Monitoring and troubleshooting data availability

Active IQ Unified Manager

NetApp
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Unified Manager monitors the reliability with which authorized users can access your stored data, alerts you to conditions that block or impede that access, and enables you to diagnose those conditions and assign and track their resolution.

The availability workflow topics in this section describe examples of how a storage administrator can use the Unified Manager web UI to discover, diagnose, and assign for resolution hardware and software conditions that adversely affect data availability.

Scanning for and resolving storage failover interconnect link down conditions

This workflow provides an example of how you might scan for, evaluate, and resolve downed storage failover interconnect link conditions. In this scenario, you are an administrator using Unified Manager to scan for storage failover risks before starting an ONTAP version upgrade on your nodes.

What you'll need

You must have the Operator, Application Administrator, or Storage Administrator role.

If storage failover interconnections between HA pair nodes fail during a nondisruptive upgrade attempt, the upgrade fails. Therefore, common practice is for the administrator to monitor and confirm storage failover reliability on the cluster nodes targeted for upgrade before the start of an upgrade.

Steps

1. In the left navigation pane, click **Event Management**.
2. In the **Event Management** inventory page, select **Active Availability events**.
3. At the top of the **Event Management** inventory page **Name** column, click and enter `*failover` in the text box to limit the event to display to storage failover-related events.

   All past events related to storage failover conditions are displayed.

   In this scenario, the Unified Manager displays the event, "Storage Failover Interconnect One or More Links Down" in its Availability Incidents section.

4. If one or more events related to storage failover are displayed on the **Event Management** inventory page, perform the following steps:
   a. Click the event title link to display event details for that event.

      In this example, you click the event title "Storage Failover Interconnect One or More Links Down".

      The Event details page for that event is displayed.

   b. On the Event details page, you can perform one or more of the following tasks:
      - Review the error message in the Cause field and evaluate the issue.
      - Assign the event to an administrator.

- Acknowledge the event.

Related information

Event details page

Unified Manager user roles and capabilities

Performing corrective action for storage failover interconnect links down

When you display the Event details page of a storage failover-related event, you can review the summary information of the page to determine the urgency of the event, possible cause of the issue, and possible resolution to the issue.

What you'll need

You must have the Operator, Application Administrator, or Storage Administrator role.

In this example scenario, the event summary provided on the Event details page contains the following information about the storage failover interconnect link down condition:

```
Event: Storage Failover Interconnect One or More Links Down

Summary

Severity: Warning
State: New
Impact Level: Risk
Impact Area: Availability
Source: aardvark
Source Type: Node
Acknowledged By:
Resolved By:
Assigned To:
Cause: At least one storage failover interconnected link
       between the nodes aardvark and bonobo is down.
       RDMA interconnect is up (Link0 up, Link1 down)
```

The example event information indicates that a storage failover interconnect link, Link1, between HA pair nodes aardvark and bonobo is down, but that Link0 between Apple and Boy is active. Because one link is active, the remote dynamic memory access (RDMA) is still functioning and a storage failover job can still succeed.

However, to ensure against both links failing and storage failover protection being totally disabled, you decide to further diagnose the reason for Link1 going down.

Steps

1. From the **Event** details page, you can click the link to the event specified in the Source field to obtain further details of other events that might be related to the storage failover interconnection link down

condition.

In this example, the source of the event is the node named aardvark. Clicking that node name displays the HA Details for the affected HA pair, aardvark and bonobo, on the Nodes tab of the Cluster / Health details page, and displays other events that recently occurred on the affected HA pair.

2. Review the **HA Details** for more information relating to the event.

   In this example, the relevant information is in the Events table. The table shows the “Storage Failover Connection One or More Link Down” event, the time the event was generated, and, again, the node from which this event originated.

Using the node location information in the HA Details, request or personally complete a physical inspection and repair of the storage failover issue on the affected HA pair nodes.

Related information

Event details page

Unified Manager user roles and capabilities

Resolving volume offline issues

This workflow provides an example of how you might evaluate and resolve a volume offline event that Unified Manager might display in the Event Management inventory page. In this scenario, you are an administrator using Unified Manager to troubleshoot one or more volume offline events.

What you’ll need

You must have the Operator, Application Administrator, or Storage Administrator role.

Volumes might be reported offline for several reasons:

- The SVM administrator has deliberately taken the volume offline.
- The volume’s hosting cluster node is down and storage failover to its HA pair partner has failed also.
- The volume’s hosting storage virtual machine (SVM) is stopped because the node hosting the root volume of that SVM is down.
- The volume’s hosting aggregate is down due to simultaneous failure of two RAID disks.

You can use the Event Management inventory page and the Cluster/Health, Storage VM/Health, and Volume/Health details pages to confirm or eliminate one or more of these possibilities.

Steps

1. In the left navigation pane, click **Event Management**.
2. In the **Event Management** inventory page, select **Active Availability events**.
3. Click the hypertext link displayed for the Volume Offline event.

   The Event details page for the availability incident is displayed.

4. On that page, check the notes for any indication that the SVM administrator has taken the volume in

question offline.

5. On the **Event** details page, you can review the information for one or more of the following tasks:
   - Review the information displayed in the Cause field for possible diagnostic guidance.

     In this example, the information in the Cause field informs you only that the volume is offline.

   - Check the Notes and Updates area for any indication that the SVM administrator has deliberately taken the volume in question offline.
   - Click the source of the event, in this case the volume that is reported offline, to get more information about that volume.
   - Assign the event to an administrator.
   - Acknowledge the event or, if appropriate, mark it as resolved.

Performing diagnostic actions for volume offline conditions

After navigating to the Volume / Health details page of a volume reported to be offline, you can search for additional information helpful to diagnosing the volume offline condition.

What you'll need

You must have the Operator, Application Administrator, or Storage Administrator role.

If the volume that is reported offline was not taken offline deliberately, that volume might be offline for several reasons.

Starting at the offline volume's Volume / Health details page, you can navigate to other pages and panes to confirm or eliminate possible causes:

- Click **Volume / Health** details page links to determine if the volume is offline because its host node is down and storage failover to its HA pair partner has failed also.

  See Determining if a volume offline condition is caused by a down node.

- Click **Volume / Health** details page links to determine if the volume is offline and its host storage virtual machine (SVM) is stopped because the node hosting the root volume of that SVM is down.

  See Determining if a volume is offline and SVM is stopped because a node is down.

- Click **Volume / Health** details page links to determine if the volume is offline because of broken disks in its host aggregate.

  See Determining if a volume is offline because of broken disks in an aggregate.

Related information

Unified Manager user roles and capabilities

Determining if a volume is offline because its host node is down

You can use the Unified Manager web UI to confirm or eliminate the possibility that a

volume is offline because its host node is down and that storage failover to its HA pair partner is unsuccessful.

What you'll need

You must have the Operator, Application Administrator, or Storage Administrator role.

To determine if the volume offline condition is caused by failure of the hosting node and subsequent unsuccessful storage failover, perform the following actions:

Steps

1. Locate and click the hypertext link displayed under SVM in the **Related Devices** pane of the offline volume's **Volume / Health** details page.

   The Storage VM / Health details page displays information about the offline volume's hosting storage virtual machine (SVM).

2. In the **Related Devices** pane of the **Storage VM / Health** details page, locate and click hypertext link displayed under Volumes.

   The Health: All Volumes view displays a table of information about all the volumes hosted by the SVM.

3. On the **Health: All Volumes** view State column header, click the filter symbol , and then select the option **Offline**.

   Only the SVM volumes that are in offline state are listed.

4. On the Health: All Volumes view, click the grid symbol , and then select the option **Cluster Nodes**.

   You might need to scroll in the grid selection box to locate the **Cluster Nodes** option.

   The Cluster Nodes column is added to the volumes inventory and displays the name of the node that hosts each offline volume.

5. On the **Health: All Volumes** view, locate the listing for the offline volume and, in its Cluster Node column, click the name of its hosting node.

   The Nodes tab on the Cluster / Health details page displays the state of the HA pair of nodes to which the hosting node belongs. The state of the hosting node and the success of any cluster failover operation is indicated in the display.

After you confirm that the volume offline condition exists because its host node is down and storage failover to the HA pair partner has failed, contact the appropriate administrator or operator to manually restart the down node and fix the storage failover problem.

Determining if a volume is offline and its SVM is stopped because a node is down

You can use the Unified Manager web UI to confirm or eliminate the possibility that a volume is offline because its host storage virtual machine (SVM) is stopped due to the node hosting the root volume of that SVM being down.

What you'll need

You must have the Operator, Application Administrator, or Storage Administrator role.

To determine if the volume offline condition is caused its host SVM being stopped because the node hosting the root volume of that SVM is down, perform the following actions:

Steps

1. Locate and click the hypertext link displayed under the SVM in the **Related Devices** pane of the offline volume's **Volume / Health** details page.

   The Storage VM / Health details page displays the "running" or the "stopped" status of the hosting SVM. If the SVM status is running, then the volume offline condition is not caused by the node hosting the root volume of that SVM being down.

2. If the SVM status is stopped, then click **View SVMs** to further identify the cause of the hosting SVM being stopped.
3. On the **Health: All Storage VMs** view SVM column header, click the filter symbol and then type the name of the stopped SVM.

   The information for that SVM is shown in a table.

4. On the **Health: All Storage VMs** view, click and then select the option **Root Volume**.

   The Root Volume column is added to the SVM inventory and displays the name of the root volume of the stopped SVM.

5. In the Root Volume column, click the name of the root volume to display the **Storage VM / Health** details page for that volume.

   If the status of the SVM root volume is (Online), then the original volume offline condition is not caused because the node hosting the root volume of that SVM is down.

6. If the status of the SVM root volume is (Offline), then locate and click the hypertext link displayed under Aggregate in the Related Devices pane of the SVM root volume's Volume / Health details page.
7. Locate and click the hypertext link displayed under Node in the **Related Devices** pane of the Aggregate's **Aggregate / Health** details page.

   The Nodes tab on the Cluster / Health details page displays the state of the HA pair of nodes to which the SVM root volume's hosting node belongs. The state of the node is indicated in the display.

After you confirm that the volume offline condition is caused by that volume's host SVM offline condition, which itself is caused by the node that hosts the root volume of that SVM being down, contact the appropriate administrator or operator to manually restart the down node.

Determining if a volume is offline because of broken disks in an aggregate

You can use the Unified Manager web UI to confirm or eliminate the possibility that a volume is offline because RAID disk problems have taken its host aggregate offline.

What you'll need

You must have the Operator, Application Administrator, or Storage Administrator role.

To determine if the volume offline condition is caused by RAID disk problems that are taking the hosting aggregate offline, perform the following actions:

Steps

1. Locate and click the hypertext link displayed under Aggregate in the **Related Devices** pane of the **Volume / Health** details page.

   The Aggregate / Health details page displays the online or offline status of the hosting aggregate. If the aggregate status is online, then RAID disk problems are not the cause of the volume being offline.

2. If the aggregate status is offline, then click **Disk Information** and look for broken disk events in the **Events** list on the **Disk Information** tab.
3. To further identify the broken disks, click the hypertext link displayed under Node in the **Related Devices** pane.

   The Cluster / Health details page is displayed.

4. Click **Disks**, and then select **Broken** in the **Filters** pane to list all disks in the broken state.

   If the disks in the broken state caused the offline state of the host aggregate, the name of the aggregate is displayed in the Impacted Aggregate column.

After confirming that the volume offline condition is caused by broken RAID disks and the consequent offline host aggregate, contact the appropriate administrator or operator to manually replace the broken disks and put the aggregate back online.