Zerto Virtual Replication
Offsite Backup and Deduplication
With Windows Server 2012R2
Version 5.5
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**CHAPTER 1: INTRODUCTION**

**Offsite Backups with Zerto Virtual Replication**

Zerto Virtual Replication provides extended recovery, using an offsite backup mechanism, that enables you to recover to a recovery site based on a daily or weekly backup, going as far back as a year. Offsite backups periodically save copies of the replicated virtual machines at the recovery site to a designated long-term storage repository. The repository can be local storage to the server running the Zerto Virtual Manager service or an SMB share, including an SMB share coming from a Windows 2012 Server R2.

Backup copies are saved on a simplified daily or weekly backup schedule as shown in the following diagram for a VMware environment.

For more information about Zerto Virtual Replication offsite backup, refer to the Zerto Virtual Manager Administration Guide for your environment.

Saving backups requires disk space and the more often a backup is created, the more space is required to store them. One solution is to save the backups to a public cloud such as Amazon Web Services (AWS) or Microsoft Azure.

**Deduplication with Windows Server 2012**

One of the most useful features in Windows Server 2012 R2 is the built-in deduplication capability. This allows for a relatively low-cost replacement of the more expensive hardware deduplication and archival systems and is more consistent with a Software-Defined Data Center (SDDC) approach.

**Note:** Software-Defined Data Center [http://www.vmware.com/software-defined-datacenter/](http://www.vmware.com/software-defined-datacenter/)

According to Microsoft, the expected savings depends on the use case. As shown in the table below, the disk savings can be significant.


<table>
<thead>
<tr>
<th>SCENARIO</th>
<th>CONTENT</th>
<th>TYPICAL SPACE SAVINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>User documents</td>
<td>Documents, photos, music, videos</td>
<td>30-50%</td>
</tr>
<tr>
<td>Deployment shares</td>
<td>Software binaries, cab files, symbol files</td>
<td>70-80%</td>
</tr>
<tr>
<td>Virtualization libraries</td>
<td>Virtual hard disk files</td>
<td>80-95%</td>
</tr>
<tr>
<td>General file share</td>
<td>All of the above</td>
<td>50-60%</td>
</tr>
</tbody>
</table>
Offsite Backups and Deduplication

Using Zerto Virtual Replication offsite backups with Windows Server 2012 deduplication provides a software-only, powerful data archiving solution.

Zerto Virtual Replication and Windows Server 2012 deduplication enable a very cost-effective, yet very capable solution for data retention and archiving with the efficient utilization of storage assets. It streamlines data protection by combining backup and DR operations into Zerto Virtual Replication and optimizes the Windows Server 2012 investment by using its built-in deduplication capability. This combination removes dependencies on hardware for replication and is a very capable workflow orchestration and data deduplication solution, as shown in the following diagram for a VMware environment.
Deployment Architecture

Pairing Zerto Virtual Replication 4.5 and Windows Server 2012 R2 creates a dynamic, efficient, and relatively low-cost deduplicated backup storage and long-term archiving solution.

This architecture streamlines multiple components and operations:

- Leverage the most efficient data replication and workflow on the market today by using Zerto Virtual Replication.
- Use relatively low-cost Windows Server 2012 R2 at the target location with the target SMB storage share configured with Windows Server 2012 R2 deduplication.
- Keep the backup and archiving operations local to the target site - eliminate duplicate replication efforts often found in separate DR and Backup products.

The following procedures are based on Zerto Virtual Replication version 3.5 and higher in both the protected and recovery sites.

The sites are configured as described in the Zerto Virtual Manager Administration Guide for your environment.
Configuring Windows Server 2012 R2 Deduplication

The following procedure describes how to enable deduplication on a Windows 2012 R2 server. It assumes the implementer has read the Windows Server 2012 Plan to Deploy Deduplication guide and fully understands the features, functionality, and limitations.

You can set up deduplication using the Server Manager or PowerShell cmdlets.

**To set up deduplication using the Server Manager:**

1. Add the deduplication components in Windows Server 2012 R2 from the Server Manager.

   ![](image)

2. Enable deduplication from Server Manager > File and Storage Services.
To set up deduplication using PowerShell cmdlets:

1. Add the deduplication components in Windows Server 2012 R2 with the following PowerShell commands
   
   **Note:** For a complete list of PowerShell commands for deduplication, see the Microsoft Technet article:
   

   ```powershell
   Import-Module ServerManager
   Add-WindowsFeature -name FS-Data-Deduplication
   Import-Module Deduplication
   ```

2. Enable deduplication on Windows drive E:\ by PowerShell, use the following command:

   ```powershell
   Enable-DedupVolume E:
   ```
Configuring Zerto Virtual Replication Offsite Backups

Using the Zerto User Interface, both local storage on the Zerto Virtual Manager server or SMB shares can be added as offsite backup repositories.

To set up offsite backup:

1. In the Zerto User Interface, click SETUP > REPOSITORIES.
   The New Repository dialog is displayed.

2. Specify the following settings:
   - **Repository Name** – A unique name for the repository.
   - **Repository Type** – The repository must reside as a Network Share (SMB) drive.
   - **Username** – User name to access the Network Share drive. The name can be entered using either of the following formats:
     - username
     - domain\username
   - **Password** – The password for the user name.
   - **Path** – The path to the SMB Network share. The path must be accessible from the Zerto Virtual Manager, so if the repository is on a different domain than the Zerto Virtual Manager, the domain must be included in the path.
   - **Set as Default Repository** – Check if you want the repository to be used as the default when specifying extended recovery in a VPG.
   - **Enable Compression** – Check this option to compress backups stored in the repository. Compression is done using zip compression, set to level six. If you want better compression, which requires more CPU, or less compression to reduce the CPU overhead, contact Zerto support.
     - **Note:** Compression usually reduces the effectiveness of deduplication on stored data. If the backup repository resides on a deduplication-enabled storage appliance, it is recommended that the data be stored uncompressed.

3. Click VALIDATE to validate the path specified.
4. Click SAVE.
The repository is created.

You can define more than one repository. When defining offsite backup, you specify which repository to use. The default repository is the default displayed when an offsite backup is defined.

After setting up a repository, you can protect virtual machines with extended recovery, enabling offsite backup. You specify the backup requirements for these machines, as described in the Zerto Virtual Manager Administration Guide for your environment. Specify the Windows Server 2012 R2 Repository for the backup.

Wait for a few backups to run to evaluate the space savings using deduplication.
Monitoring Deduplication with Offsite Backups

After a few offsite backups have been created, you can monitor the effectiveness of deduplication on the Windows 2012 Server in the Server Manager GUI.

You can also monitor the deduplication status by the following PowerShell command:

```
Get-DedupStatus | Format-List
```
This shows an 89% deduplication savings rate for a few weeks of offsite backups.


Zerto tested Windows Server 2012 R2 with deduplication as the SMB target repository for offsite backup and found disk savings rates ranging from 80% to 90%. These results are consistent with Microsoft’s Virtualization libraries savings estimate in the table in “Deduplication with Windows Server 2012”, on page 4.

**Note:**
- There are differences between the first version of Windows Server 2012 and R2.¹
- While Zerto has experienced excellent deduplication rates in its testing, results will vary depending on the ability of the source data to be deduplicated.


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**Monitoring Deduplication with Offsite Backups**

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ABOUT ZERTO

Zerto is committed to keeping enterprise and cloud IT running 24/7 by providing scalable business continuity software solutions. Through the Zerto Cloud Continuity Platform, organizations seamlessly move and protect virtualized workloads between public, private and hybrid clouds. The company’s flagship product, Zerto Virtual Replication, is the standard for protection of applications in cloud and virtualized datacenters.

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