



# **Zenoss Resource Manager Upgrade Guide**

Release 5.3.1

Zenoss, Inc.

[www.zenoss.com](http://www.zenoss.com)

# Zenoss Resource Manager Upgrade Guide

Copyright © 2017 Zenoss, Inc. All rights reserved.

Zenoss, Own IT, and the Zenoss logo are trademarks or registered trademarks of Zenoss, Inc., in the United States and other countries. All other trademarks, logos, and service marks are the property of Zenoss or other third parties. Use of these marks is prohibited without the express written consent of Zenoss, Inc., or the third-party owner.

Amazon Web Services, AWS, and EC2 are trademarks of Amazon.com, Inc. or its affiliates in the United States and/or other countries.

Flash is a registered trademark of Adobe Systems Incorporated.

Oracle, the Oracle logo, Java, and MySQL are registered trademarks of the Oracle Corporation and/or its affiliates.

Linux is a registered trademark of Linus Torvalds.

RabbitMQ is a trademark of Pivotal Software, Inc.

SNMP Informant is a trademark of Garth K. Williams (Informant Systems, Inc.).

Sybase is a registered trademark of Sybase, Inc.

Tomcat is a trademark of the Apache Software Foundation.

VMware is a registered trademark or trademark of VMware, Inc. in the United States and/or other jurisdictions.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

All other companies and products mentioned are trademarks and property of their respective owners.

Part Number: 1092.17.244

Zenoss, Inc.  
11305 Four Points Drive  
Bldg 1 - Suite 300  
Austin, Texas 78726

# Contents

<b>About this guide</b> .....	<b>5</b>
Supported operating environments.....	5
Resource Manager publications.....	6
Change history.....	7
<b>Chapter 1: Documented upgrade paths</b> .....	<b>9</b>
Release dates and versions.....	9
Upgrade paths included in this document.....	9
<b>Part I: Appliance deployments</b> .....	<b>11</b>
<b>Chapter 2: Before upgrading</b> .....	<b>12</b>
Preparing to upgrade.....	12
Rebuilding the MIB catalog.....	12
Downloading the update ISO file.....	13
Attaching the upgrade ISO.....	13
Stopping Resource Manager.....	14
<b>Chapter 3: Upgrading single-host appliance deployments</b> .....	<b>15</b>
Removing Docker containers on the master host.....	15
Updating Control Center on the master host.....	16
Updating on the master host.....	17
<b>Chapter 4: Upgrading multi-host appliance deployments</b> .....	<b>19</b>
Removing Docker containers on the master host.....	19
Updating delegate hosts.....	20
Updating the master host.....	23
<b>Chapter 5: After upgrading</b> .....	<b>28</b>
Starting Resource Manager.....	28
<b>Part II: Customized deployments</b> .....	<b>29</b>
<b>Chapter 6: Before upgrading</b> .....	<b>30</b>
Rebuilding the MIB catalog.....	30
Downloading Resource Manager image files.....	30
Importing Resource Manager image files.....	31
<b>Chapter 7: Upgrading Resource Manager</b> .....	<b>32</b>

Stopping Resource Manager.....	32
Upgrading Resource Manager.....	32
<b>Chapter 8: After upgrading a customized deployment.....</b>	<b>34</b>
Removing the pre-upgrade snapshot.....	34
<b>Part III: High-availability deployments.....</b>	<b>35</b>
Scope.....	35
<b>Chapter 9: Before upgrading a high-availability deployment.....</b>	<b>36</b>
Rebuilding the MIB catalog.....	36
Downloading Resource Manager image files.....	36
<b>Chapter 10: Upgrading Resource Manager software.....</b>	<b>39</b>
Stopping Resource Manager.....	39
Upgrading Resource Manager.....	39
<b>Chapter 11: After upgrading a high-availability deployment.....</b>	<b>41</b>
Removing the pre-upgrade snapshot.....	41
Moving MariaDB services into the master resource pool.....	41
<b>Appendix A: Using Zenoss Toolbox.....</b>	<b>43</b>
Zenoss Toolbox tools.....	43
Running Zenoss Toolbox tools.....	43
<b>Appendix B: Common upgrade error recovery procedures.....</b>	<b>45</b>
A snapshot with the given tag already exists.....	45
<b>Appendix C: Installing an application template.....</b>	<b>46</b>
Downloading the template package.....	46
Installing the application template.....	46
<b>Appendix D: ZenPack considerations.....</b>	<b>47</b>
Alternate naming convention for LUN- and VM-specific metrics.....	47

# About this guide

*Zenoss Resource Manager Upgrade Guide* provides detailed instructions for upgrading Zenoss Resource Manager (Resource Manager) from one minor or micro version to a more recent version.

---

**Note** Zenoss strongly recommends reviewing the *Zenoss Resource Manager Planning Guide* carefully before using this guide.

---

## Supported operating environments

---

The Resource Manager application is deployed in and managed by Control Center. The supported operating environments of Resource Manager are the environments that Control Center supports at a given release. The following sections identify the supported operating environments of Resource Manager.

### Resource Manager, Control Center, and operating systems

The following table identifies the supported combinations of Resource Manager, Control Center, and operating system releases.

Resource Manager release	Control Center release	Host OS
5.3.0, 5.3.1	1.3.0, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.4.0	RHEL/CentOS 7.1, 7.2, or 7.3 (64-bit)
5.2.0, 5.2.1, 5.2.2, 5.2.3, 5.2.4, 5.2.6*	1.2.0, 1.2.1, 1.2.2, 1.2.3, 1.3.0, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.4.0	RHEL/CentOS 7.1, 7.2, or 7.3 (64-bit)
5.1.9, 5.1.10	1.1.9, 1.2.0	RHEL/CentOS 7.1 or 7.2 (64-bit)
5.1.8	1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.9	RHEL/CentOS 7.1 or 7.2 (64-bit)
5.1.7	1.1.5, 1.1.6, 1.1.7, 1.1.8	RHEL/CentOS 7.1 or 7.2 (64-bit)
5.1.6 (internal release only)	(none)	(none)
5.1.4, 5.1.5	1.1.5, 1.1.6, 1.1.7	RHEL/CentOS 7.1 or 7.2 (64-bit)
5.1.3	1.1.2, 1.1.3, 1.1.5	RHEL/CentOS 7.1 or 7.2 (64-bit)
5.1.2	1.1.2, 1.1.3	RHEL/CentOS 7.1 or 7.2 (64-bit)
5.1.1	1.1.1, 1.1.2	RHEL/CentOS 7.1 or 7.2 (64-bit)

### Hypervisors

Hypervisor	Versions
VMware vSphere	5.0, 5.1, 5.5, 6.0, 6.5
Microsoft Hyper-V	Version 2.0 with Windows Server 2008 R2 SP1 Version 3.0 with Windows Server 2012 and 2012 R2

### Public cloud platforms

Amazon Web Services (AWS) is fully supported.

---

\* Version 5.2.5 was withdrawn.

Microsoft Azure is supported only for collector pools. Deploying a full Control Center cluster to operate Resource Manager is NOT supported on Microsoft Azure.

## Supported clients and browsers

The following table identifies the supported combinations of client operating systems and web browsers.

Client OS	Supported Browsers
Windows 7 and 8.1	Internet Explorer 11 (Enterprise mode only; compatibility mode is not supported.) Internet Explorer 10*
Windows 10	Internet Explorer 11 (Enterprise mode only; compatibility mode is not supported.) Internet Explorer 10* Firefox 50 and later Chrome 54 and later Microsoft Edge
Windows Server 2012 R2	Firefox 30 Chrome 36
Macintosh OS/X 10.9	Firefox 30 and above Chrome 36 and above
Ubuntu 14.04 LTS	Firefox 30 and above Chrome 37 and above
Red Hat Enterprise Linux 6.5, CentOS 6.5	Firefox 30 and above Chrome 37 and above

## Resource Manager publications

Title	Description
<i>Zenoss Resource Manager Administration Guide</i>	Provides an overview of Resource Manager architecture and features, as well as procedures and examples to help use the system.
<i>Zenoss Resource Manager Configuration Guide</i>	Provides required and optional configuration procedures for Resource Manager, to prepare your deployment for monitoring in your environment.
<i>Zenoss Resource Manager Installation Guide</i>	Provides detailed information and procedures for creating deployments of Control Center and Resource Manager.
<i>Zenoss Resource Manager Planning Guide</i>	Provides both general and specific information for preparing to deploy Resource Manager.

\* Support for Internet Explorer 10 will be withdrawn beginning with the next major release of Resource Manager.

Title	Description
<i>Zenoss Resource Manager Release Notes</i>	Describes known issues, fixed issues, and late-breaking information not already provided in the published documentation set.
<i>Zenoss Resource Manager Upgrade Guide</i>	Provides detailed information and procedures for upgrading deployments of Resource Manager.

## Additional information and comments

If you have technical questions about this product that are not answered in this guide, please visit the [Zenoss Support](#) site or contact Zenoss Support.

Zenoss welcomes your comments and suggestions regarding our documentation. To share your comments, please send an email to [docs@zenoss.com](mailto:docs@zenoss.com). In the email, include the document title (*Zenoss Resource Manager Upgrade Guide*) and part number (1092.17.244).

## Change history

The following list associates document part numbers and the important changes to this guide since the previous release. Some of the changes involve features or content, but others do not. For information about new or changed features, refer to the *Zenoss Resource Manager Release Notes*.

### 1092.17.244 (5.3.1)

Update release numbers.

### 1092.17.230 (5.3.0)

You can upgrade by using the appliance artifacts or a converged set of non-appliance artifacts. This document is reorganized and updated with associated information.

Update release numbers.

### 1092.17.171 (5.2.6)

Update release numbers.

### About 5.2.5

Version 5.2.5 was withdrawn.

### 1092.17.122 (5.2.4)

Update release numbers.

### 1092.17.100 (5.2.3)

Add a part for upgrading high-availability deployments.

Update release numbers.

### 1092.17.058 (5.2.2)

Update release numbers.

### 1092.17.044 (5.2.1)

Remove change history entries prior to release 5.2.0.

Add a part about upgrading custom deployments, move scope chapter before the part.

Remove temporary chapter about installing an updated version of the Cisco UCS ZenPack.

Add a part for upgrading appliance deployments.

### 1092.16.352 (5.2.0)

Add a temporary chapter, for installing an updated version of the Cisco UCS ZenPack.

**1092.16.335 (5.2.0)**

Remove procedures for upgrading Control Center clusters. That information is now in the *Control Center Upgrade Guide*.

Add a section that details the supported operating environments of Resource Manager.

Add an appendix about installing a new application template.

Remove the high-availability chapters. Upgrades to high-availability are now performed by Zenoss personnel.

Add an appendix about installing a new application template.



## 1

# Documented upgrade paths

---

This chapter identifies the release dates of Control Center and Resource Manager, and the upgrade paths included in this guide.

## Release dates and versions

---

### Release 5.2.x and 5.3.x

Release Date	Control Center	Resource Manager
30 Aug 2017	1.4.0	5.3.1
17 Aug 2017	1.4.0	5.3.0
06 Jul 2017	1.3.3	5.2.6
19 Jun 2017	1.3.3	5.2.5 (withdrawn)
03 May 2017	1.3.2	5.2.4
06 Apr 2017	1.3.1	5.2.3
09 Mar 2017	1.3.0	5.2.2
27 Feb 2017	1.2.3	5.2.2
31 Jan 2017	1.2.2	5.2.1
16 Dec 2016	1.2.1	5.2.0
28 Nov 2016	1.2.0	5.2.0

## Upgrade paths included in this document

---

For questions about performing an upgrade or for assistance, please contact Zenoss Support.

### Upgrading from Resource Manager 5.3.x

From	To
Resource Manager 5.3.0	Resource Manager 5.3.1

**Upgrading from Resource Manager 5.2.x**

<b>From</b>	<b>To</b>
Resource Manager 5.2.6	Resource Manager 5.3.1
Resource Manager 5.2.4	Resource Manager 5.3.1
Resource Manager 5.2.3	Resource Manager 5.3.1
Resource Manager 5.2.2	Resource Manager 5.3.1
Resource Manager 5.2.1	Resource Manager 5.3.1
Resource Manager 5.2.0	Resource Manager 5.3.1

**Upgrading from Resource Manager 5.1.x**

<b>From</b>	<b>To</b>
Resource Manager 5.1.10	Resource Manager 5.3.1
Resource Manager 5.1.9	Resource Manager 5.3.1
Resource Manager 5.1.8	Resource Manager 5.3.1
Resource Manager 5.1.7	Resource Manager 5.3.1
Resource Manager 5.1.5	Resource Manager 5.3.1
Resource Manager 5.1.4	Resource Manager 5.3.1
Resource Manager 5.1.3	Resource Manager 5.3.1
Resource Manager 5.1.2	Resource Manager 5.3.1
Resource Manager 5.1.1	Resource Manager 5.3.1

# Part I: Appliance deployments

The chapters in this part describe how to upgrade deployments of Resource Manager that are based on virtual appliances. The upgrade software includes the option to upgrade Control Center and Resource Manager independently.

The procedures in this part are valid for all of the upgrade paths listed in [Upgrade paths included in this document](#) on page 9.

Upgrades of Control Center or Resource Manager include upgrades of the virtual machine operating system.

---

**Note** The procedures in this part are deployment-specific. That is, the procedures only upgrade a single-host deployment to a single-host deployment and likewise for multi-host deployments. For more information about converting a single-host deployment to a multi-host deployment, refer to the *Zenoss Resource Manager Installation Guide*.

---

## Before upgrading

---

To prepare to update an appliance-based deployment, follow the procedures in this section.

### Preparing to upgrade

---

Before you upgrade your deployment, perform this procedure.

- 1 Verify that Resource Manager is operating normally.
  - a Log in to the Control Center browser interface as `ccuser`.
  - b In the **Application** column of the **Applications** table, click **Zenoss.resmgr**.
  - c Verify that all of the services in the **IP Assignments** table have valid IP addresses.
  - d Scroll down to the **Services** table, and then verify that none of the child services have failing health checks.
- 2 Check the integrity of Resource Manager databases.

For more information, see [Using Zenoss Toolbox](#) on page 43.
- 3 Create a backup of Resource Manager.

Backups can be created with the Control Center backup feature or with the backup feature of your hypervisor.

---

**Note** Before starting a hypervisor backup, Resource Manager, the Control Center service, and the Control Center master host virtual machine must be shut down cleanly and completely.

---

### Rebuilding the MIB catalog

---

Use this procedure to rebuild the MIB catalog. **This procedure is required when upgrading Resource Manager from release 5.3.0 to 5.3.1 only.**

To perform this procedure, Resource Manager must be operating normally.

- 1 Log in to the Control Center master host as `root`, or as a user with superuser privileges.
- 2 Attache to a Zope container as user `zenoss`.

```
serviced service attach zope su - zenoss
```

- 3 Start `zendmd`.

```
zendmd
```

- 4 Rebuild the MIB index and commit the changes.  
Each command may take up to 60 seconds.

```
dmd.Mibs.reIndex()
commit()
```

- 5 Exit the container.

```
exit
```

## Downloading the update ISO file

---

To perform this procedure, you need:

- A workstation with internet access.
- Permission to download files from the [File Portal - Download Zenoss Enterprise Software](#) site. Zenoss customers may request permission by filing a ticket at the [Zenoss Support](#) site.
- A secure network copy program.

Use this procedure to download the required files to a workstation and then copy the files to a location your hypervisor can use.

Perform these steps:

- 1 In a web browser, navigate to the [File Portal - Download Zenoss Enterprise Software](#) site.
- 2 Log in with the account provided by Zenoss Support.
- 3 Download the Zenoss Service Dynamics update file.

Choose the file with the highest version number. The version number is represented as *Version* in the following file name:

```
update-zenoss-zsd-Version.x86_64.iso
```

- 4 Use a secure copy program to copy the file to a location your hypervisor can use.

## Attaching the upgrade ISO

---

Use one of the procedures in this section to attach the update ISO file to the CD/DVD drive of each host in your Control Center cluster.

### Attaching an update ISO with vSphere

To perform this task, you need:

- A VMware vSphere client
- A copy of the Resource Manager update ISO file (on your workstation)

Use this procedure to attach a Resource Manager update ISO file to the CD/DVD drive of a Control Center host.

- 1 Use the VMware vSphere Client to log in to vCenter as `root`, or as a user with superuser privileges.
- 2 With the **View** menu, enable **Toolbar** and **Show VMs in Inventory**.
- 3 In the **Inventory** list, select the name of the Control Center host.
- 4 Enable the CD/DVD drive of the Control Center master host.
  - a On the **Summary** page, click **Edit Settings**.
  - b In the **Hardware** table of the **Virtual Machine Properties** dialog, select **CD/DVD drive 1**.
  - c In the **Device Type** area, click **Client Device**.

- d At the bottom of the **Virtual Machine Properties** dialog, click **OK**.

---

**Note** If the CD/DVD drive is configured to connect when the virtual machine starts, you may have to turn off the virtual machine, reconfigure the drive, and then turn on the virtual machine, before proceeding to the next step. Before turning off the virtual machine, stop Resource Manager. For more information, see [Stopping Resource Manager](#) on page 14.

---

- 5 Attach the update ISO file to the Control Center master host.
  - a In the toolbar, click the CD/DVD drive icon.
  - b From the menu, select **CD/DVD drive 1 > Connect to ISO image on local disk**.
  - c In the **Open** dialog, select the update ISO file, and then click the **Open** button.

## Attaching an update ISO with Hyper-V

To perform this task, you need:

- Microsoft Remote Desktop Connection
- A copy of the Resource Manager update ISO file (on the Hyper-V host)

Use this procedure to attach a Resource Manager update ISO file to the CD/DVD drive of a Control Center host.

- 1 Use Microsoft Remote Desktop Connection to log in to a Hyper-V host as Administrator, or as a user with Administrator privileges.
- 2 Start **Hyper-V Manager**.
- 3 In the **Virtual Machines** area of Hyper-V Manager, select the Control Center host, and then right-click to select **Settings**.
- 4 In the **Hardware** area of the **Settings** dialog, select **IDE Controller 1 > DVD Drive**.
- 5 In the **Media** area, click the **Image file** radio button, and then click **Browse** button.
- 6 In the **Open** dialog, select the update ISO file, and then click the **Open** button.
- 7 At the bottom of the **Settings** dialog, click the **OK** button.

## Stopping Resource Manager

---

Use this procedure to stop Resource Manager.

- 1 Log in to the Control Center browser interface as `ccuser`.
- 2 In the **Actions** column of the **Applications** table, click the **Stop** control of **Zenoss.resmgr**.
- 3 In the **Stop Service** dialog, click **Stop Service and NV Children**.

# Upgrading single-host appliance deployments

# 3

This chapter describes how to upgrade a single-host deployment of Resource Manager that is based on a virtual appliance.

For optimum results, Zenoss recommends reviewing the upgrade procedures before performing the upgrade.

## Removing Docker containers on the master host

Occasionally, stopping the Control Center service leaves Docker containers in the local repository. Perform this procedure on the Control Center master host to ensure no containers remain.

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 Use the **Down Arrow** key to select **Root Shell**, and then press **Enter**.  
The menu is replaced by a command prompt similar to the following example:

```
[root@resmgr ~]#
```

- 4 Stop the Control Center service.

```
systemctl stop serviced
```

- 5 Ensure that no containers remain in the local repository.
  - a Display the identifiers of all containers, running and exited.

```
docker ps -qa
```

- If the command returns no result, stop. This procedure is complete.
  - If the command returns a result, perform the following substeps.
- b Remove all remaining containers.

```
docker ps -qa | xargs --no-run-if-empty docker rm -fv
```

- c Display the identifiers of all containers, running and exited.

```
docker ps -qa
```

- If the command returns no result, stop. This procedure is complete.
  - If the command returns a result, perform the remaining substeps.
- d Disable the automatic startup of `serviced`.

```
systemctl disable serviced
```

- e Reboot the host.

```
reboot
```

- f Log in to the master host as `root`, or as a user with superuser privileges.
- g Enable the automatic startup of `serviced`.

```
systemctl enable serviced
```

To return to the **Appliance Administration** menu, enter the `exit` command.

## Updating Control Center on the master host

Before performing this procedure, attach the update ISO file to the Control Center master host. For more information, see [Attaching the upgrade ISO](#) on page 13.

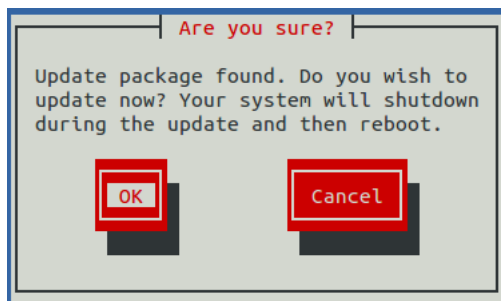
Use this option to update Control Center on a master host.

---

**Note** The upgrade software creates a record of its work in `/tmp/upgrade-zsd-cc-*.log`.

---

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 In the **Appliance Administration** menu, use the down arrow key to select **Update System**, and then press **Enter**.



- To update the system, press **Enter**.
  - To cancel the update, press **Tab**, and then press **Enter**.
- 4 In the **Upgrade Options** menu, choose **Upgrade to Control Center v.r.m** and then press **Enter**. The **Appliance Administration** menu is replaced by progress messages as the Control Center upgrade begins. The following list identifies the major steps of the upgrade, which takes about 20 minutes:
- Install the Zenoss mirror repository. All subsequent install and update procedures use the mirror.
  - Install a new version of Control Center.
  - Install a new version of Docker.
  - Install images into the local Docker repository.
  - Install utility packages.



- Upgrade the master host virtual machine to CentOS 7.3.

The following message displays when the upgrade completes:

```
Complete!
The master host update attempt succeeded.
Control Center v.r.m is installed.
The update log is /tmp/upgrade-zsd-cc-*.log.

Follow these steps to complete the update:
1. On each delegate host, attach the update ISO, and then update
   Control Center.
2. On the master host, generate and distribute authentication tokens
   to each delegate host.
   (Control Center v.r.m requires authentication tokens for all
   delegate communications.)
3. On the master host, update Zenoss Service Dynamics to v.r.m.
For more information, refer to the Zenoss Service Dynamics Upgrade
Guide.

Press any key to reboot...
```

- 5 Press any key.

## Updating on the master host

Before performing this procedure, upgrade Control Center.

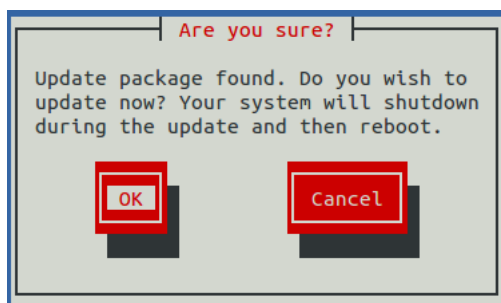
Use this option to update on a master host.

---

**Note** The upgrade software creates a record of its work in `/tmp/upgrade-xxx-product-*.log`.

---

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 In the **Appliance Administration** menu, use the down arrow key to select **Update System**, and then press **Enter**.



- To update the system, press **Enter**.
  - To cancel the update, press **Tab**, and then press **Enter**.
- 4 In the **Upgrade Options** menu, choose **Upgrade to Zenoss Service Dynamics v.r.m** and then press **Enter**. The **Appliance Administration** menu is replaced by progress messages as the upgrade begins. The following list identifies the major steps of the upgrade, which takes about 30 minutes:
    - Install or update the Zenoss mirror repository. All subsequent install and update procedures use the mirror.
    - Install images into the local Docker registry.

- Add or update ZenPacks for Zenoss Analytics and Zenoss Service Impact.
- Install a new application template for Resource Manager.
- Start the Resource Manager upgrade script.

The following message displays when the upgrade completes:

```
Zenoss Service Dynamics upgraded successfully.  
Upgrade log stored at /tmp/upgrade-xxx-product-*.log.  
Press any key to reboot...
```

- 5 Press any key.

# Upgrading multi-host appliance deployments

# 4

This chapter describes how to upgrade a multi-host deployment of Resource Manager that is based on a virtual appliance.

For optimum results, Zenoss recommends reviewing the upgrade procedures before performing the upgrade.

## Removing Docker containers on the master host

Occasionally, stopping the Control Center service leaves Docker containers in the local repository. Perform this procedure on the Control Center master host to ensure no containers remain.

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 Use the **Down Arrow** key to select **Root Shell**, and then press **Enter**.  
The menu is replaced by a command prompt similar to the following example:

```
[root@resmgr ~]#
```

- 4 Stop the Control Center service.

```
systemctl stop serviced
```

- 5 Ensure that no containers remain in the local repository.
  - a Display the identifiers of all containers, running and exited.

```
docker ps -qa
```

- If the command returns no result, stop. This procedure is complete.
  - If the command returns a result, perform the following substeps.
- b Remove all remaining containers.

```
docker ps -qa | xargs --no-run-if-empty docker rm -fv
```

- c Display the identifiers of all containers, running and exited.

```
docker ps -qa
```

- If the command returns no result, stop. This procedure is complete.
  - If the command returns a result, perform the remaining substeps.
- d Disable the automatic startup of `serviced`.

```
systemctl disable serviced
```

- e Reboot the host.

```
reboot
```

- f Log in to the master host as `root`, or as a user with superuser privileges.
- g Enable the automatic startup of `serviced`.

```
systemctl enable serviced
```

To return to the **Appliance Administration** menu, enter the `exit` command.

## Updating delegate hosts

---

Repeat each procedure in this section on each delegate host in your deployment.

### Removing Docker containers on delegate hosts

Occasionally, stopping the Control Center service leaves Docker containers in the local repository. Perform this procedure on each Control Center delegate host to ensure no containers remain.

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 Use the **Down Arrow** key to select **Root Shell**, and then press **Enter**.  
The menu is replaced by a command prompt similar to the following example:

```
[root@resmgr ~]#
```

- 4 Stop the Control Center service.

```
systemctl stop serviced
```

- 5 Ensure that no containers remain in the local repository.

- a Display the identifiers of all containers, running and exited.

```
docker ps -qa
```

- If the command returns no result, proceed to the next step.
  - If the command returns a result, perform the following substeps.
- b Remove all remaining containers.

```
docker ps -qa | xargs --no-run-if-empty docker rm -fv
```

- If the remove command completes, proceed to the next step.
- If the remove command does not complete, the most likely cause is an NFS conflict. Perform the following substeps.

- c** Stop the NFS and Docker services.

```
systemctl stop nfs && systemctl stop docker
```

- d** Start the NFS and Docker services.

```
systemctl start nfs && systemctl start docker
```

- e** Repeat the attempt to remove all remaining containers.

```
docker ps -qa | xargs --no-run-if-empty docker rm -fv
```

- If the remove command completes, proceed to the next step.
- If the remove command does not complete, perform the remaining substeps.

- f** Disable the automatic startup of `serviced`.

```
systemctl disable serviced
```

- g** Reboot the host.

```
reboot
```

- h** Log in to the delegate host as `root`, or as a user with superuser privileges.

- i** Enable the automatic startup of `serviced`.

```
systemctl enable serviced
```

## 6 Dismount all filesystems mounted from the Control Center master host.

This step ensures no stale mounts remain when the storage on the master host is replaced.

- a** Identify filesystems mounted from the master host.

```
awk '/serviced/ { print $1, $2 }' < /proc/mounts \
| grep -v '/opt/serviced/var/isvcs'
```

- If the preceding command returns no result, stop. This procedure is complete.
- If the preceding command returns a result, perform the following substeps.

- b** Force the filesystems to dismount.

```
for FS in $(awk '/serviced/ { print $2 }' < /proc/mounts \
| grep -v '/opt/serviced/var/isvcs')
do
  umount -f $FS
done
```

- c** Identify filesystems mounted from the master host.

```
awk '/serviced/ { print $1, $2 }' < /proc/mounts \
| grep -v '/opt/serviced/var/isvcs'
```

- If the preceding command returns no result, stop. This procedure is complete.
- If the preceding command returns a result, perform the following substeps.

- d** Perform a lazy dismount.

```
for FS in $(awk '/serviced/ { print $2 }' < /proc/mounts \
| grep -v '/opt/serviced/var/ismvcs')
do
    umount -f -l $FS
done
```

- e** Restart the NFS service.

```
systemctl restart nfs
```

- f** Determine whether any filesystems remain mounted from the master host.

```
awk '/serviced/ { print $1, $2 }' < /proc/mounts \
| grep -v '/opt/serviced/var/ismvcs'
```

- If the preceding command returns no result, stop. This procedure is complete.
- If the preceding command returns a result, perform the remaining substeps.

- g** Disable the automatic startup of serviced.

```
systemctl disable serviced
```

- h** Reboot the host.

```
reboot
```

- i** Log in to the delegate host as `root`, or as a user with superuser privileges.

- j** Enable the automatic startup of `serviced`.

```
systemctl enable serviced
```

To return to the **Appliance Administration** menu, enter the `exit` command.

## Updating Control Center on a delegate host

Before performing this procedure, attach the update ISO file to the Control Center delegate host. For more information, see [Attaching the upgrade ISO](#) on page 13.

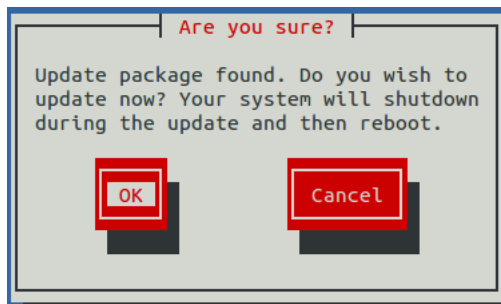
Use this option to update Control Center on a delegate host.

---

**Note** The upgrade software creates a record of its work in `/tmp/upgrade-zsd-cc-*.log`.

---

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 In the **Appliance Administration** menu, use the down arrow key to select **Update System**, and then press **Enter**.



- To update the system, press **Enter**.
  - To cancel the update, press **Tab**, and then press **Enter**.
- 4 In the **Upgrade Options** menu, choose **Upgrade to Control Center v.r.m** and then press **Enter**. The **Appliance Administration** menu is replaced by progress messages as the Control Center upgrade begins. The following list identifies the major steps of the upgrade, which takes about 20 minutes:
- Install the Zenoss mirror repository. All subsequent install and update procedures use the mirror.
  - Install a new version of Control Center.
  - Install a new version of Docker.
  - Install images into the local Docker repository.
  - Install utility packages.
  - Upgrade the master host virtual machine to CentOS 7.3.

---

**Note** During the upgrade, you may see a message about a loopback thinpool device, along with a prompt to abort or continue. At the prompt, press any key; there is no reason to abort the upgrade.

---

The following message displays when the upgrade completes:

```
Complete!
The delegate host update attempt succeeded.
Control Center v.r.m is installed.
The update log is /tmp/upgrade-zsd-cc-*.log.

Follow these steps to complete the update:
1. On each delegate host, attach the update ISO, and then update
   Control Center.
2. On the master host, generate and distribute authentication tokens
   to each delegate host.
   (Control Center v.r.m requires authentication tokens for all
   delegate communications.)
3. On the master host, update Zenoss Service Dynamics to v.r.m.
   For more information, refer to the Zenoss Service Dynamics Upgrade
   Guide.

Press any key to reboot...
```

- 5 Press any key.

## Updating the master host

---

Perform each procedure in this section on the Control Center master host.

### Updating Control Center on the master host

Before performing this procedure, attach the update ISO file to the Control Center master host. For more information, see [Attaching the upgrade ISO](#) on page 13.

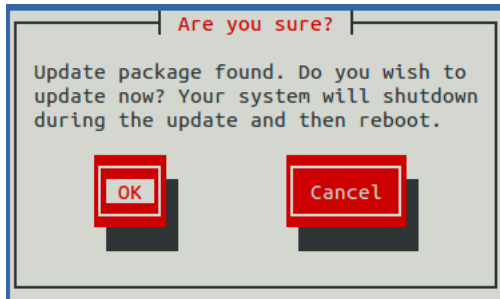
Use this option to update Control Center on a master host.

---

**Note** The upgrade software creates a record of its work in `/tmp/upgrade-zsd-cc-*.log`.

---

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 In the **Appliance Administration** menu, use the down arrow key to select **Update System**, and then press **Enter**.



- To update the system, press **Enter**.
  - To cancel the update, press **Tab**, and then press **Enter**.
- 4 In the **Upgrade Options** menu, choose **Upgrade to Control Center v.r.m** and then press **Enter**. The **Appliance Administration** menu is replaced by progress messages as the Control Center upgrade begins. The following list identifies the major steps of the upgrade, which takes about 20 minutes:
    - Install the Zenoss mirror repository. All subsequent install and update procedures use the mirror.
    - Install a new version of Control Center.
    - Install a new version of Docker.
    - Install images into the local Docker repository.
    - Install utility packages.
    - Upgrade the master host virtual machine to CentOS 7.3.

The following message displays when the upgrade completes:

```
Complete!
The master host update attempt succeeded.
Control Center v.r.m is installed.
The update log is /tmp/upgrade-zsd-cc-*.log.

Follow these steps to complete the update:
1. On each delegate host, attach the update ISO, and then update
   Control Center.
2. On the master host, generate and distribute authentication tokens
   to each delegate host.
   (Control Center v.r.m requires authentication tokens for all
   delegate communications.)
3. On the master host, update Zenoss Service Dynamics to v.r.m.
   For more information, refer to the Zenoss Service Dynamics Upgrade
   Guide.

Press any key to reboot...
```

- 5 Press any key.



## Updating delegate hosts with authentication

Starting with version 1.3.0, Control Center requires authentication tokens for all delegate communications. The tokens are based on RSA key pairs created by the master `serviced` instance. When you create a key pair for a delegate, `serviced` bundles its public key with the delegate's private key. The `serviced` instance on the delegate installs the credentials and uses them to sign messages with the required unique tokens.

Credentials are installed by using an SSH connection or a file.

- The command to create a key pair can initiate an SSH connection with a delegate and install credentials. This option is the most secure, because no file is created. However, it requires either public key authentication or password authentication between the master and delegate hosts.
- When no SSH connection is requested, the command to create a key pair creates a file containing the credentials. You can move the credentials file to the delegate host with any file transfer method, and then install it on the delegate.

The following procedures demonstrate how to create credentials and install them on a delegate.

### Registering a delegate using SSH

To succeed, the following statements about the login account used to perform this procedure must be true:

- The account exists on both the master host and on the delegate host.
- The account has `serviced` CLI privileges.
- The account has either public key authentication or password authentication enabled on the master host and on the delegate host.

Use this procedure to create the authentication credentials that delegate hosts require, and to register the credentials through an SSH connection.

Perform these steps on the Control Center master host:

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 Use the **Down Arrow** key to select **Root Shell**, and then press **Enter**.  
The menu is replaced by a command prompt similar to the following example:

```
[root@resmgr ~]#
```

- 4 Display the host IDs of all cluster hosts.

```
serviced host list | cut -c-85
```

The host ID is in the first column of the output.

- 5 Create authentication credentials for a delegate host and register the credentials.

If the master and delegate host are configured for key-based access, the following command does not prompt you to add the delegate to the list of known hosts or to provide the password of the remote user account.

Replace *Host-ID* with the host ID of a delegate host:

```
serviced key reset --register Host-ID
```

- 6 Repeat the preceding step for each delegate host in your deployment.

## Registering a delegate using a file

Use this procedure to create the authentication credentials that delegate hosts require, and to register the credentials by using a file.

Start this procedure on the Control Center master host:

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 Use the **Down Arrow** key to select **Root Shell**, and then press **Enter**.  
The menu is replaced by a command prompt similar to the following example:

```
[root@resmgr ~]#
```

- 4 Display the host IDs of all cluster hosts.

```
serviced host list | cut -c-85
```

The host ID is in the first column of the output.

- 5 Create and distribute credentials files for delegate hosts.  
Repeat the following substeps for each delegate host in your deployment.
  - a Create authentication credentials for a delegate host.  
Replace *Host-ID* with the host ID of a delegate host identified in the preceding step:

```
serviced key reset Host-ID
```

The command creates a unique credentials file in the local directory.

- b Copy the credentials files to each delegate host.  
Use a file transfer utility such as `scp` to copy the files. Once copied to a delegate host, the credentials file is not needed on the master host and can be deleted.

- 6 Install the credentials on delegate hosts.  
Repeat the following substeps on each delegate host in your deployment.

- a Log in to a delegate host as `root`, or as a user with superuser privileges.
  - b Use the **Down Arrow** key to select **Root Shell**, and then press **Enter**.  
The menu is replaced by a command prompt similar to the following example:

```
[root@resmgr ~]#
```

- c Install the credentials.  
Replace *Credentials-File* with the pathname of the credentials file:

```
serviced host register Credentials-File
```

- d Delete the credentials file.  
The file is no longer needed on the delegate host.  
Replace *Credentials-File* with the pathname of the credentials file:

```
rm Credentials-File
```

To return to the **Appliance Administration** menu, enter the `exit` command.

## Updating on the master host

Before performing this procedure, upgrade Control Center.

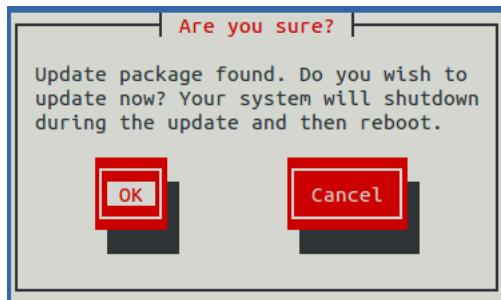
Use this option to update on a master host.

---

**Note** The upgrade software creates a record of its work in `/tmp/upgrade-xxx-product-*.log`.

---

- 1 Gain access to the Control Center host, through the console interface of your hypervisor, or through a remote shell utility such as *PuTTY*.
- 2 Log in as the `root` user.
- 3 In the **Appliance Administration** menu, use the down arrow key to select **Update System**, and then press **Enter**.



- To update the system, press **Enter**.
  - To cancel the update, press **Tab**, and then press **Enter**.
- 4 In the **Upgrade Options** menu, choose **Upgrade to Zenoss Service Dynamics v.r.m** and then press **Enter**. The **Appliance Administration** menu is replaced by progress messages as the upgrade begins. The following list identifies the major steps of the upgrade, which takes about 30 minutes:
    - Install or update the Zenoss mirror repository. All subsequent install and update procedures use the mirror.
    - Install images into the local Docker registry.
    - Add or update ZenPacks for Zenoss Analytics and Zenoss Service Impact.
    - Install a new application template for Resource Manager.
    - Start the Resource Manager upgrade script.

The following message displays when the upgrade completes:

```
Zenoss Service Dynamics upgraded successfully.
Upgrade log stored at /tmp/upgrade-xxx-product-*.log.
Press any key to reboot...
```

- 5 Press any key.

## After upgrading

---

After Resource Manager is upgraded, perform the procedures in this chapter.

### Starting Resource Manager

---

Use this procedure to start Resource Manager and verify the upgrade.

- 1 Display the login page of the Control Center browser interface.  
Replace *HostName* with the name or IP address of the Control Center master host:

```
https://HostName
```

- 2 Log in as `ccuser`.  
The **Applications** table shows the updated application, and the **Application Templates** table includes the old and new templates.

---

**Note** Do not attempt to add either the old or the new application template. The new template is already added and deployed.

---

- 3 In the **Actions** column of the **Applications** table, click the **Start** control of **Zenoss.resmgr**.
- 4 In the **Start Service** dialog, click **Start Service and NN Children**.

## Part II: Customized deployments

The chapters in this part describe how to upgrade customized deployments of Resource Manager. The procedures in this part are valid for all of the upgrade paths listed in *Upgrade paths included in this document* on page 9.

## 6

## Before upgrading

---

Use the procedures in this chapter to importing updated Docker images for Resource Manager into the local registry of the Control Center master host.

### Rebuilding the MIB catalog

---

Use this procedure to rebuild the MIB catalog. **This procedure is required when upgrading Resource Manager from release 5.3.0 to 5.3.1 only.**

To perform this procedure, Resource Manager must be operating normally.

- 1 Log in to the Control Center master host as `root`, or as a user with superuser privileges.
- 2 Attache to a Zope container as user `zenoss`.

```
serviced service attach zope su - zenoss
```

- 3 Start `zendmd`.

```
zendmd
```

- 4 Rebuild the MIB index and commit the changes.  
Each command may take up to 60 seconds.

```
dmd.Mibs.reIndex()  
commit()
```

- 5 Exit the container.

```
exit
```

### Downloading Resource Manager image files

---

To perform this procedure, you need

- a workstation with internet access
- permission to download files from the [File Portal - Download Zenoss Enterprise Software](#) site. Zenoss customers can request permission by filing a ticket at the [Zenoss Support](#) site
- a secure network copy program

Use this procedure to

- download the required files to a workstation
  - copy the files to a Control Center master host
- 1 In a web browser, navigate to the [File Portal - Download Zenoss Enterprise Software](#) site.
  - 2 Log in with the account provided by Zenoss Support.
  - 3 Download the self-installing Docker image files for Resource Manager.  
Select the files with the highest version number. The version number is represented as *Version* in the following file names:
    - `install-zenoss-hbase_vVersion.run`
    - `install-zenoss-opentsdb_vVersion.run`
    - `install-zenoss-resmgr_Version.run`
  - 4 Use a secure copy program to copy the files to the Control Center master host.

## Importing Resource Manager image files

---

Use this procedure to import Resource Manager image from self-installing archive files.

- 1 Log in to the master host as `root`, or as a user with superuser privileges.
- 2 Copy or move the archive files to `/root`.
- 3 Add execute permission to the files.

```
chmod +x /root/*.run
```

- 4 Change directory to `/root`.

```
cd /root
```

- 5 Import the images.

```
for image in install-zenoss*.run
do
  echo -n "$image: "
  ./$image
done
```

Importing begins when you press the `y` key. If you press the `y` key and then the **Return** key, the current image is imported, but the next one is not.

- 6 List the images in the registry.

```
docker images
```

The result should include one image for each archive file.

- 7 Optional: Delete the archive files, if desired.

```
rm -i ./install-*.run
```

- 8 Copy the upgrade scripts from the new Resource Manager image to `/root/5.3.x`.

```
docker run -it --rm -v /root:/mnt/root \
  zenoss/resmgr_5.3:5.3.1_1 rsync -a /root/5.3.x /mnt/root
```

## Upgrading Resource Manager

---

This chapter contains the procedures for upgrading Resource Manager. Before starting the procedures in this chapter, complete the procedures in [Before upgrading](#) on page 30.

---

**Note** Before performing an upgrade or installing a ZenPack, Zenoss strongly recommends checking the integrity of Resource Manager databases. For more information, see [Using Zenoss Toolbox](#) on page 43.

---

### Stopping Resource Manager

---

Use this procedure to stop Resource Manager.

- 1 Log in to the Control Center master host as a user with `serviced` CLI privileges.
- 2 Check the status of Resource Manager.

```
serviced service status --show-fields 'Name,ServiceID,Status'
```

- If the status of all services is `stopped`, this procedure is complete. Continue to the next procedure.
- If the status is `running`, perform the remaining steps.

- 3 Stop Resource Manager.

```
serviced service stop Zenoss.resmgr
```

- 4 Check the status of Resource Manager.

```
serviced service status --show-fields 'Name,ServiceID,Status'
```

Repeat the command until the status of all services is `stopped`.

### Upgrading Resource Manager

---

Use this procedure to upgrade Resource Manager.

- 1 Log in to the Control Center master host as `root`, or as a user with superuser privileges.
- 2 Start the upgrade script.

```
/root/5.3.x/upgrade-resmgr.sh
```



The upgrade process begins. If you encounter errors, see [Common upgrade error recovery procedures](#) on page 45.

**3** Restart Resource Manager.

Some Resource Manager services are started during the upgrade, and they must be restarted.

```
serviced service restart Zenoss.resmgr
```

## After upgrading a customized deployment

---

After Resource Manager is upgraded, perform the procedures in this chapter.

### Removing the pre-upgrade snapshot

---

The Resource Manager upgrade script uses Control Center to create and tag a snapshot of the system before it begins the upgrade process. Tagged snapshots persist until they are explicitly removed, and grow over time. When you are satisfied the new release is working properly, remove the pre-upgrade snapshot.

- 1 Log in to the Control Center master host as a user with `serviced` CLI privileges.
- 2 Display a list of all Control Center snapshots, with their tags.

```
serviced snapshot list -t
```

Example result, truncated to save space:

Snapshot	Description	Tags
xm5mtezbyo2_20160211-220535.480		preupgrade-resmgr-5.2.0

The snapshot identifier is shown in the first column.

- 3 Remove the pre-upgrade snapshot.

Replace *Snapshot-ID* with the identifier of the pre-upgrade snapshot returned in the previous step:

```
serviced snapshot remove Snapshot-ID
```

# High-availability deployments

## Scope

The chapters in this part describe how to upgrade high-availability deployments of Resource Manager. The procedures in this part are valid for all of the upgrade paths listed in [Upgrade paths included in this document](#) on page 9.

This part does not include information about updating Control Center. For more information, refer to the *Control Center Upgrade Guide for High-Availability Deployments*.

## Before upgrading a high-availability deployment

# 9

Use the procedures in this chapter to prepare your for high-availability Resource Manager deployment for an upgrade.

### Rebuilding the MIB catalog

Use this procedure to rebuild the MIB catalog. **This procedure is required when upgrading Resource Manager from release 5.3.0 to 5.3.1 only.**

To perform this procedure, Resource Manager must be operating normally.

- 1 Log in to the Control Center master host as `root`, or as a user with superuser privileges.
- 2 Attache to a Zope container as user `zenoss`.

```
serviced service attach zope su - zenoss
```

- 3 Start `zendmd`.

```
zendmd
```

- 4 Rebuild the MIB index and commit the changes.  
Each command may take up to 60 seconds.

```
dmd.Mibs.reIndex()  
commit()
```

- 5 Exit the container.

```
exit
```

### Downloading Resource Manager image files

To perform this procedure, you need

- a workstation with internet access
- permission to download files from the [File Portal - Download Zenoss Enterprise Software](#) site. Zenoss customers can request permission by filing a ticket at the [Zenoss Support](#) site
- a secure network copy program

Use this procedure to

- download the required files to a workstation
- copy the files to a Control Center master host

You will copy files to both the primary node and the secondary node.

- 1 In a web browser, navigate to the [File Portal - Download Zenoss Enterprise Software](#) site.
- 2 Log in with the account provided by Zenoss Support.
- 3 Download the self-installing Docker image files for Resource Manager.  
Select the files with the highest version number. The version number is represented as *Version* in the following file names:

- `install-zenoss-hbase_vVersion.run`
- `install-zenoss-opentsdb_vVersion.run`
- `install-zenoss-resmgr_Version.run`

- 4 Use a secure copy program to copy the files to the Control Center master host.  
Copy files to both the primary node and the secondary node.

## Importing Resource Manager image files

Use this procedure to import Resource Manager image from self-installing archive files.

- 1 Use the virtual hostname or virtual IP address of the high-availability cluster to log in to the Control Center master node as a user with `serviced` CLI privileges.
- 2 In a separate terminal session, log in to the other master host as `root`, or as a user with superuser privileges.
- 3 On both nodes, copy or move the archive files to `/root`.
- 4 On both nodes, add execute permission to the files.

```
chmod +x /root/*.run
```

- 5 On both nodes, change directory to `/root`.

```
cd /root
```

- 6 On both nodes, import the images.

```
for image in install-zenoss*.run
do
  echo -n "$image: "
  ./$image
done
```

Importing begins when you press the **y** key. If you press the **y** key and then the **Return** key, the current image is imported, but the next one is not.

- 7 On both nodes, list the images in the registry.

```
docker images
```

The result should include one image for each archive file.

- 8 Optional: On both nodes, delete the archive files, if desired.

```
rm -i ./install-*.run
```

- 9 On both nodes, copy the upgrade scripts from the new Resource Manager image to `/root/5.3.x`.

```
docker run -it --rm -v /root:/mnt/root \
```

```
zenoss/resmgr_5.3:5.3.1_1 rsync -a /root/5.3.x/mnt/root
```

# Upgrading Resource Manager software

# 10

This chapter includes the procedures for upgrading high-availability deployment of Resource Manager. Before starting the procedures in this chapter, complete the procedures in [Before upgrading a high-availability deployment](#) on page 36.

---

**Note** Zenoss strongly recommends checking the integrity of Resource Manager databases before performing an upgrade or installing a ZenPack. For more information, see [Using Zenoss Toolbox](#) on page 43.

---

## Stopping Resource Manager

Use this procedure to stop Resource Manager in a high-availability Control Center deployment.

- 1 Use the virtual hostname or virtual IP address of the high-availability cluster to log in to the Control Center master node as a user with `serviced` CLI privileges.
- 2 Check the status of Resource Manager.

```
serviced service status --show-fields 'Name,ServiceID,Status'
```

- If the status of all services is `stopped`, this procedure is complete. Continue to the next procedure.
  - If the status is `running`, perform the remaining steps.
- 3 Stop Resource Manager.

```
serviced service stop Zenoss.resmgr
```

- 4 Check the status of Resource Manager.

```
serviced service status --show-fields 'Name,ServiceID,Status'
```

Repeat the command until the status of all services is `stopped`.

## Upgrading Resource Manager

Use this procedure to upgrade a high-availability deployment of Resource Manager.

- 1 Use the virtual hostname or virtual IP address of the high-availability cluster to log in to the Control Center master node as a user with `serviced` CLI privileges.

**2** Start the upgrade script.

```
/root/5.3.x/upgrade-resmgr.sh
```

The upgrade process begins. If you encounter errors, see [Common upgrade error recovery procedures](#) on page 45.

**3** Restart Resource Manager.

Some Resource Manager services are started during the upgrade, and they must be restarted.

```
serviced service restart Zenoss.resmgr
```



# After upgrading a high-availability deployment

# 11

After is upgraded, perform the procedures in this chapter.

## Removing the pre-upgrade snapshot

The Resource Manager upgrade script uses Control Center to create and tag a snapshot of the system before it begins the upgrade process. Tagged snapshots persist until they are explicitly removed, and grow over time. When you are satisfied the new release is working properly, remove the pre-upgrade snapshot.

- 1 Log in to the Control Center master host as a user with `serviced` CLI privileges.
- 2 Display a list of all Control Center snapshots, with their tags.

```
serviced snapshot list -t
```

Example result, truncated to save space:

Snapshot	Description	Tags
xm5mtezbyo2_20160211-220535.480		preupgrade-resmgr-5.2.0

The snapshot identifier is shown in the first column.

- 3 Remove the pre-upgrade snapshot.

Replace *Snapshot-ID* with the identifier of the pre-upgrade snapshot returned in the previous step:

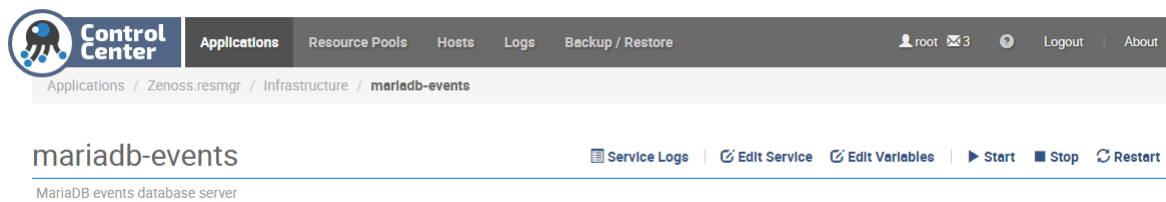
```
serviced snapshot remove Snapshot-ID
```

## Moving MariaDB services into the master resource pool

To perform this procedure, both Control Center master host nodes must have sufficient RAM and CPU resources for Control Center services and for the MariaDB services. For more information about the amount of RAM and CPU resources that are required, please contact your Zenoss representative.

Use this procedure to move the **mariadb-model** and **mariadb-events** services to the **master** resource pool. If the services are already in the **master** resource pool, skip this procedure.

- 1 Log in to the Control Center browser interface.
- 2 In the **Applications** table, click **Zenoss.resmgr**.
- 3 Scroll down to the **Services** table, and then expand the **Infrastructure** entry.
- 4 In the **Service** column of the **Services** table, click **mariadb-events**.



- 5 On the **mariadb-events** page, click **Edit Service**.
- 6 In the **Edit Service** dialog box, select **master** from the list in the **Resource Pool ID** field.
- 7 At the bottom of the **Edit Service** dialog box, click **Save Changes**.
- 8 On the **mariadb-events** page, click **Restart**.
- 9 Repeat steps 3-8 for the **mariadb-model** service.

## A

# Using Zenoss Toolbox

---

This appendix provides an introduction to the Zenoss Toolbox, which is included in Resource Manager. For up-to-date information, refer to the Zenoss Toolbox [KnowledgeBase article](#).

## Zenoss Toolbox tools

---

The Zenoss Toolbox tools examine key Resource Manager components for common issues affecting data integrity. Zenoss recommends running the following tools, in order, before upgrading Resource Manager:

- 1 The `zodbscan` tool quickly scans the Zope Object Database (ZODB) to provide a preliminary indication of the health of the database, and to determine whether the database needs to be compressed with `zenossdbpack` before upgrading. The `zodbscan` tool may instruct you to run the following tools:
  - a The `findposkeyerror` tool checks objects and their relationships, and provides options for fixing errors.
  - b The `zenrelationscan` tool checks only ZenRelations between objects.
- 2 The `zencatalogscan` tool checks ZODB object catalogs, which speed up web interface access.

The tools are run inside a Zope container, and the log files for each command are found in `$ZENHOME/log/toolbox`.

## Running Zenoss Toolbox tools

---

- 1 Log in to the Control Center master host as a user with `serviced` CLI privileges.
- 2 Start an interactive session in a Zope container.

```
serviced service attach zope/0
```

- 3 Switch user to `zenoss`.

```
su - zenoss
```

- 4 Run the Zenoss Toolbox tools, in order.  
For more information about the tools, see [Zenoss Toolbox tools](#) on page 43.
- 5 Exit the `zenoss` user account.

```
exit
```

**6** Exit the Zope container.

```
exit
```

# Common upgrade error recovery procedures

# B

This appendix describes common error messages during upgrades, and provides procedures for recovering and continuing.

## A snapshot with the given tag already exists

When an upgrade attempt fails, the upgrade script does not remove the snapshot it creates at the beginning of the upgrade process. Use this procedure to remove the tag of the pre-upgrade snapshot and restart the upgrade. Untagged snapshots are removed when their time-to-live (TTL) expires. The TTL value is defined by the `SERVICED_SNAPSHOT_TTL` variable in the Control Center configuration file.

- 1 Log in to the Control Center master host as a user with `serviced` CLI privileges.
- 2 Create a variable for the identifier of the tenant application.

```
myTenant=$(serviced service list Zenoss.resmgr --format='{{.ID}}')
```

- 3 Display a list of all Control Center snapshots, with their tags.

```
serviced snapshot list -t
```

Example result, truncated to save space:

Snapshot	Description	Tags
xm5mtezbyo2_20160211-220535.480		preupgrade-resmgr-5.2.0

The snapshot identifier is shown in the first column.

- 4 Remove the tag of the pre-upgrade snapshot.  
Replace *Tag-Name* with the name of the pre-upgrade snapshot that was displayed in the previous step:

```
serviced snapshot untag ${myTenant} Tag-Name
```

- 5 Restart the upgrade script.

```
/root/5.3.x/upgrade-resmgr.sh
```

## C

## Installing an application template

---

This appendix includes procedures for downloading and installing the most recent Resource Manager application template. The latest template is not needed to perform an upgrade, and is included in appliance upgrades. Use the procedures in this appendix if you plan to delete a deployed application template and then redeploy with a newer version of the template. (For example, in a development or staging environment.)

### Downloading the template package

---

To perform this procedure, you need:

- A workstation with internet access.
- Permission to download files from the [File Portal - Download Zenoss Enterprise Software](#) site. Zenoss customers may request permission by filing a ticket at the [Zenoss Support](#) site.
- A secure network copy program.

Use this procedure to download the required files to a workstation and then copy the files to the Control Center master host.

Perform these steps:

- 1 In a web browser, navigate to the [File Portal - Download Zenoss Enterprise Software](#) site.
- 2 Log in with the account provided by Zenoss Support.
- 3 Download the template package file.  
`zenoss-resmgr-service-5.3.1-1.noarch.rpm`
- 4 Use a secure copy program to copy the package file to the Control Center master host.

### Installing the application template

---

Use this procedure to install the Resource Manager template on a Control Center master host.

- 1 Log in to the target host as `root`, or as a user with superuser privileges.
- 2 Change directory to the directory in which the template package file is located.
- 3 Install the template.

```
yum install ./zenoss-resmgr-service-5.3.1-1.noarch.rpm
```

The template file is stored in `/opt/serviced/templates`.

# ZenPack considerations

# D

This appendix describes special considerations for upgrading ZenPacks. For more information about ZenPacks, see the [ZenPack catalog](#).

## Alternate naming convention for LUN- and VM-specific metrics

This information applies to the VMware vSphere ZenPack. By default, LUN- and VM-specific metrics are written under the following naming convention:

```
<device-id>/<metric-name>
```

To improve retrieval speed of metrics (graphing speed) for vSphere instances with thousands of LUNs or virtual machines, you can enable the following alternate naming convention:

```
<device-id>/<component-id>/<metric-name>
```

**Note** Changing the naming convention causes historical metrics to become inaccessible.

The following configuration properties support the alternate convention:

- `zVSPHERELUNContextMetric` - Controls whether to use LUN-specific metric names when storing performance data.

For example, with this configuration property enabled, the metric name `diskReadRequests_diskReadRequests` changes as follows:

Old name:

```
sol-vcenter/diskReadRequests_diskReadRequests
```

New name:

```
sol-vcenter/HostSystem_host-134_uaa.600508e001da816aa59a72903/
diskReadRequests_diskReadRequests
```

- `zVSPHEREVMContextMetric` - Controls whether to use VM-specific metric names when storing performance data.

For example, with this configuration property enabled, the metric name `cpuUsageAvg_cpuUsageAvg` changes as follows:

Old name:

```
vxchnge-vcenter/cpuUsageAvg_cpuUsageAvg
```

New name:

```
vxchnge-vcenter-02/VirtualMachine_vm-2556/cpuUsageAvg_cpuUsageAvg
```

For more information, see the **VMware vSphere ZenPack** in the [ZenPack catalog](#).

## Enabling the alternate metric naming convention

This procedure requires a restart the `zenvsphere` daemon.

- 1 Log in to the Resource Manager browser interface.
- 2 Navigate to the **Infrastructure** page.
- 3 In the left pane, choose **vSphere**.
- 4 In the main pane, click the name of the VMware vSphere device.
- 5 In the left pane, choose **Configuration Properties**.
- 6 In the main pane, **Name** column, double-click the vSphere context metric name.
- 7 In the **Edit Config Property** dialog box, check **Store *x* metrics by context**, and then click **Submit**.  
The property value changes to **true**.
- 8 Restart the `zenvsphere` daemon.