

# Dell EMC RecoverPoint for Virtual Machines

Version 5.2

## Installation and Deployment Guide

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# Preface

As part of an effort to improve product lines, we periodically release revisions of software and hardware. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features.

Contact your technical support professional if a product does not function properly or does not function as described in this document.

 **Note:** This document was accurate at publication time. Go to Online Support (<https://support.emc.com>) to ensure that you are using the latest version of this document.

## Purpose

This document describes how to install and configure a Recoverpoint for Virtual Machines system.

## Audience

This document is intended for Virtualization Administrators who manage, maintain and scale their virtual environments, and Application Administrators who monitor application performance.

## Related documentation

The following publications provide additional information:

- *RecoverPoint for Virtual Machines Release Notes*
- *RecoverPoint for Virtual Machines Quick Start Installation Poster*
- *RecoverPoint for Virtual Machines Basic Configuration Installation Guide*
- *RecoverPoint for Virtual Machines Installation and Deployment Guide*
- *RecoverPoint for Virtual Machines Product Guide*
- *RecoverPoint for Virtual Machines Administrator's Guide*
- *RecoverPoint for Virtual Machines CLI Reference Guide*
- *RecoverPoint for Virtual Machines Deployment REST API Programming Guide*
- *RecoverPoint for Virtual Machines REST API Programmer's Guide*
- *RecoverPoint for Virtual Machines Security Configuration Guide*
- *RecoverPoint for Virtual Machines Scale and Performance Guide*
- *RecoverPoint for Virtual Machines FAQ*
- *Recoverpoint for Virtual Machines Simple Support Matrix*

In addition to the core documents, we also provide White papers and Technical Notes on applications, arrays, and splitters.

## Typographical conventions

This document uses the following style conventions:

<b>Bold</b>	Used for names of interface elements, such as names of windows, dialog boxes, buttons, fields, tab names, key names, and menu paths (what the user specifically selects or clicks)
<i>Italic</i>	Used for full titles of publications referenced in text
Monospace	Used for:

- System code
- System output, such as an error message or script
- Pathnames, filenames, prompts, and syntax
- Commands and options

<i>Monospace italic</i>	Used for variables
<b>Monospace bold</b>	Used for user input
[ ]	Square brackets enclose optional values
	Vertical bar indicates alternate selections - the bar means “or”
{ }	Braces enclose content that the user must specify, such as x or y or z
...	Ellipses indicate nonessential information omitted from the example

### Where to get help

Technical support, product, and licensing information can be obtained as follows:

#### Product information

For documentation, release notes, software updates, or information about products, go to Online Support at <https://support.emc.com>.

#### Technical support

Go to Online Support and click Service Center. You will see several options for contacting Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your sales representative for details about obtaining a valid support agreement or with questions about your account.

### Your comments

Your suggestions will help us continue to improve the accuracy, organization, and overall quality of the user publications. Send your opinions of this document to [techpubcomments@emc.com](mailto:techpubcomments@emc.com).

# CHAPTER 1

## Introduction to RecoverPoint for VMs

RecoverPoint for VMs is a virtualized solution that provides data replication, protection, and recovery within the VMware vSphere environment. Definition of key terms and a system diagram help you to understand the system operation.

- [RecoverPoint for VMs system](#)..... 14

## RecoverPoint for VMs system

Key components of the RecoverPoint for VMs system are defined and illustrated.

Key system components that are involved in this installation include:

### **vRPA**

The virtual RecoverPoint Appliance is a data appliance that manages data replication. You will create the vRPAs you need by using the vSphere Web Client from the vCenter Server.

### **vRPA cluster**

A group of up to 8 vRPAs that work together to replicate and protect data. You will create the vRPA clusters and connect them to the system by using the RecoverPoint for VMs Deployer wizards.

### **RecoverPoint for VMs plug-in**

The vSphere Web Client user interface for managing VM replication. Automatically installed after you create the vRPA cluster.

### **RecoverPoint for VMs splitter**

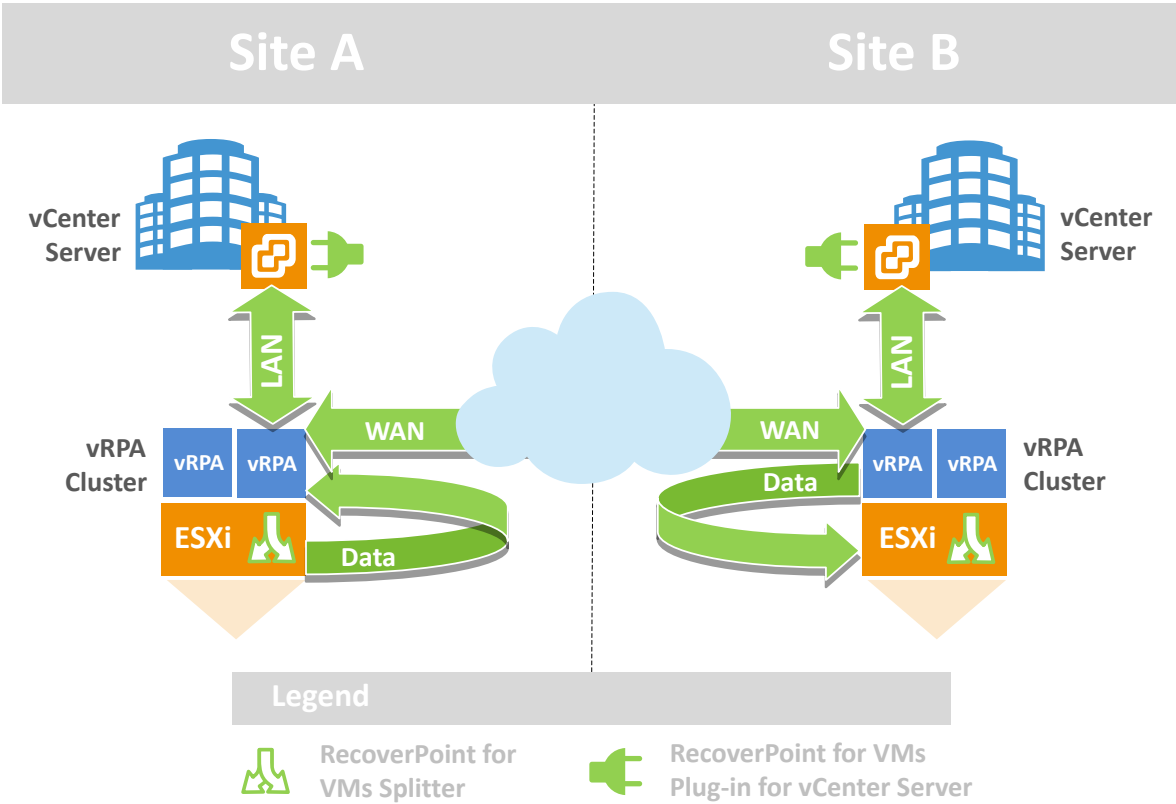
Proprietary software installed on every ESXi host in an ESXi cluster involved in RecoverPoint replication or running virtual RPAs. Splits every write to the VMDK and sends a copy of the write to the vRPA and then to the designated storage volumes. Automatically installed after you register the ESXi cluster.

### **RecoverPoint for VMs system**

One or more connected vRPA clusters.

[Figure 1](#) on page 15 provides a reference diagram that shows the vRPA and vRPA clusters within the RecoverPoint for VMs system. The diagram shows how these components interconnect within the VMware vSphere environment.

Figure 1 RecoverPoint for VMs system







# CHAPTER 2

## Preparing to install RecoverPoint for VMs

Guidelines help you choose the number of vRPAs and vRPA clusters, vRPA performance profile, and network adapter topology. Preparing the VMware network and determining storage capacity sets the stage for a successful installation.

• <a href="#">RecoverPoint for VMs networking example</a> .....	18
• <a href="#">Planning your system</a> .....	19
• <a href="#">Preparing the VMware environment</a> .....	22
• <a href="#">Understanding the installation flow</a> .....	24

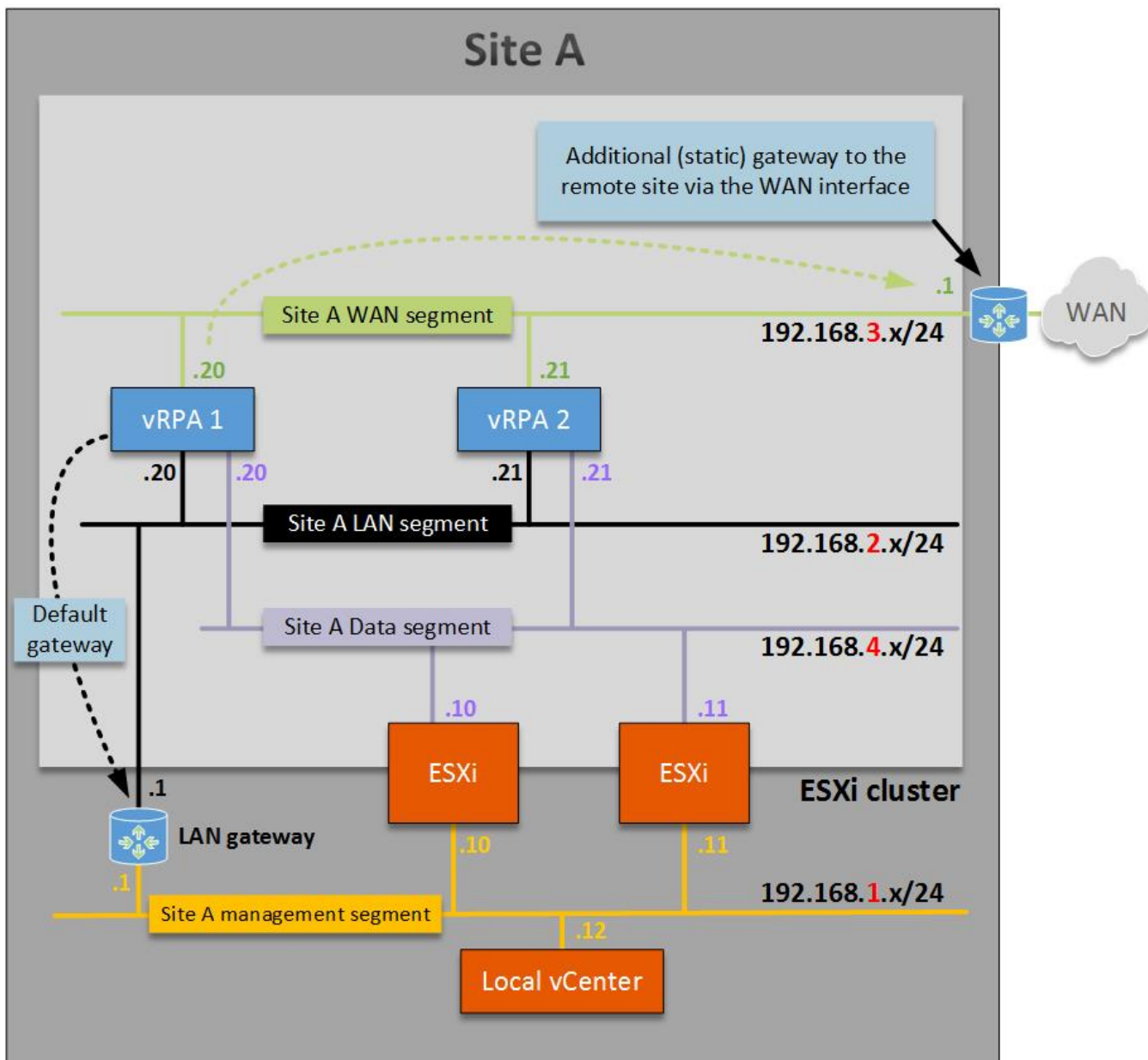
## RecoverPoint for VMs networking example

A reference diagram is a valuable tool for planning your RecoverPoint for VMs system. The diagram shows an example of the network that interconnects key system components.

For clarity, [Figure 2](#) on page 18 shows the components and interconnections of only one site in a small system. The IP addresses are for illustration purposes only.

The remaining sections of this chapter will help you to plan a system that meets your specific requirements.

**Figure 2** Networking example



# Planning your system

## System limitations

Understanding system limitations facilitates the installation of the RecoverPoint for VMs system. Successful operation of RecoverPoint for VMs depends on a persistent vSphere deployment. For a comprehensive and up-to-date list of system limitations, see the *RecoverPoint for Virtual Machines Release Notes*.

## Allocating IP addresses

Knowing how many IP addresses you need for the RecoverPoint for VMs system helps you to allocate the IP addresses before the installation is scheduled.

The RecoverPoint for VMs system requires these IP addresses:

- Cluster management IP address for each vRPA cluster
- An IP address for each vRPA network adapter (see [Choosing a network adapter topology](#) on page 21)
- An IP address for each VMkernel port

To allocate the necessary IP addresses for the RecoverPoint for VMs system, consult with the network administrator.

Document these addresses in an installation data form or spreadsheet before you begin the installation.

## Documenting the installation settings

Creating an inventory of the RecoverPoint for VMs system ensures that you have all the required settings before the installation begins.

As you perform the required planning, create an installation data form or spreadsheet to record the values that you type during the installation. See [Installation data forms](#) on page 70 for examples.

Adhere to a consistent naming and numbering convention for the components of the RecoverPoint for VMs system. For example:

- For vRPAs: <vRPA\_name>\_1, <vRPA\_name>\_2, ... <vRPA\_name>\_8
- For vRPA clusters: <vRPA\_cluster\_site\_name\_1>, <vRPA\_cluster\_site\_name\_2> (for example: London\_1 or New York\_2)

## Choosing a vRPA topology

The first step in planning the RecoverPoint for VMs system is to determine how many vRPAs you need in each vRPA cluster and how many vRPA clusters you need in the system.

### How many vRPAs?

Determining the number of vRPAs in the system is based on existing storage capacity, VMware infrastructure, and replication requirements such as high availability or product evaluation.

For typical installations, two vRPAs per vRPA cluster is sufficient. Two vRPAs per vRPA cluster provide the high availability that most production environments require.

For production environments that do not require high availability or for product evaluation in non-production environments, a single vRPA per cluster is also possible.

To scale up and support higher throughput, you may non-disruptively add vRPAs (up to 8) to each vRPA cluster.

All vRPA clusters in a system must have the same number of vRPAs.

The actual number of vRPAs that you need for each vRPA cluster depends on the capabilities of your storage, network, ESXi hosts, and the scale and performance requirements of your system.

For specific details and examples, refer to the *RecoverPoint for Virtual Machines Scale and Performance Guide*.

## How many vRPA clusters?

The number of vRPA clusters you need is based on whether you require local or remote replication, or both.

For most installations, you will install two vRPA clusters in your RecoverPoint for VMs system.

For local replication, you need only one vRPA cluster. To support remote replication, two vRPA clusters are required. The maximum number of vRPA clusters in a system is five.

A vRPA cluster is confined to a single ESXi cluster. All vRPAs in a vRPA cluster must be in the same ESXi cluster.

A vRPA cluster protects VMs on the same or a different ESXi cluster. This capability requires connections between the vRPA cluster and the ESXi hosts (see [Preparing the network](#) on page 22).

For specific details and examples, refer to the *RecoverPoint for Virtual Machines Scale and Performance Guide*.

## Choosing a vRPA performance profile

The vRPA performance profile defines the number of virtual CPUs, RAM, and VMDK capacity allocated to each vRPA. You choose a performance profile depending on the number of protected VMs and expected throughput.

For most installations, 2 CPUs and 4 or 8 GB RAM is sufficient.

The actual vRPA performance profile that you need depends on these factors:

- IOPS and throughput of protected VMs
- The number of VMs protected by the vRPA cluster

You can change the resource allocation later by using the vSphere vCenter Web Client.

Decide which of these vRPA performance profiles you need:

### **Low performance, 256+ VMs**

2 virtual CPUs

8 GB RAM

35 GB VMDK capacity

### **Medium performance, 256+ VMs**

4 virtual CPUs

8 GB RAM

35 GB VMDK capacity

### **High performance, 256+ VMs**

8 virtual CPUs

8 GB RAM

### 35 GB VMDK capacity

This selection is made when you create vRPAs from the OVF wizard in the vSphere Web Client.

**NOTICE** By default, all RAM is reserved and vCPU reservation is set to 3400MHz.

If required, you can add memory and CPU resources after initial OVA deployment. For each vRPA, power off the vRPA, select Edit Settings for the vRPA VM, and add the needed resources.

For details and examples, refer to the *RecoverPoint for Virtual Machines Scale and Performance Guide*.

## I/O throttling

I/O throttling is used to slow down storage reads that are part of the initialization (full-sweep) process.

I/O throttling mitigates the negative impact of initialization on production performance. As a result, however, the initialization process may take longer than expected.

The initial default I/O throttling behavior varies according to the RecoverPoint for VMs product release. The default behavior is valid for both new installs and upgrades to the release.

RecoverPoint for VMs release	Initial default I/O throttling behavior
5.2.0.1 and earlier	Not enabled
5.2.0.2 and 5.2.0.3	Enabled at "low" level (200 MBps)
5.2.0.4 and later	Enabled at custom level (400 MBps)

You can use the `config_io_throttling Sysmgmt` CLI command to set the I/O throttling setting.

For more information on I/O throttling, see the *RecoverPoint for Virtual Machines Scale and Performance Guide* and the *RecoverPoint for Virtual Machines CLI Reference Guide*.

## Choosing a network adapter topology

RecoverPoint for VMs supports LAN, WAN, and data interfaces distributed across multiple network adapters or combined into one. The choice depends on the requirements for high availability and performance.

Combining multiple interfaces on one network adapter is recommended for small environments. The advantage is a smaller network footprint and ease of installation and management.

Where high availability and performance are desired, you should separate the LAN and WAN interfaces from the data interfaces (recommended for most installations). For even better performance, place each network on a separate virtual switch.

Decide which of these network adapter topologies you need:

### One network adapter

WAN + LAN + Data combined

Fewer IP addresses to create and manage

Not for high availability solutions

### Two network adapters (the default and recommended configuration)

WAN + LAN combined, Data separated

Better performance, high availability

### Two network adapters

LAN + Data combined, WAN separated

Better performance, high availability

DHCP for LAN is not supported

### Three network adapters

WAN, LAN, and Data separated

Better performance, high availability

DHCP for LAN is not supported

### Four network adapters

WAN and LAN separated, Data separated on two dedicated network adapters

Compatible with previous releases

Best performance and high availability. Use different subnet masks for the two Data IP addresses.

DHCP for LAN is not supported

**NOTICE** Beginning with RecoverPoint for VMs 5.2.1, IPv6 is supported on vRPA LAN and WAN interfaces, but not on vRPA Data interfaces. In product versions earlier than 5.2.1, IPv6 is not supported.

This selection is made when you run the Install a vRPA cluster wizard in the RecoverPoint for VMs Deployer.

For high-availability deployments in which clients have redundant physical switches, route each data card to a different virtual switch with a separate network adapter.

For each network adapter, you have the option to assign a dynamic or static IP addresses.

When using Dynamic Host Configuration Protocol (DHCP):

- Separating WAN and LAN interfaces on different network adapters is supported only when using static IP addresses for the LAN interface
- Redundant, highly available DHCP servers in the network ensure that when a vRPA restarts, it acquires an IP address

## Preparing the VMware environment

### Supported vSphere versions

For the most up-to-date information on supported VMware vCenter and vSphere versions, refer to the *Simple Support Matrix* available online at <https://support.emc.com>.

### Preparing the network

The RecoverPoint for VMs splitter communicates with the vRPAs through a VMkernel port. Setting up separate VMkernel ports is the best practice for isolating splitter traffic from other network traffic. You isolate the traffic by placing the vRPA data interface and a dedicated VMkernel port on a private (separate) subnet. Avoid using the same subnet that is used also for high availability (vMotion) and hosts (applications).

Depending on your existing network, you may not need to configure any additional VMkernel ports, or if so, you can do so later from the RecoverPoint for VMs plug-in UI, even after you have

protected VMs and are ready to begin replication. RecoverPoint for VMs assists in automatically creating VMkernel ports for all the ESXi hosts in the ESXi cluster. The procedure is described in the *RecoverPoint for Virtual Machines Administrator's Guide*.

Alternatively, you can configure VMkernel ports manually by following the procedure in [Configure VMkernel ports](#) on page 36.

The number of VMkernel ports you need is based on the network adapter topology you previously selected. If you decided to use four network adapters for the topology, create two VMkernel ports. Otherwise, one VMkernel port is required.

## Establishing vCenter-to-vRPA communication

During installation, the vCenter server communicates to the vRPAs over port 443 to acquire the RecoverPoint for VMs plug-in. The ESXi clusters communicate over the network with the vRPA targets.

### Procedure

- Ensure that you open port 443 between the vCenter and the vRPAs.
- Ensure that ESXi clusters can communicate with their vRPA targets. Configure the ESXi firewall profile to allow communication through the network.
- See the *RecoverPoint for Virtual Machines Security Configuration Guide* for more information.

## Preparing the storage

Determining the amount and types of storage you need requires careful planning, guidelines, and sizing tools.

RecoverPoint for VMs replicates VMs on any type of storage that VMware supports including VMFS, NFS, vSAN, and vVols.


Ensure that all ESXi hosts in the cluster where the vRPAs reside share the datastore for the repository VMDK.

RecoverPoint for VMs requires additional storage for journal VMDKs to store point-in-time history. This storage is needed at local and remote sites. The amount of journal storage you need depends on site-specific installation and replication requirements and requires careful planning. A general guideline is to begin with a number that is 15–25% of the total protected VM capacity. If required, you may add additional storage later. To size the system according to estimated workloads, use the RecoverPoint Sizer tool. See <https://help.psapps.emc.com/display/HELP/RecoverPoint+Sizer>.

The total storage capacity that is required includes:


- Storage for production VMs at the production site
- Storage for replica VMs at the replica site
- Storage for journal VMDKs
- 35 GB for each vRPA in the RecoverPoint for VMs system

A persistent scratch location on the ESXi host is required for storing splitter configuration information. The scratch location (`/scratch/log`) requires at least 500 MB of free storage space on a permanently available persistent storage device.

 **Note:** Each ESXi host should have its own dedicated datastore for the scratch directory.

For more details and examples, refer to the *RecoverPoint for Virtual Machines Scale and Performance Guide*.

For additional guidelines and sizing tools, contact Customer Support.

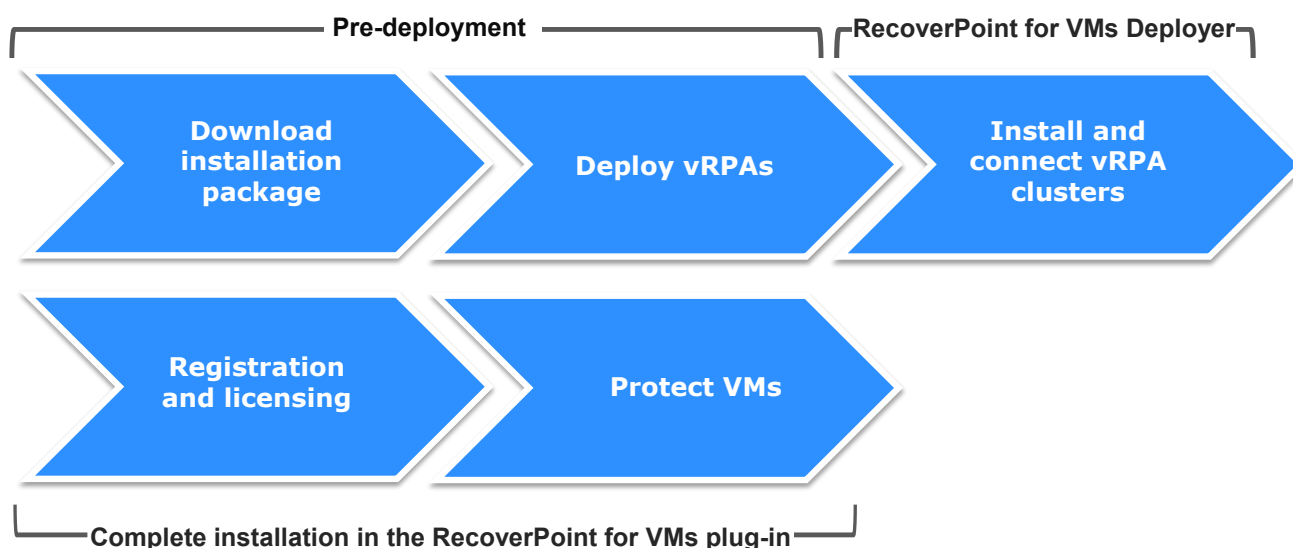
 **Note:** Shared virtual disks (VMDK/RDM) are not supported.

## Understanding the installation flow

The complete work flow includes installation and protection. Understanding the stages of the work flow helps you to successfully install the RecoverPoint for VMs system and protect VMs.

[Figure 3](#) on page 24 shows the major stages of the installation flow. [Table 1](#) on page 24 provides details of the required procedures for each stage of the installation flow. [Table 2](#) on page 25 lists the tasks that are performed in the RecoverPoint for VMs plug-in to protect VMs.

**Figure 3** Stages of the installation flow



**Table 1** Procedures in the installation flow

Stage of installation flow	Sequence of procedures in the installation flow	Interface
Download installation package	<a href="#">Download the installation package</a> on page 28	Online support site
Deploy vRPAs	<a href="#">Deploy vRPAs</a> on page 28	vSphere Web Client
Install and connect vRPA clusters	<a href="#">Install vRPA clusters</a> on page 29 <a href="#">Connect vRPA clusters</a> on page 31	RecoverPoint for VMs Deployer



**Table 2** Procedures in the protection flow

RecoverPoint for VMs plug-in step	Sequence of procedures	Interface
Registration and licensing	<a href="#">Register and license the system</a> on page 32	vSphere Web Client > RecoverPoint for VMs plug-in
Protect VMs	<a href="#">Protect VMs</a> on page 33	vSphere Web Client > RecoverPoint for VMs plug-in



# CHAPTER 3

## Installing the RecoverPoint for VMs system


Installing the RecoverPoint for VMs system involves deploying the vRPAs, installing the vRPA clusters, and connecting the vRPA clusters together. You register and license the system, and then begin protecting VMs.

• <a href="#">Download the installation package</a> .....	28
• <a href="#">Deploy vRPAs</a> .....	28
• <a href="#">Install vRPA clusters</a> .....	29
• <a href="#">Connect vRPA clusters</a> .....	31
• <a href="#">Register and license the system</a> .....	32
• <a href="#">Protect VMs</a> .....	33

## Download the installation package

Download the installation software kit and uncompress the .zip file.

### About this task

 **Note:** To complete a registration form requesting a download for evaluation, Try and Buy customers should go to <http://www.emc.com/products-solutions/trial-software-download/recoverpointforvms.htm>.

### Procedure

1. Browse to <https://support.emc.com/downloads>.
2. Perform a search in the **Type a Product Name** text box for **RecoverPoint for Virtual Machines**.
3. Locate and download **RecoverPoint for Virtual Machines <version> Installation Kit**.

Example of downloaded file:

`RecoverPoint_for_Virtual_Machines_<version>_Installation_Kit_<md5_checksum>.zip`

4. Uncompress the .zip file.

The .zip file contains the OVA file that is needed for the installation.

5. (Recommended) Obtain documentation for RecoverPoint for VMs.
6. Continue to the next section, "Deploy vRPAs."

## Deploy vRPAs

Deploy a standard OVA to create vRPAs for RecoverPoint for VMs.

### Before you begin

Ensure that you have completed:

- Preparations for installation.
- Installation data form or spreadsheet to facilitate entering requested information (recommended). See [Installation data forms](#) on page 70.

### Procedure

1. In the vSphere Web Client, right-click an ESXi host and select **Deploy OVF Template....**
2. In the **Select name and folder** screen, type a name for this vRPA and select a folder or data center.  
  
If you type the name of an existing vRPA, you are not permitted to continue.
3. In the **Select resource** screen, specify the vRPA OVF package location.
4. In the **Review details** screen, review the general properties of the OVF template. To accept, click **Next**.
5. In the **Accept License Agreements** screen, if you accept the terms of the End-User License Agreement, click **Accept** and **Next**.
6. In the **Select configuration** screen, select the desired vRPA performance profile.
7. If prompted to select a resource, in the **Select a resource** screen, select a cluster, host, or resource pool.

8. In the **Select storage** screen, select a disk format, storage policy, and high-performance datastore (best practice) to host the vRPA virtual machine files.

All ESXi hosts in the cluster where the vRPAs reside must share the datastore where the repository VMDK resides.

Do not deploy the vRPA on a local datastore.

9. In the **Setup networks** screen, select a destination network for the **RecoverPoint Management Network**, and select an IP protocol.
10. In the **Customize template** screen, type these vRPA LAN settings: IP address, subnet mask, and gateway.  
  
Follow instructions on the screen for using DHCP or static IP addresses depending on the network adapter topology.
11. The **Ready to Complete** screen summarizes all the selections. Select **Power on after deployment**. To create the vRPA, click **Finish**.  
  
The **Deploying vRPA** screen appears, showing the progress.
12. To create additional vRPAs, repeat this procedure.
13. When you finish creating vRPAs, continue to the next section, "Install vRPA clusters."

## Results

When a vRPA is created, the **vRPA Summary** tab shows the vRPA package contents as specified. The selected IP policy is implemented automatically when the vRPA is powered on.

## After you finish

To enable redundancy in case an ESXi host or datastore fails, ensure that vRPAs do not share the same ESXi host or datastore.

# Install vRPA clusters

Follow the **Install a vRPA cluster** wizard to create one or more vRPA clusters for RecoverPoint for VMs.

## About this task

When you are prompted to type data, consult the installation data form or spreadsheet that you created when planning the system (recommended). See [Installation data forms](#) on page 70.

## Procedure

1. In a web browser, type `https://<LAN-ip-address>` where *<LAN-ip-address>* is the LAN IP address of vRPA 1 or vRPA 2 in the cluster you are installing. In the home page, click **RecoverPoint for VMs Deployer**.  
  
If you are using DHCP, obtain the LAN IP address from the vSphere Web Client by selecting the vRPA and clicking the **Summary** tab.
2. If prompted, type the login credentials for the admin user and click **Sign in**.  
  
The **RecoverPoint for VMs Deployer** home page appears.
3. Select the **Install a vRPA cluster** wizard.
4. On the **Version Requirements** page, the version requirements file is automatically downloaded and validated to ensure that the system meets the requirements. If you have a `.json` configuration file that you want to import, click the **Settings** icon and then click **Import**.

If version requirements verification is successful, click **Next** to continue. If issues are found, analyze and fix blocking issues before continuing.

If the version requirements file fails to download, you are prompted to select one of these options:

- **Retry downloading the up-to-date requirements from EMC Online Support**
- **Provide version requirements file manually**
- **Do not check version requirements**

**Note:** To obtain the version requirements file for offline installation, browse to <https://rplicense.emc.com/download>. This page provides an option to download or email the `arpa-cca.xml` file. If this option is not available, open a Service Request with Customer Support Services (severity level 3). In the request, ask for the latest version requirements file for the RecoverPoint for VMs Deployer. The file is provided within one (1) business day and must be used within 30 days.

5. On the **Installation Prerequisites** page, type the requested information for the vCenter on which the current vRPA is running, and then click **Connect**.

If the **SSL Certificate** window appears, verify the vCenter's SSL certificate and click **Confirm**.

6. Review the **Pre-installation Validation Results** area. If validation errors are listed, fix them before proceeding.

If an error can be automatically fixed, the **Fix** button appears in the **Auto-Fix** column.

7. On the **Environment Settings** page, define the required settings.

- Type a name for the vRPA cluster.
- In RecoverPoint for VMs 5.2.0.3 or earlier, for better security, select the **Authenticated and encrypted communication between vRPAs** checkbox (recommended). For better performance, clear this checkbox.  
In RecoverPoint for VMs 5.2.0.4 or later, to change this setting, use the procedure, "Changing the vRPA communication security level", in the *RecoverPoint for VMs Security Configuration Guide*.

- To align with security best practices, replace the default admin user password with a new unique password.

**NOTICE** The admin user (with the administrator role) is authorized with all access permissions for managing your RecoverPoint for VMs system. The password for the admin user serves also as the password for the root user across all vRPAs in the system.

- Type IP addresses for DNS and NTP servers.

**NOTICE** If you have a cloud copy, all vRPAs must be able to resolve [amazonaws.com](https://amazonaws.com) addresses, so all vRPA clusters will require an appropriately configured DNS server. See the *RecoverPoint for VMs Cloud Solutions Guide* for more information.

8. On the **vRPA Settings** page:

- a. Select the vRPAs for the vRPA cluster and click the **Apply Selection** button.
- b. Select a repository volume from the list. All ESXi hosts in the cluster where the vRPAs reside must share this volume.

9. On the **Network Settings** page, provide the requested settings for the vRPA cluster and its vRPAs.

- In the **Network Adapters Configuration** area, keep the default setting or click **Edit** to choose a different network adapter topology.
  - In the **Network Mapping** area, for each network adapter, select a value and whether to use DHCP. Type a Cluster Management IP address.
  - In the **vRPA Settings** area, type the requested IP addresses. If the network configuration requires gateways to communicate with remote vRPA clusters, click **Add** to insert each gateway. For each gateway that you add at the current cluster, add a gateway at the remote cluster.
  - In the **Advanced Settings** area, change the **MTU** values only if required. MTU values must be consistent across the communication interface from source to target. See [KB article 484259](#) for more information.
10. On the **Deployment progress** page, on reaching 100%, click **Finish** to return to the home page. To export a configuration file of the vRPA cluster settings, click the **Settings** icon (upper right), and then click **Export**. This file provides a record of the vRPA cluster configuration for the major version you have installed. You use it to restore the vRPA cluster settings after an installation failure (requiring the installation to be repeated).  
If installation fails:
    - To identify the cause of failure, review the displayed error messages.
    - To return to the step in the wizard where you can fix the problem, click **Back**. Fix the problem and retry the installation.
    - Alternatively, you can retry the operation that failed by clicking **Retry the operation**.
    - If installation continues to fail, contact Customer Support.
  11. To enable multi-site replication, create additional vRPA clusters by repeating this procedure for each site.
  12. When all vRPA clusters are created, continue to the next section, "Connect the vRPA clusters."

## Results

Installation of the RecoverPoint for VMs plug-in for vSphere vCenter is initiated.

The plug-in installation usually occurs immediately, but it might take some time for the vCenter to identify the plug-in. If you experience issues with the RecoverPoint for VMs plug-in, log out and log in again to the vSphere Web Client as described in "Troubleshooting the RecoverPoint for VMs plug-in."

Splitters and Journal Access Modules (JAMs) are pushed to all ESXi hosts in the ESXi cluster where the vRPAs are installed.

## Connect vRPA clusters

To enable replication between any two vRPA clusters, use the **Connect vRPA clusters** wizard to establish a connection between them.


### Before you begin

In this procedure, the "current" cluster is defined as the vRPA cluster to which the **Connect vRPA clusters** wizard is currently pointed. The "remote" cluster is the vRPA cluster at a remote site. This wizard helps you to connect a remote vRPA cluster to the current vRPA cluster.

The remote vRPA cluster must not:

- Be in maintenance mode.

- Be an existing, configured vRPA cluster.
- Have protected VMs, consistency groups, or group sets.
- Have user or journal volumes.
- Have a license other than a vCenter license.
- Have been previously connected to a vRPA cluster

 **Note:** A remote vRPA cluster that meets these requirements is called a "clean" cluster.


Ensure that you have a completed installation data form or spreadsheet (recommended).

Do not exceed the maximum number of five vRPA clusters per system.

If you require a gateway for communication between vRPA clusters, add a gateway at each vRPA cluster before connecting between the clusters.

#### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/WDM` for the vRPA cluster that you want to connect.
2. In the RecoverPoint for VMs Deployer home page of the current cluster, select the **Connect vRPA clusters** wizard.
3. On the **Environment Settings** page, type the requested information for the remote cluster. It is important to enter the WAN IP of one of the remote vRPAs.
4. In the **Current Cluster Settings** area, review the list of gateways that are configured for this vRPA cluster. If required, add one or more gateways on the current vRPA cluster. Remember that for each additional gateway at the current cluster, you must add a gateway at the remote cluster.
5. On the **Add Cluster Progress** page, the remote cluster is connected to your RecoverPoint for VMs system, and IP communication is enabled between the remote cluster and the current cluster.

 **Note:** This does not enable communication between the remote cluster and any other clusters in your system. To enable communication between the remote cluster and additional clusters, follow the procedure in [Enable communication between vRPA clusters](#) on page 37.

6. Continue to the next section, "Register and license the system".

## Register and license the system

Use the RecoverPoint for VMs plug-in to register and license your system. Registration and licensing enables support and provides important product updates to keep your system running optimally.

#### Procedure

1. Ensure that you activate your entitlements.

This procedure is in the "Activate your entitlements and create your license files" section of the *RecoverPoint for Virtual Machines Administrator's Guide* or the *RecoverPoint for Virtual Machines Cloud Solution Guide*.

2. Use the **Getting Started Wizard** to add licenses and register your RecoverPoint for VMs system.

This procedure is in the "License and register RecoverPoint for VMs" section of the *RecoverPoint for Virtual Machines Administrator's Guide* or *RecoverPoint for Virtual Machines Cloud Solution Guide*.



3. Continue to the next section, "Protect VMs".

## Protect VMs

The RecoverPoint for VMs system is ready for operation. Use the RecoverPoint for VMs plug-in to begin protecting VMs.

### Procedure

1. Protect the VMs by right-clicking each VM and selecting the protection option. Detailed instructions are in the *RecoverPoint for Virtual Machines Administrator's Guide*.
2. After protection is enabled, monitor the system as described in the *RecoverPoint for Virtual Machines Administrator's Guide*.



# CHAPTER 4

## Maintaining RecoverPoint for VMs

Maintaining the RecoverPoint for VMs system involves tasks such as collecting logs, modifying vRPA cluster network settings and topology, and adding, removing, or replacing vRPAs.

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## Register ESXi clusters

By default, ESXi clusters are registered automatically as part of the Protect VM procedure.

### About this task

Alternatively, you can register ESXi clusters manually, using the RecoverPoint for VMs plug-in to the vSphere Web Client.

### Procedure

1. Access the vSphere Web Client at: `https://<vCenter-ip-address>:9443/vsphere-client/`. In the vSphere Web Client home page, click **RecoverPoint for VMs Management > Administration > vRPA Clusters**.
2. Select the **ESXi Clusters** tab.
3. Click **Add** to register an ESXi cluster. Verify that the connectivity status is OK. If there are connectivity issues with the cluster, click **Troubleshoot**.

## Configure VMkernel ports

You can configure the VMkernel ports from the RecoverPoint for VMs plug-in UI, and they will be automatically created for all the ESXi hosts in the ESXi cluster. Alternatively, you can use this procedure to manually configure VMkernel ports.

### Before you begin

An ESXi must be registered (see [Register ESXi clusters](#) on page 36) before you can configure VMkernel adapters on it.

### Procedure

1. For each ESXi host, click **Manage > Networking > VMkernel adapters**.
2. Add the VMkernel adapters.
  - Assign IP addresses that are on a routable subnet or on the same subnet as the vRPA data interfaces.

It is recommended also that the VMkernel and vRPA data ports be on the same L2 network.
  - For a standard vSwitch, create a VMkernel port with the network label: `RP-VM-Kernel-Port-Group`
  - For a distributed vSwitch:
    - Create a VMkernel port on the relevant port group.
    - On the Ports tab of the Distributed Ports Group page, label each VMkernel port that is to be used for splitter-to-vRPA communication as `RP-VM-Kernel-Port-Key`.

The vRPA data IP addresses are assigned when deploying the vRPA cluster.

## Enable communication between vRPA clusters

Use this procedure to enable communication between pairs of vRPA clusters in your system.

### About this task

Use the **Connect vRPA clusters** wizard in the RecoverPoint for VMs Deployer to add a vRPA cluster to your system, and to enable IP communication between that new cluster and one of the existing clusters. For more information, see [Connect vRPA clusters](#) on page 31.

Use the following procedure to enable communication between additional pairs of clusters.

### Procedure

1. Use an SSH client to connect as admin user to a cluster management vRPA of one of the pair of vRPA clusters between which you want to enable communication.
2. From the Boxmgmt CLI **Main Menu**, select **Cluster operations > Configure connection types to other clusters in the system > Configure cluster connection types**.
3. Select the vRPA cluster with which you want to enable communication.

### Results

Bi-directional IP communication is enabled between the designated pair of vRPA clusters.

Repeat this procedure for each pair of vRPA clusters for which you want to enable communication.

## Modify vRPA cluster network settings

Use the Modify vRPA cluster network wizard to change network settings.

### Before you begin

To modify the network adapter topology, refer to [Modify the network topology](#) on page 38.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/wdm` for the vRPA cluster that you want to modify.
2. In the home page, click **RecoverPoint for VMs Deployer**.
3. If prompted, type the login credentials for the admin user and click **Sign in**.
4. Under **More actions**, select **Modify vRPA cluster network**.
5. Make the desired changes to the **Environment Settings** page. If you have a `.json` configuration file that you want to import, hover over the **Settings** icon and click **Import**.
6. Make the desired modifications changes to the **Network Settings** page.  
Some settings cannot be modified.
7. To apply the changes, click **Modify**. To export a configuration file of the vRPA cluster settings, click the **Settings** icon (upper right), and then click **Export**. This file provides a record of the vRPA cluster configuration.

## Change the RPA communication security level

For information about the RPA communication security level, including a procedure for changing it, see the *RecoverPoint for VMs Security Configuration Guide*.

## Modify the network topology

Use this procedure to modify the existing network topology.

### Procedure

1. Pause transfer between the production and copies of the consistency groups for the vRPA cluster that you are modifying.
2. From the vSphere Web Client, add the vNIC on all vRPA VMs. Ensure that the type is VMXNET3.
3. Use an SSH client to log in to the vRPA as the admin user.
  - a. Detach the vRPA from the vRPA cluster. From the **Main** menu, select **Cluster operations > Detach RPA from cluster**.
  - b. From the **Main** menu, select **Setup > Modify settings > Enter cluster details > Network Interface and IPs Configuration**.
  - c. Select the network topology that you want to use.
  - d. Attach the vRPA back to the cluster. From the **Main** menu, select **Cluster operations > Attach RPA to cluster**.
4. Repeat step 3 on page 38 for each vRPA in the vRPA cluster.
5. Start transfer between the production and copies of the consistency groups for the modified vRPA cluster.

## Installing the splitter with Boxmgmt CLI

Ensure that all vRPAs reside on ESXi hosts with a splitter installed. Splitters are installed automatically during system installation. You can use this procedure to install splitters manually.

### Procedure

1. Use an SSH client to connect as admin user to a cluster management vRPA.
2. From the boxmgmt **Main Menu**, select **Setup > Advanced options > Splitter actions > Upgrade Splitter**.
3. Provide the vCenter Server credentials.
4. Let the system provide the vCenter certificate automatically and, if it's correct, approve the certificate.
5. Select one or more of the ESXi cluster(s) in this vCenter on which you want to deploy the splitters.

## Install the splitter with the RecoverPoint for VMs VIB installer

During system installation, the RecoverPoint for VMs splitter VIB is installed on ESXi hosts automatically. Use this procedure if you need to install the splitter VIB manually.


### Before you begin

You may need to enable ESXi Shell and SSH access before proceeding. Refer to VMware documentation for more information.

### Procedure

1. To copy the splitter VIB, use an SSH client with secure copy protocol:

```
scp <vib name> <username>@<ESXi host IP>:/scratch
```

 **Note:** Do not erase the /scratch space.

```
scp EMC_bootbank_emcjiraf_5.2.0.0.a.281-6.0.0.3657938.vib
root@10.10.10.10:/scratch
```

2. To install the splitter VIB in the ESXi host console, run the following command:

```
esxcli software vib install -v /<vib_full_path> --no-sig-check
```

If installation is successful, the following message appears:

```
Installation Result
  Message: Operation finished successfully.
  Reboot Required: false
  VIBs Installed: EMC_Recoverpoint_bootbank_RP-splitter_RPS-<version
number>
  VIBs Removed:
  VIBs Skipped:
```

3. Confirm installation of the splitter VIB in the ESXi host console by using SSH to run the following command:

```
esxcli software vib list
```

The RecoverPoint for VMs splitter installation name should appear at the top of the list.

4. Repeat this procedure for every ESX on which you want to install the RecoverPoint for VMs splitter VIB.

## Install JAM

During new installations of RecoverPoint for VMs 5.2 and later (but not upgrades to 5.2), the RecoverPoint for VMs Journal Access Module (JAM) VIB is installed automatically on all ESXi hosts that belong to ESXi clusters on which vRPAs are running. Use this procedure if you need to install the JAM VIB manually.


### Before you begin

You may need to enable ESXi Shell and SSH access before proceeding. Refer to VMware documentation for more information.

### Procedure

1. To copy the JAM VIB, use an SSH client with secure copy protocol:

```
scp <vib name> <username>@<ESXi host IP>:/scratch
```

 **Note:** Do not erase the /scratch space.

```
scp EMC_bootbank_emcjiraf_5.2.0.0.a.281-6.0.0.3657938.vib
root@10.10.10.10:/scratch
```

2. To install the JAM VIB in the ESXi host console, run the following command:

```
esxcli software vib install -v /<vib_full_path> --no-sig-check
```

If installation is successful, the following message appears:

```
Installation Result
  Message: Operation finished successfully.
  Reboot Required: false
  VIBs Installed: EMC_Recoverpoint_bootbank_emcjiraf_RPS-<version
number>
  VIBs Removed:
  VIBs Skipped:
```

3. Confirm installation of the JAM VIB in the ESXi host console by using SSH to run the following command:

```
esxcli software vib list
```

The RecoverPoint for VMs JAM installation name should appear at the top of the list.

4. Repeat this procedure for every ESX on which you want to install the RecoverPoint for VMs JAM VIB.

## Add vRPAs to a vRPA cluster

Use this procedure to add a vRPA to an existing vRPA cluster. A vRPA cluster can have up to 8 vRPAs, and all vRPAs in a cluster must run the same RecoverPoint for VMs version.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/wdm` for the vRPA cluster to which you want to add vRPAs.
2. In the home page, click **RecoverPoint for VMs Deployer**.
3. If prompted, type the login credentials for the admin user and click **Sign in**.
4. Under **More actions**, click **Add vRPAs to vRPA cluster**.
5. In the **Add Prerequisites** step, acknowledge that you have met the listed conditions by selecting the checkbox.
6. In the **Add vRPAs** step, select one or more VMs/vRPAs to add to the cluster.
  - New vRPAs must have the same RecoverPoint software ISO image as the existing vRPAs in the cluster.
  - A cluster can have a maximum of 8 vRPAs.
7. In the **vRPA Cluster Settings** and **vRPA Settings** sections, type required information for the vRPAs you are adding.
8. In the **Add vRPAs Progress** step, on reaching 100%, click **Finish** to return to the Home Page.

If adding a vRPA fails:

- To identify the cause of failure, review the displayed error messages.
- To return to the step in the wizard where you can fix the problem, click **Back**. Fix the problem, and then retry the installation wizard from that point.
- Alternatively, you can retry the operation that failed by clicking **Retry the operation**.
- If adding a vRPA continues to fail, contact Customer Support.

## Remove a vRPA from a vRPA cluster

Use this procedure to remove a vRPA from a vRPA cluster. You cannot remove a vRPA if the cluster has 2 or fewer vRPAs.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/wdm` for the vRPA cluster from which you want to remove a vRPA.
2. In the home page, click **RecoverPoint for VMs Deployer**.



3. If prompted, enter the login credentials for the admin user and click **Sign in**.
4. Under **More actions**, click **Remove vRPA from vRPA cluster**.
  - The highest numbered vRPA (the last one added) will be removed.
  - The consistency groups of the removed vRPA will be non-disruptively moved to a different vRPA.
  - The preferred vRPA setting for those consistency groups will be automatically updated.

## Replace a vRPA

Use this procedure and wizard to replace a vRPA with a different vRPA.

### Before you begin

This wizard does not support replacing a vRPA within a vRPA cluster that has only one vRPA. If you must replace a vRPA in a single-vRPA cluster, contact Customer Support.

### About this task

Deploy the new, replacement vRPA with the same IP settings as the faulty vRPA you want to replace. Ensure that the replacement vRPA is shut down. To shut down the replacement vRPA, login as admin user and select **Main Menu > Shutdown / Reboot operations > Shutdown RPA**.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/wdm` for the vRPA cluster in which you want to replace a vRPA.
2. In the home page, click **RecoverPoint for VMs Deployer**.
3. If prompted, type the login credentials for the admin user and click **Sign in**.
4. Under **More actions**, click **Replace vRPA**.
5. In the **Prerequisites** step, acknowledge that you have met the listed conditions by selecting the checkbox.
6. In the **Replace vRPA** step, select the vRPA that you want to replace.
7. Select the vRPA you want to add as a replacement.
8. In the **Replacement Progress** step, on reaching 100% click **Finish** to return to the home page.


If replacing a vRPA fails:

- To identify the cause of failure, review the displayed error messages.
- To return to the step in the wizard where you can fix the problem, click **Back**. Fix the problem, and then retry the installation wizard from that point.
- Alternatively, you can retry the operation that failed by clicking **Retry the operation**.
- If replacing a vRPA continues to fail, contact Customer Support.

## Change default passwords


To align with security best practices, change the default passwords for the predefined users of your RecoverPoint for VMs system.

### About this task

Predefined user	Default password	Notes
admin	admin	New install or upgrade. In new install, you set a unique password during installation.
boxmgmt	boxmgmt	New install (of 5.2 or 5.2.0.1) or upgrade.  <b>Note:</b> In new installations of RecoverPoint for VMs 5.2.0.2 and later, there is no predefined boxmgmt user.
security-admin	security-admin	Upgrade only.
SE	kashyaSE	Upgrade only.

For new RecoverPoint for VMs 5.2 installs, you must replace the default admin password with a unique one whenever you install a vRPA cluster. The admin user password serves also as the password for the root user.

If, however, you have upgraded your system from RecoverPoint for VMs 5.1.1.4, you could still be using the default admin (and root) password. If so, run this procedure to change the admin password,

 **NOTICE** Keep passwords in a place where they are secure and available to you.

### Procedure

1. Create an SSH connection to the vRPA management IP address, using your RecoverPoint for VMs admin username and password to log into the Boxmgmt CLI. Then select **System management CLI** to open the Sysmgmt CLI.

Alternatively, if you have created a user with the sysmgmt role (RecoverPoint for VMs 5.2.0.2 or later), use that user to log in directly to the Sysmgmt CLI.

2. In the Sysmgmt CLI, run the `set_password` command to change the password for the current user, or run the `set_user` command to change the password of another user, provided that your user/role includes the security permission.

## Collect logs

During deployment, collecting logs for the current cluster and its vRPAs provides information that may be helpful in troubleshooting the installation.

### Procedure

1. In a web browser, type `https://<LAN-ip-address>` where `<LAN-ip-address>` is the LAN IP address of the first vRPA in the cluster. In the vRPA home page, click **RecoverPoint for VMs Deployer**.
2. If prompted, type the login credentials for the admin user and click **Sign in**.

3. At the upper right of the home page, click the Settings icon, and then click **Collect Logs**.
4. In the **Collect Cluster Logs** dialog box, type start and end times for log collection.
5. If required, under the Advanced section, you may add one or more vRPAs from other clusters to the log collection.
6. To begin the log collection, click **Collect Logs**.

Depending on the size of the environment, log collection may take several minutes to complete. A message in the **Collect Cluster Logs** dialog box indicates when the log collection is complete. Collected logs are stored in the vRPA file system.

7. To download a log file, click the name of the cluster in the **Location** column of the **Collect Cluster Logs** dialog box.

This action opens a browser window to the downloadable log file. To download it, click the `.tar` file.



# CHAPTER 5

## Upgrading RecoverPoint for VMs

Upgrading RecoverPoint for VMs involves downloading the upgrade package and sequentially upgrading the vRPA clusters, the splitters, and the RecoverPoint for VMs plug-in.

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## Upgrade overview

Upgrade the RecoverPoint for VMs system to a later version by downloading the desired upgrade package. Then upgrade the vRPA clusters, splitters, JAM VIBs (if VIBs exist in earlier version), and RecoverPoint for VMs plug-in.

In general, upgrading RecoverPoint for VMs consists of:

- Downloading the upgrade package
- Upgrading the vRPA clusters
- Upgrading the RecoverPoint for VMs splitters
- Upgrading the RecoverPoint for VMs JAM VIBs (only when the original installation was RecoverPoint for VMs 5.2 or later)
- Upgrading RecoverPoint for VMs plug-in

For upgrades to RecoverPoint for VMs 5.2, the source version must always be RecoverPoint for VMs 5.1.1.4 (or later 5.1.1.x release), so you may have to first upgrade to 5.1.1.4 before you will be able to upgrade to 5.2. Furthermore, before upgrading to 5.2, communication between vRPAs and splitters in RecoverPoint 5.1.1.4 (or later 5.1.1.x release) will need to be in IP mode (and not iSCSI); hence, you may need to run a procedure to migrate your system from iSCSI to IP mode.

For RecoverPoint for VMs 5.2, vCenters and ESXi hosts must be running version 6.0 Update 2 or higher. If not, upgrade the vCenters and ESXi hosts before beginning the upgrade.

When upgrading RecoverPoint for VMs, all existing RecoverPoint for VMs settings are preserved. There is no journal loss and no full sweep.

To upgrade your environment (vRPAs, splitters, and plug-in) from version 5.1.1, 5.1.1.1, 5.1.1.2, or 5.1.1.3 to 5.2:

1. Upgrade the vRPAs to 5.1.1.4.
2. If necessary, migrate vRPA-splitter communication to IP. See [Migrate to IP communication mode](#) on page 47.
3. Upgrade the vRPAs to 5.2 (or later 5.2.x version).
4. Upgrade the splitters to 5.2 (or later 5.2.x version).
5. Upgrade the plug-in to 5.2 (or later 5.2.x version).

To upgrade your environment (vRPAs, splitters, and plug-in) from version 5.1.0.x and earlier to 5.2:

1. Upgrade the vRPAs to 5.1.1.4.
2. Upgrade the splitters to 5.1.1.4.
3. Migrate vRPA-splitter communication to IP. See [Migrate to IP communication mode](#) on page 47.
4. Upgrade the vRPAs to 5.2 (or later 5.2.x version).
5. Upgrade the splitters to 5.2 (or later 5.2.x version).
6. Upgrade the plug-in to 5.2 (or later 5.2.x version).

To upgrade your environment (vRPAs, splitters, JAM VIBs, and plug-in) from version 5.2.x to a later 5.2.x:

1. Upgrade the vRPAs to the later 5.2.x version.
2. Upgrade the splitters to the later 5.2.x version.
3. Where JAM VIBs exist on the earlier 5.2.x version, upgrade the JAM VIBs to the later 5.2.x version.

4. Upgrade the plug-in to the later 5.2.x version.

After completing the upgrade, observe the following:

- Force the browser to reload updated files. From the Deployer home page, type **CTRL + F5**.
- Shadow VMs are not required. The copy VM is used in low resources mode. After upgrading to Release 5.1 and later, shadow VMs are automatically removed.

## Migrate to IP communication mode

When running RecoverPoint for VMs 5.1.1 or 5.1.1.x, you can migrate an existing RecoverPoint for VMs iSCSI environment to the IP communication mode. vRPA-splitter communication must be in IP mode before attempting to upgrade to RecoverPoint for VMs 5.2 (or later).

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>`. In the vRPA home page, click **RecoverPoint for VMs Deployer**.
2. If prompted, type the login credentials for the admin user and click **Sign in**.
3. From the RecoverPoint for VMs Deployer home page, click **Changing splitter communication mode to IP**.
4. In the **Migrate to IP communication mode** dialog box, verify that the listed prerequisites are satisfied. If the environment:
  - Does not satisfy the listed prerequisites, click **Cancel**, and perform the necessary upgrades.
  - Satisfies the listed prerequisites, click **OK**.
 Deployer tries to migrate the environment to IP communication mode.
5. If the migration is:
  - Successful, click **Close**.
  - Not successful, fix the errors that are listed, and retry the migration procedure. If still unsuccessful, collect logs and contact Customer Support.

### Results

The environment has successfully migrated to IP communication mode. RecoverPoint for VMs no longer requires iSCSI adapters on the ESXi and you may remove them.

## The Upgrade and Maintenance package

Download the RecoverPoint for VMs Upgrade and Maintenance Kit. The Upgrade and Maintenance Kit is a zip file that consists of multiple components required for the upgrade.

Download the RecoverPoint for VMs Upgrade and Maintenance Kit from <http://support.emc.com>.

## Upgrade a vRPA Cluster


The RecoverPoint for VMs Deployer supports non-disruptive upgrades for clusters with two or more vRPAs and enables upgrading an ISO image without re-protecting VMs.

### Before you begin

If you are upgrading a cluster that has only one vRPA, the upgrade is disruptive to replication, but the upgrade occurs without full sweep or journal loss. Also, during the vRPA restart, the Upgrade Progress report may not update, and Deployer may become temporarily unavailable. When the

vRPA completes its restart, the user can log back in to Deployer and observe the Upgrade Progress to completion.

When you upgrade a cluster that has two or more vRPAs and is connected to a cluster with a single vRPA, a partially disruptive upgrade occurs. When the first vRPA is upgraded, all consistency groups move to another RPA. However, for consistency groups that are replicated in the single vRPA, replication stops while the first vRPA is upgraded.

 **CAUTION** Do not attempt to upgrade multiple connected clusters at the same time. This practice is not supported. Rather, upgrade connected vRPA clusters one cluster at a time until all of the connected vRPA clusters are upgraded to the same release.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/WDM` for the vRPA cluster that you want to upgrade.
2. In the home page, click **RecoverPoint for VMs Deployer**.
3. If prompted, type the login credentials for the admin user, and click **Sign in**.
4. Click **Upgrade a vRPA cluster**.  
The wizard performs a system check.
5. In the **Upgrade Prerequisites** step, ensure that you meet the conditions that are listed on the screen. Select the checkbox: **I have fulfilled these conditions**.
6. In the **ISO** step, choose how you want to provide the ISO image for upgrading RecoverPoint for VMs.
7. In the **Change Version Requirements** step, the version requirements file is automatically downloaded and validated to ensure that the system meets the requirements. If the version requirements file fails to download, select one of these options:
  - **Retry downloading the up-to-date requirements from Online Support**
  - **Provide version requirements file manually**
  - **Do not check version requirements**

Issues that are found are displayed for you to analyze. It is recommended that you fix blocking issues before continuing.
8. In the **System Diagnostics** step, Deployer checks for tweak modifications and signed scripts on the vRPAs. If discovered, these modifications are collected and the user is prompted to send the modifications file to Customer Support for analysis.
9. In the **Upgrade Progress** step, the progress bar displays the replacement progress. On reaching 100%, click **Finish** to return to the Deployer home page.
10. If upgrading fails, review the displayed error message to identify the cause of the failure. To correct the issue and retry the upgrade, click **Back**.

If upgrading a vRPA continues to fail, contact Customer Support.

## Upgrade splitters and JAMs for entire ESX cluster

For a system that is running RecoverPoint for VMs 5.2.2 or later, use this procedure to upgrade splitters and JAM VIBs on all of the ESXi hosts in an ESX cluster.

### Before you begin

To maintain uninterrupted replication throughout the upgrade of all splitters and JAMs, ensure that at least two ESXi hosts in the ESX cluster have an installed splitter.



The ESX cluster must contain at least two ESXi hosts that are not already in maintenance mode prior to running the upgrade procedure.

Ensure that DRS is enabled in automatic mode.

### Procedure

1. Use an SSH client to log in to the vRPA as the admin user.
2. From the Main menu, select **Setup > Advanced options > Splitter actions > Upgrade Splitter**.
3. Enter the requested information: vCenter Server IP address and TCP port number (if other than the default, 443), and the vCenter credentials.
4. Let the system provide the vCenter certificate automatically and, if it's correct, approve the certificate.
5. Select the ESX cluster on which to upgrade the RecoverPoint for VMs splitters and JAM VIBs.

The splitter and JAM VIB version currently installed on each of the ESXi hosts is listed, along with the splitter and JAM VIB version to be installed by the upgrade (that is, the VIBs for the currently installed RecoverPoint for VMs version).

6. Type **y** to begin the upgrade.

Each ESXi host enters maintenance mode, in turn, as its splitter and JAM VIBs are upgraded. The table of splitter and JAM VIB versions is updated as the upgrade progresses.

## Upgrade splitter for single ESXi host

Use this procedure to upgrade the RecoverPoint for VMs splitter on a single ESXi host.

### Before you begin

You may need to enable ESXi Shell and SSH access before proceeding. Refer to VMware documentation for more information.


### About this task

To keep vRPAs working during the splitter upgrade, ensure that at least two ESXi hosts have an installed splitter.

### Procedure

1. On the ESXi host, vMotion all VMs to another ESXi host.
2. At the ESXCLI, enter maintenance mode. From the ESXi host console, use SSH to run the following command:

```
esxcli system maintenanceMode set -e=true
```

 **Note:** For VSAN environments, this command requires an additional switch (refer to the vSphere documentation for the vSphere version that you are using).


3. Remove the old RecoverPoint vSphere Installation Bundle on the ESXi host.

```
esxcli software vib remove -n "RP-Splitter"
```

4. Install the splitter by using this method:

- a. To copy the RecoverPoint VIB to the `tmp` directory, use an SSH client with secure copy protocol:

```
scp <vib name> <username>@<ESXi host IP>:/scratch
```

 **NOTICE** Do not erase the `/scratch` space during the upgrade.

Example:

```
scp kdriver_RPESX-00.5.0.0.0.0.h.152.000.vib root@10.10.10.10:/scratch
```

- b. To install the splitter, in the ESXi host console, run the following command:

```
esxcli software vib install -v /scratch/<vib_full_path> --no-sig-check
```

If installation is successful, the following message appears:

```
Installation Result
Message: Operation finished successfully.
Reboot Required: false
VIBs Installed: EMC_Recoverpoint_bootbank_RP-Splitter_RPS-<version
number>
VIBs Removed:
VIBs Skipped:
```

- c. Confirm installation of the splitter in the ESXi host console by using SSH to run the following command:

```
esxcli software vib list
```

The RecoverPoint for VMs splitter installation bundle name should appear at the top of the list.

5. On the ESXi host, exit maintenance mode by running the following command:


```
esxcli system maintenanceMode set -e=false
```

6. vMotion the VMs back to this ESXi host.  
7. Repeat this procedure for each ESXi host.

## Upgrade JAM for single ESXi host

Use this procedure to upgrade the RecoverPoint for VMs JAM VIB for a single ESXi host.

### Before you begin

 **Note:** For new installations of RecoverPoint for VMs 5.2 and later, the RecoverPoint for VMs Journal Access Module (JAM) VIB is installed automatically on all ESXi hosts that belong to ESXi clusters on which vRPAs are running. For an upgrade from 5.2.x to a later 5.2.x version, you must manually upgrade the JAM VIB on the ESXi hosts.


You may need to enable ESXi Shell and SSH access before proceeding. Refer to VMware documentation for more information.

Ensure that the JAM VIB for the earlier 5.2.x version exists on the ESXi host on which you are updating the JAM VIB.

### Procedure

1. On the ESXi host, vMotion all VMs to another ESXi host.
2. At the ESXCLI, enter maintenance mode. From the ESXi host console, use SSH to run the command:

```
esxcli system maintenanceMode set -e=true
```

 **Note:** For VSAN environments, this command requires an additional switch. Refer to the vSphere documentation for the vSphere version that you are using.


3. To remove the old JAM installation, run the command:

```
esxcli software vib remove -n emcjrnf
```

4. Install the new JAM VIB.

- a. Use an SSH client with secure copy protocol to copy the RecoverPoint JAM VIB:

```
scp <vib name> <username>@<ESXi host IP>:/scratch
```

 **Note:** Do not erase the /scratch space during the upgrade.

```
scp EMC_bootbank_emcjiraf_5.2.0.0.a.281-6.0.0.3657938.vib
root@10.10.10.10:/scratch
```

- b. To install the JAM VIB in the ESXi host console, run the command:

```
esxcli software vib install -v /scratch/<vib_full_path> --no-sig-check
```

If installation is successful, the following message appears:

```
Installation Result
  Message: Operation finished successfully.
  Reboot Required: false
  VIBs Installed: EMC_Recoverpoint_bootbank_emcjiraf_RPS-<version
number>
  VIBs Removed:
  VIBs Skipped:
```

- c. Confirm installation of the JAM VIB in the ESXi host console by using SSH to run the command:

```
esxcli software vib list
```

The RecoverPoint for VMs JAM installation name should appear at the top of the list.

5. On the ESXi host, exit maintenance mode by running the command:

```
esxcli system maintenanceMode set -e=false
```

6. vMotion the VMs back to this ESXi host.

7. Repeat this procedure for every ESXi host on which you want to upgrade the RecoverPoint for VMs JAM VIB

## Upgrade the RecoverPoint for VMs plug-in

Use the vSphere Web Client to upgrade the RecoverPoint for VMs plug-in.

### Before you begin

The vRPA is backward-compatible, but the RecoverPoint for VMs plug-in is not. New vRPAs work with older plug-ins, but a new RecoverPoint for VMs plug-in might not be able to communicate with older vRPAs. Therefore, the RecoverPoint for VMs plug-in version must correspond with the version of the oldest vRPA cluster.

### About this task

Upgrade the RecoverPoint for VMs plug-in for each vCenter in the system.

### Procedure

1. Access the vSphere Web Client at: <https://<vCenter-ip-address>:9443/vsphere-client/>. In the vSphere Web Client home page, click the **RecoverPoint for VMs** icon.
2. Click the **Help...** link at the top right of the **RecoverPoint for VMs Management** screen, and select **Upgrade RecoverPoint for VMs**.
3. In the **Upgrade RecoverPoint for VMs** window, select the upgrade version and click **OK**.
4. Log out all active user sessions of the vSphere Web Client, and log back in. Verify that the RecoverPoint for VMs plug-in is listed under **Inventories**.

5. If the RecoverPoint for VMs plug-in is not listed under **Inventories**, restart the vCenter Web Client service to ensure that all active user sessions are disconnected.

After upgrading the plug-in, you will not be able to access vRPA clusters that are running earlier versions of RecoverPoint for VMs.

# CHAPTER 6

## Uninstalling RecoverPoint for VMs

You can uninstall a single vRPA cluster or all vRPA clusters from a vCenter. The uninstall tool scans the vCenter, datastores, and ESXi hosts. It removes vRPAs (production and copy VMs), configuration objects, and repository and journal volumes.

- [Using the RecoverPoint for VMs uninstall tool](#)..... 54
- [What the RecoverPoint for VMs uninstall tool does](#)..... 54
- [Preparing to uninstall vRPA clusters](#)..... 54
- [Run the RecoverPoint for VMs uninstall tool](#)..... 55
- [Finishing up the uninstall](#)..... 57

## Using the RecoverPoint for VMs uninstall tool

The uninstall tool removes vRPA clusters and their configuration entities from a vCenter.

The Uninstall tool has the following options:

- `uninstall` - Uninstalls a single vRPA cluster from a vCenter. Use this option to:
  - Replace a Try and Buy or Beta version with a supported production version
  - Remove a vRPA cluster (after data migration)
  - Remove unwanted elements from the vCenter environment
- `full_rp_uninstall` - Uninstalls all vRPA clusters from a vCenter. Use this option to completely remove all RecoverPoint entities and clusters from the vCenter.

## What the RecoverPoint for VMs uninstall tool does

The RecoverPoint for VMs uninstall tool removes vRPAs, shadow VMs, configuration objects, and repository and journal volumes.

Running the RecoverPoint for VMs Uninstall tool does the following:

1. Scans the vCenter, datastores, and ESXi hosts.
2. Displays a list of all detected vRPA clusters and marks them either active or suspected inactive. Active clusters are clusters that have registered vCenter tokens during the last hour.
3. After you select which vRPA clusters the tool should uninstall, the tool removes the following from the selected vRPA clusters: production and replica VMs that were running vRPAs, shadow VMs (if they exist), RecoverPoint configuration objects, and the repository and journal volumes.

In addition to all the actions performed when uninstalling one vRPA cluster, uninstalling all vRPAs removes all vRPA clusters on the selected vCenter with all related elements. It also removes from the vCenter RecoverPoint elements not belonging to a specific vRPA cluster, such as the RecoverPoint vCenter plug-in.

## Preparing to uninstall vRPA clusters

### Unprotect VMs

To stop replication for a vRPA, unprotect the associated VM.

#### Procedure

1. In the vSphere Web Client home page, click the **RecoverPoint for VMs Management icon** > **Protection** tab. Click **Virtual Machines**.
2. Select the VM you wish to stop replicating. Click the **Unprotect** icon. Repeat for each protected VM.

### Remove ESXi clusters from vRPA clusters

Use the vSphere Web Client and this procedure to remove a ESXi cluster from a vRPA cluster.

#### Procedure

1. In the vSphere Web Client home page, click the **RecoverPoint for VMs Management icon** > **Administration** tab.

2. Click **vRPA Clusters**.
3. Select the relevant vRPA cluster.
4. Click the **ESX Clusters** tab.
5. Click the garbage can icon next to each ESXi cluster to remove that ESXi cluster from the selected vRPA cluster.

## Uninstall a vRPA cluster

The Uninstall a vRPA cluster from this system wizard guides you in uninstalling a vRPA cluster. Use the uninstall tool to uninstall the last vRPA cluster.

### Before you begin

- You cannot uninstall a cluster from a single-cluster system.
- After you uninstall a vRPA cluster, you cannot reuse the cluster or its vRPAs.
- When you uninstall a vRPA cluster, the vRPAs are shut down and cannot be restored.
- If required, collect logs before you uninstall the cluster. Log collection for the cluster is not possible later.

### About this task

If you want to remove only one vRPA cluster from a system with two or more clusters, perform these steps from a vRPA cluster that is remaining in the system (and not from the cluster that you want to remove).

If you want to remove all of the vRPA clusters, perform these steps from one of the clusters. The last remaining cluster must be removed by using the uninstall tool.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/wdm` for the vRPA cluster that you want to uninstall.
2. In the home page, click **RecoverPoint for VMs Deployer**.
3. If prompted, type the login credentials for the admin user and click **Sign in**.
4. Under **More actions**, click **Uninstall a vRPA cluster from this system**.
5. Select the vRPA cluster that you want to remove. Click **OK**.

If cluster removal does not succeed, try again. If cluster removal fails, contact Customer Support.

### Results

The vRPA cluster is successfully uninstalled. Continue to the next procedure.

## Run the RecoverPoint for VMs uninstall tool

Download the uninstall tool, uncompress the .bat file, and run the tool in the command line.

### Before you begin

Obtain the IP and TCP port number of the vCenter (or vCenters) you want to scan, the vCenter username (and domain name, if one exists), and the vCenter password.

System requirements for the computer running the Uninstall tool:

- Microsoft Windows
- Java 7 or higher

- Note:** If a time difference of more than 30 minutes exists between the vRPA and the computer running the Uninstall tool, the tool may recognize the vRPA cluster as inactive when it is not. (The time difference is not influenced by different time zones.)

## Procedure

1. Navigate to the [RecoverPoint for Virtual Machines download page](#) under the Tools & Utilities section and click the **RecoverPoint for Virtual Machines Uninstaller Tool** link. The link is also referenced from the Customer Installation kit.

- NOTICE** Use only the version of the uninstall tool that is compatible with the RecoverPoint for VMs release that is installed on the vRPA cluster that you want to uninstall. For the latest support information, see the [Simple Support Matrix](#) for your version of RecoverPoint for VMs.

2. From a computer with IP connectivity to the vCenters managing the RecoverPoint VMs you want to uninstall, unzip the zip file.
3. Double click on `uninstaller.bat`.

The RecoverPoint for VMs Uninstall Tool opens in a command line.

4. Perform one of the following actions:

Option	Description
If uninstalling a single vRPA cluster from a vCenter	...type <code>uninstall</code> .
If uninstalling all vRPA clusters from a vCenter	...type <code>full_rp_uninstall</code> .

Type `--h` after a command to view an explanation of that command. Type `help` to view a short explanation of all available commands.

5. Enter the IP address of the vCenter.
6. Enter the vCenter's TCP port number or press Enter for the default port (443).
7. Enter the vCenter's username.
8. Enter the vCenter's password.

The tool tests connectivity and logs in to the vCenter.

9. Type `y` if you want to add another vCenter. Type `n` if you do not.

If you have remote vRPA clusters connected to a different vCenter, type that vCenter's IP address if you want to uninstall that cluster as well.

The tool displays a list of detected vRPA clusters.

10. Perform one of the following actions:

Option	Description
If uninstalling a single vRPA cluster from a vCenter	Type the index number of the vRPA cluster that you want to uninstall. To remove more than one cluster, type the index numbers separated by commas (for example: <code>1, 4, 9</code> ).
If uninstalling all vRPA clusters from a vCenter	Type <code>y</code> to perform the uninstallation.

## Results

The tool begins to scan and uninstall the cluster (or clusters).



If the process notifies you that it did not uninstall all objects, you may run the uninstall operation again.

RecoverPoint splitters are not removed by the uninstall tool. They can be manually removed from each ESXi host. For instructions, see [Uninstall the RecoverPoint for VMs splitters](#) on page 57.

## Finishing up the uninstall

### Uninstall the RecoverPoint for VMs splitters

Use the ESXCLI to uninstall the RecoverPoint for VMs splitters.


#### Procedure

1. Use ESXCLI to obtain a list of all installed vSphere Installation Bundles (VIBs):

```
esxcli software vib list
```


2. Ensure that a bundle named *RP-Splitter* is installed.
3. On the ESXi host, enter maintenance mode:

```
esxcli system maintenanceMode set -e=true
```

 **Note:** For VSAN environments, this command requires an additional switch (refer to the vSphere documentation for the vSphere version that you are using).

4. To uninstall the splitter, type:

```
esxcli software vib remove -n "RP-Splitter"
```

 **Note:** If you want to remove the JAM VIB also (while still in maintenance mode), run the command:

```
esxcli software vib remove -n emcjiraf
```

5. On the ESXi host, exit maintenance mode:

```
esxcli system maintenanceMode set -e=false
```


### Uninstall JAM

Use this procedure to uninstall the JAM VIB from an ESXi host.

#### Procedure


1. On the ESXi host, vMotion all VMs to another ESXi host.
2. At the ESXCLI, enter maintenance mode. From the ESXi host console, use SSH to run the command:

```
esxcli system maintenanceMode set -e=true
```

 **Note:** For VSAN environments, this command requires an additional switch. Refer to the vSphere documentation for the vSphere version that you are using.

3. To remove the old JAM installation, run the command:

```
esxcli software vib remove -n emcjiraf
```

 **Note:** If you want to remove the splitter VIB also (while still in maintenance mode), run the command:

```
esxcli software vib remove -n "RP-Splitter"
```

4. On the ESXi host, exit maintenance mode:

```
esxcli system maintenanceMode set -e=false
```

## Removing unused directories

From the vCenter, remove RecoverPoint for VMs plug-in directories which are no longer being used.

### Procedure

1. Connect to the vCenter server (using a local network mapping or Remote Desktop Connection). Delete the following folder:
  - **vCenter 5.5 and Windows vCenter:** C:\ProgramData\VMware\vsphere Web Client\vc-packages\vsphere-client-serenity\com.emc.recoverpoint.vwc-<version>
  - **vCenter 5.5 and vCSA:** /var/lib/vmware/vsphere-client/vc-packages/vsphere-client-serenity/com.emc.recoverpoint.vwc-<version>
  - **vCenter 6.0/6.5/6.7 and Windows vCenter:** C:\ProgramData\VMware\VCServer\cfg\vsphere-client\vc-packages\vsphere-client-serenity\com.emc.recoverpoint.vwc-<version>
  - **vCenter 6.0/6.5/6.7 and vCSA:** /etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/com.emc.recoverpoint.vwc-<version>
2. Restart the vSphere Web Client. For instructions, refer to [VMware KB1003895](#) (Windows), [VMware KB2109887](#) (Linux - vCenter 6.x), or [VMware KB2147152](#) (Linux - vCenter 6.5).

# CHAPTER 7

## Installing in VxRail environments

Installing RecoverPoint for VMs in VxRail environments is similar to a standard installation but includes a few specific requirements for preparing the network, configuring VMkernel ports, creating vRPAs and vRPA clusters, and adding VxRail appliances or nodes.

- [Deploying RecoverPoint for VMs in a VxRail™ environment](#)..... 60

## Deploying RecoverPoint for VMs in a VxRail™ environment

Follow specific guidelines when deploying Recoverpoint for VMs in a VxRail environment.

### About this task

When deploying RecoverPoint for VMs on VxRail appliances, follow the guidelines in this chapter along with the instructions that are listed in [Preparing the network](#) on page 22, [Deploy vRPAs](#) on page 28, and [Install vRPA clusters](#) on page 29.

## Downloading from the VxRail market place

Download the latest qualified RecoverPoint for VMs release from the VxRail manager marketplace.

## Preparing the network for VxRail

Prepare the network for the VxRail environment by choosing a network adapter topology and defining the required ports.

### About this task

VxRail supports adding a PCIe NIC to the node in E, P, S, and V Series. VxRail initialization does not impact the PCIe NIC. You can connect unused ports to the VxRail system vSphere Distributed switch. Alternatively, you can create a vSphere Standard Switch (VSS)/vSphere Distributed switch and connect the unused ports after initialization. The ports are available for uses such as RecoverPoint traffic. VxRail G-Series 2x10G models have only 2x10G ports.

In VxRail 4.0 and later, vSphere Network I/O Control (NIOC) is enabled during initialization, and vSAN traffic has the highest priority to consume the bandwidth in contention. If NIOC is enabled with the default VxRail setting, you can use the vSAN port for other traffic.

The configuration described here uses the G-Series 2x10G model uplink configuration and VxRail system vSphere Distributed switch default name ("VMware HCIA Distributed Switch") as an example. Choose a vSwitch and uplink name according to the VxRail model and uplink configuration.

Prepare the required port groups on the VMware HCIA Distributed Switch.

### Procedure

- Use the default configuration of two network adapters (WAN + LAN on one adapter and data on the other) unless required to use a different network adapter topology. For this configuration, define two port groups: RP\_WAN+LAN and RP\_DATA.
- If using a single network adapter, define one port group: RP\_ALL.
- If using four network adapters, define four port groups: RP\_WAN, RP\_LAN, RP\_DATA1, RP\_DATA2.

## Create vRPAs for VxRail

Use the OVA file and guidelines in this procedure to create vRPAs for VxRail environments.

### About this task

When creating vRPAs:

### Procedure

- In the **Select storage** screen, in the **VM Storage Policy** drop down, select **MARVIN-STORAGE-PROFILE**. The compatible VSAN datastore will be selected.

- Deploy two vRPAs and configure VM-Host affinity rules to avoid running both vRPAs on the same ESXi node (recommended).

## Create and configure VMkernel ports for VxRail

Create and configure VMkernel ports for VxRail environments.

### Procedure

1. Create one or two VMkernel ports on each ESXi node by selecting an existing distributed vSwitch “VMware HCIA Distributed Switch.”

A single VMkernel port is required when using the default of two network adapters (WAN + LAN on one network adapter and data on the other network adapter). This configuration is standard. Two VMkernel ports are required when you are using two network adapters for data.

2. To select one network adapter (uplink) as active, override the NIC teaming policy. The other network adapter should be marked as unused.

When using a single VMkernel port, assign uplink1 to the port.

When using two VMkernel ports:

- Assign uplink1 to one VMkernel port and uplink2 to the second VMkernel port.
- For uplink2, use traffic shaping to limit bandwidth to no more than 1Gb/s (if NIOC is enabled with the default VxRail setting, traffic shaping is optional):
  - a. Locate the port group, right-click it, and select **Edit Settings**.
  - b. In the **Edit Settings** window, change traffic shaping for the port group:

Traffic shaping	Field	Value
Ingress	Peak bandwidth (kb/s)	1048576
	Burst size (KB)	102400
Egress	Status	Enabled
	Average bandwidth (kb/s)	1048576
	Peak bandwidth (kb/s)	1048576
	Burst size (KB)	102400

## Create a vRPA cluster for VxRail

Use the Install a vRPA cluster wizard to create a vRPA cluster for the VxRail environment.

### About this task

When creating a vRPA cluster:

### Procedure

- In the **Environment Settings** step, select the vSAN datastore from the table of available datastores.
- In the **Network Settings** step of the wizard, specify the vRPA data network addresses (and not the VMkernel port IP addresses that were created earlier).

## Adding VxRail appliances or nodes

Adding a VxRail appliance or node requires verifying the node addition, configuring ESXi nodes, registering the new ESXi clusters, and adjusting VM-host affinity rules.

### About this task

After adding a VxRail appliance or a node to an existing appliance:

### Procedure

1. Verify that the nodes are added into the same vSAN cluster and under the same vCenter.
2. Configure each ESXi node with the required data network adapters for enabling splitter-to-vRPA communication.
3. If you created a new ESXi cluster, register it within the vRPA cluster.  
This action installs the RecoverPoint for VMs splitters on the new ESXi nodes.
4. Adjust VM-host affinity rules for the vRPAs to ensure that they are running on separate ESXi servers.

# CHAPTER 8

## Troubleshooting RecoverPoint for VMs installation

When the RecoverPoint for VMs installation is not successful, knowing how to troubleshoot the vRPAs, splitters, RecoverPoint for VMs plug-in, and replication helps you to fix the problem.

Some commands that may be useful in troubleshooting can be run from the root user, including: `ethtool`, `kps.pl`, `ping6`, `uptime`, `date`, `ssh`, `telnet`, `arping32`, `switch utils` (Dell EMC Customer Support only), `netstat`, `arp`, `ping`, `top`, and `su`.

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# Troubleshooting vRPAs

This section describes how to troubleshoot these vRPA conditions:

- vRPA is down
- vRPA is detached from cluster
- vRPA does not see storage or splitter

## vRPA is down

If a vRPA is down (powered off), check for vRPA errors, vRPA cluster status, and conflicts in the vRPA resource reservation. To investigate the root cause, collect and analyze logs. From the vSphere Web Client, power on the vRPA.

### Procedure

1. Check the RecoverPoint for VMs dashboard for Error events indicating that the vRPA is not online.
2. Log in to a surviving vRPA and type the RecoverPoint admin username and password to log in to the Boxmgmt CLI. Then select **System management CLI** to open the Sysmgmt CLI. Alternatively, if you have created a user with the sysmgmt role (RecoverPoint for VMs 5.2.0.2 or later), use that user to log in directly to the Sysmgmt CLI. To check the cluster status, use the `get_system_status` Sysmgmt CLI command. Choose to retrieve the status of all categories.
3. Confirm that the failed vRPA cannot be reached.
4. Check any conflicts in the vRPA resource reservation that might have led to the vRPA being powered off. Resolve any issues before proceeding.
5. In the vSphere Web Client, right-click the vRPA that is down and select **All vCenter Actions > Power > Power On**.
6. To ensure that the vRPA was powered on successfully, monitor the vRPA console in the vSphere Web Client.
7. To investigate the root cause of the vRPA failure, collect logs.

## vRPA is detached from the vRPA cluster

If the vRPA is detached from the vRPA cluster, check for vRPA errors and cluster status.

### Procedure

1. Check the RecoverPoint for VMs dashboard for Error events indicating that the vRPA cannot access storage or communicate with the splitters.
2. Create an SSH connection to a surviving vRPA, using your RecoverPoint for VMs admin username and password to log into the Boxmgmt CLI. Then select **System management CLI** to open the Sysmgmt CLI. Alternatively, if you have created a user with the sysmgmt role (RecoverPoint for VMs 5.2.0.2 or later), use that user to log in directly to the Sysmgmt CLI. Use the `get_system_status` Sysmgmt CLI command to check the cluster status. Choose to retrieve the status of all categories.
3. Confirm that the detached vRPA cannot be reached from the surviving vRPA.
4. Log in to the Boxmgmt CLI of the detached vRPA using admin username and password, and select **Cluster operations > Attach RPA to Cluster**. To ensure that the vRPA was powered on successfully, monitor the vRPA console in the vSphere Web Client.



5. To investigate the root cause of the vRPA detachment from the cluster, collect logs.
6. If you are using a licensed version of RecoverPoint for VMs, contact Customer Support.

## vRPA cannot detect storage or splitter

When a vRPA cannot detect the storage or the splitters, investigate the status of the vRPA and splitters. Collect and analyze the logs.

### Procedure

1. Ensure the vRPA is online.
2. Ensure the vRPA is attached to the cluster.
3. Verify that the splitters are running:
  - a. Login to ESXi hosts.
  - b. Run: `ps |grep kdriver`
  - c. Ensure that splitter processes are running.
4. To investigate the root cause of why the vRPA went down, collect logs.
5. If you are using a licensed version of RecoverPoint for VMs, contact Customer Support.

## Troubleshooting splitters

The section describes how to troubleshoot the splitter when it is not visible or is in error state.

### Splitter is not visible or in error state

To determine why the splitter is not visible or in error, check splitter processes and investigate logs.

### Procedure

1. If possible, vMotion any protected VMs from ESXi hosts with splitters in error state continue or resume replication.
2. Ensure that the splitter processes are running on the host you are troubleshooting:
  - a. Login to the ESXi host and use the following command: `ps |grep kdriver`
  - b. If processes are not running, place the ESXi node in maintenance mode and restart.
3. To investigate the root cause of the splitter failure, collect logs.
4. If you are using a licensed version of RecoverPoint for VMs, contact Customer Support.

## Troubleshooting the RecoverPoint for VMs plug-in

This section describes how to troubleshoot these conditions:

- vSphere Web client does not contain plug-in
- Plug-in does not see the vRPA cluster

### vSphere Web client does not contain plug-in

#### About this task

Go through the following steps until the problem is resolved:

### Procedure

1. Log out of vSphere Web client and log back in. Check if the RecoverPoint for VMs plug-in is listed under **Inventories**.
2. If the RecoverPoint for VMs plug-in is not listed, close all active vSphere Web client user sessions. Then check if the RecoverPoint for VMs plug-in is listed under **Inventories**.
3. If the RecoverPoint for VMs plug-in is still not listed, restart the vCenter Web Client service.
4. If the plug-in is still not visible in the vSphere Web Client, validate the vCenter Credentials configuration. You may need to reconfigure vCenter credentials. Consult Customer Support if protected VMs exist.
5. If the plug-in is still not visible in the vSphere Web Client, collect logs to investigate the root cause of why the plug-in is not visible.

## Plug-in does not detect the vRPA cluster

### About this task

Go through the following steps until the problem is resolved:

### Procedure

1. Log out of the vSphere Web Client and log back in.
2. Refresh the vSphere Web Client.
3. Log out all users from the vSphere Web Client.
4. Restart the vSphere Web Client.
5. Log in to the Managed Object Browser at <https://<vSphere Web Client>/mob>. Ensure the vCenter credentials are configured correctly.  
  
Access to the Managed Object Browser is disabled by default in vSphere 6.0 and later. For instructions on how to enable access, refer to [VMware KB2108405](#).
6. Restart vRPA1.
7. Restart vRPA2.
8. To investigate the root cause of the vRPA failure, collect logs.
9. If you are using a licensed version of RecoverPoint for VMs, contact Customer Support.

## Troubleshooting RecoverPoint for VMs replication

This section describes how to troubleshoot these conditions:

- Consistency group is in high-load transfer state or initialization is not completing
- Consistency group is in error state

## CG in high-load transfer state or initialization not completing

### Procedure

1. If consistency groups are not balanced across vRPAs, create an SSH connection to the vRPA management IP address, and type the RecoverPoint admin username and password to log in to the Boxmgmt CLI. Then select **System management CLI** to open the Sysmgmt CLI. Alternatively, if you have created a user with the sysmgmt role (RecoverPoint for VMs 5.2.0.2 or later), use that user to log in directly to the Sysmgmt CLI. Run the `balance_load Sysmgmt CLI` command and change consistency group assignments. For more information about load balancing, see the *RecoverPoint for Virtual Machines Administrator's Guide*.

2. If the throughput required by a consistency group exceeds the availability on a single vRPA, review the vRPA profile to see if additional resources can be added to meet higher IOPS requirements.
3. Enabling deduplication when WAN compression is also enabled may overload the vRPA and consequently degrade replication performance. For more information, see the *RecoverPoint for Virtual Machines Scale and Performance Guide*.
  - a. It is recommended to enable WAN and journal compression and disable deduplication.
  - b. If the consistency group contains more than one VM, consider moving VMs to dedicated consistency groups and using group sets as needed.
  - c. Consider adding vRPAs (up to 8) to the vRPA cluster for additional resources.
  - d. Review ESXi resources to ensure that there is no contention.
4. If needed, create an SSH connection to the vRPA management IP address, and type the RecoverPoint admin username and password to log in to the Boxmgmt CLI. Then select **System management CLI** to open the Sysmgmt CLI. Alternatively, if you have created a user with the sysmgmt role (RecoverPoint for VMs 5.2.0.2 or later), use that user to log in directly to the Sysmgmt CLI. Run the `config_io_throttling` command to slow down production storage reads during full sweep process.

## Consistency group is in Error state

### Procedure

1. Perform all of the procedures suggested for a consistency group in high-load state.
2. If the consistency group is still in Error state, try the following:
  - a. Check if the image access buffer is full. If so, disable image access.
  - b. Resolve any WAN issues.
  - c. Check if the consistency group is in a permanent high-load state.
3. To investigate why the consistency group is in error state, collect logs.
4. If you are using a licensed version of RecoverPoint for VMs, contact Customer Support.

## ESXi UUID duplication

In the VMware environment, each ESXi host is assigned a Universally Unique ID (UUID). RecoverPoint for VMs uses these UUIDs to maintain the integrity of replicated copies and protect the ESXi hosts from data corruption.

However, in some cases, a UUID might change with results that include:

- More than one ESXi host within a cluster reporting the same UUID.
- A single ESXi host reporting a different UUID after host restart (or similar operations).
- A single ESXi host reporting a degenerated UUID with all 0's or F's.

These cases can occur when using hardware that is not certified by VMware because the UUID is based on the BIOS UUID reported by the underlying server hardware. For more information about duplicate UUIDs, see [VMware Knowledgebase Article 2006865](#).

Duplicate or degenerated UUIDs can cause the following:

- The RecoverPoint cluster can experience reboot regulation (vRPAs restarting over and over again until they detach from the cluster).
- The RecoverPoint consistency groups may not be able to recognize, connect to, or communicate with the splitter on the affected ESXi hosts.

RecoverPoint for VMs replaces the use of VMware's ESXi host UUID and creates its own unique identifier, which ensures that no duplicate or degenerated UUIDs exist in the system. The substitution occurs only if the:

- vRPA cluster version supports this feature
- Splitter version supports this feature

For versions that do not support this feature, RecoverPoint for VMs displays a warning about the condition.

## Getting help

Support, product, and licensing information can be obtained as follows:

- Product information — For documentation, release notes, software updates, or information about products, access Online Support at: <https://support.emc.com>
- Technical support — Access to Online Support and click Service Center. You will see several options for contacting Technical Support. Note that to open a service request, you must have a valid support agreement. Contact your sales representative for details about obtaining a valid support agreement or with questions about your account.

# APPENDIX A

## RecoverPoint for VMs installation form

To streamline the installation tasks, create the RecoverPoint for VMs installation form during the planning phase. The installation form is a data sheet or spreadsheet that lists the site-specific values that you require to successfully complete the installation.

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## Installation data forms

The best practice for successful installations is to collect and document required data before the installation.

The forms that are provided in this section are examples of the types of information you should collect before installation. You can create a planning spreadsheet that matches specific requirements (number of vRPA clusters, network topology, and so forth).

You are directed to type the data from these forms (or similar data sheet) during the installation process.

**Table 3** Example: vRPA cluster/site form

vRPA cluster	vRPA cluster 1	vRPA cluster 2	vRPA cluster 3	vRPA cluster 4	vRPA cluster 5
Cluster/site name					
Time zone					
Local domain					
Primary DNS server (optional)					
Secondary DNS server (optional)					
NTP server (recommended)					
Cluster management IP					
Management default gateway IP					
Management subnet mask IP					
WAN default gateway					
WAN subnet mask					
SMTP (optional)					
vCenter IP					
vCenter credentials					
vCenter credentials					
VMkernel IP pool					
ESXi 1					
_Data1 IP					

**Table 3** Example: vRPA cluster/site form (continued)

vRPA cluster	vRPA cluster 1	vRPA cluster 2	vRPA cluster 3	vRPA cluster 4	vRPA cluster 5
_Data2 IP					
_Management IP					
ESXi 2					
_Data1 IP					
_Data2 IP					
_Management IP					

**Table 4** Example: vRPA IP form

vRPA	vRPA IPs	Site: _____	Site: _____	Site: _____	Site: _____	Site: _____
vRPA_1	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					
vRPA_2	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					
vRPA_3	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					
vRPA_4	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					
vRPA_5	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					
vRPA_6	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					

**Table 4** Example: vRPA IP form (continued)

vRPA	vRPA IPs	Site: -----	Site: -----	Site: -----	Site: -----	Site: -----
vRPA_7	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					
vRPA_8	LAN IP					
	WAN IP					
	Data1 IP					
	Data2 IP					

**Table 5** Example: Site map

Site	Site1 (Prod)	Site2 (Remote)	Site2 (Remote)	Site3 (Remote)	Site3 (Remote)
Cluster	Cluster1	Cluster2	Cluster3	Cluster4	Cluster5
vCenter	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>
ESXi 1	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>
ESXi 2	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>	<name> <ip_address>
vRPA 1	<ip_address>	<ip_address>	<ip_address>	<ip_address>	<ip_address>
vRPA 2	<ip_address>	<ip_address>	<ip_address>	<ip_address>	<ip_address>
Cluster Mgmt	<ip_address>	<ip_address>	<ip_address>	<ip_address>	<ip_address>
NIC1 IP (WAN)	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2
Data 1	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2
Data 2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2	<ip_address> RPA1 <ip_address> RPA2



# APPENDIX B

## Support procedures for uninstalling vRPA clusters

When the automated uninstall tool is unavailable, you can manually uninstall a vRPA cluster by using support procedures to guide you.

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# Uninstalling a single vRPA cluster from a vCenter manually

Perform this procedure to uninstall one vRPA cluster from a vCenter.

## Before you begin

Obtain the internal cluster name of the vRPA you are uninstalling by connecting to the vRPA Boxmgmt CLI as the admin user, and selecting **Main Menu > Setup > View Settings**.

## About this task


You must perform this procedure for each vRPA cluster you want to uninstall.

If removing the last vRPA cluster on the vCenter, use the procedure [Uninstalling all vRPA clusters from a vCenter manually](#) on page 75 instead of this one.

## Procedure

1. If the vRPA cluster is active:
  - a. Unprotect the virtual machines. For more information, see [Unprotect VMs](#) on page 76.
  - b. Remove all ESX clusters from the vRPA cluster. For more information, see [Remove ESXi clusters from vRPA clusters](#) on page 76. Repeat this step for all ESX clusters in the vRPA cluster.
2. If you are removing just one vRPA cluster from a system with at least two clusters, perform the following procedure: [Uninstall a vRPA cluster](#) on page 55.

If the procedure [Uninstall a vRPA cluster](#) on page 55 was successful, skip to step 6 on page 74. If the procedure [Uninstall a vRPA cluster](#) on page 55 failed, continue with the next step.
3. Detach the vRPAs from the cluster. For more information, see [Detaching vRPAs](#) on page 76.
4. Power off the vRPAs. For more information, see [Powering off vRPAs](#) on page 77.
5. Remove the custom tokens that correspond to the RecoverPoint for VMs cluster ID. For more information, see [Removing custom tokens from the Managed Object Browser](#) on page 77.
6. Delete from all datastores the repository folder of the cluster you are uninstalling. For more information, see [Deleting the repository folder](#) on page 77.
7. Verify that the configuration parameters are empty. For more information, see [Verifying that the configuration parameters are empty](#) on page 77.

 **Note:** Perform this step only if you encountered problems when unprotecting the VMs. Performing this step requires downtime of the production VM.
8. Ensure that the vRPA virtual machines are powered off, and delete them.
9. If the ESX cluster you are removing is not registered to any other vRPA cluster, you can uninstall the RecoverPoint for VMs splitter on that ESXi host. For more information, see [Uninstall the RecoverPoint for VMs splitters](#) on page 57.

# Uninstalling all vRPA clusters from a vCenter manually

Perform this procedure to uninstall all vRPA clusters from a vCenter.


## Before you begin

Obtain the internal cluster name of the vRPA you are uninstalling by connecting to the vRPA Boxmgmt CLI as the admin user, and selecting **Main Menu > Setup > View Settings**.

## About this task

You must perform this procedure for each vRPA cluster you want to uninstall.

## Procedure

1. If the vRPA cluster is active:
    - a. Unprotect the virtual machines. For more information, see [Unprotect VMs](#) on page 76.
    - b. Remove all ESX clusters from the vRPA clusters. For more information, see [Remove ESXi clusters from vRPA clusters](#) on page 76. Repeat this step for all ESX clusters in all vRPA clusters.
  2. If you are removing just one vRPA cluster from a system with at least two clusters, perform the following procedure: [Uninstall a vRPA cluster](#) on page 55.  
 If the procedure [Uninstall a vRPA cluster](#) on page 55 was successful, skip to step 6 on page 75. If the procedure [Uninstall a vRPA cluster](#) on page 55 failed, continue with the next step.
  3. Detach the vRPAs from the cluster. For more information, see [Detaching vRPAs](#) on page 76.
  4. Power off the vRPAs. For more information, see [Powering off vRPAs](#) on page 77.
  5. Remove the custom tokens that correspond to the RecoverPoint for VMs Internal cluster name. For more information, see [Removing custom tokens from the Managed Object Browser](#) on page 77.
  6. Delete from all datastores the repository folders of all clusters. For more information, see [Deleting the repository folder](#) on page 77.
  7. Verify that the configuration parameters are empty. For more information, see [Verifying that the configuration parameters are empty](#) on page 77.
-  **Note:** Perform this step only if you encountered problems when unprotecting the VMs. Performing this step requires downtime of the production VM.
8. Ensure that the vRPA virtual machines are powered off, and delete them.
  9. Unregister the plug-in from the Managed Object Browser. For more information, see [Unregistering the plug-in from the Managed Object Browser](#) on page 79.
  10. Uninstall the RecoverPoint for VMs splitter. For more information, see [Uninstall the RecoverPoint for VMs splitters](#) on page 57.
  11. Unregister the RecoverPoint extension from the Managed Object Browser. For more information, see [Unregistering the RP extension from the Managed Object Browser](#) on page 78.
  12. Remove the RecoverPoint datastore element. Delete the `RecoverPoint.flp` file located in the RecoverPoint folder.

## Unprotect VMs

To stop replication for a vRPA, unprotect the associated VM.

### Procedure

1. In the vSphere Web Client home page, click the **RecoverPoint for VMs Management icon > Protection** tab. Click **Virtual Machines**.
2. Select the VM you wish to stop replicating. Click the **Unprotect** icon. Repeat for each protected VM.

## Remove ESXi clusters from vRPA clusters

Use the vSphere Web Client and this procedure to remove a ESXi cluster from a vRPA cluster.

### Procedure

1. In the vSphere Web Client home page, click the **RecoverPoint for VMs Management icon > Administration** tab.
2. Click **vRPA Clusters**.
3. Select the relevant vRPA cluster.
4. Click the **ESX Clusters** tab.
5. Click the garbage can icon next to each ESXi cluster to remove that ESXi cluster from the selected vRPA cluster.

## Remove a vRPA from a vRPA cluster

Use this procedure to remove a vRPA from a vRPA cluster. You cannot remove a vRPA if the cluster has 2 or fewer vRPAs.

### Procedure

1. In a web browser, type `https://<cluster_management-ip-address>/wdm` for the vRPA cluster from which you want to remove a vRPA.
2. In the home page, click **RecoverPoint for VMs Deployer**.
3. If prompted, enter the login credentials for the admin user and click **Sign in**.
4. Under **More actions**, click **Remove vRPA from vRPA cluster**.
  - The highest numbered vRPA (the last one added) will be removed.
  - The consistency groups of the removed vRPA will be non-disruptively moved to a different vRPA.
  - The preferred vRPA setting for those consistency groups will be automatically updated.

## Detaching vRPAs

### Procedure

1. Use an SSH client to connect to a vRPA and enter login credentials for the admin user.
2. From the **Main Menu**, select **Cluster Operations > Detach from Cluster**.

Replication is paused.

3. Repeat this procedure on all vRPAs in all vRPA clusters in the system.

## Powering off vRPAs

### Procedure

1. At the vSphere Web Client, in **Inventory**, select **VMs and Templates**.
2. Select each vRPA, right-click and select **All vCenter Actions > Power > Power Off**.

## Deleting the repository folder

### Procedure

1. At the vSphere Web Client, select **Home > Storage > Manage**.
2. Select the datastore where the repository folder was created.
3. In the list of files displayed in the **Files** subtab, locate and open the `RPvStorage` folder.
4. Within the `RPvStorage` folder, delete all folders and/or files that include the Internal cluster name.

## Verifying that the configuration parameters are empty

### About this task

 **Note:** Performing this task requires downtime of the production VM.

### Procedure

1. At the vSphere Web Client, in **Inventory**, select **Hosts and Clusters**. Select a VM that was protected by RecoverPoint for VMs. Power off the VM. Right-click and select **Edit Settings...**
2. In the **Edit Settings** dialog box, select the **VM Options** tab. Expand the **Advanced** column. In the **Configuration Parameters** row, click **Edit Configuration...** to edit the advanced configuration parameters.
3. In the **Configuration Parameters** window, ensure that all configuration parameters with "RecoverPoint" or "esx\_splitter" in the name have empty values.

The following parameters must not exist or have empty values:

- RecoverPoint RPA number
- RecoverPoint CGUID
- RecoverPoint Cluster ID
- esx\_splitter.globalOptions
- esx\_splitter.scsi0:1.options

## Removing custom tokens from the Managed Object Browser

### About this task

The custom tokens that correspond to the RecoverPoint for VMs cluster ID need to be removed from the cluster(s) being reinstalled for all previously used vCenters.

**Note:** Access to the Managed Object Browser is disabled by default in vSphere 6.0. For instructions on how to enable access, refer to [VMware KB2108405](#).

#### Procedure

1. In a web browser, enter the fully-qualified domain name (or IP address) of the vCenter Server system:  
`https:// <hostname.yourcompany.com>/mob/?moid=CustomFieldsManager`
2. Log in using your vCenter login credentials.
3. In the **Methods** table, select **RemoveCustomFieldDef**.  
A new browser window opens with the **void RemoveCustomFieldDef** command displayed.
4. In the **Parameters** table, enter the value of a custom field listed in the **Properties** table that corresponds to the Internal cluster name, RecoverPoint\_TOKEN, for example, `config.RecoverPoint_TOKEN;3070371118132351610`.
5. Click **Invoke Method**.
6. If you are reinstalling several clusters, repeat steps 3 through 5 for each custom field listed in the **Properties** table that corresponds to the Internal cluster names.

## Unregistering the RP extension from the Managed Object Browser

#### About this task

The RecoverPoint extension should be unregistered from the Managed Object Browser at each vCenter that contains ESXi hosts that are hosting vRPA clusters.

**Note:** Access to the Managed Object Browser is disabled by default in vSphere 6.0. For instructions on how to enable access, refer to [VMware KB2108405](#).

#### Procedure


1. In a web browser, enter the fully-qualified domain name (or IP address) for the ESXi or vCenter Server system:  
`https:// <hostname.yourcompany.com>/mob/?moid=ExtensionManager`
2. Log in using your vCenter login credentials.
3. In the **Methods** table, select **UnregisterExtension**.  
A new browser window opens with **void UnregisterExtension** command displayed.
4. In the **Parameters** table, enter `com.emc.recoverpoint.vwc` in the value field and click **Invoke Method**.
5. Connect to the vCenter server (using a local network mapping or Remote Desktop Connection). Delete the following folder:
  - **vCenter 5.1/5.5 and Windows vCenter:** `C:\ProgramData\VMware\vsphere Web Client\vc-packages\vsphere-client-serenity\com.emc.recoverpoint.vwc-<version>`
  - **vCenter 5.1/5.5 and vCSA:** `/var/lib/vmware/vsphere-client/vc-packages/vsphere-client-serenity/com.emc.recoverpoint.vwc-<version>`
  - **vCenter 6.0/6.5/6/7 and Windows vCenter:** `C:\ProgramData\VMware\VCServer\cfg\vsphere-client\vc-packages\vsphere-client-serenity\com.emc.recoverpoint.vwc-<version>`

- **vCenter 6.0/6.5/6.7 and vCSA:** `/etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/com.emc.recoverpoint.vwc-<version>`
6. Restart the vSphere Web Client. For instructions, refer to [VMware KB1003895](#) (Windows), [VMware KB2109887](#) (Linux - vCenter 6.x), or [VMware KB2147152](#) (Linux - vCenter 6.5).

## Unregistering the plug-in from the Managed Object Browser

### About this task

Unregister the RecoverPoint for VMs plug-in from the Managed Object Browser at each vCenter that contains ESXi hosts hosting vRPA clusters. Unregister the plug-in while the vRPAs are detached.

 **Note:** Access to the Managed Object Browser is disabled by default in vSphere 6.0. For instructions on how to enable access, refer to [VMware KB2108405](#).

### Procedure

1. In a web browser, enter the fully-qualified domain name (or IP address) of the ESXi or vCenter Server system:

```
https://<hostname.yourcompany.com>/mob/?moid=ExtensionManager
```

2. Log in using your vCenter login credentials.
3. In the **Methods** table, select **UnregisterExtension**.

A new browser window opens with **void UnregisterExtension** command displayed.

4. In the **Parameters** table, enter `com.emc.recoverpoint.vwc` for the value and click **Invoke Method**.

## Removing unused directories

From the vCenter, remove RecoverPoint for VMs plug-in directories which are no longer being used.

### Procedure

1. Connect to the vCenter server (using a local network mapping or Remote Desktop Connection). Delete the following folder:
  - **vCenter 5.5 and Windows vCenter:** `C:\ProgramData\VMware\VMware Web Client\vc-packages\vsphere-client-serenity\com.emc.recoverpoint.vwc-<version>`
  - **vCenter 5.5 and vCSA:** `/var/lib/vmware/vsphere-client/vc-packages/vsphere-client-serenity/com.emc.recoverpoint.vwc-<version>`
  - **vCenter 6.0/6.5/6.7 and Windows vCenter:** `C:\ProgramData\VMware\VMware Web Client\vc-packages\vsphere-client-serenity\com.emc.recoverpoint.vwc-<version>`
  - **vCenter 6.0/6.5/6.7 and vCSA:** `/etc/vmware/vsphere-client/vc-packages/vsphere-client-serenity/com.emc.recoverpoint.vwc-<version>`
2. Restart the vSphere Web Client. For instructions, refer to [VMware KB1003895](#) (Windows), [VMware KB2109887](#) (Linux - vCenter 6.x), or [VMware KB2147152](#) (Linux - vCenter 6.5).

## Uninstall the RecoverPoint for VMs splitters

Use the ESXCLI to uninstall the RecoverPoint for VMs splitters.

### Procedure

1. Use ESXCLI to obtain a list of all installed vSphere Installation Bundles (VIBs):

```
esxcli software vib list
```

2. Ensure that a bundle named *RP-Splitter* is installed.
3. On the ESXi host, enter maintenance mode:

```
esxcli system maintenanceMode set -e=true
```

**Note:** For VSAN environments, this command requires an additional switch (refer to the vSphere documentation for the vSphere version that you are using).

4. To uninstall the splitter, type:

```
esxcli software vib remove -n "RP-Splitter"
```

**Note:** If you want to remove the JAM VIB also (while still in maintenance mode), run the command:

```
esxcli software vib remove -n emcjiraf
```

5. On the ESXi host, exit maintenance mode:

```
esxcli system maintenanceMode set -e=false
```

## Uninstall JAM

Use this procedure to uninstall the JAM VIB from an ESXi host.

### Procedure

1. On the ESXi host, vMotion all VMs to another ESXi host.
2. At the ESXCLI, enter maintenance mode. From the ESXi host console, use SSH to run the command:

```
esxcli system maintenanceMode set -e=true
```

**Note:** For VSAN environments, this command requires an additional switch. Refer to the vSphere documentation for the vSphere version that you are using.

3. To remove the old JAM installation, run the command:

```
esxcli software vib remove -n emcjiraf
```

**Note:** If you want to remove the splitter VIB also (while still in maintenance mode), run the command:

```
esxcli software vib remove -n "RP-Splitter"
```

4. On the ESXi host, exit maintenance mode:

```
esxcli system maintenanceMode set -e=false
```



# APPENDIX C

## vSphere upgrades

You may be required to upgrade a vCenter or an ESXi host that is used in the RecoverPoint for VMs system. Information about these tasks helps you to successfully perform these upgrades.

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- [Upgrading ESXi](#) ..... 82

# Upgrading vCenter


## About this task

The vCenter upgrade is transparent to RecoverPoint for VMs provided that the upgrade process does not cause a change in the vCenter UUID.

Use this procedure when you need to upgrade the vCenter within a RecoverPoint for VMs system.

During the upgrade:


- vRPA clusters cannot be managed from this vCenter. Ensure you have access to other vCenters.
- Data replication and recovery point objective (RPO) might be affected.
- vCenters in Enhanced Linked Mode might be impacted (one vCenter at a time).
- RecoverPoint for VMs plug-in should remain intact.

 **CAUTION** To avoid changing the vCenter UUID during the upgrade process, ensure that you select the **Use existing inventory** option.

## Procedure

1. If you are upgrading to vCenter 6.0, follow these best practices: [Upgrading to vCenter Server 6.0 best practices](#).
2. If you are upgrading to vCenter 6.5, follow these best practices: [Upgrading to vCenter Server 6.5 best practices](#).
3. If you are upgrading to vCenter 6.7, follow these best practices: [Upgrading to vCenter Server 6.7 best practices](#).

## Results

 **NOTICE** If RecoverPoint for VMs is in an error state after you upgrade the vCenter, check if the vCenter UUID has changed. If it has, contact Customer Support.

# Upgrading ESXi


## About this task

Use this procedure when you need to upgrade the ESXi within a RecoverPoint for VMs system. This procedure provides pre-upgrade and post-upgrade instructions when upgrading ESXi. Reference to VMware documentation is provided.

## Procedure

1. At the ESXCLI, enter maintenance mode. From the ESXi host console, use SSH to run the following command:

```
esxcli system maintenanceMode set -e=true
```

 **Note:** For VSAN environments, this command requires an additional switch (refer to the vSphere documentation for the vSphere version that you are using).

If DRS is in automatic mode, vMotion is carried out automatically. If not, you must manually use vMotion to move all VMs to a different ESXi host in the ESX cluster.

2. Follow VMware instructions for ESXi upgrade.

Upgrading to 6.0	<a href="#">Methods for upgrading to VMware ESXi 6.0</a>
Upgrading to 6.5	<a href="#">Upgrading ESXi hosts (to ESXi 6.5)</a>
Upgrading to 6.7	<a href="#">VMware ESXi Upgrade (to ESX 6.7)</a>

3. Exit maintenance mode. From the ESXi host console, use SSH to run the following command:

```
esxcli system maintenanceMode set -e=false
```

If DRS is not in automatic mode, use vMotion to manually move VMs to the upgraded ESXi host.

4. Repeat this procedure for the remaining ESXi hosts in the ESX cluster.



# APPENDIX D

## Installing on Nutanix

When installing RecoverPoint for VMs on Nutanix, if installing a version earlier than 5.2.2, you must first manually edit the settings for Nutanix storage containers that will be used by RecoverPoint for VMs.


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## Installing RecoverPoint for VMs on Nutanix

When installing a RecoverPoint for VMs version earlier than 5.2.2 on Nutanix, you must manually modify settings for Nutanix containers that will be used by RecoverPoint for VMs before you install your RecoverPoint for VMs system.

### Before you begin

RecoverPoint for VMs is supported by Nutanix AOS 4.7.5 or 5.0.2, or later. If necessary, upgrade your Nutanix installation to one of those versions.

 **NOTICE** You do not need to modify the Nutanix settings if you are installing RecoverPoint for VMs 5.2.2 or later.

### Procedure

1. To properly modify the Nutanix container settings, follow the instructions in [Dell EMC Knowledge Base Article 495379](#) and its attachments.
2. Perform a normal Installation of your RecoverPoint for VMs system, version 5.1.1 or later.