression will be applied.



3. Click the **Notifications** tab. Select the **Send email notifications to the following recipients** check box and specify the email address. When the job completes, you will receive an email notification with details on job performance. Note that you will be able to receive an email notification only if you specify global email settings. To specify email settings, select **Options** from the main menu.

	Advanced Settings X	x
Specify ba advanced	Traffic Notifications vSphere Storage Integration Advanced	y, and customize
Name	Send email notifications to the following recipients:	
Virtual Machines	administrato@veeam.com	
Destination	 Use global hourication settings Use custom notification settings specified below: 	
Job Settings	Subject: [%JobResult%] %JobName% (%VmCount% VMs) %Issues%	
Data Transfer	Votify on success	
Guest Processing	✓ Notify on warning	
Schedule	Notify on error	
Summary	Suppress notifications until the last retry	
		🎡 Advanced
	Save As Default OK Cancel	Cancel

Note: Make sure that you specify your email address once: either in the **To** field in general notification settings, or in job notification settings. If you specify both, you will receive two identical notifications when the job is completed.

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- 4. Click the **vSphere** tab.
- 5. If you replicate a non VSS-aware VM, for example, Linux-based VMs, make sure that the **Enable VMware tools quiescence** check box is selected. This option helps create transactionally consistent replicas of such VMs.
- 6. Make sure the **Use changed block tracking data** check box is selected. For VMware VMs with hardware version 7 or later, Veeam Backup & Replication employs VMware vSphere Changed Block Tracking (or CBT).Instead of scanning VMFS to know which data blocks have changed since the previous job run, Veeam Backup & Replication queries the CBT module to get the list of changed blocks. Use of CBT increases the speed and efficiency of block-level incremental replication. For example, if only 5% of a VM changed since the last replication, incremental replication will be performed 20 times faster.
- 7. Make sure the **Enable changed block tracking for all processed VMs** check box is selected, too. This option forces use of CBT even in case it is switched off at the level of the ESX host.

	Advanced Settings X	x
Specify ba advanced	Traffic Notifications vSphere Storage Integration Advanced Guest quiescence	y, and customize
Name Virtual Machines	Enable VMware Tools quiescence Native quiescence is only used for virtual machines with application-aware image processing disabled.	~
Destination	Changed block tracking Image: Use changed block tracking data (recommended)	
Job Settings Data Transfer	Enable CBT for all protected VMs automatically Changed block tracking (CBT) allows for fast incremental backup and replication of VMs with virtual hardware version 7 or later. For CBT to be enabled, VM must have no existing snapshots.	
Guest Processing		
Summary		
		🙀 Advanced
	Save As Default OK Cancel	Cancel

Step 8. Specify replication data path

You must select backup infrastructure components that must be used for the replication process and choose a path for VM data transfer.

- 1. In the **Source proxy** and **Target proxy** fields, select the backup proxy that must be used for VM replication. You can assign backup proxies explicitly or leave the **Automatic** option selected. In the latter case, Veeam Backup & Replication checks settings of available backup proxies and select the most appropriate one for the job the backup proxy that will enable the most efficient data retrieval from the source datastore. Veeam Backup & Replication first attempts to choose a backup proxy that uses the *Direct SAN Access* mode, then the backup proxy that uses the *Virtual Appliance* mode. If such proxies are not available, Veeam Backup & Replication selects the least loaded backup proxy that uses the *Network* mode.
- During the replication process, VM data can be transferred directly via backup proxy(ies) to the target datastore or via a pair of WAN accelerators. The latter scenario is recommended for replicating VM offsite or over slow network connections. To learn more about WAN acceleration, see Veeam Backup & Replication User Guide.

In this exercise, source and target hosts are located onsite. For this reason, leave the **Direct** option selected.

	New Replication Job	:
Data Transfer Choose how VM da	ta should be transferred to the target site.	
Name Virtual Machines Destination Job Settings Data Transfer	When replicating between remote sites, we highly recommended that you deploy at least one backup proxy server locally in both sites to allow for direct access to storage. Source proxy: Automatic selection Choose Automatic selection Choose O Direct	
Guest Processing Schedule Summary	Best for local and off-site replication over fast links.	
	< Previous Next > Finish Cancel	

Step 9. Specify additional guest OS processing options

To replicate VMs running VSS-aware applications, Veeam Backup & Replication uses application-aware image processing based on Microsoft VSS. Jobs with application-aware image processing produce transactionally consistent replicas, that, unlike crash consistent replicas, ensure proper recovery of virtualized applications without any data loss.

To enable application-aware image processing:

- 1. At the **Guest Processing** step of the wizard, select the **Enable application-aware image processing** check box.
- 2. Specify guest OS credentials (username and password) with Local Administrator privileges on all VMs included in the job. OS credentials are required to install, start and remove a runtime process that coordinates VSS activities inside the VM.

	New Replication Job
Guest Processing Choose additional p	g processing options available for Microsoft Windows guests.
Name	Enable application-aware processing
Virtual Machines	Quiesces applications using Microsoft VSS to ensure transactional consistency, performs transaction logs processing, and prepares application-specific VSS restore procedure.
Destination	Customize application handling options for individual VMs and applications Applications.
Job Settings	Guest OS credentials
Data Transfer	Credentials: Rev VEEAM VAdministrator (VEEAM VAdministrator, last edited: VAdd
Guest Processing	Manage accounts
Schedule	Customize guest OS credentials for individual VMs and operating systems Credentials.
Summary	Test Now
	< Previous Next > Finish Cancel

- By default, the specified guest OS credentials are used for all VMs processed by the replication job. If you replicate several VMs that use different guest OS credentials, click Advanced. Select a VM in the list and click Set User. Then enter guest OS credentials with Local Administrator privileges for this specific VM. Repeat the procedure for all VMs in the job.
- 4. To specify advanced options for VSS processing, click **Applications**. Select a VM in the list and click **Edit**.
- 5. On the **General** tab, select **Try application processing, but ignore failures** to continue the replication job even if VSS errors occur. If VSS processing fails during the job, Veeam Backup & Replication will use VMware Tools quiescence to create a transactionally consistent VM replica.

6. Make sure that the **Process transaction logs with this job** option is selected to correctly handle transaction logs after the replication job is complete. In this case, if the replication job finishes successfully, Veeam Backup & Replication will truncate transaction logs so that they do not overflow storage space. If you use a third-party backup tool that maintains the consistency of transaction logs, select the **Perform copy only** option to prevent possible conflicts.

Guest Proce Choose additio Windows VM Processing Settings N Specify application Dbject Object Application-aware processing logic quiesces applications using Microsoft VSS, and configures them to perform required VSS restore steps during next VM boot. D Require successful processing (recommended) Jc Transaction logs D Disable application processing D Disable application processing Process transaction logs Choose whether this job should process transaction logs upon successful backup. Logs pruning is supported for Microsoft Exchange and Microsoft SQL servers. Image: Process transaction logs with this job (recommended) Perform copy only (lets another application use logs)		New Replication Job	x
General SQL Scripts N Specify application Application-aware processing logic quiesces applications using Microsoft VSS, and configures them to perform required VSS restore steps during next VM boot. Add V Windows VM Require successful processing (recommended) Edit Jd Try application processing It is job should process transaction logs upon successful backup. Logs pruning is supported for Microsoft Exchange and Microsoft SQL servers. Process transaction logs with this job (recommended) St Process transaction logs with this job (recommended) Perform copy only (lets another application use logs)	Guest Proce	Windows VM Processing Settings	
ish Cancel	Choose additic N Specify application Object Vi D Linux VM D Windows VM Jc S	Applications Application-aware processing logic quiesces applications using Microsoft VSS, and configures them to perform required VSS restore steps during next VM boot. Prequire successful processing (recommended) Try application processing, but ignore failures Disable application processing Transaction logs Choose whether this job should process transaction logs upon successful backup. Logs pruning is supported for Microsoft Exchange and Microsoft SQL servers. Process transaction logs with this job (recommended) Perform copy only (lets another application use logs)	Add E dit Remove

Step 10. Specify job scheduling settings

A replication job can be scheduled or run manually. To schedule a replication job:

- 1. At the **Schedule** step of the wizard, select the **Run the job automatically** check box. If you do not select this check box, the job will be saved and you will have to run it manually.
- 2. Select the schedule type: daily, monthly, periodically or continuously. You can also chain the jobs so that they run one after another.
- 3. Select the **Retry failed VM processing** check box. During the retry cycle, only VMs that have failed during the main replication cycle will be processed.
- 4. Select the **Terminate job if it exceeds allowed backup window** check box and click **Window**. Define the backup window for your environment. In case the created job overlaps the specified window, it will be automatically terminated not to produce additional overhead on your virtual environment.
- 5. Click Create.

	New Replication Job	x
Schedule Specify the job sch	eduling options. If you do not set the schedule, the job will need to be controlled manually.	
Name Virtual Machines Destination Job Settings Data Transfer	Image: Part the job automatically Image: Daily at this time: Image: Daily at this time: Image: Omega: Omega: Daily at this time: Image: Omega:	
Guest Processing Schedule	Automatic retry Image: Setry failed VMs processing: 3 \$	
Summary	Wait before each retry attempt for: 10 minutes Backup window	
	< Previous Create Finish Cancel	

Step 11. Review job settings and start the job

- 1. Review the summary of replication job settings.
- 2. Select the Run the job when I click Finish check box and click Finish. The job will start.

Step 12. Monitor job performance in real time

When a replication job is running, you can view job statistics in the real-time mode. Job statistics provide detailed data on the job: job progress, duration, processing rate, performance bottlenecks, the amount of data processed, read and transferred, and other details of the job performance.

Beside general job statistics, you can view detailed data for each VM or VM container processed by the job.

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replication** node under **Jobs** in the inventory pane.
- 3. Click the job in the list. Now you can track the entire job performance as it runs.
- 4. Select the name of a specific VM or a VM container to view detailed statistics for this specific object only.
- 5. Wait for the job to complete. Note that the job must complete with the *Success* or at least the *Warning* status. If the job completes with the *Failed* status, the VM replica will not be created, and you will not be able to perform failover and failback operations.

		Job Tools				Veeam B	ackup &	Replication			- 5	a x	•
🗄 🔻 Home	View	Job											C
🛓 🍕	2		۵ ک	Î									
ackup Replication	Backup V	M File	Restore Import	Failover									
Job Job	Copy Co	ру Сору	Backup	Plan									
Primary Jobs	Auxilia	y Jobs	Restore	Failover Pla	ans								
Backup & Repl	lication	D Type	in an object na	me to search	for							3	K
Jobs		Name	•	Туре		Status	Last re	Next run	Target	Objects in job			
Backups		Evalua	ation backup copy	job VMwa	re Backup	Idle		<continuous></continuous>	Default Backup R	2			
Last 24 hours	s		ation backup job		re Backup	Stopped	Success	11/11/2014 1	Backup Volume 01	2			
		Evalua	ation replication j	ob VMwa	re Replica	0% comp		11/11/2014 1	esx02.veeam.local	2			
9													
Backup & Rej	plication	Job progres	\$5:									0 of 2 V	Þ
~		Job progree	55:									0 of 2 V	N
👔 Backup Infra	structure	Job progret			Data			Status		(T	hroughput (last		N
👔 Backup Infra	structure		,	1:39	Data	sed: 0.1	0 KB (0%)	Status Success	: 0				P
Backup Infra:	structure ines	Summary	: 0:00				0 KB (0%) 0 KB						P
Backup Infra: Wirtual Machi	structure ines astructure	Summary	; :: 0:00 ng rate: 0 KE		Process	0.0		Success					r
👔 Backup Infra:	structure ines astructure	Summary Duration Processir	; :: 0:00 ng rate: 0 KE	/s	Proces: Read:	0.0	о кв	Success Warning	js: O				N
👔 Backup Infra:	structure ines astructure	Summary Duration Processin Bottlened	, :: 0:00 ng rate: 0 KE ck: Dete Statu	/s acting s	Proces: Read: Transfe	0.) erred: 0.)	0 KB 0 KB	Success Warning Errors:	js: 0 0		hroughput (last	: 5 min) ration	M
Backup Infra: Wirtual Machi Storage Infra Tape Infrastr	structure ines astructure ructure	Summary Duration Processin Bottlener	, ng rate: 0 KE ck: Deto Statu www.VM () 0'	/s ecting s %	Process Read: Transfe Action	0,1 erred: 0,1	0 KB 0 KB • infrastructu	Success Warning	js: 0 0		hroughput (last	: 5 min)	M
😭 Backup Infra: 👿 Virtual Machi 🈭 Storage Infra 🍋 Tape Infrastr	structure ines astructure ructure	Summary Duration Processin Bottlened	, ng rate: 0 KE ck: Dete Statu wys VM () 0	/s ecting s %	Process Read: Transfe Action	0.) erred: 0.)	0 KB 0 KB • infrastructu	Success Warning Errors:	js: 0 0		hroughput (last	: 5 min) ration	

Step 13. Perform incremental replication

To perform incremental replication of a VM, do the following:

- 1. Open the Backup & Replication view.
- 2. Select the **Jobs** node in the inventory pane.
- 3. Right-click the job in the list and select **Start**. Wait for the job to complete. Note that the job must complete with the *Success* or at least the *Warning* status.

	b Tools	Veeam	Backup & Replication	_ 🗆 X
Home View	Job			0
Start Stop Retry Statistics	SQL Report SQL Statistic Report	Clone Disable Delete		
Job Control	Details	Manage Job		
Backup & Replication	D Type in an object name to	search for		×
⊿ 🛱 Jobs	Name	Type Status	Last result Next run	Target Objects in job
🕼 Backup	Evaluation replication job	VMware Replica Stopped	10:00:	esx02.veeam.local 2
			Stop Retry Statistics Report Disable Clone Clone Edit	
1 job selected			Enterprise Edition	Evaluation: 274 days remaining VEEAM
			Enterprise Edition	Evaluation: 214 days remaining (VCCdIII

Validation

During replication cycles, Veeam Backup & Replication creates the following files for a VM replica:

- A full VM replica (a set of VM configuration files and virtual disks). During the first replication cycle, Veeam Backup & Replication puts these files to the selected datastore to the *ReplicaName* folder and registers a VM replica on the target host.
- Replica restore points (snapshot delta files). During incremental replication, Veeam Backup & Replication creates a snapshot delta file in the same folder, next to a full VM replica.
- Replica metadata (VBK) used to store replica checksums. Veeam Backup & Replication uses this file to quickly detect changed blocks of data between two replica states. A metadata file is written to the backup repository.

To check replication results:

1. Open the vSphere Client and make sure that a VM replica has been created.



- 2. In Veeam Backup & Replication, open the Files view.
- 3. In the inventory pane, expand the datastore to which the replica has been stored. Browse to the *ReplicaName* folder and make sure that files of the VM replica are available there.
- 4. Open the **History** view and select the **Jobs** node in the inventory pane. Double-click the replication job in the list. Check the properties of the created replica.
- 5. If you have configured to receive an email message once the job completes, open your email client and check the *lnbox* folder. Make sure that you have two incoming emails with job results one for the full replication, and another one for the incremental replication.

Insight into Failover

If a primary VM in the production site becomes unavailable, you can quickly restore services by failing over to its replica. When you perform failover, the VM replica takes over the role of the original VM: you switch from the production VM to its replica and shift your I\O and processes from the production host to a secondary host. As a result, you have your VM up and running within a couple of minutes, and your users can access services and applications they need with minimal disruption.

In Veeam Backup & Replication, you can fail over to the latest state of a replica or to any of its valid restore points.

Failover itself is an intermediate step that needs to be finalized. Depending on a disaster recovery scenario, you can do one of the following:

- Perform permanent failover. When you perform permanent failover, you "commit failover". That is, you permanently switch from the original VM to a VM replica and use this replica as the original VM. This scenario is acceptable if your original VM and a VM replica are located in the same site and are nearly equal in terms of resources. In this case, your users will not experience any latency in ongoing operations.
- Perform failback. When you perform failback, you "return" from a VM replica to the original VM after the problem in the production site is eliminated. All changes that took place while the VM replica was running are transferred to the original VM. You can follow this scenario if your VM replica is located in a DR site and is running on a lower tier host and storage: that is, it is not intended for continuous operations.
- Undo failover. When you undo failover, you switch back to the original VM and work with it in the normal operation mode. All changes made to the VM replica are discarded. You can follow this scenario if you plan to perform some testing and troubleshooting of your VM replica and do not want to affect your production environment in any way.

Veeam Backup & Replication supports failover and failback operations for one VM and for a number of VMs. This way, if you have a problem with an ESX(i) host, you can restore its work with minimum downtime.

Evaluation Case

In this exercise, you will fail over from the original VM to the VM replica you created in the previous exercise, and undo failover to get back to the production VM.

When you fail over from a running original VM to a VM replica, Veeam Backup & Replication does not power off the original VM, it simply powers on the VM replica. If the original VM is running when you perform failover, you will see a notification warning.

Prerequisites

The failover option can be used with any VM replica that was successfully created at least once. Open the **Backup & Replication** view, click the **Replicas** node in the inventory pane. Then expand the replication job and check if there is at least one restore point available for the replicated VM.

Procedure

To fail over to a VM replica:

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Right-click the replicated VM and select **Failover Now**.

Replica Tools		Veeam Backup & Replic	ation	X
Failover Planned Undo Permanent	Add to lover Plan - Production Failback to Failback to Undo Com Production Failback Failb			Ø
Backup & Replication	Type in an object name to search for			×
	inux VM Evaluation repli	Status Creation time Ready 11/11/2014 6:12 AM Ready 11/11/2014 6:12 AM	Restore points Original locat Replica location 2 Failover Now 2 Add to failover plan 3 Failback to production, 4 Failback to production, 5 Remove from replicas 6 Remove from replicas 7 Properties	, , ,
Backup & Replication Backup Infrastructure Wirtual Machines Storage Infrastructure Tape Infrastructure Files Solution				
1 replica selected		Enterpris	e Edition Evaluation: 274 days remain	ing (VEEAM

4. If you want to fail over to a specific restore point, select the VM in the list, click **Point** on the right and choose the restore point to which you want to fail over.

	VMwar	re Failover Wizard	x
	Re	estore Points	×
	Available restore points for Linux VM:		
	Job	Туре	
Virtual	Evaluation replication job		
	(5 11/11/2014 6:12:09 AM	Snapshot	
Reaso	J1/11/2014 6:05:05 AM	Snapshot	M
Summa			
			ve
		ОК С	Cancel
			el

- 5. At the **Reason** step of the wizard, specify the reason for future reference and click **Next**.
- 6. Click **Finish** to fail over to a VM replica.

Validation

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Make sure that the replicated VM is put in the *Failover* state.

Replica Tools			Vee	am Backu	n & Renli	ration			-		c
Home Replica				ann backa	o oc nepin	Ludon					0
				~							-
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Failover Planned Undo Permane				t Application	Remove						
Now Failover Failover Failover	r Failover Plan +	Production Failback Fa	ilback Files	- Items -	from 👻						
Failover		Failback		Restore	Delete						
Backup & Replication	D Type in an o	bject name to search fo	ur.							-	ю
⊿ 🎲 Jobs	Name [▲]	Job Name	Status	Creation	time	Restore points	Ori	Repli			
🕼 Backup	Linux VM	Evaluation repli	Failover		014 6:05 AM	2		vcd			
🕼 Replication	Windows VM	Evaluation repli	Ready	11/11/20	014 6:12 AM	2	vcd	vcd			
🖀 Backup Copy											
Backups											
▷ In Replicas ▷ In Last 24 hours											
Backup & Replication											
🗊 Backup Infrastructure											
Virtual Machines											
😭 Storage Infrastructure											
🝋 Tape Infrastructure											
Files											
là											
1 replica selected					Enterpri	se Edition	Ev	valuation: 2	274 days remaining	veearr	

4. Open the vSphere Client and make sure that the VM replica is powered on.

Undoing Failover

When you undo failover, Veeam Backup & Replication reverts the VM replica to its pre-failover state, powers it off, and deletes all changes that have taken place since the VM replica was powered on. You can use the production VM and perform its replication as usual.

Procedure

To undo failover:

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Right-click the VM and select **Undo failover**.

Replica Tools				Veeam Backup	& Replic	ation					×
Home Replica											0
	-04		_	4.4							-
I 🖪 🖪 🖍 🐴	1	- 🚛 🔊 d	5	n 🔁 🕿	X						
Failover Planned Undo Permaner	nt Add to	Failback to Undo Co	ommit	Guest Application	Remove						
Now Failover Failover Failover		Production Failback Fa		Files + Items +	from +						
Failover		Failback		Restore	Delete						
Backup & Replication	O Type in an o	bject name to search fo	or.								×
· · ·	/	Job Name						a t			**
⊿ ∰ Jobs ∰ Backup	Name	Evaluation repli	Stat		time	Restore points	Ori	Repli vcd			
Replication	Windows VM	Evaluation repli		Failover Now		2		vcd			
🚔 Backup Copy	-		8	Planned Failover		1					
Backups			2	Permanent Failover							
Replicas			D)	Undo Failover							
Last 24 hours			(iii)	Add to failover plan	•						
			-	Failback to product		-					
				Failback to product	UN	_					
			\bar{G}^{\pm}_{i}	Restore guest files	Þ						
			R.	Remove from replic	as						
			-	Remove from disk							
Backup & Replication				-		-					
🗊 Backup Infrastructure			7	Properties							
Virtual Machines											
🍘 Storage Infrastructure											
🝋 Tape Infrastructure											
📄 Files											
l} ⇒											
1 replica selected	L				Enterpris	e Edition	Ev	aluation:	274 days remaiı	ning (VEEZ	эп .:

Validation

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Make sure that the replicated VM is put in the *Ready* state.

										_	24
Replica Tools			Ve	eam Bac <mark>k</mark> up	o & Repli	cation			L		x
Home Replica											
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Failover Planned Undo Permane				st Application	Remove						
Now Failover Failover Failover	r Failover Plan +	Production Failback Fa	iback Files	 Items - 	from +						
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Backup & Replication	D Type in an o								ж		
⊿ 🛱 Jobs	Name 📩	Job Name	Status	Creation	time	Restore points	Ori	Repli			
🕼 Backup	Linux VM	Evaluation repli	Ready	11/11/20	014 6:12 AM	2	vcd				
🕼 Replication	🔁 Windows VM	Evaluation repli	Ready	11/11/20	014 6:12 AM	2	vcd	vcd			
🛗 Backup Copy											
Backups											
Replicas											
▷ Last 24 hours											
Backup & Replication											
🗊 Backup Infrastructure											
VM Virtual Machines											
🗑 Storage Infrastructure											
🝋 Tape Infrastructure											
👔 Files											
lè ÷											
1 replica selected					Enterpri	se Edition	Ev	valuation:	274 days remaining	VEEa	П.::

4. Open the vSphere Client and make sure that the VM replica is powered off and the production VM is powered on.

Insight into Failback

If you want to resume operation of a production VM, you can fail back to it from a VM replica. When you perform failback, you get back from the VM replica to the original VM, shift your I\O and processes from the secondary host to the production host and return to the normal operation mode.

When you perform failback, Veeam Backup & Replication triggers a failback protective snapshot of a VM replica. This snapshot acts as a restore point and saves the pre-failback state of a replica to which you can return afterwards. Veeam Backup & Replication synchronizes the original VM with the VM replica to make sure you get back to the most recent state of a VM. The original VM is then powered on; all replication activities are put on hold.

You can fail back to the VM in the original location or in the new location:

- If you have managed to restore operation of the source host, you can fail back to the original VM on the source host.
- If the source host is not available, you can restore the original VM to a new location and fail back to it. You can also fail back to an entirely new location without restoring the original VM beforehand: in this case, VM replica files will be simply transferred to the necessary destination.

In Veeam Backup & Replication, failback itself is an intermediate action that needs to be finalized. Depending on a disaster recovery scenario, you can do one of the following:

- Commit failback. When you commit failback, you finalize recovery of the original VM in the production site. The original VM in the production site or at a new location becomes the primary VM, a VM replica is returned to the normal state and Veeam Backup & Replication resumes replication activities.
- **Undo failback**. If the production VM is not working as expected, you can undo failback and get back to a VM replica. In this case, the VM replica returns to the *Failover* state.

Evaluation Case

In this exercise, you will fail back from a VM replica to the primary VM on the source host, and then commit failback.

Prerequisites

You can perform failback for a VM replica in the *Failover* state. To put the VM replica to this state, make sure you have performed the Failing Over VM Replica exercise. If you have already undone failover, repeat the Failing Over VM Replica exercise for your VM.

Procedure

To fail back to the production VM:

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Right-click the VM and select **Failback to production**.

Replica Tools		Veeam Backup & Replication							
Falover Planned Undo Permanen Now Falover Falover Falover Falover Planned Undo Permanen		Failback to Undo Co Production Failback Fail Failback		Remove rs - Items - Restore Delete			٢		
Backup & Replication	🔎 Type in an o) Type in an object name to search for							
Jobs Backup Replication Backup Copy Backup Backup	Name	Job Name Evaluation repli Evaluation repli	Status Falcon Rear	Creation time CHIDDLECED AN Failover Now Planned Failover Permanent Failover Undo Failover Add to failover plan Failback to production Restore guest files Remove from replicas Remove from disk	Restore points	Ori Repli ved ved ved ved			
Backup Infrastructure			*	Properties					
Wirtual Machines Image: Storage Infrastructure Image: Tape Infrastructure Image: Files Image: Storage Infrastructure									
1 replica selected				Enterpris	e Edition	Evaluation: 274 days	remaining VEEam:		

4. At the **Destination** step of the wizard, select **Failback to the original VM**.

	Failback Wizard
Choose the de	stination for failback operation.
Replica Destination Summary	 Failback to the original VM Use if your production site is restored without any infrastucture changes, and the original VM is still present at the same location. Only differences between existing virtual disks and their actual state on replica will be transfered over the network. Failback to the original VM restored in a different location Use if you have restored the original VM from backup to a location that is different from original. Only differences between existing virtual disks and their actual state over the network. Failback to the specified location (advanced) Use if you do not have original VM remains available anywhere in the failback destination site. Actual state of entire replica's virtual disks will be transferred to the destination site, resulting in significant network traffic. Replica VM will be powered off for the duration of failback.
	< Previous Next > Finish Cancel

5. At the summary step of the wizard, select the **Power on VM after restoring** check box and click **Finish**.

Validation

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Make sure that the replicated VM is put in the *Failback* state.

Replica Tools			Ve	eam Backup	& Replic	ation				_ 🗆 X
Home Replica										0
Failover Planned Undo Permane	nt Add to	Failback to Undo Co	mmit Gues	Application	Remove					
Now Failover Failover Failover		Production Failback Fai		 Items - 	from +					
Failover		Failback		Restore	Delete					
Backup & Replication	D Type in an o	bject name to search fo	r							ж
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🚮 Backup	Linux VM	Evaluation repli	Failback	11/11/201		3		vcd		
Replication	🔁 Windows VM	Evaluation repli	Ready	11/11/201	4 6:12 AM	2	vcd	vcd		
📸 Backup Copy										
▷ Backups ▷ Packups										
Last 24 hours										
Backup & Replication										
🗊 Backup Infrastructure										
Virtual Machines										
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🝋 Tape Infrastructure										
Files										
l} ÷										
1 replica selected					Enterpris	e Edition	Ev	aluation:	274 days remain	ing (VEEam

Committing Failback

When you commit failback, you confirm that you want to get back to the production VM. Veeam Backup & Replication resumes replication activities for the VM to which you failed back.

The failback protective snapshot that saves the pre-failback state of a VM replica is not deleted — Veeam Backup & Replication uses this snapshot as an additional restore point for VM replica. With the pre-failback snapshot, Veeam Backup & Replication needs to transfer less changes and therefore puts less load on the network when replication activities are resumed.

Procedure

- 1. Open the Backup & Replication view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Right-click the VM and select **Commit Failback**.

Replica Tools			Veeam Backup	& Replication		_ D X
Home Replica	Failover Plan 🗸	Failback to Undo Con Production Failback Fail Failback	Restore	Remove from - Delete		9
▲ ♦ Jobs ↓ Backup ↓ Backup Copy ▶ Backup Copy ▶ Backup Expense ▶ ▲ Last 24 hours ♥ Backup & Replication ♥ Backup Infrastructure ♥ Storage Infrastructure ↓ Tape Infrastructure ↓ Files ↓ \$	Name	Job Name Evaluation repli Evaluation repli	Status Creation til Failover Now Planned Failover Planned Failover Planned failover Add to failover.la Commit Failback Commit Failback Restore guest files Remove from repli Remove from disk Properties Properties	n ttion	vcd vcd	
1 replica selected				Enterprise Edition	Evaluation: 274 day	s remaining (VEEAM

Validation

- 1. Open the **Backup & Replication** view.
- 2. Select the **Replicas** node in the inventory pane.
- 3. Make sure that the replicated VM is put in the *Ready* state.

Replica Tools			Veeam	Backup & Repli	ication		_ 🗆 X
Home Replica							0
🗈 🖏 🏷 🚯	Î			👟 🗙			
Failover Planned Undo Permaner Now Failover Failover Failover		Failback to Undo Cor Production Failback Fail	nmit Guest Ap back Files → I	plication Remove tems + from +			
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Backup & Replication	O Type in an o	bject name to search for					×
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🕼 Replication 🔁 Backup Copy	a windows we	Evaluation repli	Reduy	11/11/2014 0:12 AM	2	YUU YUU	
jage backup copy ▷ 🎝 Backups							
Replicas							
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Virtual Machines							
😭 Storage Infrastructure							
🝋 Tape Infrastructure							
Files							
ې 🔊							
1 replica selected				Enterpr	ise Edition	Evaluation: 274 days re	maining VEEAM

4. Open the vSphere Client and make sure the VM replica is powered off and the production VM is powered on.

DISTRIBUTED BACKUP INFRASTRUCTURE MANAGEMENT

For large geographically dispersed virtual environments with multiple Veeam backup servers, it is recommended to use Veeam Backup Enterprise Manager.

Veeam Backup Enterprise Manager is an optional component in the backup infrastructure that federates Veeam backup servers and offers a consolidated view of these servers through a web console. You can centrally control and manage jobs configured on different Veeam backup servers through a single pane of glass, edit and clone jobs, monitor jobs state and get reporting data across all backup servers. Veeam Backup Enterprise Manager also enables you to search for Windows guest OS files in all current and archived backups across your backup infrastructure and restore these files in 1 click.

This section describes a set of exercises that you should perform to learn how to manage a distributed backup infrastructure using Veeam Backup Enterprise Manager.

Exercise List

To evaluate the key features of Veeam Backup Enterprise Manager, perform the following exercises:

Exercise	Description	Time Estimates			
Installing and configuring Veeam Backup Enterprise Mana ger	configuring machine. Veeam Backup Add the Veeam backup server to Veeam Backup Enterprise Add the Veeam backup server to Veeam Backup Enterprise Manager and collect data from the added Veeam backup server				
Searching for guest OS files and restoring them in 1 click	for guest OS files and restoring to the original VM in 1 click.				
Configuring self- service restore	Delegate the file-level restore task to another team member.	2-5 minutes.			
Cloning and editing jobs	Clone a created backup job, save it under a new name and edit its settings directly in Veeam Backup Enterprise Manager.	3-5 minutes			
Restoring data from encrypted backups without a password	Create an encrypted backup file and unlock it without a password.	5-7 minutes			
Installing and Configuring Veeam Backup Enterprise Manager

Evaluation Case

In this exercise, you will install Veeam Backup Enterprise Manager, connect the Veeam backup server to it and collect data from the connected Veeam backup server. In the production environment, Veeam Backup Enterprise Manager typically federates a number of Veeam backup servers. For evaluation purposes, however, you can connect one Veeam backup server to Veeam Backup Enterprise Manager.

Prerequisites

- The machine on which you plan to install Veeam Backup Enterprise Manager must meet the system requirements.
- You should have at least one instance of the Veeam backup server installed. On the Veeam backup server, you should have at least one backup or replication job that has been successfully performed.
- Make sure that all necessary ports are open.

Procedure

To install Veeam Backup Enterprise Manager, do the following:

- 1. Download the latest version of Veeam Backup & Replication from www.veeam.com/downloads.html.
- 2. Start the autorun from the mounted ISO file and select to install Veeam Backup Enterprise Manager.

close × Veeam Backup & Replication							
Veeam [®] Backup & Replication [™]	Veeam [®] Backup Enterprise Manager [•]						
install							
Documentation	Training						
🥏 learn more	🏁 start training						
Copyright © 201	4 Veeam [®] Software						

- 3. Follow the steps in the installation wizard.
- 4. At the **Service Account** step of the wizard, select to use the Local System account or specify settings of the account that has Administrator permissions on the Veeam Backup Enterprise Manager server.
- 5. At the **SQL Server Instance** step of the wizard, choose to install a new instance of Microsoft SQL Server or use an existing one (either local or remote). If you select to use an existing Microsoft SQL Server instance, for example, if you are installing Veeam Backup Enterprise Manager on the same machine as Veeam Backup & Replication, provide credentials of a user with database owner rights.

Once the installation process is complete, you can add the Veeam backup server(s) to Veeam Backup Enterprise Manager.

- Start Veeam Backup Enterprise Manager by choosing Programs > Veeam > Veeam Backup Enterprise Manager from the Start menu. If you plan to use the web UI remotely, to access Veeam Backup Enterprise Manager, use the following HTTPS address: https://host-name:9443.
- 2. Enter credentials of a user with Local Administrator rights or the user who installed Veeam Backup Enterprise Manager and click **Login**.
- 3. Click **Configuration** at the top right corner of the window.
- 4. Click **Add** at the top of the window.

Veeam [*] Backup Enterprise M	lanager En	terprise edition				You are logged in as 'SRV02\Admin		
† НОМЕ								🕜 Help
Backup Servers	Q	Refresh 🕨 Start	Collecting	E	🍄 Add 🔛 Edit.	🔒 Remove	Schedule	Export
遇 BACKUP SERVERS	Na	ime Lo	gin	Version		Server Des	cription	
() SESSIONS								
ROLES								
🗙 SETTINGS								
KEY MANAGEMENT								
 ABOUT 	I	Page 1 of	1 ▶ ▶ ₹	1				

- 5. Enter a DNS name or the IP address of the Veeam backup server you want to add.
- 6. Provide a name and password of the user account with administrative rights on the added Veeam backup server. Make sure that this user is included in the *Veeam Backup Administrators* group on the Veeam backup server.

Veeam [®] Backup Enterprise Manag	Ger Enterprise edition	You are logged in as: SRV02VAdministrator Sign out
† НОМЕ		() Help
Backup Servers	BACKUP SERVER SETTINGS	idit 🔚 Remove 📰 Schedule 🚺 Export
阁 BACKUP SERVERS	DNS name or IP address of the Veeam Backup server:	Server Description
	srv02.veeam.local	
E SEARCH SERVERS	Server description:	
C SESSIONS		
ROLES	User name: VEEAMVAdministrator Password:	
🗙 SETTINGS	Port: 9392	
	OK Cancel	
		-
KEY MANAGEMENT		
 ABOUT 	I ← Page 1 of 1 → ▶I ◆	

- 7. Once you click **OK** and add the Veeam backup server, Veeam Backup Enterprise Manager will automatically start collecting data about all backup and replication jobs from added Veeam backup server.
- 8. To receive consolidated email notifications about the status and summary of all jobs performed in your backup infrastructure, click **Notification** on the left of the **Configuration** view and specify email notification settings.

Veeam [*] Backup Enterprise Manag	PT Enterprise edition	You are logged in as: SRV02VAdministrator	
↑ HOME		🕜 Hel	P
Notifications 涵 BACKUP SERVERS ② VCENTER SERVERS 私 SEARCH SERVERS ③ SESSIONS A ROLES	EMAIL SERVER SETTINGS SMTP server name or address: exch01.veeam.local Second Se	Save	
** SETTINGS P LICENSING ILICENSING * NOTIFICATIONS * KEY MANAGEMENT Image: The set of the	Send daily notification at: 17:00 From: backup@veeam.com To: administrators@veeam.com Subject: Last 24 hours: %1 Errors, %2 Warnings, %3 Successes Test		~

Validation

1. Click the **Last 24** hours and **Last 7** days tabs in Veeam Backup Enterprise Manager and make sure that these tabs provide information about backup and replication jobs performed on the Veeam backup server you have just added.

eam [®] ackup Enterp	orise Manag	Ger Enterprise edition		You are logged in as: SRV02\Administrator	
ASHBOARD	REPORTS	JOBS VMS FILES	ITEMS REQUESTS	(CONFIGURATIO
Last 24 hours	Last 7 days			🖓 Refr	esh 🕜 Help
SUMMARY		DATA	LAST 24 HOURS	STATUS	
Backup servers:	1	Processing speed: 75.1 MB/s	Total job runs: 5	Backups 📀 OK	
Jobs:	3	Source VMs size: 210.3 GB	Successes: 5	Backup server s 🛛 📀 OK	
VMs:	2	Full backups: 60.3 GB	🔥 Warnings: 0	Management server 🛛 📀 OK	
	0	Restore points: 30.2 MB	😣 Errors: 0	License 🛇 OK	

2. If you have configured email notification settings, open your email client and check the *lnbox* folder. Make sure that you have an incoming email about all performed jobs.

Searching for Guest OS Files and Performing 1-Click Restore

Veeam Backup Enterprise Manager allows you to search for Microsoft Windows and Linux guest files in backed up VMs. This can be useful, for example, if you need a file that has been deleted on the VM and you want to restore it from a backup. Once you find the file, you can immediately restore the file directly from Veeam Backup Enterprise Manager with 1 click. The file can be restored to its original location or saved to a local machine.

Evaluation Case

In this exercise, you will delete a file on the original VM, search for it in the backed up VM image and restore it to its original location.

Prerequisites

- Make sure that you have successfully created a backup of a Microsoft Windows or Linux VM with the guest file indexing option enabled.
- Make sure that you have successfully connected the Veeam backup server to Veeam Backup Enterprise Manager and collected data from it.

Procedure

To find a restore a guest OS file, do the following:

- 1. Delete a file you want to restore on the original VM.
- 2. In Veeam Backup Enterprise Manager, click **Home** at the top left corner of the window to get back to the main view of Veeam Backup Enterprise Manager.
- 3. In the main view of Veeam Backup Enterprise Manager, click the **Files** tab.
- 4. In the **Type in VM name** field, enter the name of a backed up VM whose file system you want to browse.
- 5. In the **Restore point** field, select a restore point from which you want to restore the deleted file.
- 6. In the **Search** field on the right, type in the name of the necessary file or a part of it and click the search icon on the right.

Veeam* Backup Enterprise Manager Enterp	rise edition		You are log SRV02V	ged in as: Administrator	
DASHBOARD REPORTS JOBS	VMS FILES	ITEMS REC)UESTS	🔅 CONF	IGURATION
Type in VM name: srv04	or pick VM from	n list			Help
BROWSE SEARCH Restore point 22.12.2014 23:34:00 IIII Back	kup info 🛛 🔭 Restore 🕶	🕞 Download 📑 Add to	o restore list	contract	Q
	Name	Date Modified	Size	Owner	
# #RECYCLE.EIN	Contract_Amber_2014-0	. 17.11.2009 19:35:19	72,0 KB	Administrators	
Documentation 2012 Documentation 2013	Contract_DFC_2014-01-1.	25.12.2009 17:22:34	93,3 KB	Administrators	
🖬 🚰 Documentation 2014	Contract_HighSchool_20	08.12.2009 17:54:31	161,2 KB	Administrators	
Contracts Invoices	Contract_Hosp_2014-05	26.01.2011 15:24:43	94,8 KB	Administrators	
H I Offers Tax Docs System Volume Information	Contract_Uni_2014-04-1	. 08.12.2010 17:29:53	143,7 KB	Administrators	
	I Page 1 of 1	▶ N Displaying 1 - 5	of 5		fiew history

7. Right-click the file in the list and select **Restore > Overwrite**. Click **Yes** to confirm the operation.

Veeam* Backup Enterprise Manager Enterprise edition			You are logged in as: SRV02VAdministrator	Sign out
DASHBOARD REPORTS JOBS VMS	FILES	ITEMS REQUESTS		CONFIGURATION
Type in VM name: srv04 Q	or pick VM from list			Help
BROWSE SEARCH Search contract Q			Adva	inced search 💌
File info extore point: 22.12.2014 23:34:00 Owner: BUIL TINVAdministrators Last modified: 08.12.2009 17:54:31 size: 161,2 KB extore point: 22.12.2014 23:34:00 Owner: BUIL TINVAdministrators Last modified: 08.12.2010 17:29:53 Size: 143,7 KB	df Verwrite Keep			lestore status
I ← Page 1 of 3 ► ►				View history

Validation

Open the primary VM and make sure that the found file has been successfully restored.

Performing Self-Restore of VM Guest OS Files

You can delegate a task of VM guest OS files restore to users having administrator rights on VMs, for example, to application owners. Delegated file-level restore simplifies the data restore process. Users do not have to wait for backup administrators to recover deleted or modified files and folders.

For delegated file-level restore, Veeam Backup & Replication offers the Veeam Self Service Restore portal. Authorized users can log on to the portal, browse the content of VM backups and restore the necessary VM guest OS files and folders to the original location or download restored files to the local computer drive. The restore process does not require any intervention from the backup administrator side: users can perform search and restore operations on their own, just like the administrator working with Veeam Backup Enterprise Manager.

Only authorized users can browse and restore files in the Veeam Self Service Restore portal. To be able to see the content of VM backups, the user must be added to the Local Administrators group in the VM guest OS. When the user logs on to the portal, the portal displays only those VMs and restore points that the user is permitted to access. Other VMs are not visible to the user.

Evaluation Case

In this exercise, you will perform self-service restore of VM guest OS files from the backup file using the Veeam Self Service File Restore portal.

Prerequisites

- Make sure that the Veeam backup server is connected to Veeam Backup Enterprise Manager.
- Make sure that the Enterprise Plus license is installed on the Veeam Backup Enterprise Manager server. You can use a valid trial license or paid license.
- Make sure that the user account under which you plan to perform self-service restore belongs to a trusted domain or the same domain as the Veeam Backup Enterprise Manager server. Users from untrusted domains cannot use the Veeam Self Service File Restore portal.

Procedure

To restore VM guest OS files using the Veeam Self Service File Restore portal:

1. Log on to the VM whose VM guest OS files you plan to restore. Make sure that the user account user which you plan to perform self-service restore is added to the local Administrators group on this VM.

💩 Iusrmgr - [Local Users and Groups (Local)\Group	s]	_ □	x
File Action View Help			
	? ×	Actions Groups More Actions Administrators More Actions	•
Add Remove Changes to a user's group memb are not effective until the next tim user logs on. OK Cancel Apply	bership ne the Help		

 In Veeam Backup & Replication, configure a backup job that processes this VM (see the Performing Backup exercise). At the Guest Processing step of the New Backup Job wizard, select the Enable gust file system indexing check box and specify a user account for file indexing.

	New Backup Job
Guest Processing Choose additional p	g rocessing options available for Microsoft Windows guests.
Name	Enable application-aware processing
Virtual Machines	Quiesces applications using Microsoft VSS to ensure transactional consistency, performs transaction logs processing, and prepares application-specific VSS restore procedure.
Storage	Customize application handling options for individual VMs and applications
Guest Processing	Enable guest file system indexing
Schedule	Creates catalog of guest files to enable browsing, searching and 1-click restores of individual files. Indexing is optional, and is not required to perform instant file level recoveries.
Summary	Customize advanced guest file system indexing options for individual VMs
	Guest OS credentials
	Credentials: 🛛 🖉 VEEAM\msmith (VEEAM\msmith, last edited: 11/11/2014) 🗸 🛛 Add
	Manage accounts
	Customize guest OS credentials for individual VMs and operating systems
	Test Now
	< Previous Next > Finish Cancel

3. Run the backup job to produce a backup file.

		Self Restore (Full)	
ob progress:			0 of 1 VM
Summary		Data	
Duration:	0:05:38	Processed: 3.2 GB (38%) Success:	0
Processing rate:	15 MB/s	Read: 3.2 GB Warnings:	0
Bottleneck:	Source	Transferred: 1.8 GB (1.8x) Errors:	0
Throughput (last 5	i min)		
		Spec	d: 15.7 MB/s
			d. 10.1 Mb/6
VM namê	Status	Action	Duration
🔁 srv04	38%	Queued for processing at 11/11/2014 6:15:46 AM	
_		Required backup infrastructure resources have been assigned	
		VM processing started at 11/11/2014 6:16:01 AM	
		VM size: 60.0 GB (22.0 GB used)	
		Solution in the system state of the system sta	0:00:04
		💙 Creating VM snapshot	0:00:02
		Solution in the system state of the system sta	0:00:51
		Saving [datastore4] srv04/srv04.vmx	
		Saving [datastore4] srv04/srv04.vmxf	
		Saving [datastore4] srv04/srv04.nvram	
		🛛 🔍 Using backup proxy VMware Backup Proxy for disk Hard disk 1	
		Hard disk 1 (40.0 GB) 3.1 GB read at 15 MB/s [CBT]	0:03:44
		Sing backup proxy VMware Backup Proxy for disk Hard disk 2	
		Hard disk 2 (20.0 GB) 98.0 MB read at 14 MB/s [CBT]	0:00:11
		Getting list of guest file system local users	
Hide Details			ОК
That Dottails			OK

4. Log on to Veeam Backup Enterprise Manager using the Administrator account.

5. Open the **Configuration** view. In the **Backup Servers** section, click **Start Collecting** to collect the latest data about the performed backup job from the Veeam backup server. To check if data has been collected, click **Sessions** on the left and make sure that the data collection session has completed with the *Success* status.

Veeam [®] Backup Enterprise Manager	Enterprise edi	tion			You are logged in as: SRV02\Administrator	Sign out
↑ HOME						Help
Backup Servers	💫 Refresh	Start Collecting	🚰 Add	Edit	Remove Schedule	Export
阁 BACKUP SERVERS	Name	Login	1 Version	I	Server Description	
VCENTER SERVERS	localhost	srv02\Administrator	8.0			
SEARCH SERVERS						
• SESSIONS						
ROLES						
X SETTINGS						
about	I Page	1 of 1 🕨 🕨	Q		Displayin	g items 1 - 1 of 1

- 6. Sign out from Veeam Backup Enterprise Manager.
- 7. Together with Veeam Backup Enterprise Manager, the Veeam Backup & Replication setup deploys the Veeam Self Service File Restore portal. Open the portal web console using the following link:

https://enterprise_manager_host:9443/selfrestore

8. Log on to the Veeam Self Service File Restore portal under the user account that you plan to use to restore VM guest OS files.

 The portal will display only one tab — Files, with the file tree of the VM guest OS file system. To restore a specific file or folder, right-click it and select the necessary restore option from the list.

Veeam* Backup Enterprise Manager Enterprise	rise edition		You are logged in a VEEAM\msr	
FILES				
Showing srv04 as of earlier today.				
BROWSE SEARCH Restore point 11/11/2014 6:16:55 am	Restore	- Download	Add to restore list Sear	ch Q
⊕ <mark>=</mark> = C:\	Name	Date Modified	Size	Owner
Backup	Invoice_2014-01-12.pdf	12/25/2009 06:22:34	93.3 KB	
Documentation 2011 Documentation 2012	Invoice_2014-03-05.pdf	12/8/2009 06:54:31 am	161.2 KB	
Documentation 2013	Invoice_2014-04-10.pdf	12/8/2010 06:29:53 am	143.7 KB	
Documentation 2014 B Contracts	Invoice_2014-05-		Overwrite Keep	
Invoices Offers	Terraine 2014.00	add to restore list	72.0 ND	
🛚 🗾 Tax Docs 🖻 🗾 System Volume Information				
	I ← Page 1 of 1	🕨 🕅 🕅 Displayin	g 1 - 5 of 5	View history

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Validation

Open the file or folder restore location and make sure that the file or folder has been successfully restored.

Cloning and Editing Jobs

Veeam Backup Enterprise Manager lets you clone jobs configured on Veeam backup servers. When you clone a job, you create an exact copy of any backup or replication job available in the job list. Configuration details of a created job copy are written to the same SQL database where details of the original job are stored. You can work with the created job both via Veeam Backup Enterprise Manager and via the Veeam Backup & Replication console on a corresponding Veeam backup server.

The recommended practice is to configure a set of "job templates" in advance, using the Veeam Backup & Replication console on every managed Veeam backup server. Administrators working Veeam Backup Enterprise Manager can then use these "job templates" for cloning and further editing.

Evaluation Case

In this exercise, you will create a copy of the backup job and edit its settings.

Prerequisites

- Make sure that you have at least one backup job that has been successfully performed on the Veeam backup server.
- Make sure that you have successfully connected the Veeam backup server to Veeam Backup Enterprise Manager and collected data from it.

Procedure

To clone a job, do the following:

1. Click the **Jobs** tab.

Vee Bac	am [®] C <mark>kup Enterprise M</mark>	lanage	Enterprise edition	on				You are logged in as: Sign out SRV02\Administrator
DAS	SHBOARD REPORTS	J	obs vms		FILES	ITEMS	REQUESTS	CONFIGURATION
Back	up server ALL	*	Job name		Last	result ALL	*	➢ Find Start job Start job
	Name	Туре	Backup Server	Platfo	Current	Latest Run	Next Run	Description
٢	Evaluation backup copy j	Backup	srv02	VMware	Success	11.11.2014 6:3	Disabled	Pilot backup copy
0	Evaluation replication job	Replica	srv02	VMware	Success	11.11.2014 6:1	11.11.2014 22:	Pilot replication
0	Evaluation backup job	Backup	srv02	VMware	Success	11.11.2014 4:4	11.11.2014 22:	Backup job created for evaluation purposes
14	4 Page 1 of 1 ▶)⊧i – 6)						Displaying items 1 - 3 of 3

- 2. Select the necessary job in the list, click **Job actions** on the toolbar and select **Clone** job.
- 3. In the displayed window, specify the name of the job copy and select a target for the job.
- 4. Click Clone.
- 5. Select the cloned job in the list.
- 6. On the toolbar, click **Job actions** and select **Edit job**. Go through the steps of the wizard and edit the job settings as required.

DIT REPLICATION JOB		>
Virtual machines Select virtual machines to pr	ocess:	
Name	Туре	Add
🔁 Windows VM	VirtualMachine	Remove
🎒 Linux VM	VirtualMachine	Exclusions
		🕆 Up
		🖶 Down
	< Previous	Next > Cancel

Validation

- 1. In Veeam Backup & Replication, open the **Backup & Replication** view.
- 2. Select the **Jobs** node in the inventory pane.
- 3. Make sure that the cloned job is available in the working area.

Restoring Data from Encrypted Backup File Without Password

When you import an encrypted backup file on another Veeam backup server and try to restore VM data from it, Veeam Backup & Replication requires a password to unlock the backup file content. In most products, if you do not provide a password, the file content will remain locked, and the backup will be of no use. Veeam Backup & Replication lets you decrypt encrypted backups even if you have lost a password, or the person who knows the password has left your organization.

To enable data decryption without a password, Veeam Backup & Replication stores the actual encryption key in the backup file twice:

- First, Veeam Backup & Replication encrypts the key with a password that you set for the job.
- Second, Veeam Backup & Replication encrypts the key with a public key from Veeam Backup Enterprise Manager.

The public key from Veeam Backup Enterprise Manager plays the role of a 'duplicate key'. To decrypt the backup file, you can either provide a password or submit a request to Veeam Backup Enterprise Manager. Veeam Backup Enterprise Manager will process your request: it will apply a private key matching the public key that was used for backup file encryption. As a result, you will be able to access backup data in the Veeam Backup & Replication console.

Evaluation Case

In this exercise, you will create an encrypted backup and restore data from it without a password. To do this, you will perform the following steps:

- 1. Create an encrypted backup with a backup job.
- 2. To emulate a situation of data decryption on another Veeam backup server, remove the created backup from the Veeam Backup & Replication console and re-import the created backup back to the Veeam Backup & Replication console.
- 3. Decrypt the backup file without a password.

Prerequisites

- Make sure that the Veeam backup server is connected to Veeam Backup Enterprise Manager.
- Make sure that Enterprise or Enterprise Plus license is installed on the Veeam backup server. You can use a valid trial license or paid license.

Procedure

Step 1. Create an encrypted backup

- 1. Open properties of a backup job that you have configured in the Performing Backup exercise.
- 2. Pass to the **Storage** step of the wizard and click **Advanced**.
- 3. In the **Advanced Settings** window, click the **Storage** tab.

	Advanced Settings X	x
Storage Specify pro job and cu	Backup Storage Notifications vSphere Storage Integration Advanced	up files produced by this
Name Virtual Machines	 Enable inline data deduplication (recommended) Exclude swap file blocks from processing (recommended) Compression level: 	Choose
Storage	Optimal (recommended)	
Guest Processing	Optimal compression provides for best compression to performance ratio, and lowest backup proxy CPU usage.	
Schedule	Storage optimization:	
Summary	Best performance at the cost of lower deduplication ratio and larger incremental backups. Recommended for SAN, DAS or local target.	
	Encryption Encryption Password: Constraints Add Constraints Add Constraints Constr	Best practices em being off-site.
		🙀 Advanced
	Save As Default OK Cancel	Cancel

- 4. In the **Encryption** section, select the **Enable backup file encryption** check box and click **Add** on the right.
- 5. In the **Password** field, enter a password that you want to use for the backup file encryption. To view the entered password, click and hold the eye icon on the right of the field.
- 6. In the **Description** field, enter a hint for the password.
- 7. Make sure that the **Loss protection enabled** label is displayed under the **Password** field. In the opposite case, you will not be able to restore data from the encrypted backup without a password.

	Advanced Settings X	
Storage Specify pro job and cu	Backup Storage Notifications vSphere Storage Integration Advanced	up files produced by this
Name Virtual Machines	Enable inline data deduplication (recommended) Password X	Choose
Storage Guest Processing	Description: My favorite book	~
Schedule Summary	Password: Ulysses	5kup
	んさ Do not lose your passwords. Veeam Support cannot recover lost passwords or retrieve your data from encrypted backup files.	Determine
	OK Cancel	Best practices em being off-site.
		鏠 Advanced
	Save As Default OK Cancel	Cancel

- 8. Save the new job settings and run the backup job once again to produce an encrypted backup file.
- 9. When you enable encryption for an already existing backup job, Veeam Backup & Replication restarts the backup chain it produces a new full backup. To make sure that the encrypted backup has been created, open the target folder on the backup repository, find a subfolder with the backup job name and make sure that a new VBK file is added to the backup chain.



Step 2. Remove the backup from the console and re-import it

- 1. In Veeam Backup & Replication, open the **Backup & Replication** view.
- 2. In the inventory pane, select **Backups** > **Disk**.
- 3. In the working area, right-click the backup job and select **Remove from backups**.

Veeam Backup & Replication will remove records about the created backup and encryption keys from the Veeam Backup & Replication database. The actual backup files will remain on the backup repository.

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- 4. On the **Home** tab of the ribbon, click **Import Backup**.
- 5. From the **Computer** list, select a backup repository where backup files are located.
- 6. In the **Backup file** field, specify a path to the VBM backup file on the backup repository.

	😨 Veeam Backup & Replication						-		x
Home Home									0
🍐 📢 🖁 😤	y 🔜 📄	ے 🚖	Î						
and the second second as	ckup VM File py → Copy Copy	Restore Import + Backup	Failover Plan +						
Primary Jobs Auxi	liary Jobs	Restore	Failover Plans						
Backup & Replication	🔎 Type in an obje	ect name to search	1 for						ж
↓ ∰ Jobs Backups	Job name		Creation time	Restore points	Repository	Platform			
 P Tepicas Last 24 hours Last 24 hours Backup & Replication Backup Infrastructure Virtual Machines Storage Infrastructure Tape Infrastructure Cloud Connect Infrastruct 		Computer: 172.16.13.97 Backup file: C:\Backup\E	y backup to imp omputers added (Microsoft Win	up job\Evaluation b Browse					
0 backups				Enterprise Edi	ition	Evaluation: 274 days rem	vining	IFEEZ	an i
o nackups				Enterprise Edi	luon	Evaluation: 274 days rem		,	<u></u>

- Click OK. Veeam Backup & Replication will import the backup and place it under the Backups > Encrypted node.
- 8. Additionally, Veeam Backup & Replication will display a warning that the backup file you import is encrypted. Click **OK** in the message window to close it.

Step 3. Decrypt the backup file without a password

- 1. In the inventory pane, click the **Encrypted** node under **Backups**.
- 2. In the working area, right-click the imported job and select **Specify password**.
- 3. In the Specify Password window, click the I have lost the password link.

	Backup Tools		Veeam Backup & Replication _	D X
Home I	Encrypted Backup			0
Specify Remove Password from Backups Actions				
Backup & Replica	ation 🔎	Type in an object name	to search for	×
Deskups Deskups Deskups Deskups Deskups Deskups Deskups Deskup & Replics Deskup & Replice Deskup Infrastruct Deskup	ation ucture s ructure ture	ne Evaluation backup job	Backup path C1Backup/Evaluation backup job/Evaluation backup job.vbm Specify Password Image: Comparison of the backup files are encrypted. Type in the encryption password for the backup files. Ihave loat the password Description: My favorite book OK	
	₿ ¥		les sense les senses su N	
1 object selected			Enterprise Edition Evaluation: 274 days remaining U	/ccdiii

- 4. In the **Encryption Key Restore** wizard, click **Copy to clipboard** to copy the displayed request for data decryption.
- 5. Open Veeam Backup Enterprise Manager.
- 6. In the top right corner of the window, click **Configuration**.
- 7. Click Key Management on the left.
- 8. Click **Password Recovery** at the top of the view.
- 9. In the **Challenge Request** window, enter the copied text of the request.



10. Pass through the next steps of the wizard. At the **Response** step of the wizard, copy the displayed text to the clipboard.

Veeam* Backup Enterprise Manager	Enterprise Plus edition	You are logged in as: SRV02\Administrator	
↑ НОМЕ			(?) Help
Key Management	Enable encryption password loss protection Password Recovery		^
因 BACKUP SERVERS	PASSWORD RECOVERY	Generate.	
CENTER SERVERS	Response	Import Export	
	Provide this response to the restore operator for entering in the restore wizard	Activate	
O SESSIONS	Storage [Id: 42dfd346-1503-47ea-9d11-f32c2c54971e, Name: C:\Backup\Evaluation backup job\Evaluation backup job2014-11- 11T053611.vbk]: EAAAAM2/VCVecCsmhpbX0318649ISAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	AAA	/
ROLES	AAAAAAAAAAAAAAAAAAAFTDaUTmg6YbxqG7VYajkUopA3nhYAJZ0ZuXfq6rQcf GFDPBZ3r1pdVn1911A= END KEY		
× SETTINGS			
NOTIFICATIONS			
REY MANAGEMENT	< Previous Finish C	Cancel	
() ABOUT	Key retention period 4		~

- 11. Get back to the Veeam Backup & Replication console; in the **Encryption Key Restore** wizard, click **Next**.
- 12. At the **Response** step of the wizard, enter the copied response to the text field and click **Next**. Veeam Backup & Replication will decrypt the backup file and move the imported backup to the **Backups** > **Disk (imported)** node.

Validation

- 1. Open the **Backup & Replication** view.
- 2. Select the **Disk (imported)** node in the inventory pane.
- 3. Make sure that the imported backup is available in the working area.

Backup Tools		Veeam Backup & Re	eplication			- 9	х
Home Backup							0
🖉 🗙							
Properties Remove							
from +							
Backup							
Backup & Replication	D Type in an object name to search f	or					\times
⊳ 🕼 Jobs	Job name	Creation time	Restore points	Repository	Platform		
⊿ 🛅 Backups	Evaluation backup job_imported	11/11/2014 4:48 AM			VMware		
📥 Disk (imported)							
Replicas							
Last 24 hours							
Backup & Replication							
Backup Infrastructure							
VM Virtual Machines							
🕡 Storage Infrastructure							
🝋 Tape Infrastructure							
😪 Cloud Connect Infrastructure							
D 🕞	»						
1 backup selected	V	Ente	erprise Edition	Evaluation: 27	4 days remainir	g (VEC	eam
1 backup selected		Ente	erprise Edition	Evaluation: 27	4 days remainir	ig (VCC	