



# **Protecting Workloads on GCP / GCVE**

## **NetApp Solutions**

NetApp  
August 14, 2023

This PDF was generated from <https://docs.netapp.com/us-en/netapp-solutions/ehc/gcp/gcp-app-dr-sc-cvs-veeam.html> on August 14, 2023. Always check docs.netapp.com for the latest.

# Table of Contents

- Protecting Workloads on GCP / GCVE ..... 1
  - Application Consistent Disaster Recovery with NetApp SnapCenter and Veeam Replication ..... 1
  - Application Disaster Recovery with SnapCenter, Cloud Volumes ONTAP and Veeam Replication ..... 4

# Protecting Workloads on GCP / GCVE

## Application Consistent Disaster Recovery with NetApp SnapCenter and Veeam Replication

Authors: Suresh Thoppay, NetApp

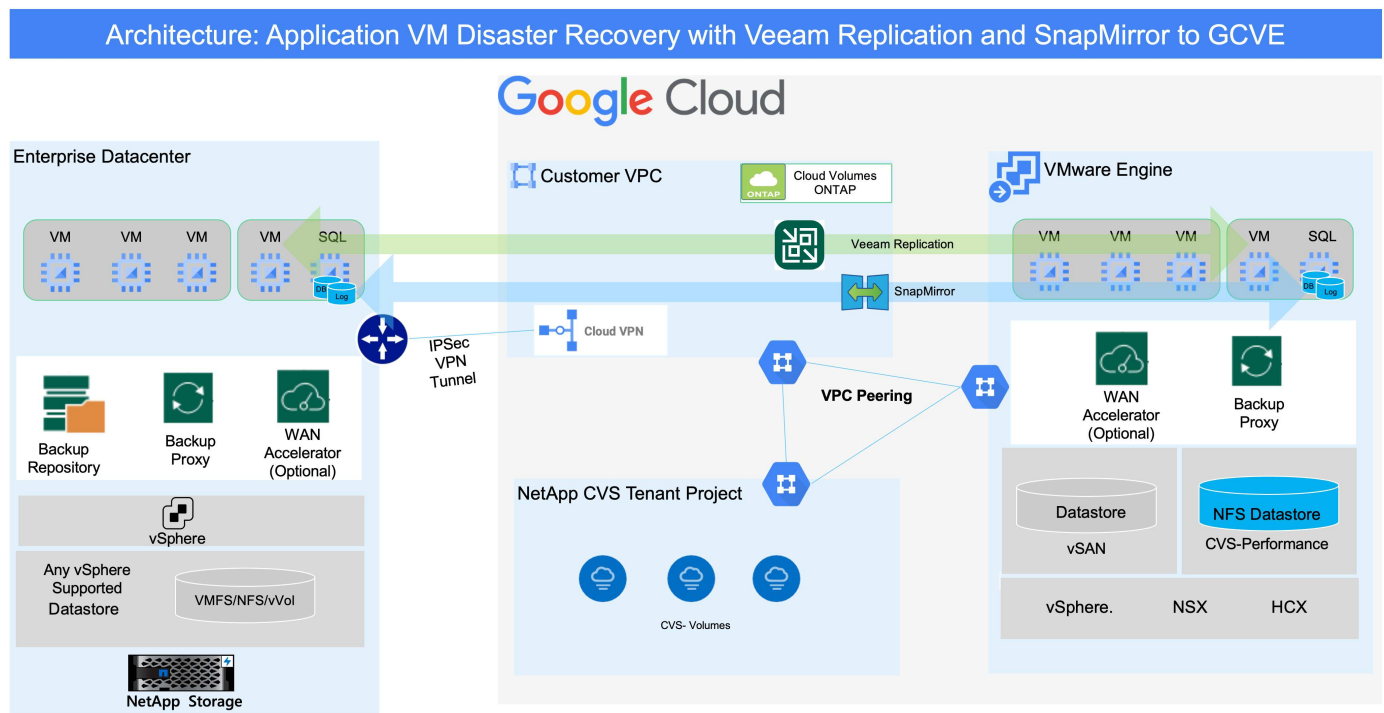
### Overview

Many customers are looking for an effective disaster recovery solution for their application VMs hosted on VMware vSphere. Many of them use their existing backup solution to perform recovery during disaster. Many times that solution increases the RTO and doesn't meet their expectations. To reduce the RPO and RTO, Veeam VM replication can be utilized even from on-prem to GCVE as long as network connectivity and environment with appropriate permissions are available.

NOTE: Veeam VM Replication doesn't protect VM guest connected storage devices like iSCSI or NFS mounts inside the guest VM. Need to protect those separately.

For application consistent replication for SQL VM and to reduce the RTO, we used SnapCenter to orchestrate snapmirror operations of SQL database and log volumes.

This document provides a step-by-step approach for setting up and performing disaster recovery that uses NetApp SnapMirror, Veeam, and the Google Cloud VMware Engine (GCVE).



### Assumptions

This document focuses on in-guest storage for application data (also known as guest connected), and we assume that the on-premises environment is using SnapCenter for application-consistent backups.



This document applies to any third-party backup or recovery solution. Depending on the solution used in the environment, follow best practices to create backup policies that meet organizational SLAs.

For connectivity between the on-premises environment and the Google Cloud network, use the connectivity options like dedicated interconnect or Cloud VPN. Segments should be created based on the on-premises VLAN design.



There are multiple options for connecting on-premises datacenters to Google Cloud, which prevents us from outlining a specific workflow in this document. Refer to the Google Cloud documentation for the appropriate on-premises-to-Google connectivity method.

## Deploying the DR Solution

### Solution Deployment Overview

1. Make sure that application data is backed up using SnapCenter with the necessary RPO requirements.
2. Provision Cloud Volumes ONTAP with the correct instance size using BlueXP within the appropriate subscription and virtual network.
  - a. Configure SnapMirror for the relevant application volumes.
  - b. Update the backup policies in SnapCenter to trigger SnapMirror updates after the scheduled jobs.
3. Install the Veeam software and start replicating virtual machines to Google Cloud VMware Engine instance.
4. During a disaster event, break the SnapMirror relationship using BlueXP and trigger failover of virtual machines with Veeam.
  - a. Reconnect the iSCSI LUNs and NFS mounts for the application VMs.
  - b. Bring up applications online.
5. Invoke failback to the protected site by reverse resyncing SnapMirror after the primary site has been recovered.

### Deployment Details

## Configure CVO on Google Cloud and replicate volumes to CVO

The first step is to configure Cloud Volumes ONTAP on Google Cloud ([cvo](#)) and replicate the desired volumes to Cloud Volumes ONTAP with the desired frequencies and snapshot retentions.

### Architecture: Cloud Volumes ONTAP communication to GCVE



For sample step-by-step instructions on setting up SnapCenter and replicating the data, Refer [Setup Replication with SnapCenter](#)

[Review of SQL VM protection with SnapCenter](#)

## Configure GCVE hosts and CVO data access

Two important factors to consider when deploying the SDDC are the size of the SDDC cluster in the GCVE solution and how long to keep the SDDC in service. These two key considerations for a disaster recovery solution help reduce the overall operational costs. The SDDC can be as small as three hosts, all the way up to a multi-host cluster in a full-scale deployment.

NetApp Cloud Volume Service for NFS Datastore and Cloud Volumes ONTAP for SQL databases and log can be deployed to any VPC and GCVE should have private connection to that VPC to mount NFS datastore and have VM connect to iSCSI LUNs.

To configure GCVE SDDC, see [Deploy and configure the Virtualization Environment on Google Cloud Platform \(GCP\)](#). As a prerequisite, verify that the guest VMs residing on the GCVE hosts are able to consume data from Cloud Volumes ONTAP after connectivity has been established.

After Cloud Volumes ONTAP and GCVE have been configured properly, begin configuring Veeam to automate the recovery of on-premises workloads to GCVE (VMs with application VMDKs and VMs with in-guest storage) by using the Veeam Replication feature and by leveraging SnapMirror for application volumes copies to Cloud Volumes ONTAP.

## Install Veeam Components

Based on deployment scenario, the Veeam backup server, backup repository and backup proxy that needs to be deployed. For this use case, there is no need to deploy object store for Veeam and Scale-out repository also not required.

[Refer to the Veeam documentation for the installation procedure](#)

For additional information, please refer [Migration with Veeam Replication](#)

## Setup VM Replication with Veeam

Both on-premises vCenter and GCVE vCenter needs to be registered with Veeam. [Setup vSphere VM Replication Job](#) At the Guest Processing step of wizard, select disable application processing as we will be utilizing SnapCenter for application aware backup and recovery.

<https://netapp.hosted.panopto.com/Panopto/Pages/Embed.aspx?id=8b7e4a9b-7de1-4d48-a8e2-b01200f00692>

## Failover of Microsoft SQL Server VM

<https://netapp.hosted.panopto.com/Panopto/Pages/Embed.aspx?id=9762dc99-081b-41a2-ac68-b01200f00ac0>

## Benefits of this solution

- Uses the efficient and resilient replication of SnapMirror.
- Recovers to any available points in time with ONTAP snapshot retention.
- Full automation is available for all required steps to recover hundreds to thousands of VMs, from the storage, compute, network, and application validation steps.
- SnapCenter uses cloning mechanisms that do not change the replicated volume.
  - This avoids the risk of data corruption for volumes and snapshots.
  - Avoids replication interruptions during DR test workflows.
  - Leverages the DR data for workflows beyond DR, such as dev/test, security testing, patch and upgrade testing, and remediation testing.
- Veeam Replication allows changing VM IP addresses on DR site.

# Application Disaster Recovery with SnapCenter, Cloud Volumes ONTAP and Veeam Replication

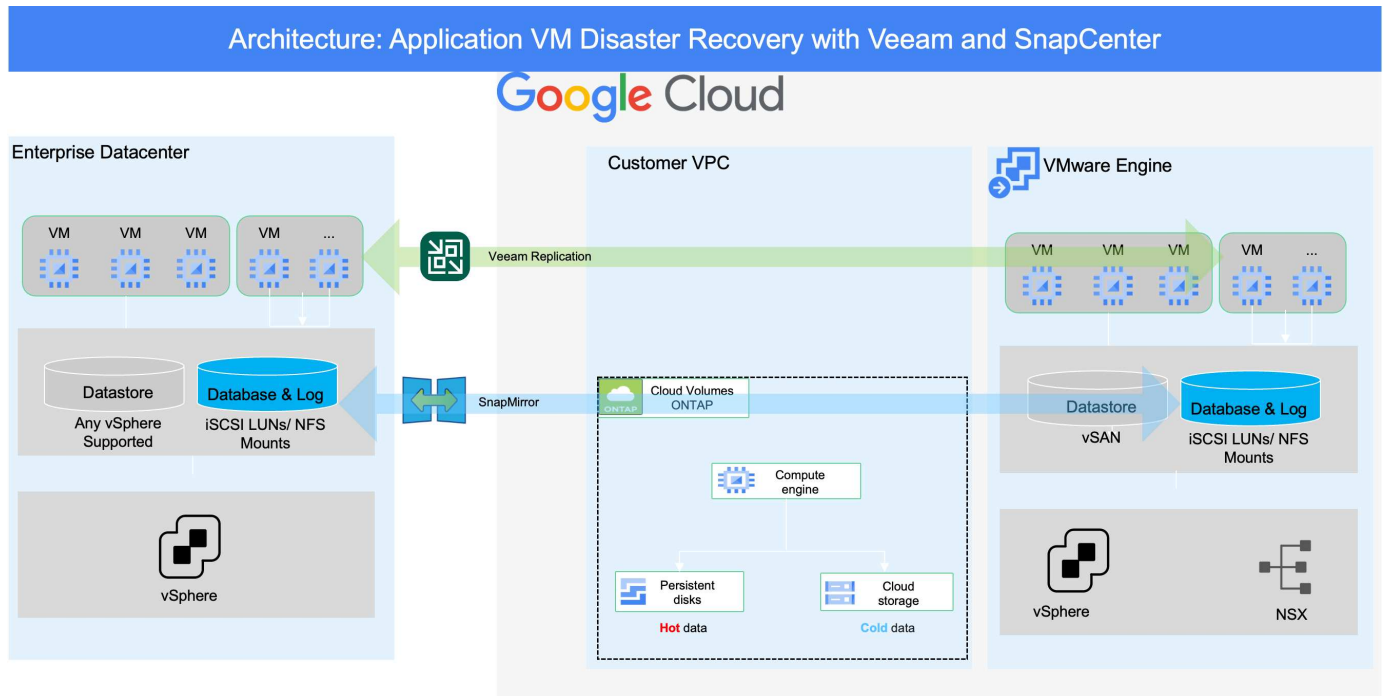
Authors: Suresh Thoppay, NetApp

## Overview

Disaster recovery to cloud is a resilient and cost-effective way of protecting workloads against site outages and data corruption events such as ransomware. With NetApp SnapMirror, on-premises VMware workloads that use guest-connected storage can be replicated to NetApp Cloud Volumes ONTAP running in Google Cloud. This covers application data; however, what about the actual VMs themselves. Disaster recovery should cover

all dependent components, including virtual machines, VMDKs, application data, and more. To accomplish this, SnapMirror along with Veeam can be used to seamlessly recover workloads replicated from on-premises to Cloud Volumes ONTAP while using vSAN storage for VM VMDKs.

This document provides a step-by-step approach for setting up and performing disaster recovery that uses NetApp SnapMirror, Veeam, and the Google Cloud VMware Engine (GCVE).



## Assumptions

This document focuses on in-guest storage for application data (also known as guest connected), and we assume that the on-premises environment is using SnapCenter for application-consistent backups.



This document applies to any third-party backup or recovery solution. Depending on the solution used in the environment, follow best practices to create backup policies that meet organizational SLAs.

For connectivity between the on-premises environment and the Google Cloud network, use the connectivity options like dedicated interconnect or Cloud VPN. Segments should be created based on the on-premises VLAN design.



There are multiple options for connecting on-premises datacenters to Google Cloud, which prevents us from outlining a specific workflow in this document. Refer to the Google Cloud documentation for the appropriate on-premises-to-Google connectivity method.

## Deploying the DR Solution

### Solution Deployment Overview

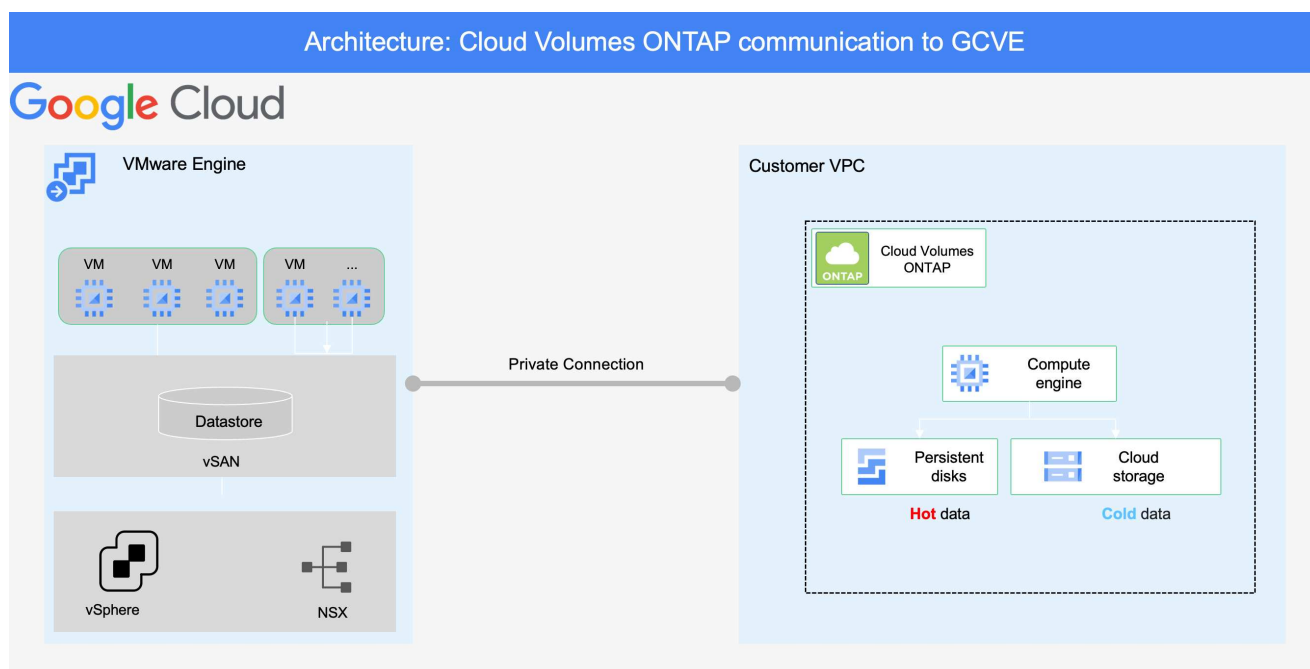
1. Make sure that application data is backed up using SnapCenter with the necessary RPO requirements.
2. Provision Cloud Volumes ONTAP with the correct instance size using Cloud manager within the appropriate subscription and virtual network.

- a. Configure SnapMirror for the relevant application volumes.
  - b. Update the backup policies in SnapCenter to trigger SnapMirror updates after the scheduled jobs.
3. Install the Veeam software and start replicating virtual machines to Google Cloud VMware Engine instance.
4. During a disaster event, break the SnapMirror relationship using Cloud Manager and trigger failover of virtual machines with Veeam.
  - a. Reconnect the iSCSI LUNs and NFS mounts for the application VMs.
  - b. Bring up applications online.
5. Invoke failback to the protected site by reverse resyncing SnapMirror after the primary site has been recovered.

## Deployment Details

### Configure CVO on Google Cloud and replicate volumes to CVO

The first step is to configure Cloud Volumes ONTAP on Google Cloud ([cvo](#)) and replicate the desired volumes to Cloud Volumes ONTAP with the desired frequencies and snapshot retentions.



For sample step-by-step instructions on setting up SnapCenter and replicating the data, Refer to [Setup Replication with SnapCenter](#)

[Setup Replication with SnapCenter](#)



## Configure GCVE hosts and CVO data access

Two important factors to consider when deploying the SDDC are the size of the SDDC cluster in the GCVE solution and how long to keep the SDDC in service. These two key considerations for a disaster recovery solution help reduce the overall operational costs. The SDDC can be as small as three hosts, all the way up to a multi-host cluster in a full-scale deployment.

Cloud Volumes ONTAP can be deployed to any VPC and GCVE should have private connection to that VPC to have VM connect to iSCSI LUNs.

To configure GCVE SDDC, see [Deploy and configure the Virtualization Environment on Google Cloud Platform \(GCP\)](#). As a prerequisite, verify that the guest VMs residing on the GCVE hosts are able to consume data from Cloud Volumes ONTAP after connectivity has been established.

After Cloud Volumes ONTAP and GCVE have been configured properly, begin configuring Veeam to automate the recovery of on-premises workloads to GCVE (VMs with application VMDKs and VMs with in-guest storage) by using the Veeam Replication feature and by leveraging SnapMirror for application volumes copies to Cloud Volumes ONTAP.

## Install Veeam Components

Based on deployment scenario, the Veeam backup server, backup repository and backup proxy that needs to be deployed. For this use case, there is no need to deploy object store for Veeam and Scale-out repository also not required.

[Refer to the Veeam documentation for the installation procedure](#)

## Setup VM Replication with Veeam

Both on-premises vCenter and GCVE vCenter needs to be registered with Veeam. [Setup vSphere VM Replication Job](#) At the Guest Processing step of wizard, select disable application processing as we will be utilizing SnapCenter for application aware backup and recovery.

[Setup vSphere VM Replication Job](#)

## Failover of Microsoft SQL Server VM

[Failover of Microsoft SQL Server VM](#)

## Benefits of this solution

- Uses the efficient and resilient replication of SnapMirror.
- Recovers to any available points in time with ONTAP snapshot retention.
- Full automation is available for all required steps to recover hundreds to thousands of VMs, from the storage, compute, network, and application validation steps.
- SnapCenter uses cloning mechanisms that do not change the replicated volume.
  - This avoids the risk of data corruption for volumes and snapshots.
  - Avoids replication interruptions during DR test workflows.

- Leverages the DR data for workflows beyond DR, such as dev/test, security testing, patch and upgrade testing, and remediation testing.
- Veeam Replication allows changing VM IP addresses on DR site.

## Copyright information

Copyright © 2023 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

## Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.