NetApp

Cable a two-node SAS-attached stretch MetroCluster configuration

ONTAP MetroCluster

NetApp
July 14, 2022

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The MetroCluster components must be physically installed, cabled, and configured at both geographic sites. The steps are slightly different for a system with native disk shelves as opposed to a system with array LUNs.

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.

Required MetroCluster hardware components and naming guidelines for two-node SAS-attached stretch configurations

The MetroCluster configuration requires a variety of hardware components. For convenience and clarity, standard names for components are used throughout the MetroCluster documentation. One site is referred to as Site A and the other site is referred to as Site B.

Supported software and hardware

The hardware and software must be supported for the MetroCluster FC configuration.

NetApp Hardware Universe

When using AFF systems, all controller modules in the MetroCluster configuration must be configured as AFF systems.

Hardware redundancy in the MetroCluster configuration

Because of the hardware redundancy in the MetroCluster configuration, there are two of each components at each site. The sites are arbitrarily assigned the letters A and B and the individual components are arbitrarily assigned the numbers 1 and 2.

Two single-node ONTAP clusters

The SAS-attached stretch MetroCluster configuration requires two single-node ONTAP clusters.

Naming must be unique within the MetroCluster configuration.

Example names:

- Site A: cluster_A
- Site B: cluster_B

Two storage controller modules

The SAS-attached stretch MetroCluster configuration requires two storage controller modules.

- Naming must be unique within the MetroCluster configuration.
- All controller modules in the MetroCluster configuration must be running the same version of ONTAP.
- All controller modules in a DR group must be of the same model.
- All controller modules in a DR group must use the same FC-VI configuration.

Some controller modules support two options for FC-VI connectivity:

- Onboard FC-VI ports
- An FC-VI card in slot 1

  A mix of one controller module using onboard FC-VI ports and another using an add-on FC-VI card is not supported. For example, if one node uses onboard FC-VI configuration, then all other nodes in the DR group must use onboard FC-VI configuration as well.

Example names:

- Site A: controller_A_1
- Site B: controller_B_1

At least four SAS disk shelves (recommended)

The SAS-attached stretch MetroCluster configuration requires at least two SAS disk shelves. Four SAS disk shelves is recommended.

Two shelves are recommended at each site to allow disk ownership on a per-shelf basis. A minimum of one shelf at each site is supported.

Example names:

- Site A:
  - shelf_A_1_1
  - shelf_A_1_2
- Site B:
  - shelf_B_1_1
  - shelf_B_1_2

Mixing IOM12 and IOM 6 modules in a stack

Your version of ONTAP must support shelf mixing. Refer to the Interoperability Matrix Tool (IMT) to see if your version of ONTAP supports shelf mixing. NetApp Interoperability

For further details on shelf mixing, see: Hot-adding shelves with IOM12 modules to a stack of shelves with IOM6 modules

Install and cable MetroCluster components for two-node SAS-attached stretch configurations

Installing and cabling MetroCluster components for two-node SAS-attached stretch configurations

The storage controllers must be cabled to the storage media and to each other. The storage controllers must also be cabled to the data and management network.

Before you begin any procedure in this document

The following overall requirements must be met before completing this task:

- Prior to installation you must have familiarized yourself with the considerations and best practices for installing and cabling disk shelves for your disk shelf model.

- All MictoCluster components must be supported.

  NetApp Interoperability Matrix Tool

  In the IMT, you can use the Storage Solution field to select your MetroCluster solution. 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.

About this task

- The terms node and controller are used interchangeably.

Racking the hardware components

If you have not received the equipment already installed in cabinets, you must rack the components.

This task must be performed on both MetroCluster sites.

Steps

1. Plan the positioning of the MetroCluster components.

   The amount of rack space needed depends on the platform model of the storage controllers, the switch types, and the number of disk shelf stacks in your configuration.

2. Using standard shop practices for working with electrical equipment make sure you are properly grounded.

3. Install the storage controllers in the rack or cabinet.

   AFF and FAS Documentation Center

4. Install the disk shelves, daisy-chain the disk shelves in each stack, power them on, and set the shelf IDs.

   See the appropriate guide for your disk shelf model for information about daisy-chaining disk shelves and setting shelf IDs.

   > (i) Shelf IDs must be unique for each SAS disk shelf within each MetroCluster DR group (including both sites). When manually setting shelf IDs, you must power-cycle the disk shelf.

Cabling the controllers to each other and the storage shelves

The controller FC-VI adapters must be cabled directly to each other. The controller SAS ports must be cabled to both the remote and local storage stacks.

This task must be performed at both MetroCluster sites.

Steps

1. Cable the FC-VI ports.

The above illustration is a typical representative cable connection. The specific FC-VI ports will vary by controller module.

- FAS8200 and AFF A300 controller modules can be ordered with one of two options for FC-VI connectivity:
  - Onboard ports 0e and 0f are configured in FC-VI mode.
  - Ports 1a and 1b on an FC-VI card go in slot 1.
- AFF A700 and FAS9000 storage systems controller modules use four FC-VI ports each.
- AFF A400 and FAS8300 storage system controller modules use FC-VI ports 2a and 2b.

2. Cable the SAS ports.

The following illustration shows the connections. Your port usage might be different depending on the available SAS and FC-VI ports on the controller module.

Cabling the cluster peering connections

You must cable the controller module ports used for cluster peering so that they have

connectivity with the cluster on their partner site.

This task must be performed on each controller module in the MetroCluster configuration.

At least two ports on each controller module should be used for cluster peering.

The recommended minimum bandwidth for the ports and network connectivity is 1 GbE.

Steps

1. Identify and cable at least two ports for cluster peering and verify they have network connectivity with the partner cluster.

   Cluster peering can be done on dedicated ports or on data ports. Using dedicated ports provides a higher throughput for the cluster peering traffic.

   Cluster and SVM peering express configuration

Cabling the management and data connections

You must cable the management and data ports on each storage controller to the site networks.

This task must be repeated for each new controller at both MetroCluster sites.

You can connect the controller and cluster switch management ports to existing switches in your network. In addition you can connect controller to new dedicated network switches such as NetApp CN1601 cluster management switches.

Steps

1. Cable the controller's management and data ports to the management and data networks at the local site.

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