



# **Cluster and SVM peering configuration**

## **System Manager Classic**

NetApp  
July 01, 2022

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# Cluster and SVM peering configuration

## Cluster and SVM peering overview

Cluster administrators can create authenticated peer relationships between clusters and SVMs to enable the clusters to communicate with each other so that data is replicated between volumes in different clusters. You can perform the procedures using the ONTAP System Manager *classic* interface, which is available with ONTAP 9.7 and earlier ONTAP 9 releases.

Use the ONTAP System Manager *classic* interface to create cluster peer relationships and SVM peer relationships if the following apply:

- You are working with clusters running ONTAP 9.7 or earlier ONTAP 9 releases.
- You want cluster peering relationships that are authenticated.
- You want to use best practices, not explore every available option.
- You want to use System Manager, not the ONTAP command-line interface (CLI) or an automated scripting tool.

## Other ways to do this in ONTAP

ONTAP System Manager in ONTAP 9.3 simplifies the way that you configure peer relationships between clusters and between SVMs. The cluster peering procedure and SVM peering procedure can be used for all ONTAP 9 versions. You should use the appropriate procedure for your version of ONTAP.

To perform these tasks with...	Refer to...
The redesigned System Manager (available with ONTAP 9.7 and later)	<ul style="list-style-type: none"><li>• <a href="#">Cluster management with System Manager</a></li></ul>
The ONTAP command-line interface (CLI)	<ul style="list-style-type: none"><li>• <a href="#">Cluster and SVM peering overview with the CLI</a>  Use the command-line interface to set up cluster peering relationships and SVM peering relationships.</li><li>• <a href="#">Network management</a>  Use the command-line interface to configure subnets, intercluster LIFs, routes, firewall policies, and other networking components</li></ul>

## Prerequisites for cluster peering

Before you set up cluster peering using the ONTAP System Manager *classic* interface with ONTAP 9.7 or earlier, you should confirm that the connectivity, port, IP address, subnet, firewall, and cluster-naming requirements are met.

## Connectivity requirements

Every intercluster LIF on the local cluster must be able to communicate with every intercluster LIF on the remote cluster.

Although it is not required, it is typically simpler to configure the IP addresses used for intercluster LIFs in the same subnet. The IP addresses can reside in the same subnet as data LIFs, or in a different subnet. The subnet used in each cluster must meet the following requirements:

- The subnet must have enough IP addresses available to allocate to one intercluster LIF per node.

For example, in a six-node cluster, the subnet used for intercluster communication must have six available IP addresses.

Each node must have an intercluster LIF with an IP address on the intercluster network.

Intercluster LIFs can have an IPv4 address or an IPv6 address.



ONTAP 9 enables you to migrate your peering networks from IPv4 to IPv6 by optionally allowing both protocols to be present simultaneously on the intercluster LIFs. In earlier releases, all intercluster relationships for an entire cluster were either IPv4 or IPv6. This meant that changing protocols was a potentially disruptive event.

## Port requirements

You can use dedicated ports for intercluster communication, or share ports used by the data network. Ports must meet the following requirements:

- All ports that are used to communicate with a given remote cluster must be in the same IPspace.

You can use multiple IPspaces to peer with multiple clusters. Pair-wise full-mesh connectivity is required only within an IPspace.

- The broadcast domain that is used for intercluster communication must include at least two ports per node so that intercluster communication can fail over from one port to another port.

Ports added to a broadcast domain can be physical network ports, VLANs, or interface groups (ifgrps).

- All ports must be cabled.
- All ports must be in a healthy state.
- The MTU settings of the ports must be consistent.

## Firewall requirements

Firewalls and the intercluster firewall policy must allow the following protocols:

- ICMP service
- TCP to the IP addresses of all the intercluster LIFs over the ports 10000, 11104, and 11105
- Bidirectional HTTPS between the intercluster LIFs

Although HTTPS is not required when you set up cluster peering using the CLI, HTTPS is required later if you use ONTAP System Manager to configure data protection.

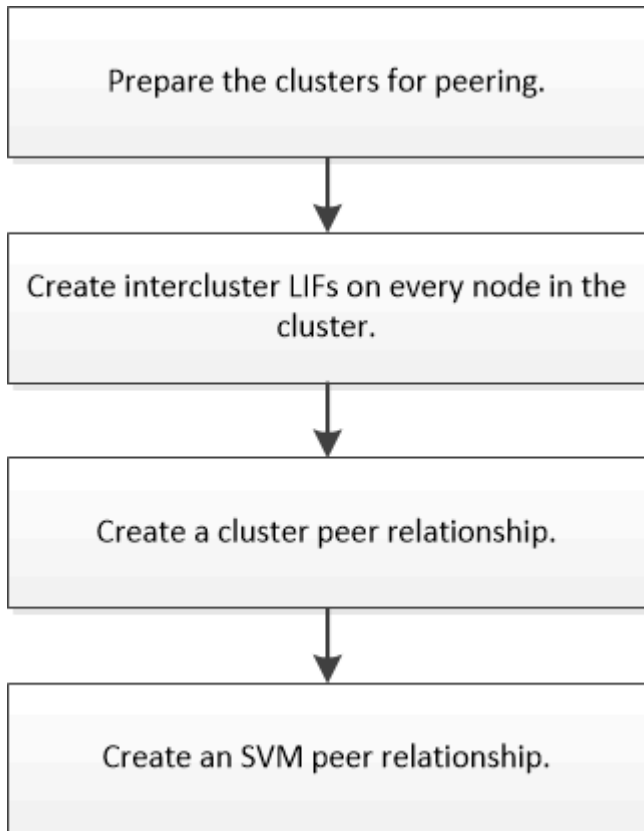
The default `intercluster` firewall policy allows access through the HTTPS protocol and from all IP addresses (0.0.0.0/0). You can modify or replace the policy if necessary.

#### Related information

[Data protection](#)

## Cluster and SVM peering workflow

You can set up a peering relationship by using the ONTAP System Manager with ONTAP 9.7 or earlier. Setting up a peering relationship involves preparing each cluster for peering, creating intercluster logical interfaces (LIFs) on each node of each cluster, setting up a cluster peer relationship, and then setting up an SVM peering relationship.



If you are running ONTAP 9.2 or earlier, you create an SVM peering relationship while creating a data protection relationship between the source volume and the destination volume.

### Prepare for cluster peering

Before creating a cluster peering relationship using the ONTAP System Manager *classic* interface with ONTAP 9.7 or earlier, you must verify that the time on each cluster is synchronized with an external Network Time Protocol (NTP) server, and determine the subnets, ports, and passphrases that you want to use.

#### Steps

1. If you are running ONTAP 9.2 or earlier, determine the passphrase that you want to use for each cluster peer relationship.

The passphrase must include at least eight characters.

For the relationship between...	The passphrase is...
Cluster A and Cluster B	

Beginning with ONTAP 9.3, you can generate the passphrase from the remote cluster while creating the cluster peer relationship.

### Creating a cluster peer relationship (Beginning with ONTAP 9.3)

2. Identify the subnets, IP addresses, and ports that you will use for intercluster LIFs.

By default, the IP address is automatically selected from the subnet. If you want to specify the IP address manually, you must ensure that the IP address either is already available in the subnet or can be added to the subnet later. Information about subnets is available in the Network tab.

Create a table similar to the following table to record information about the clusters. The following table assumes that each cluster has four nodes. If a cluster has more than four nodes, add rows for the additional information.

	Cluster A	Cluster B
Subnet (ONTAP 9.2 or earlier)		
IP address (Beginning with ONTAP 9.3, optional for ONTAP 9.2 or earlier)		
Node 1 port		
Node 2 port		
Node 3 port		
Node 4 port		

## Configure peer relationships (Beginning with ONTAP 9.3)

A peer relationship defines the network connections that enable clusters and SVMs to exchange data securely. Beginning with ONTAP 9.3, until ONTAP 9.7, you can use the ONTAP System Manager *classic* interface to perform a simplified method to configure peer relationships between clusters and between SVMs.

### Create intercluster LIFs (Beginning with ONTAP 9.3)

Beginning with ONTAP 9.3, until ONTAP 9.7, you can use the ONTAP System Manager *classic* interface to create intercluster logical interfaces (LIFs), which enable the cluster network to communicate with a node. You must create an intercluster LIF within each

IPspace that will be used for peering, on each node in each cluster for which you want to create a peer relationship.

### About this task

For example, if you have a four-node cluster that you want to peer with cluster X over IPspace A, and peer with cluster Y over IPspace Y, then you need a total of eight intercluster LIFs; Four on IPspace A (one per node), and four on IPspace Y (one per node).

You must perform this procedure on both clusters for which you want to create a peer relationship.

### Steps

1. Click **Configuration > Advanced Cluster Setup**.
2. In the **Setup Advanced Cluster Features** window, click **Proceed** next to the **Cluster Peering** option.
3. Select an IPspace from the **IPspace** list.
4. Enter the IP address, port, network mask, and gateway details of each node.

	IP Address	Port	Netmask	Gateway (Optional)
sti50-vsrm-ucs103a	10.53.32.1	e0d	255.255.240.0	
sti50-vsrm-ucs103b	10.53.32.2	e0d		

5. Click **Submit and Continue**.

### What to do next

You should enter the cluster details in the Cluster Peering window to continue with cluster peering.

### Create a cluster peer relationship (Beginning with ONTAP 9.3)

Beginning with ONTAP 9.3, until ONTAP 9.7, you can use the ONTAP System Manager *classic* interface create a cluster peer relationship between two clusters by providing a system-generated passphrase and the IP addresses of the intercluster LIFs of the remote cluster.

### About this task

Beginning with ONTAP 9.6, cluster peering encryption is enabled by default on all newly created cluster peering relationships. Cluster peering encryption must be enabled manually for peering relationship created prior to upgrading to ONTAP 9.6. Cluster peering encryption is not available for clusters running ONTAP 9.5 or earlier. Therefore, both clusters in the peering relationship must be running ONTAP 9.6 in order to enable cluster peering encryption.

Cluster peering encryption uses the Transport Security Layer (TLS) to secure cross-cluster peering communications for ONTAP features such as SnapMirror and FlexCache.

### Steps

1. In the **Target Cluster Intercluster LIF IP addresses** field, enter the IP addresses of the intercluster LIFs of the remote cluster.


2. Generate a passphrase from the remote cluster.
  - a. Specify the management address of the remote cluster.
  - b. Click **Management URL** to launch ONTAP System Manager on the remote cluster.
  - c. Log in to the remote cluster.
  - d. In the **Cluster Peers** window, click **Generate Peering Passphrase**.
  - e. Select the IPspace, validity of the passphrase, and SVM permissions.

You can allow all of the SVMs or selected SVMs for peering. When a SVM peer request is generated, the permitted SVMs are automatically peered with the source SVMs without requiring you to accept the peer relationship from the remote SVMs.

- f. Click **Generate**.

The passphrase information is displayed.

### Generate Peering Passphrase

 Passphrase generated successfully

Use the following information for peering based on the IPspace "Default":

Intercluster LIF IP Address 172.21.91.12

Passphrase QS7k+laFYJzclV9UMPXvHgWd

Passphrase Validity Valid Until Mon Nov... America/New\_Y

SVM Permissions All

[Email passphrase details](#)

[Copy passphrase details](#)

---

[Done](#)

- g. Click **Copy passphrase details** or **Email passphrase details**.
  - h. Click **Done**.
3. In the source cluster, enter the generated passphrase that you obtained in [Step 2](#).
4. Click **Initiate Cluster Peering**.

The cluster peer relationship is successfully created.



5. Click **Continue**.

#### What to do next

You should specify the SVM details in the SVM Peering window to continue with the peering process.

### Create SVM peer relationships

Beginning with ONTAP 9.3, until ONTAP 9.7, you can use the ONTAP System Manager *classic* interface to create SVM peer relationships. The storage virtual machine (SVM) peering enables you to establish a peer relationship between two SVMs for data protection.

#### Steps

1. Select the initiator SVM.
2. Select the target SVM from the list of permitted SVMs.
3. Click **Initiate SVM Peering**.
4. Click **Continue**.

#### What to do next

You can view the intercluster LIFs, cluster peer relationship, and SVM peer relationship in the Summary window.

### Configure peer relationships (ONTAP 9.2 and earlier)

Using the ONTAP System Manager *classic* interface with ONTAP 9.2 or an earlier ONTAP 9 release, you can create SVM peer relationships.

A peer relationship defines network connections that enable clusters and SVMs to exchange data securely. You must create a cluster peer relationship before you can create an SVM peer relationship.

### Create intercluster interfaces on all nodes (ONTAP 9.2 or earlier)

Using the ONTAP System Manager *classic* interface with ONTAP 9.2 or an earlier ONTAP 9 release, you can create intercluster LIFs that will be used for peering.

Clusters communicate with each other through logical interfaces (LIFs) that are dedicated to intercluster communication. You must create an intercluster LIF within each IPspace that will be used for peering. The LIFs must be created on each node in each cluster for which you want to create a peer relationship.

#### Before you begin

You must have identified the subnet and ports, and optionally the IP addresses, that you plan to use for the intercluster LIFs.

#### About this task

You must perform this procedure on both clusters for which you want to create a peer relationship. For example, if you have a four-node cluster that you want to peer with cluster X over IPspace A, and peer with cluster Y over IPspace Y, then you need a total of eight intercluster LIFs; Four on IPspace A (one per node), and four on IPspace Y (one per node).

## Steps

1. Create an intercluster LIF on one node of the source cluster:

- a. Navigate to the **Network Interfaces** window.
- b. Click **Create**.

The Create Network Interface dialog box is displayed.

- c. Enter a name for the intercluster LIF.

You can use "icl01" for the intercluster LIF on the first node, and "icl02" for the intercluster LIF on the second node.

- d. Select **Intercluster Connectivity** as the interface role.
- e. Select the IPspace.

- f. In the **Add Details** dialog box, select **Using a subnet** from the **Assign IP Address** drop-down list, and then select the subnet that you want to use for intercluster communication.

By default, the IP address is automatically selected from the subnet after you click **Create**. If you do not want to use the IP address that is automatically selected, you must manually specify the IP address that the node uses for intercluster communication.

- g. If you want to manually specify the IP address that the node uses for intercluster communication, select **Use this IP Address**, and type the IP address.

You must ensure that the IP address that you want to use either is already available in the subnet or can be added to the subnet later.

- h. In the **Ports** area, click the node that you are configuring, and select the port that you want to use for this node.

- i. If you decided not to share ports for intercluster communication with data communication, confirm that the selected port displays "0" in the **Hosted Interface Count** column.

**Create Network Interface** X

Specify the following details to add a new network interface for data and management access of the chosen SVM.

Name:

Interface Role:  Serves Data  
 Intercluster Connectivity

SVM:

Protocol Access:  CIFS  iSCSI  
 NFS  FC/FCoE

Management Access:  Enable Management Access

Subnet:

The IP address is selected from this subnet.  
 Use this IP Address:

*i* This IP address will be added to the chosen subnet if the address is not already present in the subnet available range.

Port: 

Ports or Adapters	Hosted Interface Count	Speed
▲ clusterA-node1		
e0c	3	1000 Mbps
e0d	0	1000 Mbps
e0e	0	1000 Mbps

j. Click **Create**.

2. Repeat [Step 1](#) for each node in the cluster.


Each node in the cluster has an intercluster LIF.

3. Make a note of the IP addresses of the intercluster LIFs so that you can use them later when you create peer relationships with other clusters:

- a. In the **Network Interfaces** window, in the **Role** column, click , clear the **All** check box, and then select **Intercluster**.

The Network Interfaces window displays only intercluster LIFs.

- b. Note down the IP addresses that are listed in the **IP Addresses/WWPN** column, or leave the **Network Interfaces** window open so that you can retrieve the IP addresses later.

You can click the column display icon  to hide the columns that you do not want to view.

## Results

All of the nodes in each cluster have intercluster LIFs that can all communicate with each other.

### Create a cluster peer relationship (ONTAP 9.2 or earlier)

Using the ONTAP System Manager *classic* interface with ONTAP 9.2 or an earlier ONTAP 9 release, you can create a cluster peer relationship between two clusters by

entering a predetermined passphrase and the IP addresses of the intercluster LIFs of the remote cluster, and then verifying that the relationship was created successfully.

### Before you begin

- You must know the IP addresses of all of the intercluster LIFs of the clusters that you want to peer.
- You must know the passphrase that you will use for each peer relationship.

### About this task

You must perform this procedure on each cluster.

### Steps

1. From the source cluster, create a cluster peer relationship with the destination cluster.
  - a. Click the **Configurations** tab.
  - b. In the **Cluster Settings** pane, click **Cluster Peers**.
  - c. Click **Create**.

The **Create Cluster Peer** dialog box is displayed.

- d. In the **Details of the remote cluster to be peered** area, specify the passphrase that both peers will use to ensure an authenticated cluster peer relationship.
- e. Enter the IP addresses of all of the intercluster LIFs of the destination cluster (one per node) separated by commas.

Details of the local cluster		Details of the remote cluster to be peered	
Cluster Name:	clusterA	Passphrase:	*****
Intercluster IP Addresses:		Intercluster IP Addresses:	10.238.14.33,10.238.14.36
clusterA-node1	10.53.52.120		
clusterA-node2	10.53.52.121		

- f. Click **Create**.

The authentication status is “pending” because only one cluster has been configured.

2. Switch to the destination cluster, and then create a cluster peer relationship with the source cluster:
  - a. Click the **Configurations** tab.
  - b. In the **Cluster Settings** pane, click **Cluster Peers**.
  - c. Click **Create**.

The Create Cluster Peer dialog box is displayed.

- d. In the **Details of the remote cluster to be peered** area, specify the same passphrase that you specified in [Step 1d](#) and the IP addresses of the intercluster LIFs of the source cluster, and then click

## Create.

**Create Cluster Peer**

For a cluster to communicate with another cluster in a peer relationship, enter a passphrase and the intercluster IP addresses of the peer cluster.  
Tell me more about cluster peering

**Details of the local cluster**

Cluster Name: clusterB

Intercluster IP Addresses:

clusterB-node1	10.238.14.33
clusterB-node2	10.238.14.36

**Details of the remote cluster to be peered**

Passphrase:

Intercluster IP Addresses: 10.53.52.120,10.53.52.121

3. From the **Cluster Peers** window of the destination cluster, confirm that the source cluster is “available” and that the authentication status is “OK”.

'Availability' and 'Authentication Status' information might be stale for up to several minutes.

Create Modify Passphrase Modify Peer Network Parameters Delete Refresh

Peer Cluster	Availability	Authentication Status
clusterA	available	ok

You might have to click **Refresh** to view the updated information.

The two clusters are in a peer relationship.

4. Switch to the source cluster, and confirm that the destination cluster is “available” and that the authentication status is “OK”.

You might have to click **Refresh** to view the updated information.

### What to do next

Create an SVM peer relationship between the source and destination SVMs while creating a data protection relationship between the source volume and the destination volume.

[Volume backup using SnapVault](#)

[Volume disaster recovery preparation](#)

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