Best Practices for Zerto in High Availability

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ZVR-ZHA-7.5
Best Practices for Zerto in High Availability

This document describes best practices for high availability and decreasing downtime using Zerto. See the following sections:

- VMware Clusters on page 3
- Zerto Virtual Manager Failover Cluster on page 4

VMware Clusters

A cluster is a group of tightly coupled hosts that work closely together so that in many respects they can be viewed as though they are a single computer. Clusters are used for high availability and load balancing. With a cluster, you define two or more physical machines that will provide resources for the hosts that are assigned to that cluster. By using clusters, you can achieve high availability and load balancing of virtual machines. Load balancing is referred to as DRS (Distributed Resource Scheduler) by VMware.

Thus, you use clusters for the following:

- If one of the physical hosts goes down, the other physical host starts up the VMs that the original host was running (high availability).
- If one physical host is over utilized by a VM, that VM is moved to the other physical host (DRS).

Both of these features use vMotion to move these virtual guests from one system to another.

You cannot apply high availability nor DRS to a Virtual Replication Appliance (VRA).

See also:

- VMware High Availability (VMHA) on page 3
- DRS on page 4

VMware High Availability (VMHA)

VMware high availability decreases downtime and improves reliability with business continuity by enabling another ESX/ESXi host to start up virtual machines that were running on another ESX/ESXi host that went down.

High availability is automatically disabled by Zerto while updating recovered virtual machines in the recovery site from the VRA journal. After the promotion of the data from the journal to the virtual machine completes, high availability is automatically re-enabled.

The HA configuration can include admission control to prevent virtual machines being started if they violate availability constraints. If this is the case, then a failover, test failover or migration of the virtual machines in a VPG to the cluster with this configuration will fail, if the availability constraints are violated when the virtual machines are recovered. It is recommended to test the failover, as described in See Testing Recovery on page 1, to ensure recovery will succeed, even when HA is configured with admission control.
Recommended Best Practices for High Availability

Zerto recommends the following best practices:

• Install Zerto on a dedicated virtual machine with a dedicated administrator account and with VMware High Availability (HA) enabled.
  • Avoid installing other applications on this machine.
  • If other applications are installed, the Zerto Virtual Manager service must receive enough resources and HA must remain enabled.

DRS

VMware DRS enables balancing computing workloads with available resources in a cluster.

DRS is automatically disabled by Zerto while updating recovered virtual machines in the recovery site from the journal for these recovered virtual machines. After the promotion of the data from the journal to the recovered virtual machine completes, DRS is automatically re-enabled.

If DRS is disabled for the site, VMware removes all resource pools in the site. If the recovery was defined to a resource pool, recovery will be to any one of the hosts in the recovery site with a VRA installed on it.

Note: If the site is defined in Zerto Cloud Manager, only a resource pool can be specified and the resource pool must also have been defined in Zerto Cloud Manager. For details about Zerto Cloud Manager, refer to Zerto Cloud Manager Administration Guide.

Zerto Virtual Manager Failover Cluster

What is Zerto’s Failover Cluster?

When you have a Zerto system, you want your system to always be up and running, and to never go down. But, as with all systems, your Zerto system will need maintenance, (like security patches, and operating system updates) and will need to be upgraded with the latest Zerto releases.

In order to perform these maintenance procedures, Zerto has integrated with Microsoft’s Failover Cluster feature and now allows their customers to install Zerto Virtual Manager in a clustered environment.

With a clustered ZVM environment running, you are able to reduce downtime when performing maintenance procedures such as:
• Operating System maintenance
• Upgrade your Zerto Virtual Manager

Clustered Concepts

<table>
<thead>
<tr>
<th>TERM OR PHRASE</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>clustered role</td>
<td>Clustered applications and services</td>
</tr>
<tr>
<td>node</td>
<td>Clustered nodes (meaning, servers) are connected by physical cables and by software. If one or more of the cluster nodes fail, other nodes begin to provide service continuously.</td>
</tr>
<tr>
<td>Active/passive node</td>
<td>A resources cluster where only one instance is active at any given time.</td>
</tr>
<tr>
<td>Zerto Failover Cluster Role Mover</td>
<td>The Zerto Failover Cluster Role Mover tool facilitates an unobtrusive move of the clustered role from one node to the other, with minimal consequences to Zerto Virtual Manager.</td>
</tr>
<tr>
<td>switch node</td>
<td></td>
</tr>
<tr>
<td>Microsoft Failover Clustering</td>
<td>A Windows Server feature that enables you to group multiple servers together into a fault-tolerant cluster (renamed in Windows Server 2008 from Microsoft Cluster Service (MSCS))</td>
</tr>
<tr>
<td>Minimal downtime</td>
<td>The time it takes for the ZVR to start.</td>
</tr>
</tbody>
</table>

Use Cases

With your clustered Zerto Virtual Manager environment running, you are able to perform the following procedures:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
<th>Follow procedure...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System maintenance</td>
<td>You have a running clustered Zerto Virtual Manager, which has one active and one passive node.</td>
<td>Performing Maintenance on your Zerto Virtual Manager Operating System</td>
</tr>
<tr>
<td></td>
<td>You need to perform operating system maintenance on both of the nodes.</td>
<td></td>
</tr>
<tr>
<td>Zerto Virtual Manager upgrade</td>
<td>You have a running clustered Zerto Virtual Manager, which has one active and one passive node.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>You need to perform ZVM upgrade on both of the nodes.</td>
<td></td>
</tr>
</tbody>
</table>
Performing Maintenance on your Zerto Virtual Manager Operating System

Use the following procedure to perform operating system maintenance on both of the ZVM clustered nodes.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| Step 1: | Log into the **passive** node, and perform your maintenance operation. Zerto continues to run on the active node.  
When the maintenance operation is complete, and the passive node is back online, continue to the next step. |
| Step 2: | Switch the nodes using the procedure Using the Zerto Failover Cluster Role Mover Tool on page 6.  
Outcome: The passive node which was updated with the maintenance operation is now the **active** node. |
| Step 3: | Connect to the now passive node (in other words, the node which still needs to be maintained) and perform the same maintenance operation. |

Using the Zerto Failover Cluster Role Mover Tool

The Zerto Failover Cluster Role Mover tool facilitates an unobtrusive move of the clustered role from one node to the other, with minimal consequences to Zerto Virtual Manager.

The user defines a timespan, during which time the tool will identify the best available point in time to move the clustered role. Although it is possible to use the Failover Cluster Manager to move a role from one node to the other, the Zerto Failover Cluster Role Mover can identify a time which will cause minimal interference to Zerto Virtual Manager.

**To use the Zerto Failover Cluster Role Mover Tool:**

1. Copy and replace the **tweak.txt** file to the node to which you are moving.
2. On the relevant cluster node, navigate to **Zerto > Zerto**.
3. Right-click the file **ZFailoverClusterRoleMover.exe**, and select **Run as administrator**.  
   A command prompt window opens.
The tool runs with the default timespan settings.

**Tip:**

- To change the default timespan, see To change the default timespan settings on page 7.
- You can stop the tool from running by entering Ctrl+C.

4. When the tool completes moving the role from one node to the other, a success or failure message appears.

5. If a failure message appears, verify the following before trying again:
   - The active node is up (and not down).
   - That no failover or retention activities are running on the active node.

6. If a failure message appears again, call Zerto Support.

**To change the default timespan settings**

1. Open and Command Prompt, and Run as administrator.

2. Change directory to Zerto > Zerto.

3. To view the tool help, enter:
   ```
   2FailoverClusterRoleMover.exe --help
   ```
4. To change the default time span (in minutes), enter:

   ```
   ZFailoverClusterRoleMover.exe -t <enter a new timespan>
   ```

5. You can stop the tool from running by entering `Ctrl+C`.

Switching from a Non-Clustered (Standard) Environment to a Clustered Environment

Before switching from a non-Clustered (standard) environment to a clustered environment, review the Considerations and Before you Begin sections below.

Considerations

- This procedure can be performed only when an external SQL Server is used.
- The ZVM IP will be used as the Cluster IP. It is configured in the Zerto role IP. This is used so as to maintain connections to existing peer sites and to retain VPG configurations.

If you change the IP, you will need to pair all the peer sites, and reconfigure the VPGs.

**Note:**

When relevant, you are able to switch back from a clustered environment to a non-clustered environment.

Go to Switching from a Clustered Environment to a Non-Clustered (Standard) Environment.

Before you Begin

Make sure:

- You have decided on the following, and have the information accessible:
  - Cluster Name
Best Practices for Zerto in High Availability

- Cluster IP
- Zerto Role Name
- Zerto Role IP

You have:
- Access to the Registry.
- (Recommended) A backup of the Registry

To Switch from a Non-Clustered (Standard) Mode to a Clustered Mode:

1. In the Failover Cluster Manager, create a cluster. Review the Microsoft procedure.

2. In one of the cluster nodes, on the VM, install ZVM. See First Clustered Node - Installing Zerto Virtual Replication on page 11.

3. In the Failover Cluster Manager, create an empty role. To do this, right click the roles menu on the left pane, and select Create Empty Role.

   When the role is created, it is automatically in the state, Running.

4. Name the Role:
   a. Right-click the role, and select Properties.
   b. In the General tab, define the role Name.
   c. Click Apply.

5. Configure Failover settings.
   a. Navigate to the Failover tab and define the following:

   - Maximum restarts in the specified period: 12
   - Period: 1 hour

   b. In the Failback area, select Prevent failback.
   c. Click Apply, then click OK.

6. Stop the role. To do this, right-click the role, and select Stop Role.

7. Select the node where ZVM is not installed, and install ZVM. See Second Clustered Node - Installing Zerto Virtual Replication on page 20.

8. Copy and replace the tweak.txt file from the first node to the second node.

9. Select the node where ZVM is installed, and Stop all Zerto Services. Both nodes now have ZVM.

10. Reconfigure the Zerto Services Startup Type from Automatic to Manual. To do this:
   a. Open the Services manager.
   b. Select and right-click the service Zerto Virtual Manager.
c. Navigate to Properties > General tab, Startup type drop-down list, and select Manual.

d. Repeat steps Select and right-click the service Zerto Virtual Manager. on page 9 and Navigate to Properties > General tab, Startup type drop-down list, and select Manual. on page 10 for the services Zerto Virtual Backup Appliance, and Zerto Online Services Connector.

11. Change the Log On modes to a domain account for the services Zerto Virtual Manager and Zerto Virtual Backup Appliance. To do this:
   a. Navigate to Properties > Log On tab.
   b. Select This account, then enter the same domain account credentials which you entered when you installed the first clustered node, First Clustered Node - Installing Zerto Virtual Replication on page 11.

12. Update the Registry. Go to the Registry, navigate to HKEY_LOCAL-MACHINE > SOFTWARE > Zerto > Zerto Virtual Replication, and create the FailOverCluster key with it’s sub-keys.
   a. Right-click the key Zerto Virtual Replication, and select New > Key, then enter FailoverCluster.
   b. Right-click the key FailoverCluster, and select New > Key, then enter ClusterDetails.
   c. Right-click the key FailoverCluster, and select New > Key, then enter ZvmRoleDetails.

13. Select the ClusterDetails sub-key, then set the cluster IP value:
   a. In the right pane, right-click and select New > String value.
   b. Enter the value name: IP
   c. Right-click IP, select Modify, then enter the value data: Cluster IP

14. Select the ClusterDetails sub-key, then set the cluster name value:
   a. In the right pane, right-click and select New > String value.
   b. Enter the value name: Name
   c. Right-click Name, select Modify, then enter the value data: Cluster Name

15. Select the ZvmRoleDetails sub-key, then set the ZVM (Zerto?) role IP value:
   a. In the right pane, right-click and select New > String value.
   b. Enter the value name: IP
   c. Right-click IP, select Modify, then enter the value data: Role IP

16. Select the ZvmRoleDetails sub-key, then set the ZVM role name value:
   a. In the right pane, right-click and select New > String value.
   b. Enter the value name: Name
   c. Right-click Name, select Modify, then enter the value data: (Zerto?) Role Name

17. Configure the ZVM Role on the cluster. See Configuring the Role with Zerto Services on page 29.
First Clustered Node - Installing Zerto Virtual Replication

Use the following procedure to configure ZVR on the first clustered node.

Before you Begin:

- **vCD environments only**: When you install and configure an AMQP Server for Zerto Virtual Replication, make sure you enter the Cluster role IP in the field AMQP host.

To install Zerto Virtual Manager on the first clustered node:

1. On the **first cluster node**, run the Zerto Installer.
   - If the required version of **Microsoft .NET Framework** is not installed, you are prompted to install the required version of .NET Framework, which is **included** as part of the Zerto installation package.
     
     After .NET is installed, the machine **automatically restarts** and the Zerto installation begins.

2. Follow the wizard until the Installation Type window appears, then select the option, **Custom Installation**.

   The Choose Stand-alone Or Clustered Installation window appears.

   ![Choose Stand-alone Or Clustered Installation](image)

   - **Clustered Installation**
     - Install a Zerto Software instance to run in a fail-over cluster.
     - Before proceeding, review Zerto documentation for requirements & prerequisites.

3. Select **Clustered Installation**, then click **Next**.

   The Windows Service User window appears.

   This is the account which will run the Zerto Virtual Manager Service.

   **Note:**

   The user who runs the Windows Zerto Virtual Manager service must be configured with permission to *logon as a service*.

   ![Windows Service User](image)
4. **Best Practice:** Enter the domain username and password of the user who will run the Zerto Virtual Manager Service.

   **Note:**
   Make sure that the domain user has the required privileges.

5. Click **NEXT**.

   The Database Type window appears.

   ![Database Type Window](image)

   - In the Database Type window you connect the first node to an external Microsoft SQL Server. This is the same database which will be used for the second node.
   - Do not select Connect to an existing database - that option will be used when you install Zerto on the second node, later on.

6. Connect to the external database by selecting **Connect to an external Microsoft SQL Server or Microsoft SQL Server Express database**, then enter the SQL Server Authentication details.

   a. **Server Name:** The domain name and server instance to connect to, with the format: `<server_name><instance_name>` or `<Server_IP><instance_name>`

   b. Specify an authentication method. Select one of the following:

      - **Windows Authentication**
      - or -
      - **SQL Server Authentication**

   c. If you selected **Windows Authentication**: This option is enabled only if a specific service user account was specified in Windows Service User, in step 4 on page 12. In this case, the service account name and password are used.

   d. If you selected **SQL Server Authentication**, the Test Authentication button is also displayed. Define the following:
• **Username:** The user name for the SQL Server database.
  
• **Password:** A valid password for the given user name.
  
  The installer checks whether it can connect to the specified database with the specified username and password.

e. Click **TEST CONNECTION.** You can only continue when the authentication is successful.

7. Click **NEXT.**

   The Cluster Details window appears.

```
Cluster Details
Set the cluster parameters to be used by the Zerto Software clustered installation.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster Name</td>
<td>The exact name of the cluster, as it was created in the Failover Cluster Manager.</td>
</tr>
<tr>
<td>Cluster IP</td>
<td>The IP of the cluster, as it was defined in the Failover Cluster Manager.</td>
</tr>
<tr>
<td>Zerto role name</td>
<td>The exact name of the role, as it appears in the Failover Cluster Manager.</td>
</tr>
<tr>
<td>Zerto role IP</td>
<td>The IP of the role, as it appears in the Failover Cluster Manager.</td>
</tr>
</tbody>
</table>
```

8. Enter the cluster details:

   - **Cluster Name**: The exact name of the cluster, as it was created in the Failover Cluster Manager.
   - **Cluster IP**: The IP of the cluster, as it was defined in the Failover Cluster Manager.
   - **Zerto role name**: The exact name of the role, as it appears in the Failover Cluster Manager.
   - **Zerto role IP**: The IP of the role, as it appears in the Failover Cluster Manager.

9. Click **NEXT.** The vCenter Server Connectivity window appears.
10. Enter connection settings that the Zerto Virtual Manager uses to communicate with the vCenter Server:

- **IP/Host name**: The IP address or host name of the machine where the vCenter runs.
- **Username**: The user name for a user with administrator level privileges to the vCenter Server. The name can be entered using either of the following formats:
  - `username`
  - `domain/username`
- **Password**: A valid password for the given user name.

11. Click **NEXT**.

- For further steps on vCloud Direct (vCD) Connectivity, continue to The vCloud Director Connectivity window is displayed. on page 14.
- Otherwise, go to The Zerto Virtual Manager Site Details window appears, where you define general information about the site. on page 16.

12. The vCloud Director Connectivity window is displayed.
13. When using vCloud Director and you have installed an AMQP server, click the **Enable vCD BC/DR** checkbox and enter the VMware vCloud Director access details:

- **IP / Host name:** The IP address or host name of the machine where vCD runs. When connecting to vCD with multiple cells, enter the virtual IP for the network load balancing used by the cells.
- **Username:** The user name for an administrator to vCD.
- **Password:** A valid password for the given user name.
- **AMQP Username:** The user name for the AMQP server.
- **AMQP Password:** A valid password for the given AMQP user name.

If the vCD connection settings are not specified, for example, when you do not have an AMQP server installed, they can be set in the **Advanced Settings** dialog in the **Site Configuration** panel, in the Zerto User Interface after installation, as described in the Zerto Cloud Manager Administration Guide.

**Tip:**

Zerto provides an AMQP installation kit if you do not have one installed for vCD.

- Run **ZertoAMQPInstallWizard.exe** as described in the Zerto Cloud Manager Administration Guide, and enter the following credentials:

- **Username:** The AMQP user account Zerto will use. RabbitMQ prior to version 3.3 installs with a default administrator user: guest. In RabbitMQ version 3.3 and higher, specify a user with administrator privileges.
• **Password:** The password for the user. RabbitMQ prior to version 3.3 installs with a default password of guest.

14. Click **NEXT**.

15. The Zerto Virtual Manager Site Details window appears, where you define general information about the site.

```
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Name</td>
<td>A name to identify the site. This name is displayed in the Zerto User Interface. This field is mandatory.</td>
</tr>
<tr>
<td>Site Location</td>
<td>(Optional) Information such as the address, or name of the site to identify it.</td>
</tr>
<tr>
<td>Contact Name</td>
<td>(Optional) The name of the person to contact if a need arises.</td>
</tr>
<tr>
<td>Contact Email</td>
<td>(Optional) The email address to contact if a need arises.</td>
</tr>
<tr>
<td>Contact Phone</td>
<td>(Optional) The phone number to contact if a need arises.</td>
</tr>
</tbody>
</table>
```

16. Enter the site details:

17. Click **NEXT**.

The Online Services and Zerto Mobile Application window appears.
Online Services and Zerto Mobile Application

Online services and the Zerto Mobile Application enhance your overall experience with Zerto and its products, allowing you to monitor your environments anytime, anywhere.

The service requires a valid support contract for the Zerto solution, and for environment data to be sent periodically to Zerto.

Such non-publicly identifiable data includes among other things, Zerto licensing information, Zerto version information, and environment statistics (number of virtual machines, number of replicated virtual machines, number of VPGs, etc.)

For more information, please see the Zerto Privacy Policy statement at http://www.zerto.com/privacy-policy

Enable Online Services and Zerto Mobile Application

The Online Services and Zerto Mobile Application are enabled by default.

- You can disable these services by deselecting Enable Online Services and Zerto Mobile Application.

18. Click NEXT.

The Zerto Virtual Manager Communication window appears.

In this window you define the connection settings (ports) which are used by Zerto Virtual Manager to communicate with Zerto Virtual Managers on other sites.

Zerto Virtual Manager Communication

Zerto Virtual Manager (ZVM) communicates with other ZVMs to manage replication between sites.

Enter the connection settings to be used by ZVM to communicate with ZVMs on other sites.

Warning: If the protected site recovers to a site maintained by a cloud service provider, do not change the TCP port values.

IP / Host Name Used by the Zerto User Interface

HTTP Port (ZVM) 9080
HTTPS Port (clients <-> ZVM) 9669
TCP Port (ZVM <-> ZVM) 9081
TCP Port (ZVM -> VBA) 9180
<table>
<thead>
<tr>
<th>Port Description Parameter</th>
<th>Default Port Number</th>
<th>Communication Direction</th>
<th>Between...</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP/Host Name Used by the Zerto User Interface</td>
<td>NA</td>
<td></td>
<td>Zerto User Interface - and - Zerto Virtual Manager</td>
<td>IP to access the Zerto Virtual Manager from the Zerto User Interface. If the machine has more than one NIC, select the appropriate IP from the list. Otherwise, the IP that is displayed is the only option.</td>
</tr>
<tr>
<td>HTTP Port (ZVM)</td>
<td>9080</td>
<td>Inbound</td>
<td>Zerto Virtual Manager - and - Zerto Internal APIs, and Cmdlets</td>
<td></td>
</tr>
<tr>
<td>HTTP Port (clients&lt;&gt;ZVM)</td>
<td>9669</td>
<td>Inbound</td>
<td>Zerto User Interface - and - Zerto Virtual Manager</td>
<td></td>
</tr>
<tr>
<td>Port Description Parameter</td>
<td>Default Port Number</td>
<td>Communication Direction</td>
<td>Between...</td>
<td>Comments</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| TCP Port (ZVM<->ZVM)       | 9081                | Inbound and outbound     | Zerto Virtual Manager - and - Zerto Virtual Manager | • When both the protected and recovery sites belong to the same enterprise:  
• If you change this value, when pairing sites, use the TCP port value specified here. Pairing the sites is described in Zerto Installation Guide for Microsoft Hyper-V or VMware vSphere, in the section **Pairing Sites**.  
• When an enterprise uses a cloud service provider to supply disaster recovery services:  
• Do not change this value |
| TCP Port (ZVM->VBA)        | 9180                | Inbound and outbound     | Zerto Virtual Manager - and - Virtual Backup Appliance (VBA) | |

19. Click **NEXT**.

The installation performs checks to verify that the installation can proceed successfully.

20. You must **exclude** the following folders from antivirus scanning:

   Zerto Virtual Replication
%ProgramData%\Zerto\Data\zvm_db.mdf
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto.Zvm.Service.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto.Vba.VbaService.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto Online Services\Connector\Zerto.Online.Services.Connector.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Embedded DB Manager\Service\Zerto.LocalDbInstanceManagerService.exe

Failure to do so may lead to the Zerto Virtual Replication folder being incorrectly identified as a threat and in some circumstances corrupt the Zerto Virtual Replication folder.

21. Add the machine to the relevant host boot configuration, so that on starting up the host, this machine, running the Zerto Virtual Manager, is also powered on automatically.

Note: If the vSphere Client console was open during the installation, close it and reopen it to ensure you have the Zerto Virtual Manager user interface loaded.


Second Clustered Node - Installing Zerto Virtual Replication

Use the following procedure to configure ZVR on the second clustered node.

Before You Begin:

• Verify you installed and configured Zerto Virtual Manager on the first node.

• **vCD environments only**: When you install and configure an AMQP Server for Zerto Virtual Replication, make sure you enter the Cluster role IP in the field **AMQP host**.

To install Zerto Virtual Manager on the second clustered node:

1. Copy the **storage_properties.xml** file from the first node, to a folder in the second node.

2. On the **second cluster node**, run the Zerto Installer.

   • If the required version of **Microsoft .NET Framework** is not installed, you are prompted to install the required version of .NET Framework, which is **included** as part of the Zerto installation package.

   After .NET is installed, the machine **automatically restarts** and the Zerto installation begins.

3. Follow the wizard until the Installation Type window appears, then select the option, **Custom Installation**.

   The Choose Stand-alone Or Clustered Installation window appears.
4. Select **Clustered Installation**, then click **Next**.

The Windows Service User window appears.

This is the account which will run the Zerto Virtual Manager Service.

**Note:**

The user who runs the Windows Zerto Virtual Manager service must be configured with permission to 'logon as a service'.

<table>
<thead>
<tr>
<th>Windows Service User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select the user who will run the Windows Zerto Virtual Manager service.</td>
</tr>
<tr>
<td>Run the installed service as:</td>
</tr>
<tr>
<td>This account</td>
</tr>
<tr>
<td>Password</td>
</tr>
<tr>
<td>Confirm Password</td>
</tr>
</tbody>
</table>

The installer will grant the “Logon as Service” right to this account if it is not already granted.

5. **Best Practice:** Enter the **domain** username and password of the user who will run the Zerto Virtual Manager Service.

**Note:**

Make sure that the domain user has the required privileges.

6. Click **NEXT**.

The Database Type window appears.
You now configure the database for the **second node**.

7. Select **Connect to an existing database using a "storage_properties.xml" file**, then browse to the `storage_properties.xml` file which you copied over to a folder in the second node in **step 1 on page 20**.

   This automatically connects the database from the first node to the second node.

8. Click **TEST CONNECTION**.

9. **You can only continue when the authentication is successful.**

10. Click **NEXT**. The **Cluster Details** window appears.

11. Enter the cluster details, **exactly as they were entered on the first node**:

    - **Cluster Name**: The exact name of the cluster, as it was created in the Failover Cluster Manager.
    - **Cluster IP**: The IP of the cluster, as it was defined in the Failover Cluster Manager.
**Zerto role name**  The exact name of the role, as it was created in the Failover Cluster Manager.

**Zerto role IP**  The IP of the first role, at it appears in the Failover Cluster Manager.

12. Click **NEXT**. The vCenter Connectivity window appears.

13. Enter connection settings that the **Zerto Virtual Manager** uses to communicate with the vCenter Server:

   - **IP/Host name**: The IP address or host name of the machine where the vCenter runs.
   - **Username**: The user name for a user with administrator level privileges to the vCenter Server. The name can be entered using either of the following formats:
     - username
     - domain/username
   - **Password**: A valid password for the given user name.

14. Click **NEXT**.

   - For further steps on vCloud Direct (vCD) Connectivity, continue to step 15 on page 23.
   - Otherwise, go to step 18 on page 25.

15. The vCloud Director Connectivity window is displayed.
16. When using vCloud Director and you have installed an AMQP server, click the Enable vCD BC/DR checkbox and enter the VMware vCloud Director access details:

- **IP / Host name**: The IP address or host name of the machine where vCD runs. When connecting to vCD with multiple cells, enter the virtual IP for the network load balancing used by the cells.
- **Username**: The user name for an administrator to vCD.
- **Password**: A valid password for the given user name.
- **AMQP Username**: The user name for the AMQP server.
- **AMQP Password**: A valid password for the given AMQP user name.

If the vCD connection settings are not specified, for example, when you do not have an AMQP server installed, they can be set in the Advanced Settings dialog in the Site Configuration panel, in the Zerto User Interface after installation, as described in the Zerto Cloud Manager Administration Guide.

---

☑️ **Tip**:

Zerto provides an AMQP installation kit if you do not have one installed for vCD.

- Run `ZertoAMQPInstallWizard.exe` as described in the Zerto Cloud Manager Administration Guide, and enter the following credentials:

- **Username**: The AMQP user account Zerto will use. RabbitMQ prior to version 3.3 installs with a default administrator user: guest. In RabbitMQ version 3.3 and higher, specify a user with administrator privileges.

- **Password**: The password for the user. RabbitMQ prior to version 3.3 installs with a default password of guest.

17. Click **NEXT**.
18. The Zerto Virtual Manager Site Details window appears, where you define general information about the site.

![Site Details Window](image)

19. Enter the site details:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Name</td>
<td>(Optional) A name to identify the site. This name is displayed in the Zerto User Interface</td>
</tr>
<tr>
<td>Site Location</td>
<td>(Mandatory) Information such as the address, or name of the site to identify it.</td>
</tr>
<tr>
<td>Contact Name</td>
<td>(Mandatory) The name of the person to contact if a need arises.</td>
</tr>
<tr>
<td>Contact Email</td>
<td>(Optional) The email address to contact if a need arises.</td>
</tr>
<tr>
<td>Contact Phone</td>
<td>(Optional) The phone number to contact if a need arises.</td>
</tr>
</tbody>
</table>

20. Click NEXT.

The Online Services and Zerto Mobile Application window appears.

**Online Services and Zerto Mobile Application**

Online services and the Zerto Mobile Application enhance your overall experience with Zerto and its products, allowing you to monitor your environments anytime, anywhere.

The service requires a valid support contract for the Zerto solution, and for environment data to be sent periodically to Zerto.

Such non-publicly identifiable data includes among other things, Zerto licensing information, Zerto version information, and environment statistics (number of virtual machines, number of replicated virtual machines, number of VPGs, etc.)

For more information, please see the Zerto Privacy Policy statement at [http://www.zerto.com/privacy-policy](http://www.zerto.com/privacy-policy)

- [x] Enable Online Services and Zerto Mobile Application
The Online Services and Zerto Mobile Application are enabled by default.

- You can disable these services by deselecting Enable Online Services and Zerto Mobile Application.

21. Click NEXT.

The Zerto Virtual Manager Communication window appears.

In this window you define the connection settings (ports) which are used by Zerto Virtual Manager to communicate with Zerto Virtual Managers on other sites.

![Zerto Virtual Manager Communication](image)

- **IP / Host Name Used by the Zerto User Interface**: 10.171.64.204
- **HTTP Port (ZVM)**: 9080
- **HTTPS Port (clients<>ZVM)**: 9669
- **TCP Port (ZVM<>ZVM)**: 9081
- **TCP Port (ZVM -> VBA)**: 9180
<table>
<thead>
<tr>
<th>PORT DESCRIPTION PARAMETER</th>
<th>DEFAULT PORT NUMBER</th>
<th>COMMUNICATION DIRECTION</th>
<th>BETWEEN...</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| IP/Host Name Used by the Zerto User Interface | NA |  | Zerto User Interface  
- and -  
Zerto Virtual Manager |  |
| HTTP Port (ZVM) | 9080 | Inbound | Zerto Virtual Manager  
- and -  
Zerto internal APIs, and Cmdlets |  |
| HTTP Port (clients<->ZVM) | 9669 | Inbound | Zerto User Interface  
- and -  
Zerto Virtual Manager |  |
<table>
<thead>
<tr>
<th>PORT DESCRIPTION PARAMETER</th>
<th>DEFAULT PORT NUMBER</th>
<th>COMMUNICATION DIRECTION</th>
<th>BETWEEN...</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| TCP Port (ZVM<->ZVM)        | 9081                | Inbound and outbound     | Zerto Virtual Manager - and - Zerto Virtual Manager | • When both the protected and recovery sites belong to the same enterprise:  
• If you change this value, when pairing sites, use the TCP port value specified here. See the section Pairing Sites.  
• When an enterprise uses a cloud service provider to supply disaster recovery services:  
• Do not change this value |
| TCP Port (ZVM->VBA)         | 9180                | Inbound and outbound     | Zerto Virtual Manager - and - Virtual Backup Appliance (VBA) | |

22. Click NEXT.

The installation performs checks to verify that the installation can proceed successfully.

23. You must exclude the following folders from antivirus scanning:
Zerto Virtual Replication
%ProgramData%\Zerto\Data\zvm_db.mdf
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto.Zvm.Service.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto.Vba.VbaService.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Zerto Online Services Connector\Zerto.Online.Services.Connector.exe
C:\Program Files\Zerto\Zerto Virtual Replication\Embedded DB Manager Service\Zerto.LocalDbInstanceManagerService.exe

Failure to do so may lead to the Zerto Virtual Replication folder being incorrectly identified as a threat and in some circumstances corrupt the Zerto Virtual Replication folder.

24. Add the machine to the relevant host boot configuration, so that on starting up the host, this machine, running the Zerto Virtual Manager, is also powered on automatically.

Note: If the vSphere Client console was open during the installation, close it and reopen it to ensure you have the Zerto Virtual Replication user interface loaded.


Configuring the Role with Zerto Services

Use the following procedures to add Zerto services to the role, and to configure the role for Zerto Virtual Manager - in the following order:

1. Adding and Configuring the Zerto Virtual Manager Service on page 29
2. Adding and Configuring the Zerto Virtual Backup Appliance Service on page 30
3. Adding and Configuring the Online Services Connector Service on page 31

Adding and Configuring the Zerto Virtual Manager Service

Procedure 1: To add the Zerto Virtual Manager service on page 29

Procedure 2: To configure the Zerto Virtual Manager service on page 29

Procedure 1: To add the Zerto Virtual Manager service

1. Select the role which you created in Creating a Role for the Zerto Services.
2. Right-click the role and select Add Resource > Generic Service.
3. From the list of services, select Zerto Virtual Manager service, then click Next.
4. Complete the wizard.
1. Right-click the service **Zerto Virtual Manager**, and select **Properties**.

2. Define the service’s startup parameter:
   a. Click the **General** tab.
   b. In the **Startup Parameters** field enter the following parameter: /RUNASPARTOFCLUSTER

3. Configure the service’s dependencies:
   a. Click the **Dependencies** tab.
   b. In the first row, select the network resource name, which you entered in **Procedure 2: To add and configure a network resource to the role**, and click **Apply**.

4. Define the Policies. Navigate to the **Policies** tab, and configure the following:

<table>
<thead>
<tr>
<th>If resource fails, attempt restart on current node</th>
<th>Select this option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period for restart</td>
<td>15:00 (minutes)</td>
</tr>
<tr>
<td>Maximum restarts in the specified period</td>
<td>10</td>
</tr>
<tr>
<td>Delay between restarts</td>
<td>30 (seconds)</td>
</tr>
<tr>
<td>If restart is unsuccessful, fail over all resources in this Role</td>
<td>Select this option</td>
</tr>
<tr>
<td>If all the restart attempts fail, begin restarting again after the specified period</td>
<td>Deselect this option</td>
</tr>
</tbody>
</table>

5. Proceed to **Adding and Configuring the Zerto Virtual Backup Appliance Service on page 30**.

**Adding and Configuring the Zerto Virtual Backup Appliance Service**

**Procedure 1: To add the Zerto Virtual Backup Appliance service on page 30**

**Procedure 2: To configure the Zerto Virtual Backup Appliance service on page 30**

**Procedure 1: To add the Zerto Virtual Backup Appliance service**

1. Select and right-click the role, then navigate to **Add Resource > Generic Service**.
2. Select the service **Zerto Virtual Backup Appliance**, then click **Next**.
3. Complete the wizard.

**Procedure 2: To configure the Zerto Virtual Backup Appliance service**

1. Right-click the service **Zerto Backup Appliance**, and select **Properties**.
2. Configure the service’s dependencies:
   a. Click the **Dependencies** tab.
b. In the first row, select Zerto Virtual Manager, and click **Apply**.

3. **Define the Policies.** Navigate to the **Policies** tab, and configure the following:

| If resource fails, attempt restart on current node | Select this option |
| Period for restart | 15:00 (minutes) |
| Maximum restarts in the specified period | 10 |
| Delay between restarts | 30 (seconds) |
| If restart is unsuccessful, fail over all resources in this Role | Deselect this option |
| If all the restart attempts fail, begin restarting again after the specified period | Select this option |

4. **Proceed to** Adding and Configuring the Online Services Connector Service on page 31.

**Adding and Configuring the Online Services Connector Service**

**Procedure 1: To add the Zerto Online Services Connector service on page 31**

1. **Select and right-click the role, then navigate to Add Resource > Generic Service.**
2. **Select the service Zerto Online Services Connector, then click Next.**
3. **Complete the wizard.**

**Procedure 2: To configure the Zerto Online Services Connector service on page 31**

1. **Right-click the service Zerto Online Services Connector, and select Properties.**
2. **Configure the service’s dependencies:**
   a. **Click the Dependencies tab.**
   b. **In the first row, select the network resource name, and click Apply.**
3. **Define the Policies.** Navigate to the **Policies** tab, and configure the following:

| If resource fails, attempt restart on current node | Select this option |
| Period for restart | 15:00 (minutes) |
Maximum restarts in the specified period  |  10
Delay between restarts  |  30 (seconds)
If restart is unsuccessful, fail over all resources in this Role  |  Deselect this option
If all the restart attempts fail, begin restarting again after the specified period  |  Select this option

4. Click **Apply**, and click **OK**.
5. Right-click the role, and select **Start Role**.

### Switching from a Clustered Environment to a Non-Clustered (Standard) Environment

In clustered mode, the clustered ZVM is connected to all its peer sites via the IP which is configured in the cluster, in the Zerto role IP.

When switching from clustered mode to a non-clustered mode, this IP is used as the IP for the ZVM’s VM.

If you decide not to use this IP, all the peer sites and VPGs will be removed, and you will need to re-pair the ZVM with all its peer sites and to reconfigure all the VPGs.

**Before you Begin:**

Make sure you have:

- Access to the Registry.
- (Recommended) A backup of the Registry

**To switch from Clustered to Standard mode:**

1. In the Failover Cluster Manager, navigate to the ZVM cluster and select the Zerto role.
2. Right-click the role, and select **Stop Role**.
3. Then select **Remove**, to remove the ZVM role.
4. Select the ZVM cluster, right-click and select **Shutdown Cluster**, or **Destroy Cluster**.

There are now two nodes, each with ZVM, but which are not connected.

5. Decide which node will be used as the **non-clustered** mode.
6. Select the **other node**, (not the one you selected in step **Decide which node will be used as the non-clustered mode. on page 32**) and **uninstall ZVM**. You can also clean or delete the VM.
7. Connect to the VM which will become the **non-clustered VM**, (which you selected in step **Decide which node will be used as the non-clustered mode. on page 32**).
8. Verify that all running Zerto Services are **Stopped**. Specifically the following Zerto services:
• Zerto Virtual Manager
• Zerto Virtual Backup Appliance
• Zerto Online Services Connector

9. Go to the Registry, navigate to HKEY_LOCAL-MACHINE > SOFTWARE > Zerto > Zerto Virtual Replication, and select the FailOverCluster key.

10. Right-click the FailOverCluster key and select Delete.

   Once this key is deleted, ZVM will no longer identify itself in cluster mode.

11. Reconfigure the Zerto Services Startup Type from Manual to Automatic. To do this:
   a. Open the Services manager.
   b. Select and right-click the service Zerto Virtual Manager.
   c. Navigate to Properties > General tab, Startup type drop-down list, and select Automatic.
d. Repeat steps Select and right-click the service Zerto Virtual Manager. on page 33 and Navigate to Properties > General tab, Startup type drop-down list, and select Automatic. on page 33 for Zerto Virtual Backup Appliance service.

e. For the Zerto Online Services Connector, select and right-click the service Zerto Online Services Connector, then navigate to Properties > General tab, Startup type drop-down list, and select Automatic (Delayed Start).

12. Using the Diagnostics application, run the flow Reconfigure Zerto Virtual Manager.

a. Open the Zerto Diagnostics application.

   For example, via Start > Programs > Zerto > Zerto Diagnostics.

   The Zerto Diagnostics menu dialog is displayed.

b. Select Reconfigure Zerto Virtual Manager, then click Next.

c. Complete the Diagnostics wizard.
Zerto enhances the Zerto IT Resilience Platform by converging disaster recovery and backup to deliver continuous availability within a simple, scalable platform. Zerto delivers enhanced analytics, platform improvements and cloud performance upgrades required in the future of IT resilience.

Learn more at Zerto.com.

For assistance using Zerto’s Solution, contact: @Zerto Support.

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