



# **Parts of a fabric MetroCluster configuration**

## **Active IQ Unified Manager 9.9**

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# Parts of a fabric MetroCluster configuration

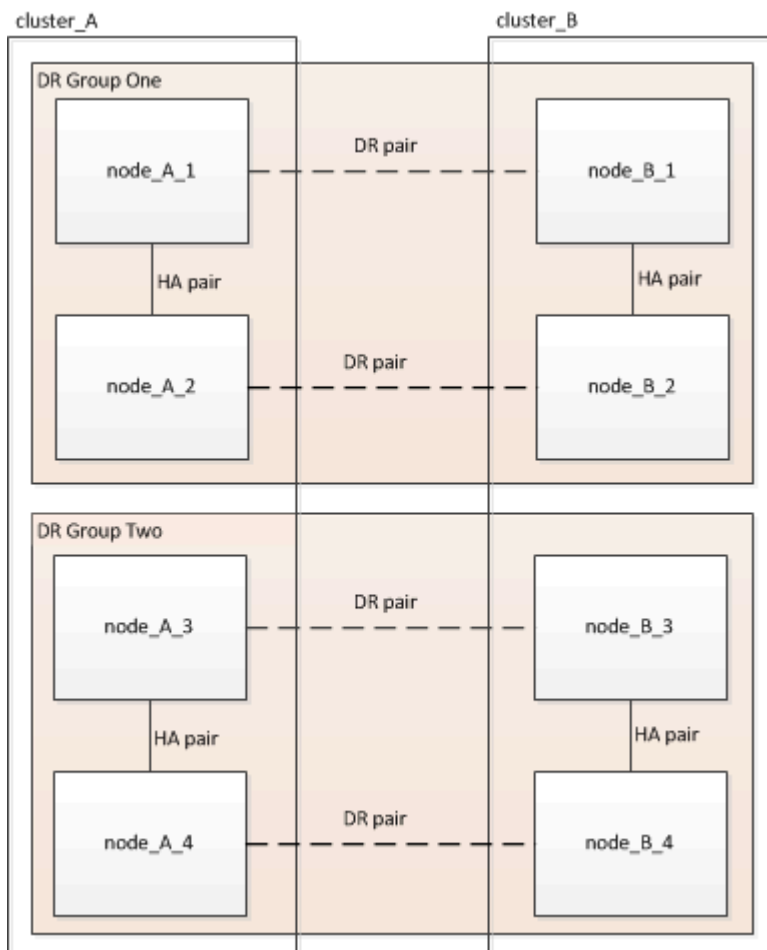
As you plan your MetroCluster configuration, you should understand the hardware components and how they interconnect.

## Disaster Recovery (DR) groups

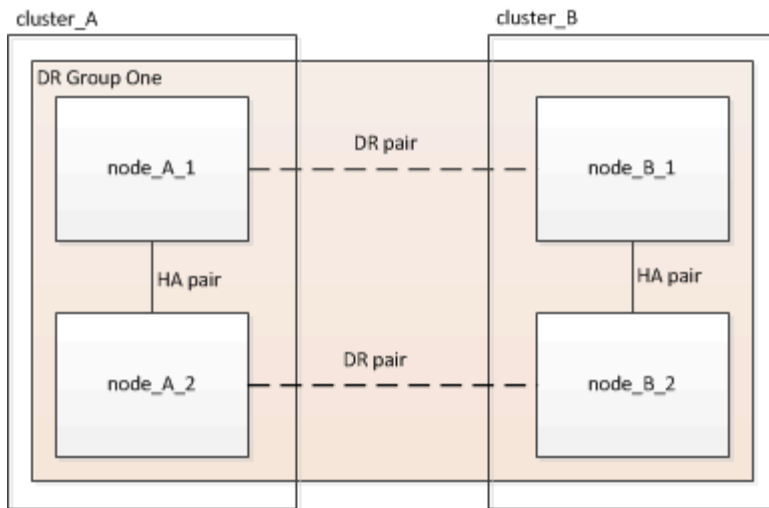
A fabric MetroCluster configuration consists of one or two DR groups, depending on the number of nodes in the MetroCluster configuration. Each DR group consists of four nodes.

- An eight-node MetroCluster configuration consists of two DR groups.
- A four-node MetroCluster configuration consists of one DR group.

The following illustration shows the organization of nodes in an eight-node MetroCluster configuration:



The following illustration shows the organization of nodes in a four-node MetroCluster configuration:



## Key hardware elements

A MetroCluster configuration includes the following key hardware elements:

- Storage controllers

The storage controllers are not connected directly to the storage but connect to two redundant FC switch fabrics.

- FC-to-SAS bridges

The FC-to-SAS bridges connect the SAS storage stacks to the FC switches, providing bridging between the two protocols.

- FC switches

The FC switches provide the long-haul backbone ISL between the two sites. The FC switches provide the two storage fabrics that allow data mirroring to the remote storage pools.

- Cluster peering network

The cluster peering network provides connectivity for mirroring of the cluster configuration, which includes storage virtual machine (SVM) configuration. The configuration of all of the SVMs on one cluster is mirrored to the partner cluster.

## Eight-node fabric MetroCluster configuration

An eight-node configuration consists of two clusters, one at each geographically separated site. **cluster\_A** is located at the first MetroCluster site. **cluster\_B** is located at the second MetroCluster site. Each site has one SAS storage stack. Additional storage stacks are supported, but only one is shown at each site. The HA pairs are configured as switchless clusters, without cluster interconnect switches. A switched configuration is supported, but is not shown.

An eight-node configuration includes the following connections:

- FC connections from each controller's HBAs and FC-VI adapters to each of the FC switches
- An FC connection from each FC-to-SAS bridge to an FC switch

- SAS connections between each SAS shelf and from the top and bottom of each stack to an FC-to-SAS bridge
- An HA interconnect between each controller in the local HA pair

If the controllers support a single-chassis HA pair, the HA interconnect is internal, occurring through the backplane, meaning that an external interconnect is not required.

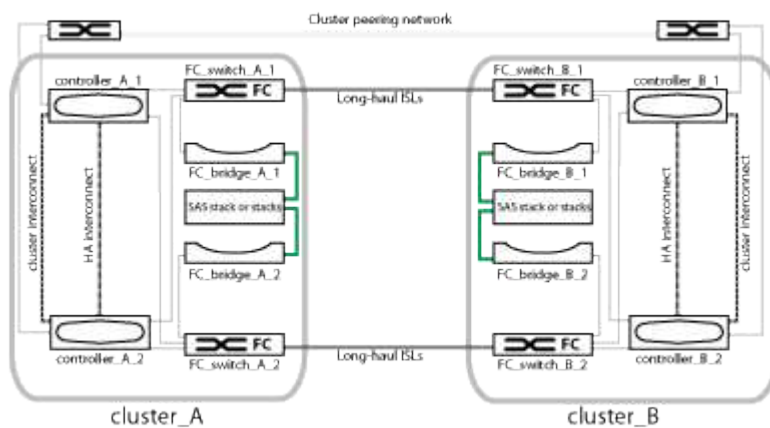
- Ethernet connections from the controllers to the customer-provided network that is used for cluster peering

SVM configuration is replicated over the cluster peering network.

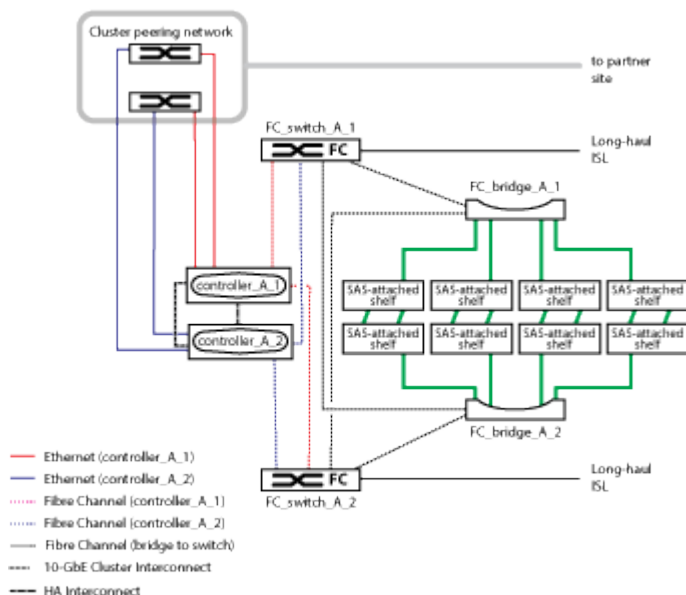
- A cluster interconnect between each controller in the local cluster

## Four-node fabric MetroCluster configuration

The following illustration shows a simplified view of a four-node fabric MetroCluster configuration. For some connections, a single line represents multiple, redundant connections between the components. Data and management network connections are not shown.

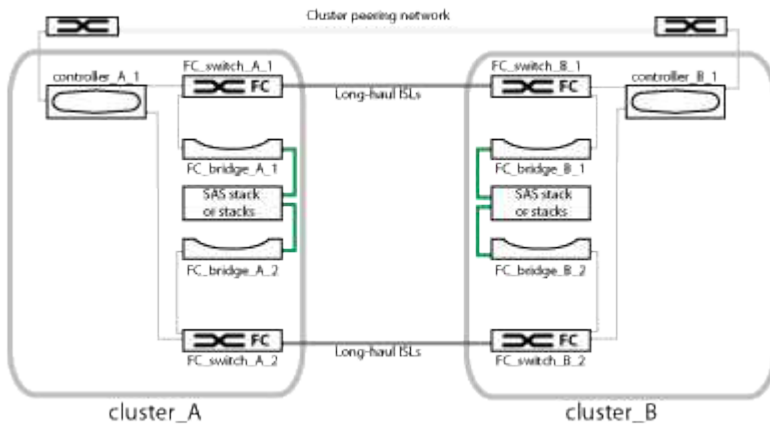


The following illustration shows a more detailed view of the connectivity in a single MetroCluster cluster (both clusters have the same configuration):



# Two-node fabric MetroCluster configuration

The following illustration shows a simplified view of a two-node fabric MetroCluster configuration. For some connections, a single line represents multiple, redundant connections between the components. Data and management network connections are not shown.

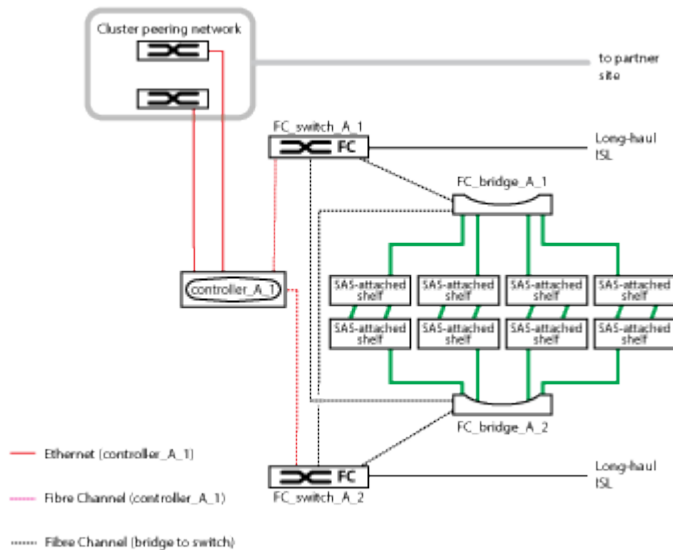


A two-node configuration consists of two clusters, one at each geographically separated site. cluster\_A is located at the first MetroCluster site. cluster\_B is located at the second MetroCluster site. Each site has one SAS storage stack. Additional storage stacks are supported, but only one is shown at each site.



In a two-node configuration, the nodes are not configured as an HA pair.

The following illustration shows a more detailed view of the connectivity in a single MetroCluster cluster (both clusters have the same configuration):



A two-node configuration includes the following connections:

- FC connections between the FC-VI adapter on each controller module
- FC connections from each controller module's HBAs to the FC-to-SAS bridge for each SAS shelf stack
- SAS connections between each SAS shelf and from the top and bottom of each stack to an FC-to-SAS bridge

- Ethernet connections from the controllers to the customer-provided network that is used for cluster peering

SVM configuration is replicated over the cluster peering network.

## Parts of a two-node SAS-attached stretch MetroCluster configuration

The two-node MetroCluster SAS-attached configuration requires a number of parts, including two single-node clusters in which the storage controllers are directly connected to the storage using SAS cables.

The MetroCluster configuration includes the following key hardware elements:

- Storage controllers

The storage controllers connect directly to the storage using SAS cables.

Each storage controller is configured as a DR partner to a storage controller on the partner site.

- Copper SAS cables can be used for shorter distances.
- Optical SAS cables can be used for longer distances.



In systems using E-Series array LUNs, the storage controllers can be directly connected to the E-Series storage arrays. For other array LUNs, connections via FC switches are required.

### [NetApp Interoperability Matrix Tool](#)

In the IMT, you can use the Storage Solution field to select your MetroCluster solution. You use the **Component Explorer** to select the components and ONTAP version to refine your search. You can click **Show Results** to display the list of supported configurations that match the criteria.

- Cluster peering network

The cluster peering network provides connectivity for mirroring of the storage virtual machine (SVM) configuration. The configuration of all SVMs on one cluster is mirrored to the partner cluster.

## Parts of a two-node bridge-attached stretch MetroCluster configuration

As you plan your MetroCluster configuration, you should understand the parts of the configuration and how they work together.

The MetroCluster configuration includes the following key hardware elements:

- Storage controllers

The storage controllers are not connected directly to the storage but connected to FC-to-SAS bridges. The storage controllers are connected to each other by FC cables between each controller's FC-VI adapters.

Each storage controller is configured as a DR partner to a storage controller on the partner site.

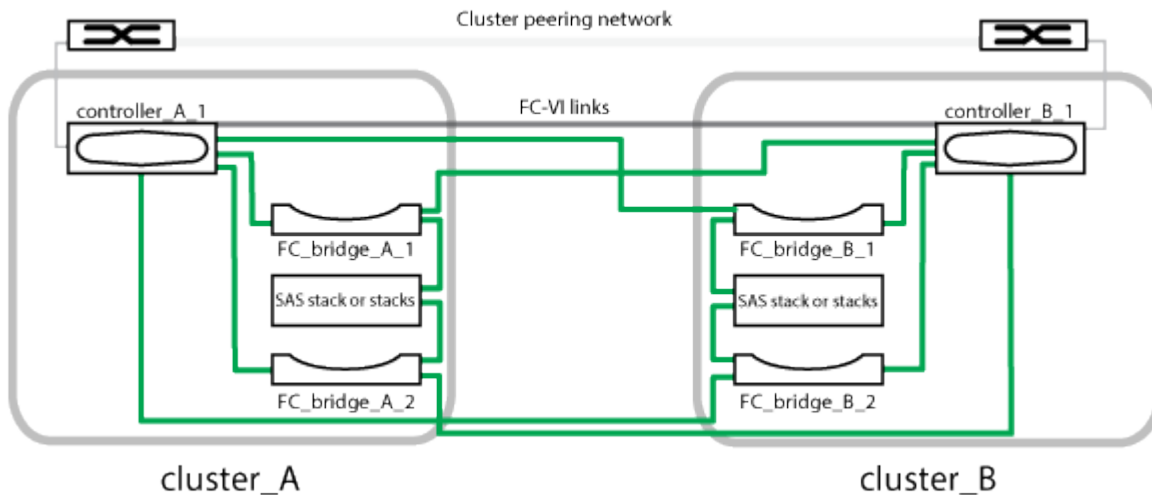
- FC-to-SAS bridges

The FC-to-SAS bridges connect the SAS storage stacks to the FC initiator ports on the controllers, providing bridging between the two protocols.

- Cluster peering network

The cluster peering network provides connectivity for mirroring of the storage virtual machine (SVM) configuration. The configuration of all SVMs on one cluster is mirrored to the partner cluster.

The following illustration shows a simplified view of the MetroCluster configuration. For some connections, a single line represents multiple, redundant connections between the components. Data and management network connections are not shown.



- The configuration consists of two single-node clusters.
- Each site has one or more stacks of SAS storage.



SAS shelves in MetroCluster configurations are not supported with ACP cabling.

Additional storage stacks are supported, but only one is shown at each site.



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