How to Deploy NetApp FlexCache with Cloud Volumes ONTAP on Google Cloud

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Many enterprise Google Cloud users are finding it challenging to manage large datasets that are distributed across multiple data centers and multiple clouds and cloud regions.

Deriving meaningful intelligence, such as running analytics, with dispersed data sets can require migrating all of that data to a centralized location. These data migrations can be expensive and time consuming, and inevitably increase the total cost of ownership (TCO).

NetApp FlexCache® solves these issues by providing a writable, persistent cache of a data volume stored in a remote location that is consistent and coherent with its original data set. Coupled with NetApp Cloud Volumes ONTAP®, FlexCache can bring data closer to users without additional data migration and consumption costs attached to it.

In this guide, we will show you how to set up NetApp FlexCache with Cloud Volumes ONTAP on Google Cloud.

FlexCache and Cloud Volumes ONTAP: A Short Introduction

FlexCache creates writable, persistent cached copies of data volumes that can be stored in remote locations, making it easier and faster for dispersed workforces and applications to use that data.

A NetApp FlexCache is not a traditional cache that is a full duplicate copy of the source data, but instead is an intelligent sparse container of the source data. While the FlexCache copy looks and feels the same as the source data to the applications accessing the copy, only the file metadata is cached initially. The actual data blocks are dynamically retrieved from the source, behind the scenes, and only on demand, ensuring reduced data migration between the source and the destination volumes as well as the un-necessary data duplication.

NetApp Cloud Volumes ONTAP offers enterprise grade data storage and data management capabilities in the cloud on AWS, Azure, and Google Cloud. Using Cloud Volumes ONTAP, FlexCache can create copies of datasets that are space and cost efficient. Deploying FlexCache with Cloud Volumes ONTAP enables customers to burst into the cloud and leverage innovations

such as cloud-based analytics without the need to move all the data from various data centers or remote and branch office (ROBO) sites.

More details on how FlexCache works in cloud-based analytics can be found here.

Prerequisites

This section highlights the prerequisites that need to be in place before we can proceed with the implementation of FlexCache with Cloud Volumes ONTAP on Google Cloud.

- Google Cloud subscription
  - An active Google cloud subscription with the appropriate privileges
  - NetApp Cloud Manager subscription with appropriate Google Cloud connector deployed and configured

- On-premises NetApp cluster with
  - ONTAP 9.6 or higher
  - Cluster and SVM administrator privileges
  - A valid NetApp FlexCache license (included from ONTAP 9.7 or higher)

- Cloud Volumes ONTAP instance
  - Access to NetApp Cloud Manager
  - A Cloud Volumes ONTAP instance deployed successfully on the Google Cloud region of your choice. Read how to set up Cloud Volumes ONTAP on Google Cloud here.

- Network connectivity
  - Appropriate VPN connection between the on premises ONTAP cluster and the Cloud Volumes ONTAP instance on Google Cloud VPC

For additional information around supported and unsupported ONTAP features for FlexCache volumes, please refer to the ONTAP documentation. You can find sizing guidelines for FlexCache here.

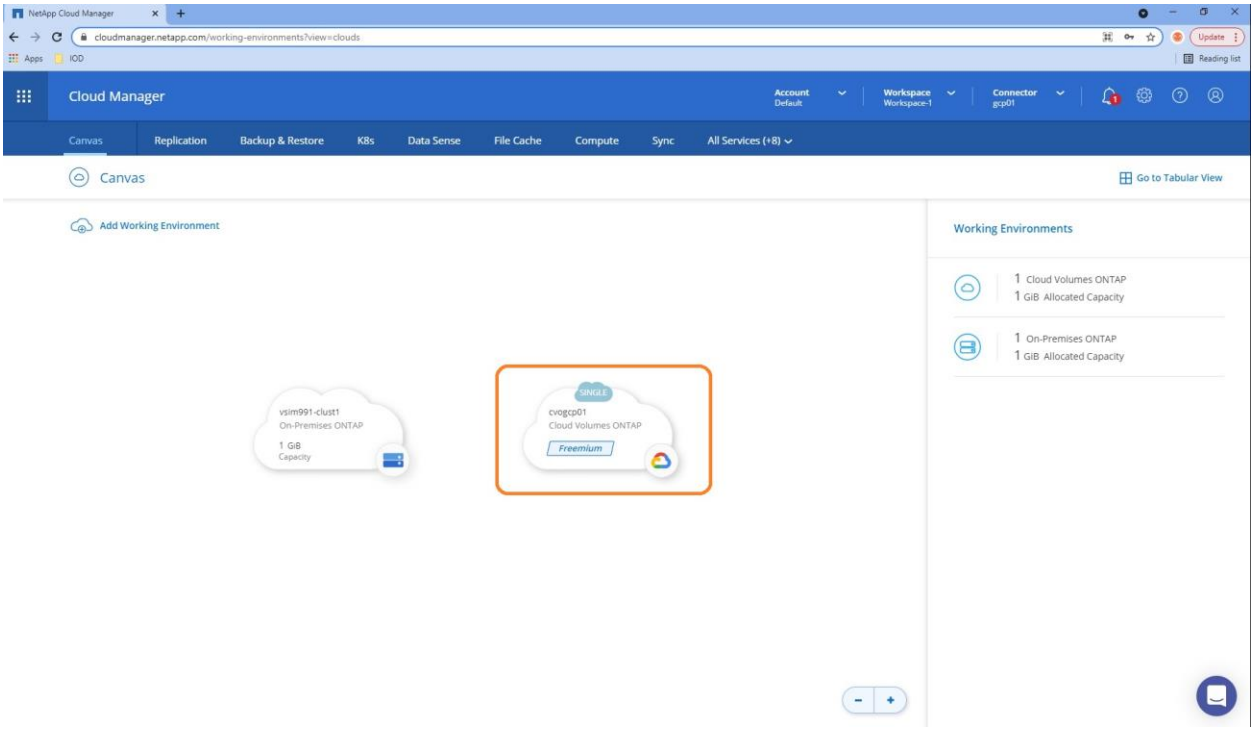
How to Set Up FlexCache with Cloud Volumes ONTAP on Google Cloud

Let's have a look at the steps involved in setting up a FlexCache volume on Cloud Volumes ONTAP on Google Cloud.

1. Setting up a Cluster Peering Relationship

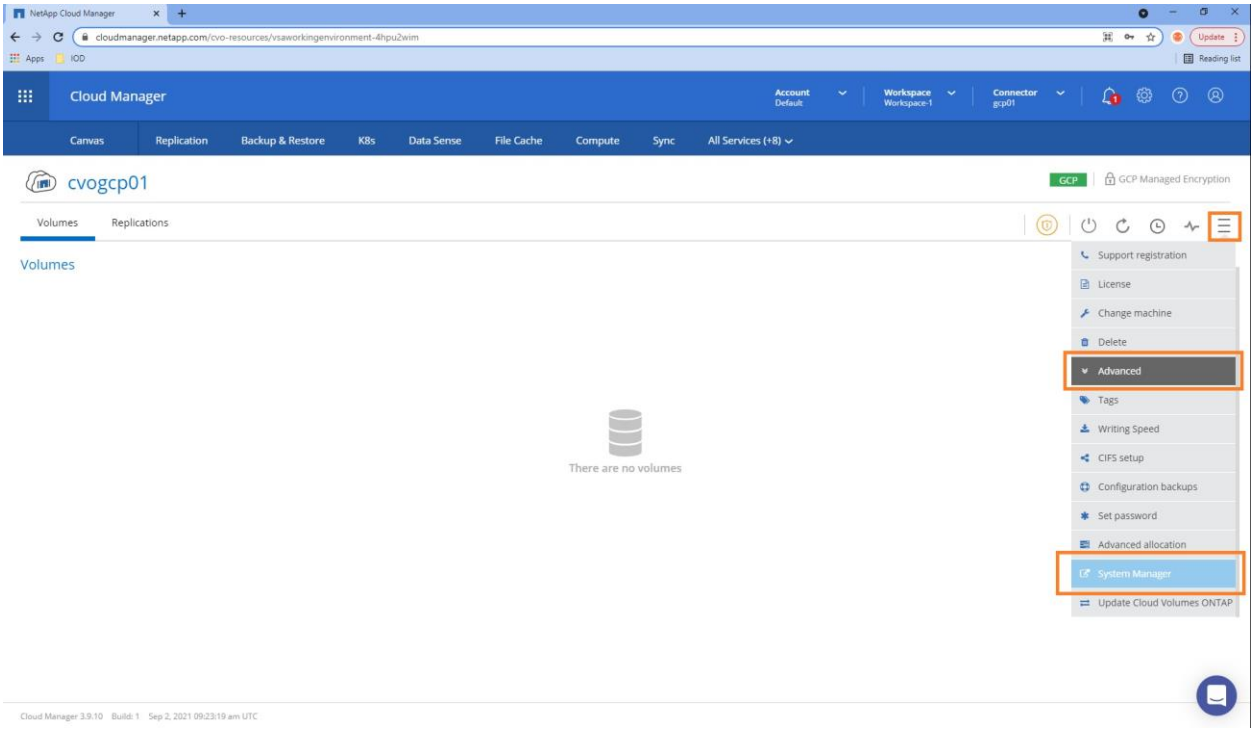
The first thing to do is to make sure that the cluster peering relationship is set up between the on-premises ONTAP cluster and the Cloud Volumes ONTAP cluster on Google cloud.

1.1 Go to the Cloud Manager homepage and double click on the Cloud Volumes ONTAP instance on the Canvas.

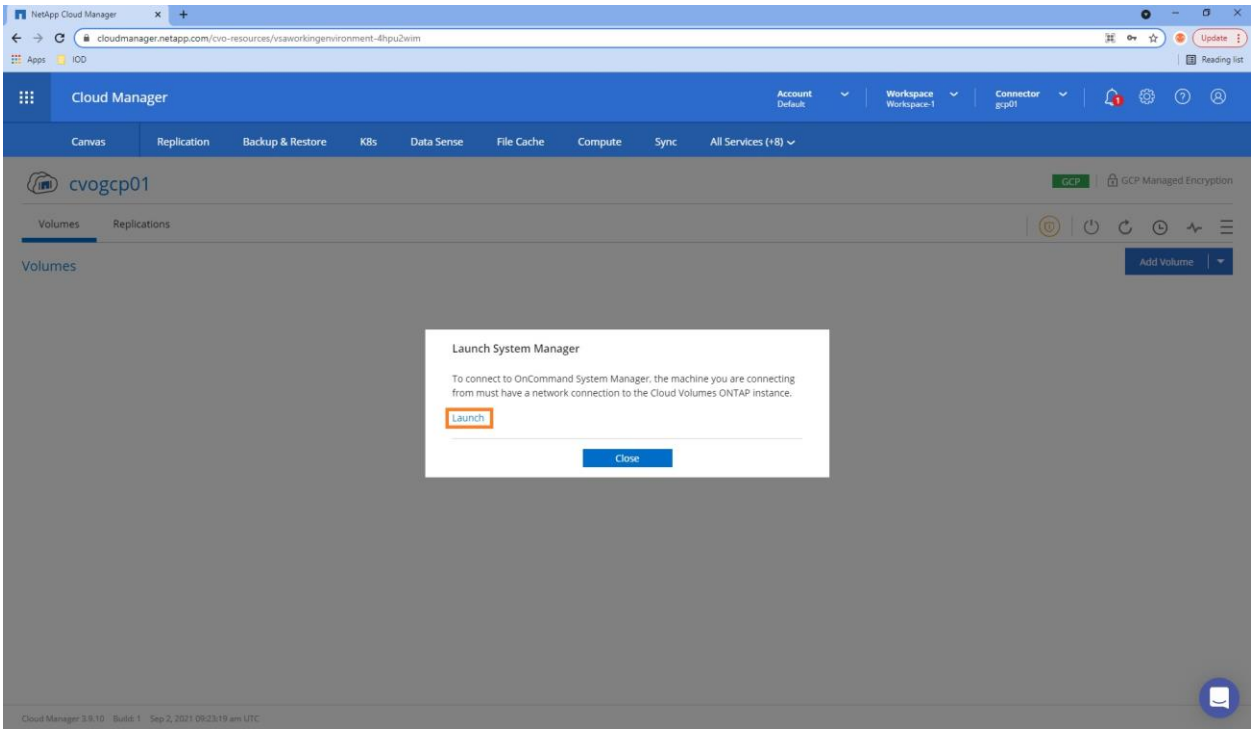


1.2 Once inside the Cloud Volumes ONTAP instance working environment, click on the hamburger menu icon on the right, as shown below.

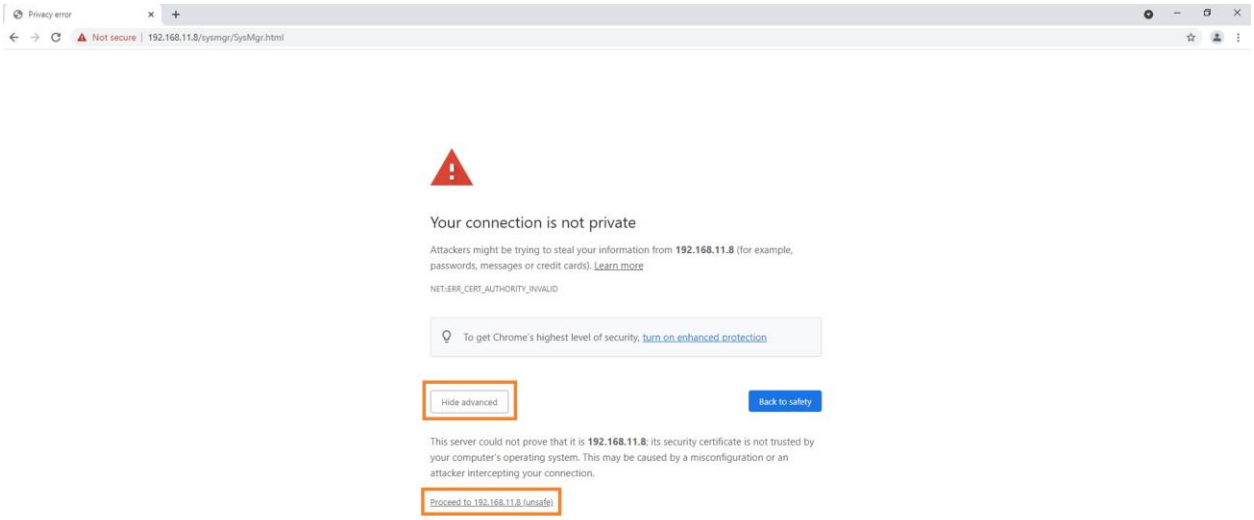
Click on the “Advanced” drop down menu and select “System Manager.” This will open the NetApp System Manager view of the Cloud Volumes ONTAP instance.



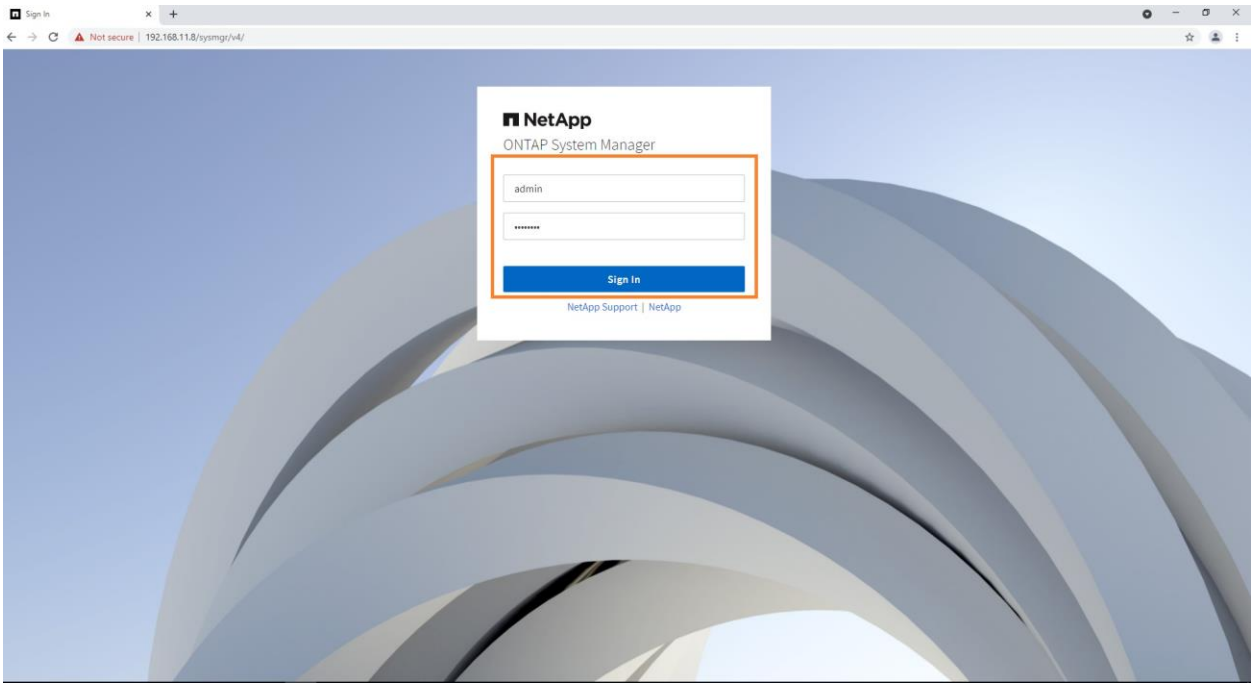
1.3 Click on the “Launch” link in the follow-up message. Ensure that networking connectivity exists from your workstation to the Cloud Volumes ONTAP instance deployed on your Google Cloud VPC.



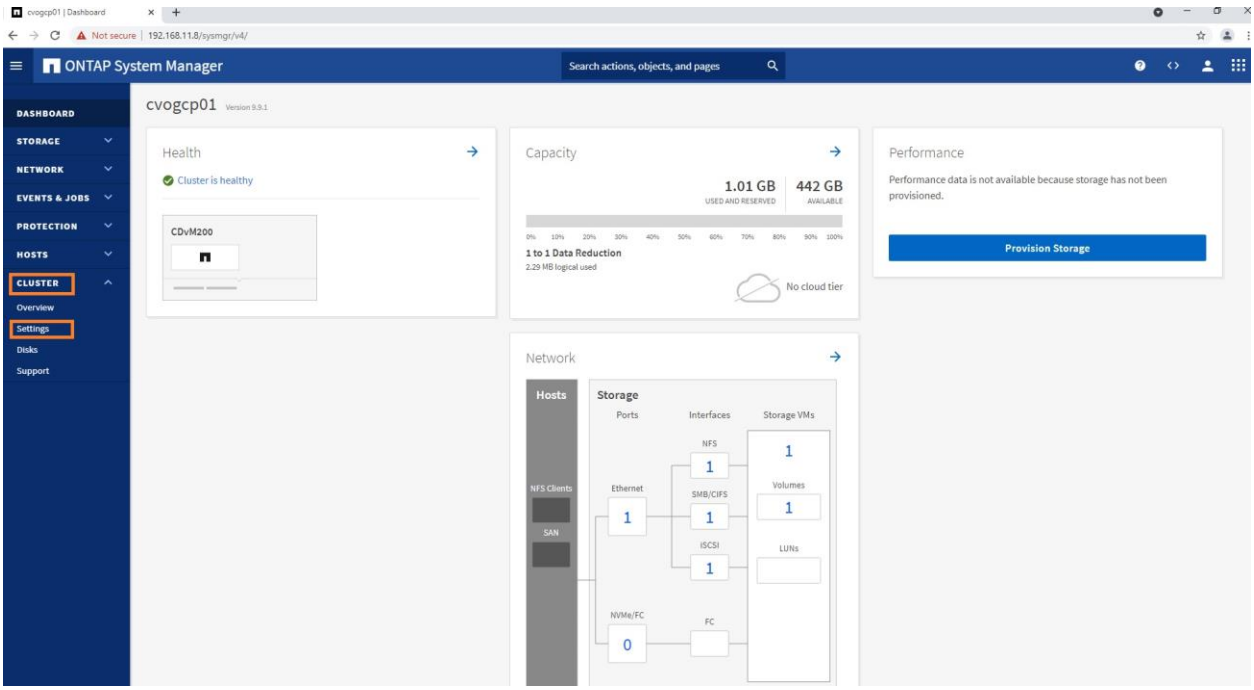
1.4 If you are prompted to confirm an insecure connection due to the use of default SSL certificates on the Cloud Volumes ONTAP instance, click “Proceed” as shown below.



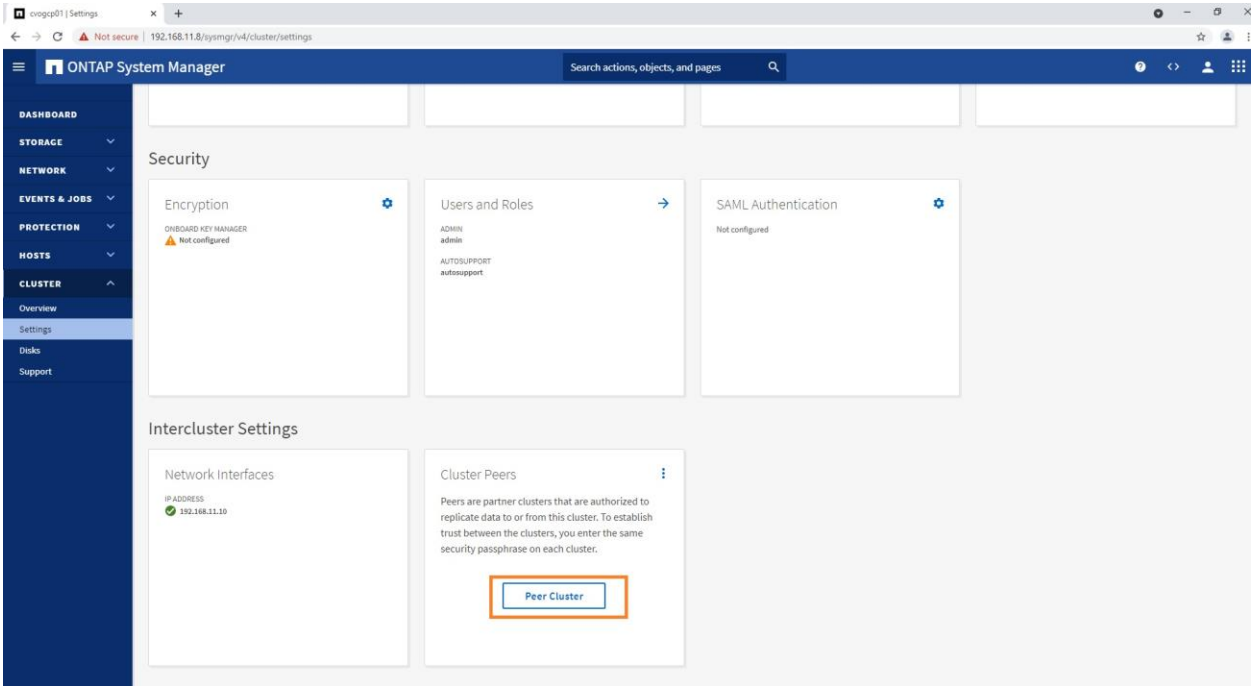
1.5 Now log in to System Manager using the appropriate credentials.



1.6 In ONTAP System Manager, go to the left-hand menu. Click on the “Cluster” option and select “Settings” from the submenu that’s presented.

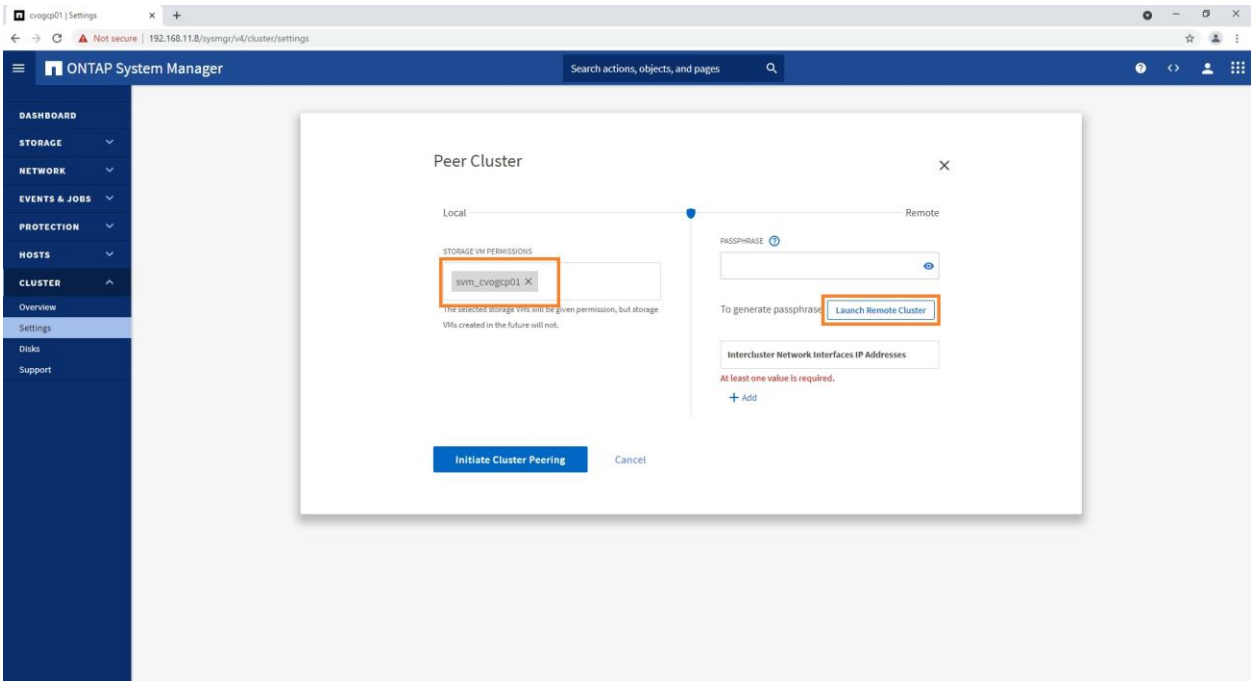


1.7 On the Settings screen, scroll down until you get to the “Intercluster Settings” section. Click the “Peer Cluster” button as shown below to begin the cluster peering process.



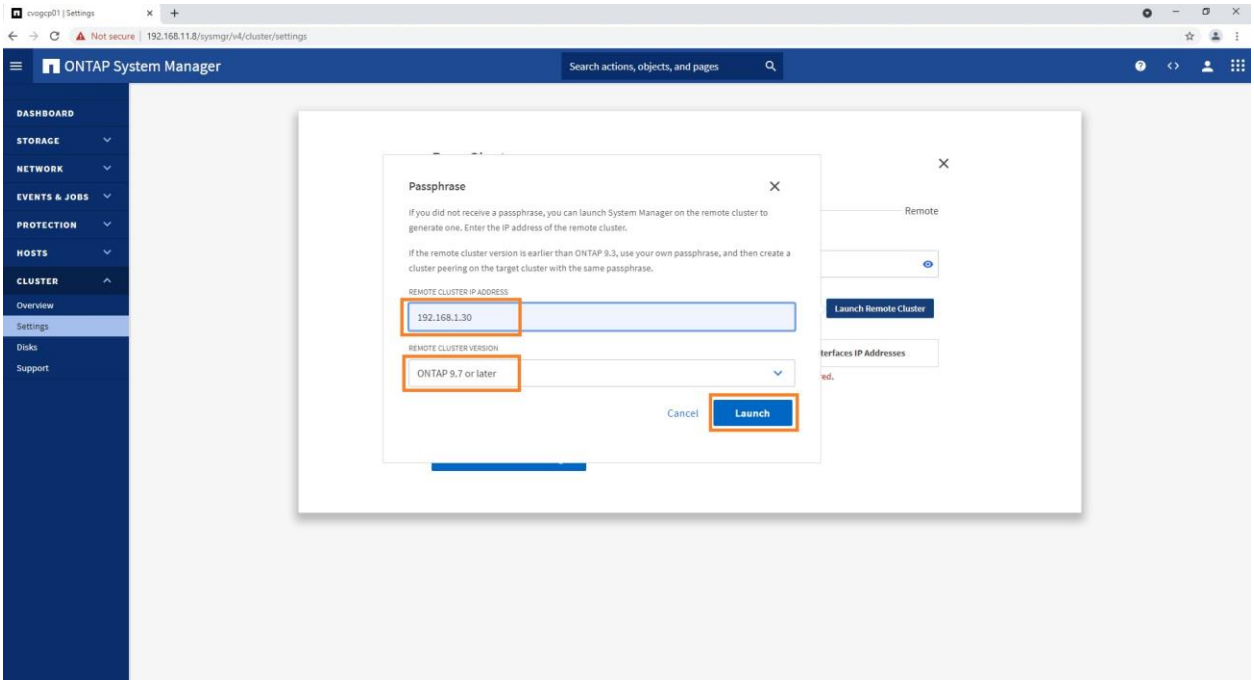
1.8 In the Peer Cluster window, select the appropriate SVM to use on the Cloud Volumes ONTAP instance.

When you are done, click on the “Launch Remote Cluster” link to launch the System Manager view of the on-premises cluster. This will generate an authentication passphrase.

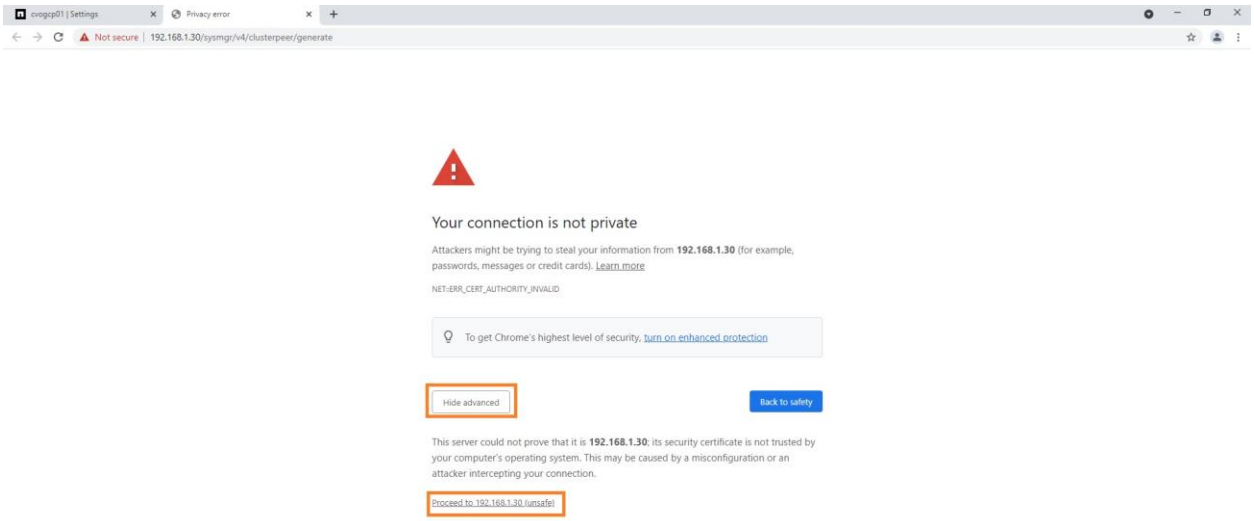


1.9 Provide the IP address of the on-premises cluster and select the appropriate ONTAP version of the cluster. Note that this IP address needs to be the cluster management IP of the on-premises cluster and should be fully reachable from the Google Cloud-based Cloud Volumes ONTAP instance.

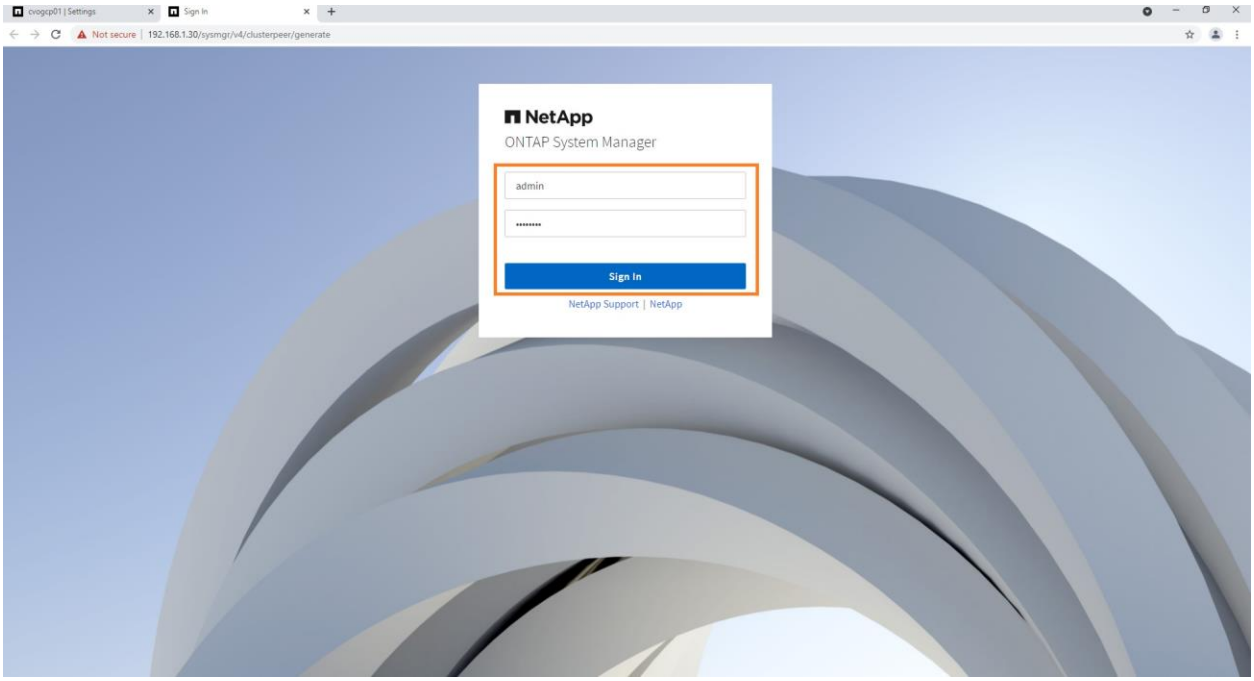
When you’re done, click “Launch.”



1.10 Similar to earlier, if you are prompted to confirm an insecure connection due to the use of default SSL certificates on the on-premises ONTAP instance, click “Proceed” as shown below.

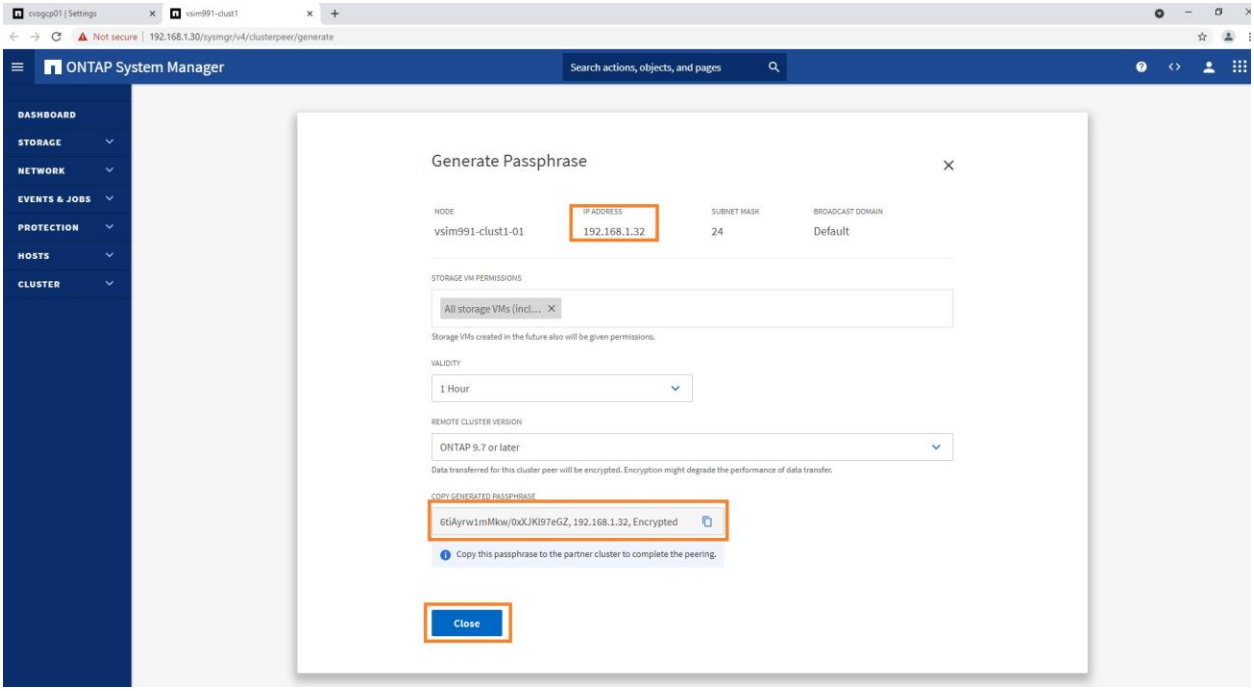


1.11 Now log in to the System Manager using your appropriate credentials.



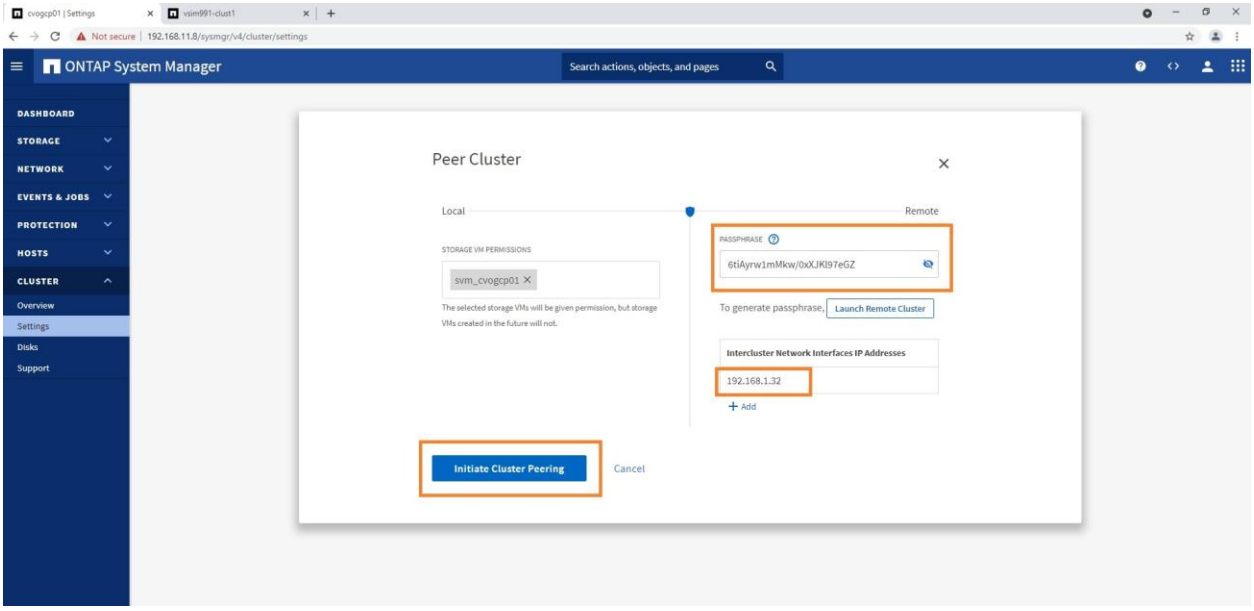
1.12 From the on-premises ONTAP instance, verify and note down the Cluster Management LIF IP and the generated passphrase.

These will both be needed later.

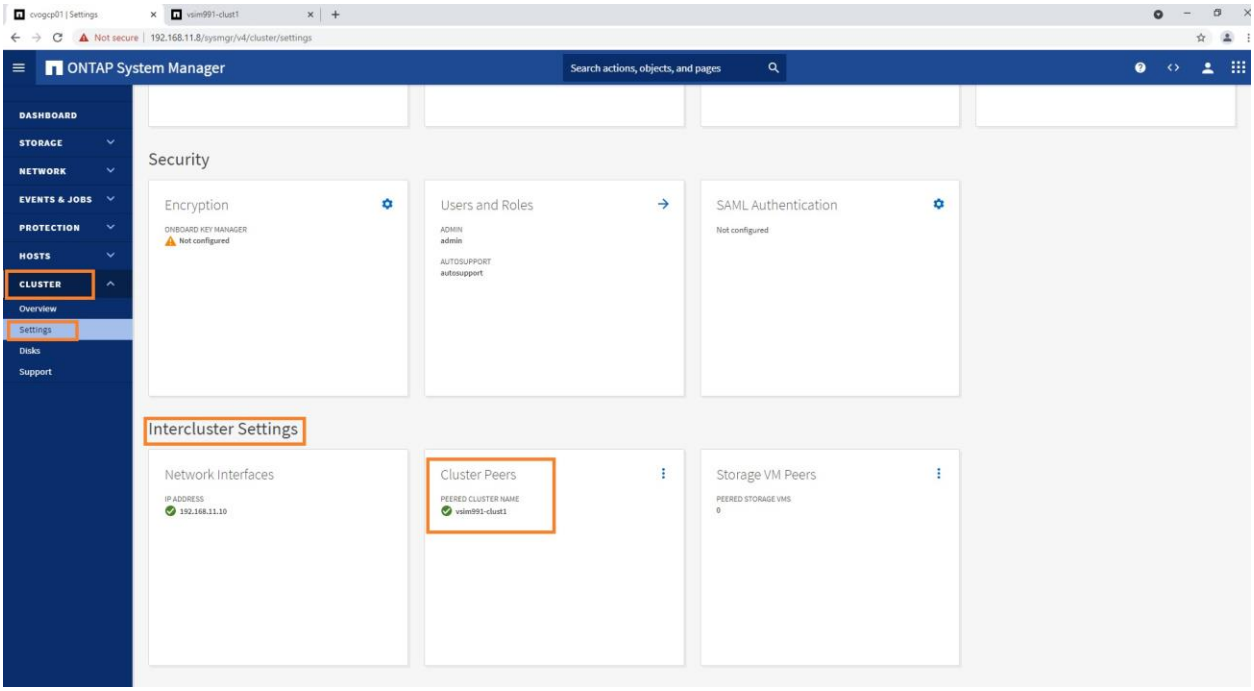


1.13 Now, go back to the System Manager view of the Cloud Volumes ONTAP instance. Here you will paste or type in the passphrase generated in the previous step.

Add / verify the Intercluster network interface IP address and click the “Initiate Cluster Peering” button to start the peering process.



1.14 Once complete, verify the peering is in place by navigating to the Intercluster settings section, as shown below.

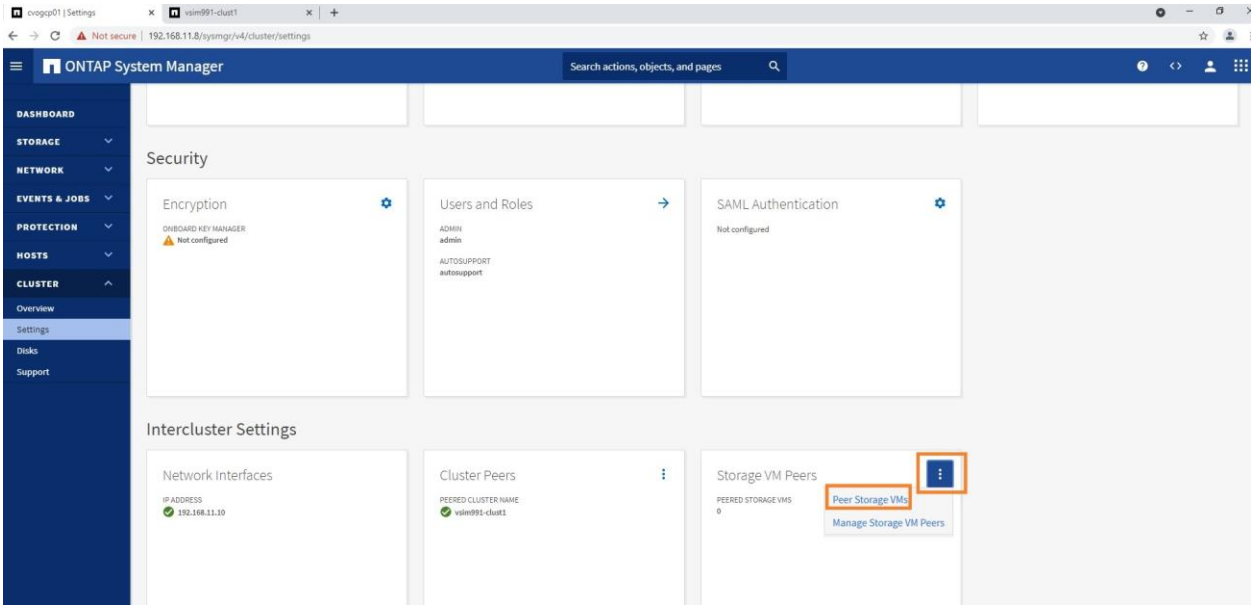


2. Setting up the SVM Peering Relationship

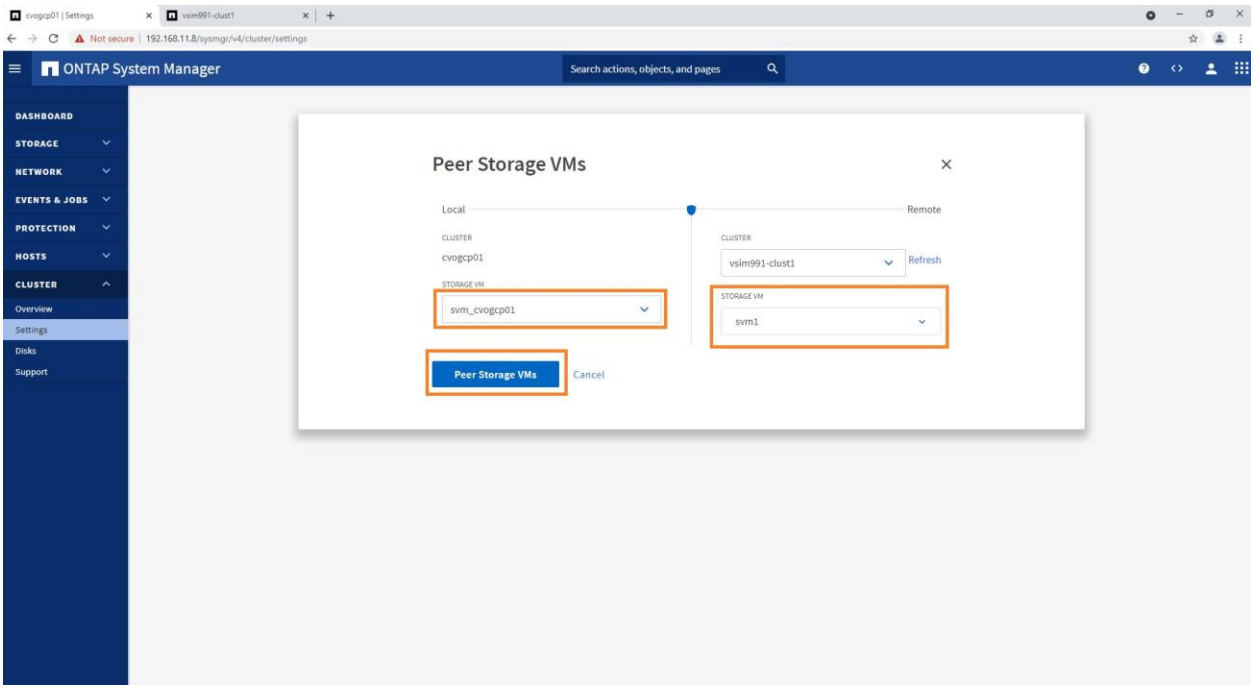
Now that cluster peering is set up between your on-premises ONTAP cluster and the Cloud Volumes ONTAP cluster, the next step is to set up the SVM (Storage Virtual Machine) peering between the two clusters.

2.1 In the System Manager Settings window, go to the “Storage VM Peers” option under “Intercluster Settings.”

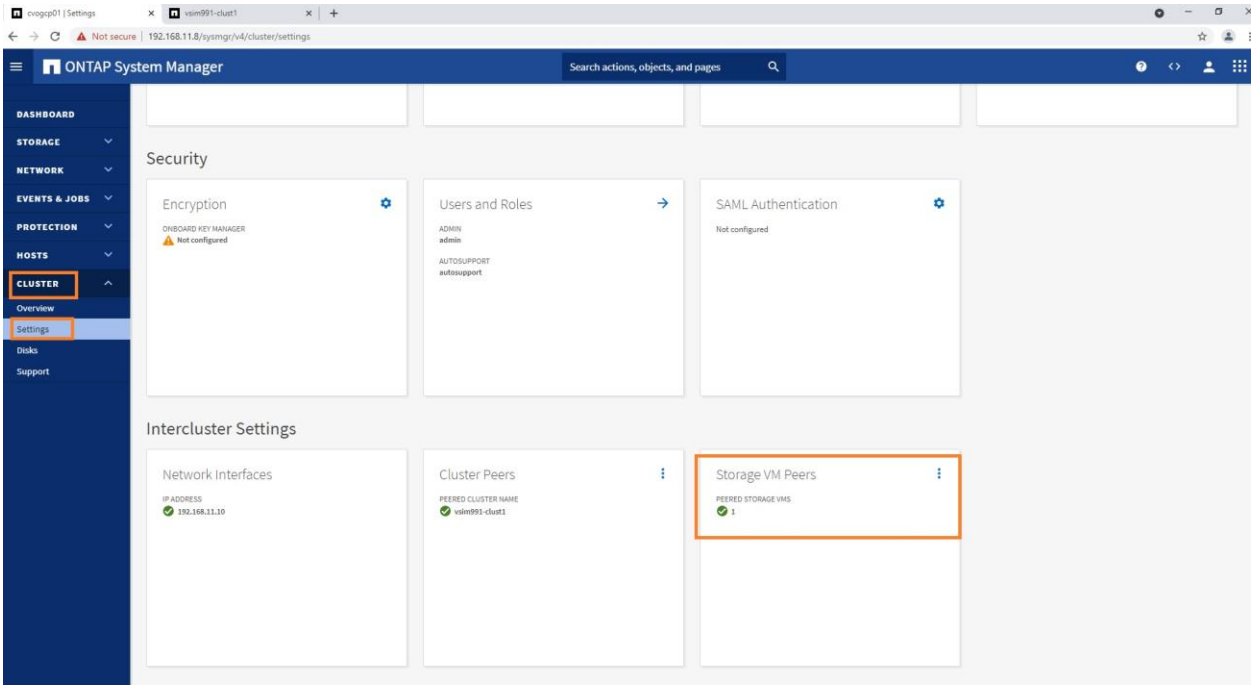
Click the three dots to expand the menu and select the “Peer Storage VMs” option.



2.2 Select the appropriate Storage VM names for the local (Cloud Volumes ONTAP) instance and the remote (on-premises ONTAP) instances and click “Peer Storage VMs” to begin the SVM peering process.



2.3 Once complete, you will be able to review this under the Cluster -> Settings -> Intercluster Settings section, as shown below.

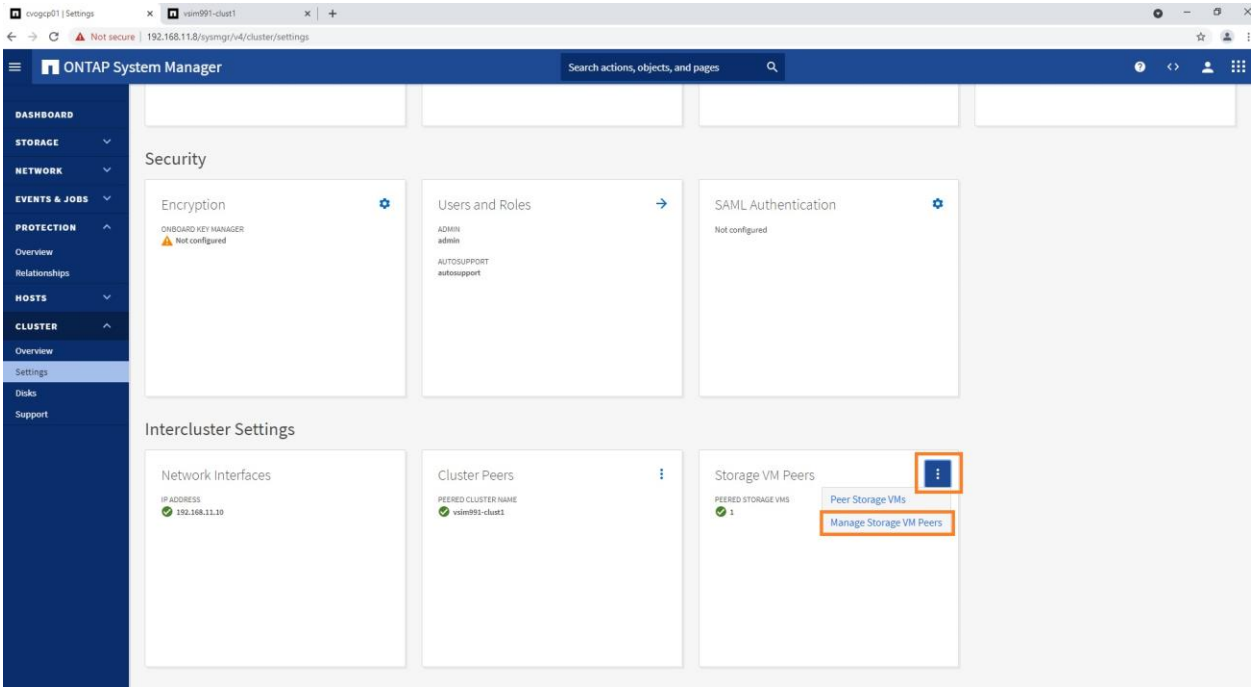


3. Verify FlexCache Application Settings

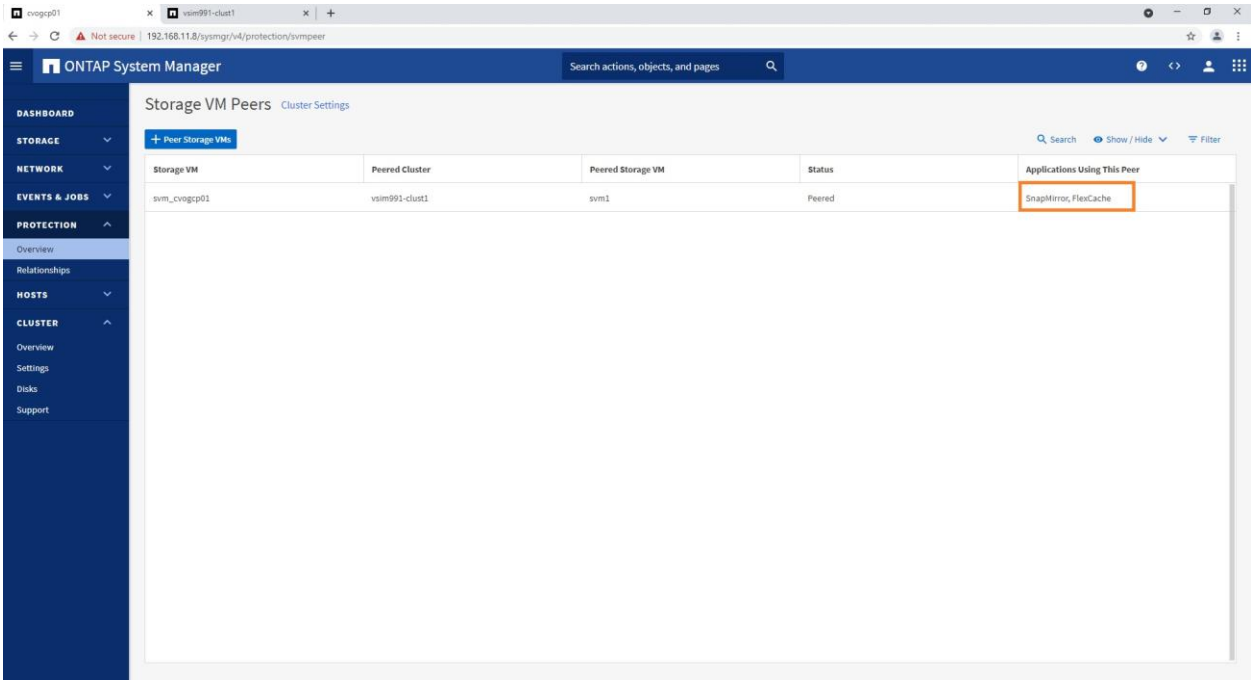
We will now verify that FlexCache is enabled to leverage the SVM peering relationship set up earlier.

3.1 In the Settings page of System Manager, find the “Storage VM Peers” menu under the Intercluster Settings.

Expand the menu by clicking the three dots and select “Manage Storage VM Peers” from the options presented.



3.2 This will take you to the Storage VM Peers view. Here, you can verify that FlexCache is already enabled as a valid application that can use this SVM peering as shown below.

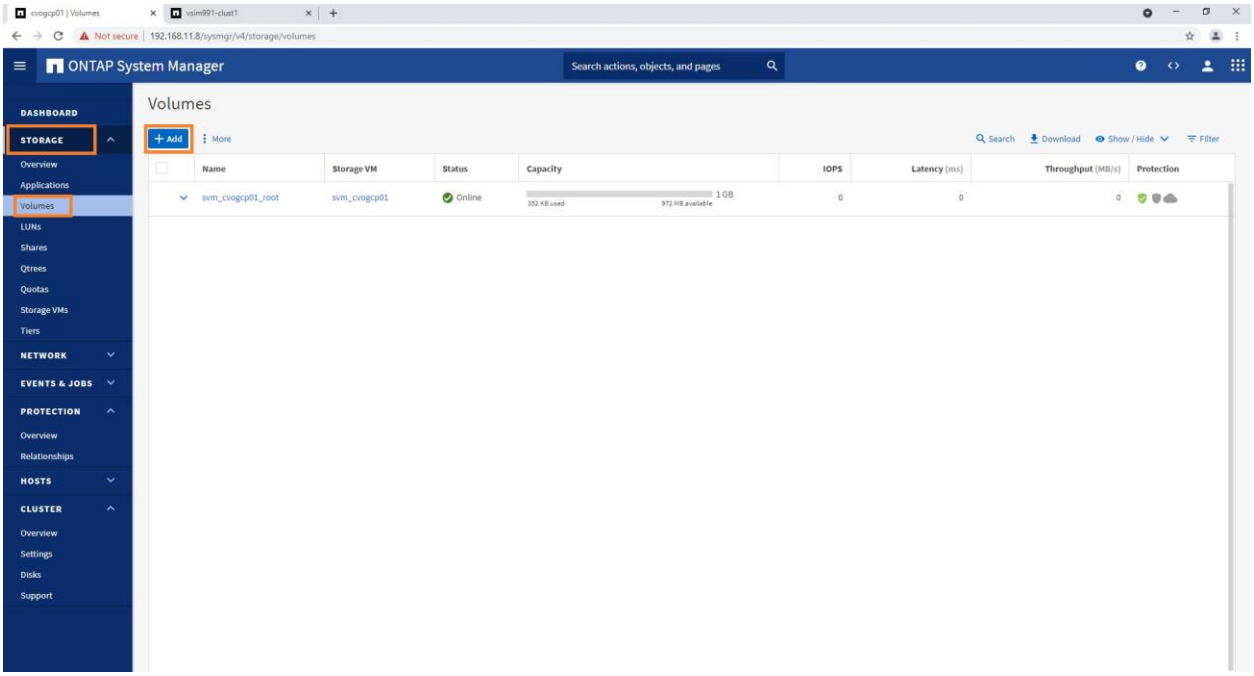


4. Create a FlexCache Volume on Cloud Volumes ONTAP

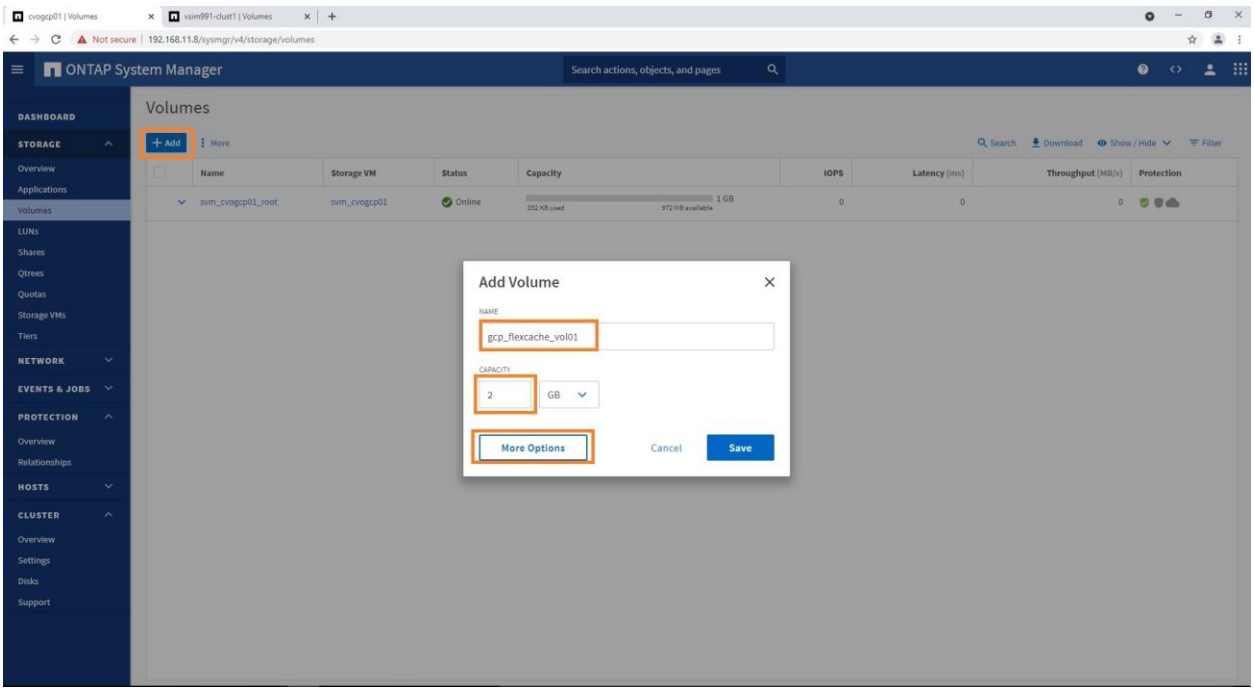
Now that the cluster and SVM peering is ready between the on-premises and Google Cloud ONTAP instances and FlexCache is enabled, we will go ahead and create the FlexCache volume on the Cloud Volumes ONTAP instance on Google Cloud.

4.1 On the left-hand menu of the System Manager view for the Cloud Volumes ONTAP instance, click the “Storage” menu option.

In the expanded menu, select “Volumes.”

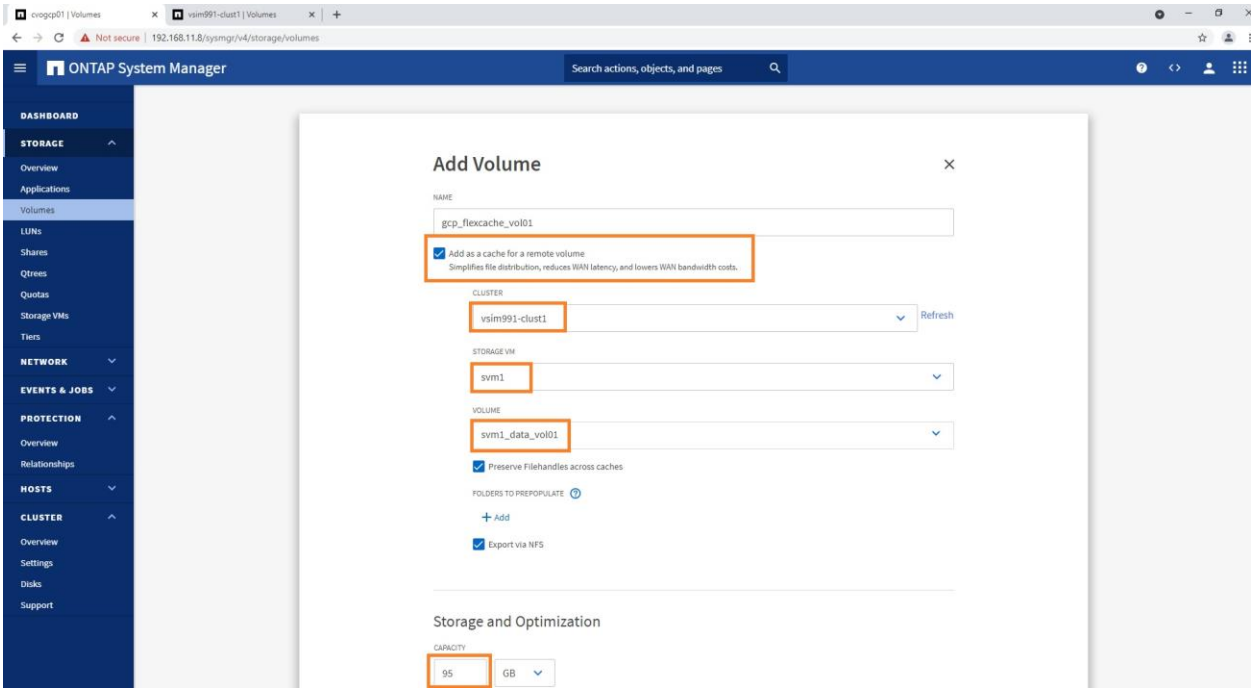


4.2 Click on “+Add” and type a name for the FlexCache volume and select the size. Note the sizing considerations referenced in the prerequisites section above. Then click the “More Options” button.



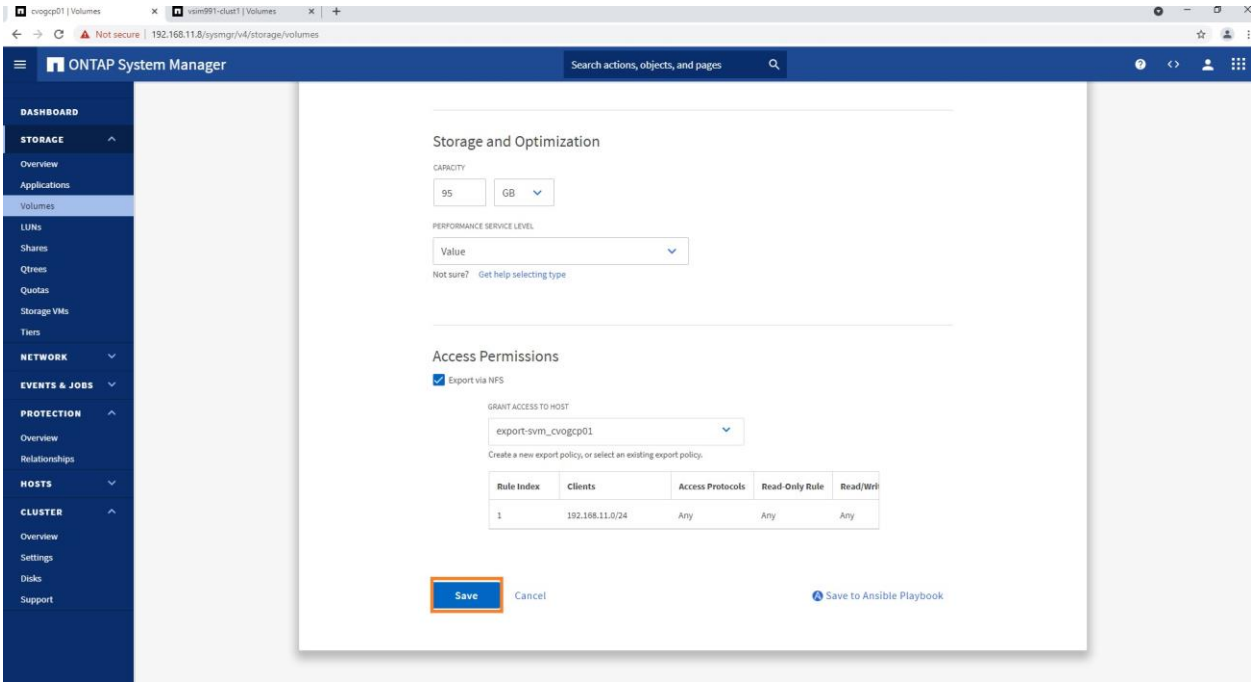
4.3 Check the box to add this volume as a FlexCache volume for a remote volume. This will enable the cluster settings section where you can select the on-premises cluster

name, the appropriate SVM name, and the source volume on that SVM to create a FlexCache for.

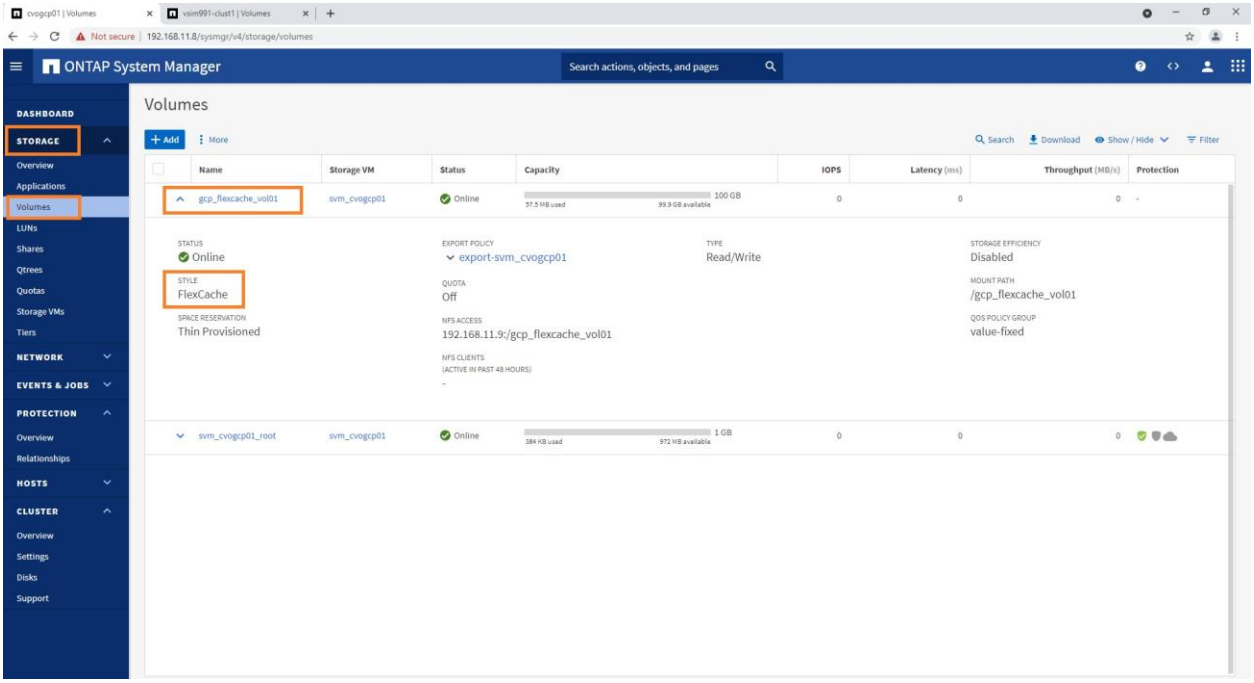


4.4 You can review the rest of the settings and options as needed. For the purpose of this illustration, we will leave them as default.

When you're done, scroll down to click "Save."

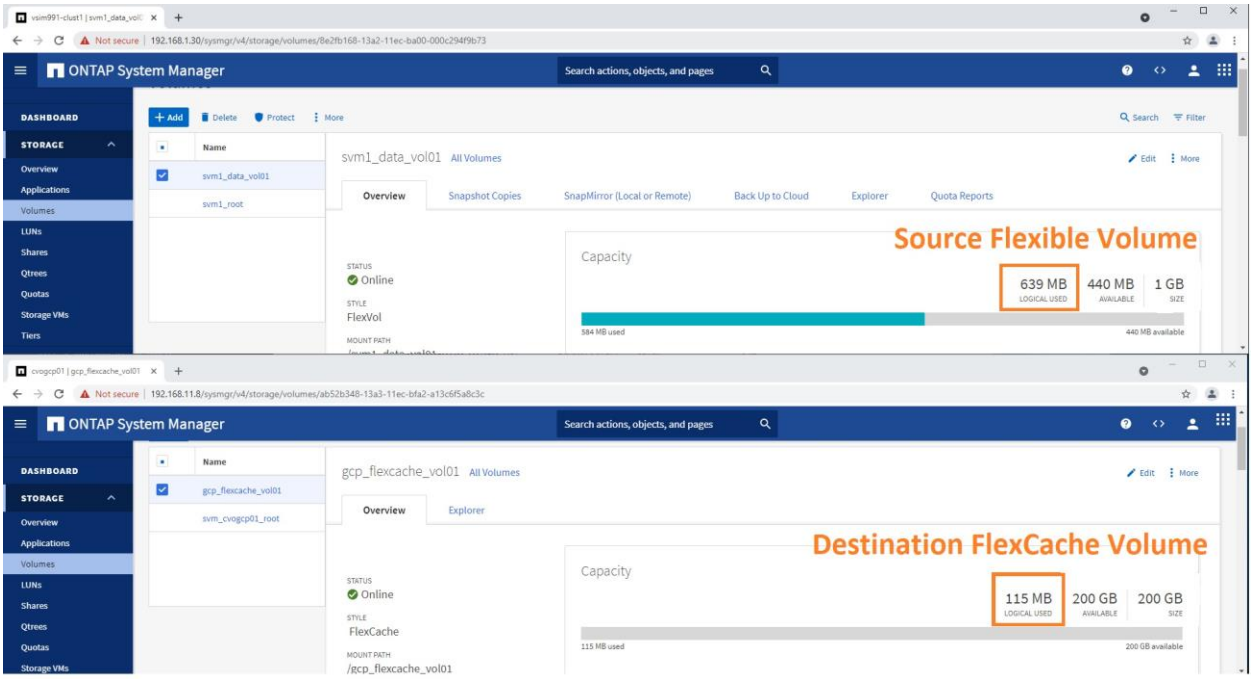


4.5 This will now create the FlexCache volume on the Cloud Volumes ONTAP instance on Google Cloud as a cache volume for the on-premises source data volume. You can view the details by clicking on the name of the FlexCache volume as shown below.



4.6 And that's it. You now have a working FlexCache volume on NetApp Cloud Volumes ONTAP running in Google Cloud.

When comparing the System Manager view of the source volume (on-premises) and the destination FlexCache volume (on Google Cloud), you can see the space consumption difference between the two volumes due to the inherent benefits of FlexCache.



Summary

Together with NetApp Cloud Volumes ONTAP on Google Cloud, NetApp FlexCache provides a convenient way for the customers to access and leverage various data generated and stored on premises without the need to do a clunky & expensive data migration to the cloud.

This article illustrates how simple it is to set up FlexCache on Cloud Volumes ONTAP in Google Cloud. Customers implementing FlexCache in production are encouraged to refer to the best practices listed within the NetApp Technical Report 4743.