# Managing and monitoring MetroCluster configurations

## Active IQ Unified Manager

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# Managing and monitoring MetroCluster configurations

The monitoring support for MetroCluster configurations in the Unified Manager web UI enables you to check for any connectivity issues in your MetroCluster configuration. Discovering a connectivity issue early enables you to manage your MetroCluster configurations effectively.

## Performance monitoring of MetroCluster configurations

Unified Manager enables you to monitor the write throughput between clusters in a MetroCluster configuration to identify workloads with a high amount of write throughput. If these high-performing workloads are causing other volumes on the local cluster to have high I/O response times, Unified Manager triggers performance events to notify you.

When a local cluster in a MetroCluster configuration mirrors its data to its partner cluster, the data is written to NVRAM and then transferred over the interswitch links (ISLs) to the remote aggregates. Unified Manager analyzes the NVRAM to identify the workloads whose high write throughput is overutilizing the NVRAM, placing the NVRAM in contention.

Workloads whose deviation in response time has exceeded the performance threshold are called victims and workloads whose deviation in write throughput to the NVRAM is higher than usual, causing the contention, are called *bullies*. Because only the write requests are mirrored to the partner cluster, Unified Manager does not analyze read throughput.

Unified Manager treats the clusters in a MetroCluster configuration as individual clusters. It does not distinguish between clusters that are partners or correlate the write throughput from each cluster.

**Related information**

Performance event analysis and notification

Performance event analysis for a MetroCluster configuration

Roles of workloads involved in a performance event

Identifying victim workloads involved in a performance event

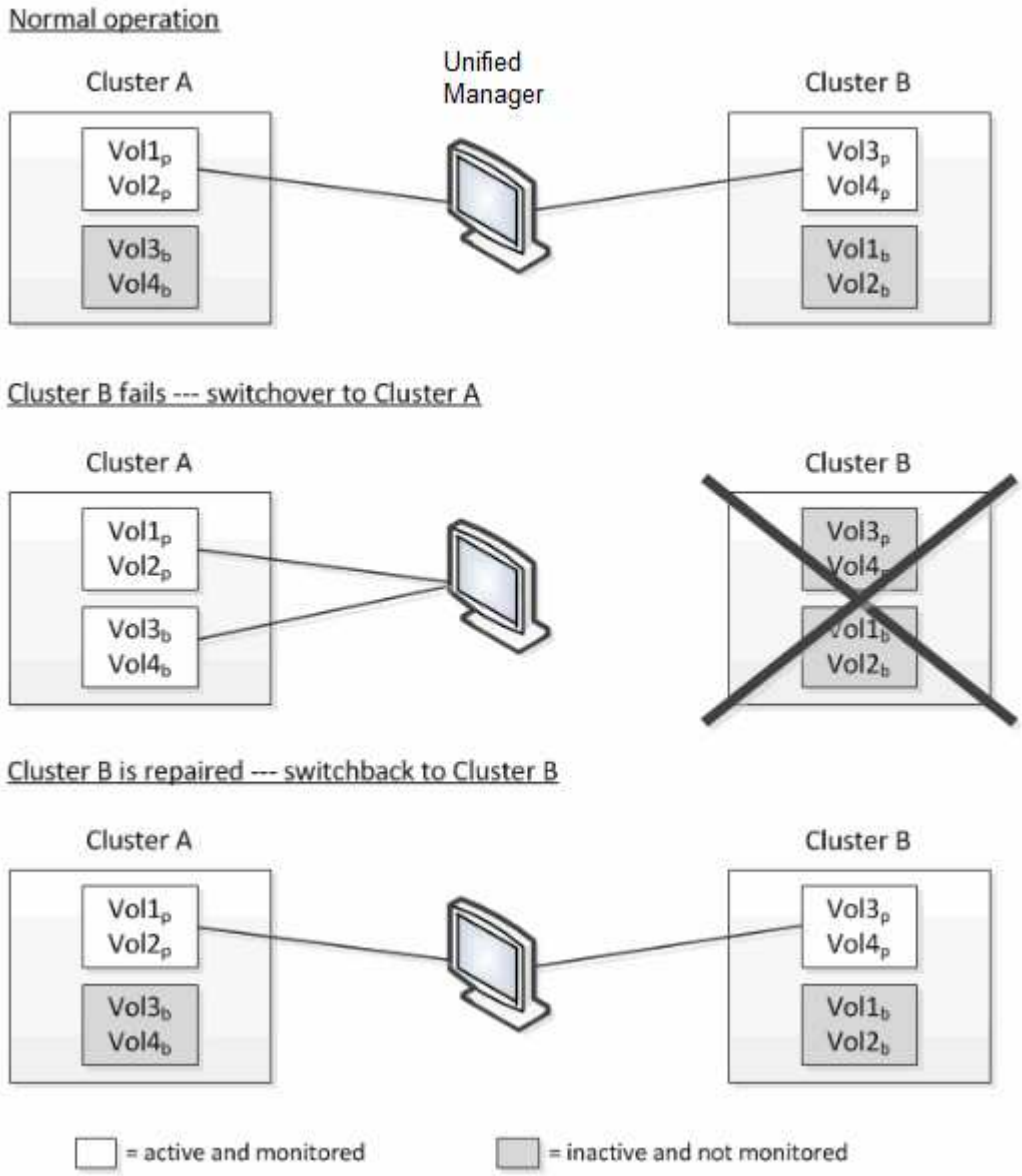
Identifying bully workloads involved in a performance event

Identifying shark workloads involved in a performance event

### Volume behavior during switchover and switchback

Events that trigger a switchover or switchback cause active volumes to be moved from one cluster to the other cluster in the disaster recovery group. The volumes on the cluster that were active and serving data to clients are stopped, and the volumes on the other cluster are activated and start serving data. Unified Manager monitors only those volumes that are active and running.

Because volumes are moved from one cluster to another, it is recommended that you monitor both clusters. A single instance of Unified Manager can monitor both clusters in a MetroCluster configuration, but sometimes the distance between the two locations necessitates using two Unified Manager instances to monitor both clusters. The following figure shows a single instance of Unified Manager:




The volumes with p in their names indicate the primary volumes, and the volumes with b in their names are mirrored backup volumes that are created by SnapMirror.

During normal operation:

- Cluster A has two active volumes: Vol1p and Vol2p.
- Cluster B has two active volumes: Vol3p and Vol4p.
- Cluster A has two inactive volumes: Vol3b and Vol4b.
- Cluster B has two inactive volumes: Vol1b and Vol2b.

Information pertaining to each of the active volumes (statistics, events, and so on) is collected by Unified Manager. Vol1p and Vol2p statistics are collected by Cluster A, and Vol3p and Vol4p statistics are collected by Cluster B.

After a catastrophic failure causes a switchover of active volumes from Cluster B to Cluster A:

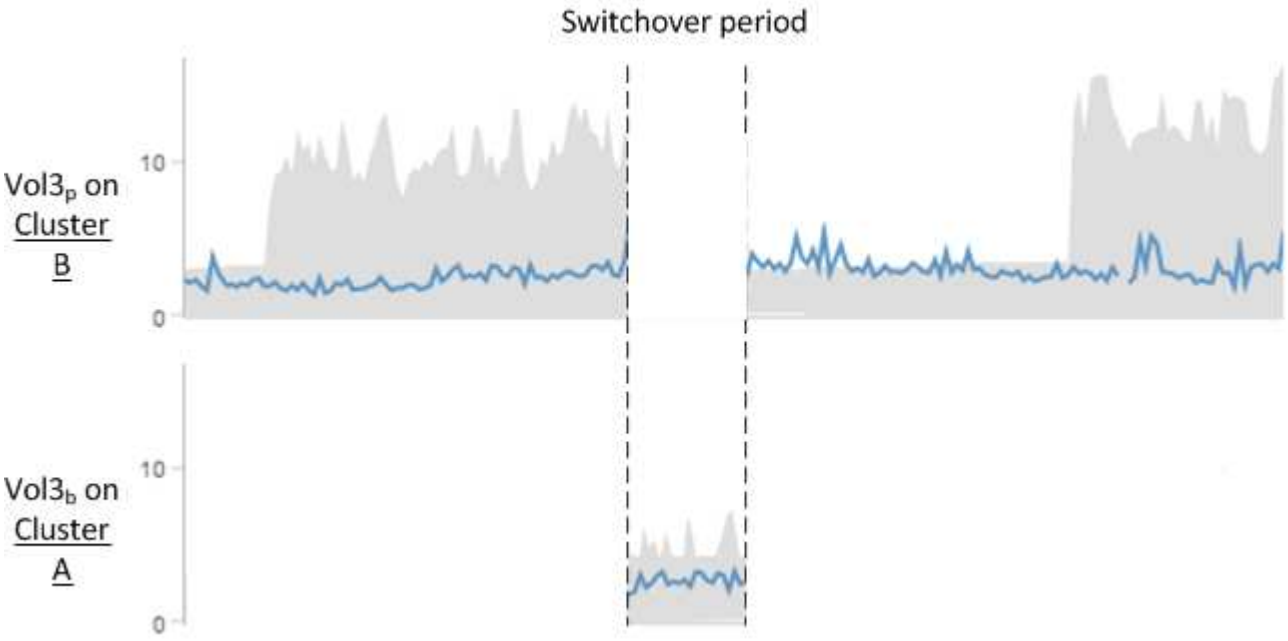
- Cluster A has four active volumes: Vol1p, Vol2p, Vol3b, and Vol4b.
- Cluster B has four inactive volumes: Vol3p, Vol4p, Vol1b, and Vol2b.

As during normal operation, information pertaining to each of the active volumes is collected by Unified Manager. But in this case, Vol1p and Vol2p statistics are collected by Cluster A, and Vol3b and Vol4b statistics are also collected by Cluster A.

Note that Vol3p and Vol3b are not the same volumes, because they are on different clusters. The information in Unified Manager for Vol3p is not the same as Vol3b:

- During switchover to Cluster A, Vol3p statistics and events are not visible.
- On the very first switchover, Vol3b looks like a new volume with no historical information.

When Cluster B is repaired and a switchback is performed, Vol3p is active again on Cluster B, with the historical statistics and a gap of statistics for the period during the switchover. Vol3b is not viewable from Cluster A until another switchover occurs:




- MetroCluster volumes that are inactive, for example, Vol3b on Cluster A after switchback, are identified with the message “This volume was deleted”. The volume is not actually deleted, but it is not currently being monitored by Unified Manager because it is not the active volume.
- If a single Unified Manager is monitoring both clusters in a MetroCluster configuration, volume search returns information for whichever volume is active at that time. For example, a search for "Vol3" would return statistics and events for Vol3b on Cluster A if a switchover has occurred and Vol3 has become active on Cluster A.

# Cluster connectivity status definitions

Connectivity between the clusters in a MetroCluster configuration can be one of the following statuses: Optimal, Impacted, or Down. Understanding the connectivity statuses

enables you to manage your MetroCluster configurations effectively.

| Connectivity status | Description | Icon displayed |
|---|---|---|
| Optimal | Connectivity between the clusters in the MetroCluster configuration is normal. | |
| Impacted | One or more errors compromise the status of failover availability; however, both of the clusters in the MetroCluster configuration are still up. For example, when the ISL link is down, when the intercluster IP link is down, or when the partner cluster is not reachable. | |
| Down | Connectivity between the clusters in the MetroCluster configuration is down because one or both of the clusters are down or the clusters are in failover mode. For example, when the partner cluster is down because of a disaster or when there is a planned switchover for testing purposes. | Switchover with errors:<br> <br>Switchover successful:<br> |

# Data mirroring status definitions

MetroCluster configurations provide data mirroring and the additional ability to initiate a failover if an entire site becomes unavailable. The status of data mirroring between the clusters in a MetroCluster configuration can either be Normal or Mirroring Unavailable. Understanding the status enables you to manage your MetroCluster configurations effectively.

| Data mirroring status | Description | Icon displayed |
|---|---|---|
| Normal | Data mirroring between the clusters in the MetroCluster configuration is normal. | |

| Data mirroring status | Description | Icon displayed |
| --- | --- | --- |
| Mirroring Unavailable | Data mirroring between the clusters in the MetroCluster configuration is unavailable because of switchover. For example, when the partner cluster is down because of a disaster or when there is a planned switchover for testing purposes. | Switchover with errors:<br> <br>Switchover successful:<br> |

# Monitoring MetroCluster configurations

You can monitor connectivity issues in your MetroCluster configuration. The details include the status of the components and connectivity within a cluster and the connectivity status between the clusters in the MetroCluster configuration.

**What you'll need**

- Both the local and remote clusters in the MetroCluster configuration must be added to Active IQ Unified Manager.
- You must have the Operator, Application Administrator, or Storage Administrator role.

You can use the information displayed in the Cluster / Health details page to rectify any connectivity issues. For example, if the connectivity between the node and the switch in a cluster is down, the following icon is displayed:

If you move the pointer over the icon, you can view detailed information about the generated event.

Unified Manager uses system health alerts to monitor the status of the components and connectivity in the MetroCluster configuration.

The MetroCluster Connectivity tab is displayed only for clusters in a MetroCluster configuration.

**Steps**

1. In the left navigation pane, click **Storage** > **Clusters**.

   A list of all of the monitored clusters is displayed.

2. From the **Health: All Clusters** view, click the name of the cluster for which you want to view MetroCluster configuration details.
3. In the **Cluster / Health** details page, click the **MetroCluster Connectivity** tab.

   The topology of the MetroCluster configuration is displayed in the corresponding cluster object area.

If you discover connectivity issues in your MetroCluster configuration, you must log in to System Manager or access the ONTAP CLI to resolve the issues.

**Related information**

Cluster / Health details page

# Monitoring MetroCluster replication

You can monitor and diagnose the overall health condition of the logical connections while mirroring the data. You can identify the issues or any risk that interrupts mirroring of cluster components such as aggregates, nodes, and storage virtual machines.

**What you'll need**

Both the local and remote cluster in the MetroCluster configuration must be added to Unified Manager

You can use the information displayed in the Cluster / Health details page to rectify any replication issues.

If you move the pointer over the icon, you can view detailed information about the generated event.

Unified Manager uses system health alerts to monitor the status of the components and connectivity in the MetroCluster configuration.

**Steps**

1. In the left navigation pane, click **Storage** > **Clusters**.

   A list of the monitored clusters is displayed.

2. From the **Health: All Clusters** view, click the name of the cluster for which you want to view MetroCluster replication details, and then click the **MetroCluster Replication** tab.

   The topology of the MetroCluster configuration to be replicated is displayed at the local site in the corresponding cluster object area with the information about the remote site where the data is being mirrored.

If you discover mirroring issues in your MetroCluster configuration, you must log in to System Manager or access the ONTAP CLI to resolve the issues.

**Related information**

Cluster / Health details page

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