Virtual Server Protection (VSP) for VMware

USER GUIDE
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INTRODUCTION TO VIRTUAL SERVER PROTECTION (VSP) FOR VMWARE

Virtual Server Protection (VSP) for VMware is a comprehensive solution to protect virtual machines running in a vCenter or ESX server. The VSP package contains all components that are required to protect virtual machines, in a compact configuration that can be used for evaluation and to provide ongoing protection.

This free 30-day evaluation package supports backups and restores for up to 2 TB of data.

SUPPORT

To schedule a review session with a Systems Engineer to conduct a product overview, discuss best practices, design concepts, or general administration, or if you are having issues installing the software or are receiving error messages that require assistance, please submit a request to VM@commvault.com.

KEY FEATURES

• Includes all components required to protect virtual machines in a vCenter or ESX server.

• Provides a Getting Started interface to configure storage, host connectivity, and backups in a matter of minutes, and back up selected virtual machines immediately. The Getting Started tab also provides the ability to restore virtual machine data, schedule backups, and monitor protection activities.

• Performs off-host backups for hundreds of virtual machines, to support continuity of operations and disaster recovery.

• Provides granular backup and recovery options.

• Enables scheduled backup and restore jobs; virtual machines are automatically protected without user intervention.

• Provides source or target-side deduplication to reduce backup storage requirements and network traffic.

• Includes advanced configuration and management options.
HOW TO DEPLOY

VSP can be installed on a single backup server that is either a physical computer or a virtual machine. It provides protection for virtual machines on a vCenter or ESX host. VSP can be used for an initial evaluation of the CommServe software and to provide ongoing protection for virtual machines.

HOW TO USE THESE PAGES

THE PAGES IN THIS SECTION ARE DESIGNED TO BE USED IN SEQUENCE:

• **System Requirements** - Review system requirements for the backup server and virtual machine hosts.
• **Installation** - Install the software.
• **Getting Started** - Configure the system and execute a backup
• **Restore Virtual Machine Data** - Restore complete VMs; recover files; schedule regular restores to a standby server.
• **Explore Further** - Understand the configuration produced by Getting Started; extend your license; expand protection to other types of data; explore additional options.

SYSTEM REQUIREMENTS

BACKUP SERVER

The backup server is the computer where you install VSP. This can be a physical computer or a virtual machine. Ensure that the computer satisfies the following system requirements:

<table>
<thead>
<tr>
<th>Operating Systems</th>
<th>Microsoft Windows Server 2012 R2 x64 Editions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Microsoft Windows Server 2012 x64 Editions</td>
</tr>
<tr>
<td></td>
<td>Microsoft Windows Server 2008 x64 Editions</td>
</tr>
<tr>
<td>Hard Drive</td>
<td>100 GB recommended.</td>
</tr>
<tr>
<td></td>
<td>Depending upon the number of virtual machines that you are planning to backup, ensure that the backup server computer has sufficient free space to store all the virtual machine data.</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB RAM minimum required</td>
</tr>
<tr>
<td>Processor</td>
<td>All Windows-compatible processors supported</td>
</tr>
</tbody>
</table>
VIRTUAL MACHINES

The following system requirements apply for VSP:

| Virtual Machine Host | The following versions are supported for vSphere, vCenter, vCenter Server Appliance, and ESX/ESXi: 4.x, 5.0.x, 5.1.x, 5.5, 5.5.1, 5.5.2, 5.5.3  
For any ESXi servers, the VADP is not available in the free version of ESXi. The Essentials licensing level or higher is required. |
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Virtual Machine Hardware</td>
<td>Version 4.0, 7.0, 8.0, 9.0, 10.0</td>
</tr>
<tr>
<td>Virtual Machine Operating Systems</td>
<td>All Guest Operating Systems supported by VADP and VCB</td>
</tr>
<tr>
<td>VMware Tools on Virtual Machines</td>
<td>Install the latest version of VMware Tools supported by the host on each virtual machine. At a minimum, the version of VMware tools on virtual machines must also be supported on the host; unsupported versions must be upgraded.</td>
</tr>
</tbody>
</table>
| VM Lifecycle Management | Consider the following conditions when using VM Lifecycle Management:  
VMware vCenter 4.1 or later is required.  
A version of VMware Tools that is supported by the host must be installed on templates (preferably the latest supported version).  
Support for Windows Server 2008, Windows 7, and Linux (RedHat5)  |
INSTALLATION

Install the software on a physical computer or a virtual machine. This computer is called the backup server.

BEFORE YOU BEGIN

Verify that the computer where you install the software satisfies the minimum requirements specified in System Requirements – Backup Server.

During the VSP installation, the following components are installed if they are not already available on the backup server:

- Java 7 Update 17
- Microsoft .NET Framework 4.0
- Microsoft SQL Server 2008 R2

INSTALLING VSP

Notes:

- Do not install the software to a mapped network drive.
- When specifying the destination folder, use only alphanumeric characters. Do not use the characters / : * ? “ < > | #
- Ensure that Server Manager is not running during the installation.
- Disaster recovery files enable recovery of the VSP database, registry, and firewall configuration. Back up disaster recovery files to removable storage media that can be stored offsite.

During the installation, you confirm the program installation folder and provide a path for disaster recovery backup files. To install VSP, perform the following steps:

1. Log on to the backup server as an Administrator or as a member of the Administrator group on that computer.

2. From the location on the backup server where you downloaded the VSP installation package, right-click the package and select Run as administrator, then click Yes in the User Account Control dialog box.

3. In the Commvault Installer dialog box, verify the file path for the software installation. The installer downloads installation files and checks for prerequisite software.

4. If the backup server does not have .NET Framework 4.0, the installer prompts you to continue by installing it. .NET Framework 4.0 can co-exist with other versions of .NET Framework. Click Yes to continue by installing .NET Framework. After installing .NET Framework, the installer installs the VSP software and database engine.
5 On the Configure page, verify the path for storing disaster recovery (DR) backup files (by default, C:\dr).

If you select Use Network Path, you must provide:
• Network share username for a user who has administrative rights to the network path in the format domain\username
• Network share password for the specified user

6 Click Next. The installer customizes firewalls on the backup server, configures the Virtual Server Agent (VSA), initializes the database, and applies any required service pack updates.

7 When the setup is complete, click Finish.

GETTING STARTED: CONFIGURE AND START A BASIC BACKUP

The Getting Started wizard provides a step-by-step guide to quickly configure storage and host connectivity, then perform an initial backup.

Going through these steps will give you a good idea of how VSP simplifies backup protection for virtual machines.

Perform the following steps to use the Getting Started wizard:

1 From the Programs menu, click Commvault > VirtualServerProtection Administrative Console.

2 If you have not activated the license yet, click OK at the prompt to continue.

   The CommCell Console is displayed. The right pane of the CommCell Browser displays the Getting Started wizard.

   If the Getting Started wizard is not displayed in the right pane of the CommCell Browser, click Home in the top menu and select Getting Started.

3 Add storage:
   a. Under the Configure Storage heading, click Add New Storage.
   b. In the Add Disk Library dialog box, enter the name and location for the disk library where backups are stored. Ensure that there is sufficient free space to hold backups for all virtual machines.

   To test basic backup and recovery for a virtual machine, use a local folder on the backup server.

   This step creates a disk library with the name you entered and two storage policies: one for disaster recovery (DR) and another for the disk library that you added.

   You can click the entry added under Configure Storage to view the Copy Properties dialog for the disk library storage policy.
4 Add a vCenter or ESX server:
   a. Under the **Configure vCenter or ESX** heading, click **Add New vCenter or ESX**.
   b. In the **Enter VMware vCenter Client** dialog box, enter the host name in the **vCenter Server Name** field, and then enter the user credentials for the vCenter or ESX server.
   c. Click **OK**.

This step creates the following objects:

- A client with the same name as the host is displayed under the Client Computers entry in the CommCell Browser.
- A virtualization client named **Virtual Server** is displayed under the client.
- A virtual server instance named **VMware** is displayed under the virtualization client. The instance includes a proxy for the host.
- A **defaultBackupSet** object is displayed under the VMware instance.
- A subclient named **default** is displayed under the defaultBackupSet entry. The next step customizes the subclient content to specify the virtual machines that are to be backed up.

After you add a vCenter or ESX server, the **Getting Started** tab changes to display additional options.

5 Select the virtual machines that require backup:
   a. Under **Configure vCenter or ESX**, click **Select VMs**.

      For evaluation purposes, you can choose a single virtual machine or a small number of virtual machines.
   b. In the **Browse** dialog box, select the virtual machines to back up and click **OK**. (If a Warning dialog is displayed, click **Yes**.)

      By default, the storage policy for the new disk library is used.
   c. Click **OK** to save the subclient properties.

      By default, the default subclient contains a single entry (\) that enables auto-discovery of all virtual machines on the vCenter or ESX server. For evaluation purposes, you can back up a single virtual machine and then restore it from the backup.

      You can click **Configure** to change the content selection in the subclient properties.

6 Under **Configure vCenter or ESX**, click **Backup** to initiate your first backup.

   A message indicates that the backup job has been submitted.

7 In the **Backup Options for Subclient** dialog box, click **OK**.

   By default, an immediate incremental backup is selected. For the first backup, VSP always performs a full backup.

8 Click **Take me to Job Controller** to monitor the progress of the backup.

   After performing the initial backup, you can restore a virtual machine or files from the backup.
RESTORE VIRTUAL MACHINE DATA

Perform a restore immediately after your first full backup to understand the process.

The basic steps for restoring data are:

1. Initiate the restore.
2. Continue with one of the following:
   - Restore Full Virtual Machine.
   - Restore Guest Files and Folders.

INITIATE THE RESTORE

Perform the following steps to restore virtual machine data:

1. On the Getting Started tab, click Restore.
2. Right-click the subclient under defaultBackupSet and click Browse and Restore.
3. In the Restore Options dialog box, continue with one of the following:
   - Restore Full Virtual Machine
   - Restore Guest Files and Folders

RESTORE FULL VIRTUAL MACHINE

1. In the Restore Options dialog box, select Full Virtual Machine.
2. Click View Content.
   
   The contents of the latest backup for the subclient are displayed on a Client content tab in the right pane of the Console.

3. Expand the content tree in the left section of the Client content tab and select a virtual machine
4. Click Recover All Selected.
5. In the Restore Options for All Selected Items dialog box:
   a. Clear the Restore in place check box.
      
      Only use the Restore in place option if you intend to replace the existing virtual machine with the backup.
   b. Click in the Change VM display name to column and enter a new name for the virtual machine.
   c. Optional: Enter new values in the ESX Server and Datastore columns.
   d. Optional: Select the Power ON Virtual Machine after restore option.
      
      Only select the Unconditionally overwrite VM with the same name option in the following circumstances:
      - If you are restoring in place and replacing the production VM (for example, because it is corrupted or needs to be reverted to an earlier point in time).
      - If you are updating a duplicate VM on a standby server from the most recent backup.
6 Click **OK**.

The job runs immediately.

RESTORE GUEST FILES AND FOLDERS

1 In the **Restore Options** dialog box, select **Guest Files and Folders**.

2 Click **View Content**.

   The contents of the latest backup for the default subclient are displayed on a Client content tab in the right pane of the Console.

3 Expand the content tree in the left section of the **Client** content tab and select one or more files or folders.

   The content for the selected items is displayed in the right section of the Client content tab.

4 Click **Recover All Selected**.

5 Optional: In the **Restore Options for All Selected Items** dialog box, select the **Restore To Virtual Machine** option. If that option is selected, you can select a new vCenter or VM, then supply user credentials for the target VM.

   By default, files are restored to a folder on the backup server unless you select the **Restore To Virtual Machine** option.

6 Click **Browse** to select a value for the **Specify Destination Path** field. On the resulting dialog, select a folder and click **OK**.

7 Click **OK**.

   The job runs immediately.

EXPLORE FURTHER

OTHER GETTING STARTED OPTIONS

In addition to basic configuration, backup, and restore, the following options are available from the **Getting Started** tab:

- **Schedule** - Perform scheduling tasks for the default subclient. By default, backup jobs are associated with the default schedule policy for the site. You can create a schedule or choose not to schedule jobs.

  For more information, see **Scheduling**.

- **Job Monitoring** - Display the **Job Controller** window to monitor active jobs. Right-click a job to see job control and viewing options.

  For more information, see **Job Controller**.
• Job History - Display the Data Protection Job History dialog to view information about completed jobs. To view job results, right-click a job and select View Job Details.

The Virtual Machine Status tab provides information about the virtual machines that were backed up. Double-click a virtual machine to see detailed information for that VM.

For more information, see Job History.

• Alerts - Configure alerts for the default subclient.

For more information, see Alerts and Notifications.

• Reports - Generate reports for VSP.

For more information, see Reports Overview.

RESULTS OF GETTING STARTED

After you use the Getting Started tab to configure storage, connect to a vCenter or ESX server, and select virtual machines to back up, the following objects are accessible through the CommCell Browser. To view the settings for any of these objects, you can right-click the object and select Properties.

• Installation creates the following objects:

  • The tree in the CommCell Browser is created; the parent node is named using the host name of the backup server.

  • A MediaAgent is created with the same name as the host name of the backup server. The MediaAgent can be accessed through Client Computer Groups > MediaAgents or through Storage Resources > MediaAgents.

  • A client computer is created and named using the host name of the backup server. The client can be accessed under the Client Computers branch of the CommCell Browser. Underneath the client are entries named File System (including a defaultBackupSet) and Virtual Server to represent the MediaAgents installed on the backup server. MediaAgents provide data movement and content indexing services for the backup server. Backup and restore operations are enabled by default.

  • A master user group is created for administrators. The master group is accessible through Security > CommCell User Groups. The master group is assigned on the Security tab for all objects.

  • The Add Storage step creates a disk library and two storage policies: one for disaster recovery (DR) and another for the disk library you added. The disk library is added under Storage Resources > Libraries. The storage policies are added under Policies > Storage Policies.
A Primary object for the storage policy contains parameters to control storage for the backup. It identifies the proxy used for backups and includes data retention controls, data path information, and other controls. View the properties for the Primary copy to get an idea of how the storage policy controls the backup process. (To create auxiliary copies, you can assign additional copy objects to a storage policy.)

- The Add vCenter or ESX step creates the following objects:
  - A client with the same name as the host you entered is displayed under the Client Computers entry in the CommCell Browser.
  - A virtualization client named Virtual Server is displayed under the client.
  - A virtual server instance named VMware is displayed under the virtualization client. The instance includes a proxy representing the MediaAgent on the backup server, which manages backups for the client.
  - A defaultBackupSet object is displayed under the VMware instance.
  - A subclient named default is displayed under the defaultBackupSet entry. The virtual machines to be backed up are specified on the Content tab of the subclient.
  - By default, the Content tab contains a single entry ‘\’ that enables auto-discovery of all virtual machines on the vCenter or ESX host; but that entry is replaced with the virtual machine you select during the Select Content step.

- The Select Content step customizes the subclient content to specify the virtual machines that are to be backed up and enables you to select the storage policy associated with your disk library.

In a production environment, you can restore the ‘\’ entry on the Content tab of the subclient to automatically protect all virtual machines on the vCenter or ESX host. You can also add different subclients to provide customized controls for different classes of virtual machines in your environment. For example, one subclient can be used for frequent backups of VMs that have high transaction or high input/output requirements, and another for daily backups of less critical VMs. Each subclient can have an appropriate schedule and storage policy associated with it.

- Running the first backup creates a full backup of the virtual machine you selected. After virtual machines are backed up, you can recover complete virtual machines or files.

Configuring VSP, running a backup, and performing restores provides a complete experience of the basic backup cycle.
VSP COMPONENTS, CONTROLS, AND CONCEPTS

COMPONENTS

The components of a backup and restore solution for virtual machines are a vCenter or ESX server, a backup server running VSP, and storage resources. VSP provides resources to ensure continued protection for virtual machines, improve the speed of protection operations, and minimize the impact of backups and restores on production systems.

CONTROLS

The Getting Started tab of the CommCell Console provides support for basic configuration and operations. You can use it to configure storage, provide vCenter or ESX server connection information, and select virtual machines to be backed up. You can also use it to perform ongoing operations: perform backups and restores, schedule jobs, monitor jobs and job history, configure alerts, and view reports.

The CommCell Console and Browser provide access to more advanced functions and objects. Menu options in the CommCell Console provide access to functions. Objects can be accessed through the CommCell Browser, with right-click options for properties and appropriate tasks.

The Control Panel provides access to system-level settings, including the following:

• Add/Remove Software (Tools): Product update connections and controls.

• User Preferences (Tools): Interface controls, job retention, event display, virtual machine display.

• Alerts (Configure): Add, edit, delete, or disable email alerts.

• E-Mail & Web Server Configuration (Monitoring): Email and IIS configuration (used for alerts and reports) and online help settings.

• System Owner Capabilities (Monitoring): Control access to specific operations for all system users.

• DR Backup Settings (System): Disaster recovery settings.

Property settings for the CommCell (top level object in the CommCell Browser) provide additional system-level settings.

Jobs that are active or recently completed, including backup and restore jobs, can be monitored and controlled using the Job Controller tab in the CommCell Console. Job history can be viewed at different levels of the client hierarchy; higher level objects provide history for administrative jobs as well as protection operations. You can use right-click options to view detailed information for jobs or to perform job-related tasks (such as restoring data from a backup job). Jobs can be run immediately, or they can be scheduled at the job level or by creating a schedule policy.

The Event Viewer can be used to monitor key events.
**CONCEPTS**

*Backups* provide full protection for virtual machines and data. *Full backups* are performed initially and can be scheduled on a periodic basis; *incremental backups* can be performed more frequently to capture changes since the last previous backup. In configuring backups, you can choose whether to enable granular recovery from backups.

*Job streams* move content identified in a subclient to a MediaAgent, which manages *data streams* to storage resources. Subclient properties can specify the optimal number of readers or streams. The actual number of job streams is determined by the associated storage policy and the available data paths. Multiple job streams can be included in each data stream. Stream data can use compression, encryption, and deduplication.

*Deduplication* identifies each block of data that is backed up and ensures that it is stored only once. Deduplication is automatically enabled for VSP and is managed through the storage policy and its copies.

*Retention* determines how long backed up data is retained. Retention controls are available at the subclient, job, media, and policy levels. Retention controls can be used to determine what storage media (for example, disk or tape) are used for different types of data, and when *data aging* can be used to remove or overwrite backed up data.

*Snapshots* capture point-in-time state information. *Hardware snapshots* capture dynamic hardware mirrored volumes that can be quiesced, split apart and mounted on a proxy server, and used as a source for backup, archive, replication, or offline mining to minimize the impact on the production host. A hardware snapshot can also be used to recover a volume that is lost on the production server. *Software snapshots* can be used to get stable, crash-consistent backups when locked or opened files might be a concern.
## KEY VSP OBJECTS

You can create and manage the following key objects through the CommCell Browser. (This is not a complete list of VSP objects.)

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
<th>CommCell Browser Path</th>
<th>More Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Groups</td>
<td>Provide control, management, and reporting capabilities for multiple clients. Clients can belong to multiple groups and inherit properties or activities from the group. User groups can be associated with client groups, and clients in the client group inherit those associations.</td>
<td>Client Computer Groups</td>
<td>Client Computer Groups</td>
</tr>
<tr>
<td>Clients</td>
<td>Clients include the backup server and each vCenter or ESX server. Clients for vCenter or ESX servers include subordinate objects: Virtual Server, VMware (instance), one or more backup sets, and one or more subclients. Clients include the backup server and each vCenter or ESX server. Clients for vCenter or ESX servers include subordinate objects: Virtual Server, VMware (instance), one or more backup sets, and one or more subclients. Backup sets provide a container to manage or view data sets. Subclients identify data content (virtual machines) to be backed up and associate the content with a storage policy that provides management options. Content can be identified using patterns, and filters can be used to exclude content. Additional clients can be added by right-clicking Client Computers and selecting New Client &gt; Virtualization &gt; VMware vCenter.</td>
<td>Client Computers</td>
<td>Client Computers</td>
</tr>
</tbody>
</table>
| Users          | Include both internal and external users:  
• CommCell users (define internally)  
• Microsoft Active Directory (external)  
• IBM Domino Directory Server (external)  
• Users can be assigned to one or more groups. | Security > CommCell Users | User Administration and Security |
<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
<th>CommCell Browser Path</th>
<th>More Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Groups</td>
<td>Provide capabilities for users in the group and can be associated with objects to provide authorized access (such as a client, library, or storage policy). External users or groups can be associated with CommCell user groups, with single sign on as an option.</td>
<td>Security &gt; CommCell User Groups</td>
<td>User Administration and Security</td>
</tr>
<tr>
<td>Name Servers</td>
<td>Enable domain support for external users through a name server or Active Directory.</td>
<td>Security &gt; Name Servers</td>
<td>Single Sign On (SSO)</td>
</tr>
<tr>
<td>Libraries</td>
<td>Libraries represent storage resources (disk or tape). They provide controls for data streams, capacity thresholds and aging, mount paths, and number of data writers.</td>
<td>Storage Resources &gt; Libraries</td>
<td>Library and Drive Configuration</td>
</tr>
<tr>
<td>MediaAgents</td>
<td>Provide data transport for backups and restores, writers to disk devices, and device control over media changers and removable media devices. MediaAgents also manage content indexes that are used to locate content for restores.</td>
<td>Storage Resources &gt; Libraries</td>
<td>MediaAgent</td>
</tr>
<tr>
<td>Schedule Policies</td>
<td>Provide timing rules for different types of jobs and agents. Schedule policies can be associated with specific objects (such as clients, backup sets, or subclients), and can trigger alerts.</td>
<td>Policies &gt; Schedule Policies</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Storage Policies</td>
<td>Manage physical data paths for storage media and implement business rules for management and data retention. Each storage policy has a Primary copy and can have additional copies when multiple backups of the same data are required. Retention, data paths, deduplication controls, and other media-specific settings are specified on each copy.</td>
<td>Policies &gt; Storage Policies</td>
<td>Storage Policy Storage Policy Copies</td>
</tr>
<tr>
<td>Reports</td>
<td>Provide standard (Classic) or custom reports about different aspects of data management. Reports can be accessed through the CommCell Console menu tabs or through the CommCell Browser.</td>
<td>Reports</td>
<td>Reports Overview</td>
</tr>
</tbody>
</table>
EXTENDING YOUR VSP LICENSE

You can extend your VSP license by sending an email to Commvault Customer Support at prodreg@commvault.com. Include the IP address of the backup server, which is shown in the License Expiration Warning presented when you start VSP.

EXPLORE ADDITIONAL OPTIONS

COMMCELL MANAGEMENT

For more information about managing and scheduling backup and restore operations, refer to the following:

- Job Management
- Alerts and Notifications
- Log Files
- Reports Overview
- Scheduling
- User Account and Password Management
- User Administration and Security
- Command Line

MEDIA MANAGEMENT

For more information about configuring storage and creating additional copies of the data, refer to the following:

- Storage Policy
- Storage Policy Copies
- Data Aging
- Deduplication
- Library and Drive Configuration

VIRTUAL SERVER AGENT

For more information about selecting virtual machines for backups and additional backup and restore configurations, refer to the following:

- Advanced Configuration - VMware
- Advanced Backup - VMware
- Advanced Restore - VMware
- IntelliSnap - Getting Started - VMware
ONLINE HELP

Online help is available by clicking the Help button on the Getting Started tab.

DISCLAIMER
Minor revisions and/or service packs that are released by application and operating system vendors are supported by our software but may not be individually listed in our System Requirements. We will provide information on any known caveat for the revisions and/or service packs. In some cases, these revisions and/or service packs affect the working of our software. Changes to the behavior of our software resulting from an application or operating system revision/service pack may be beyond our control. The older releases of our software may not support the platforms supported in the current release. However, we will make every effort to correct the behavior in the current or future releases when necessary. Please send an email to VM@commvault.com for any problem with a specific application or operating system.

Additional considerations regarding minimum requirements and End-of-Life policies from application and operating system vendors are also applicable.

SUPPORT
For support, send an email to VM@commvault.com.