system ha commands

ONTAP commands

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system ha commands

system ha interconnect config show

Display the high-availability interconnect configuration information

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect config show` command displays the high-availability interconnect device basic configuration information.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command displays only the fields that you specify.

| [-instance] }

Use this parameter to display all the fields from all nodes in cluster.

[-node {<nodename>|local}] - Node (privilege: advanced)

Use this parameter to display all the fields from the specified node in the cluster.

[-transport <text>] - Interconnect Type (privilege: advanced)

Selects the nodes that match this HA interconnect transport type.

[-local-sysid <integer>] - Local System ID (privilege: advanced)

Selects the nodes that match this local system unique identifier.

[-partner-sysid <integer>] - Partner System ID (privilege: advanced)

Selects the nodes that match this partner system unique identifier.

[-initiator {local|partner}] - Connection Initiator (privilege: advanced)

Selects the nodes that match this parameter value. The value is the initiator of the connection request.

[-port-name <text>,…] - Port (privilege: advanced)

Selects the nodes that match this port name.

[-ipaddress <text>,…] - IP Address (privilege: advanced)

Selects the nodes that match this IP address.

[-interface {backplane|external}] - Interface (privilege: advanced)

Selects the nodes that match this parameter value. *`external`* means the HA interconnect links between partner nodes are connected externally. *`backplane`* means the HA interconnect links between partner nodes are connected over the backplane.

Examples

The following example displays the HA interconnect configuration information on FAS8000 series nodes in the cluster:

```
cluster1::*> system ha interconnect config show
Node: ic-f8040-01
          Interconnect Type: Infiniband (Mellanox ConnectX)
            Local System ID: 536875713
          Partner System ID: 536875678
       Connection Initiator: local
                  Interface: backplane

Port   IP Address         Flags
----  -----------------  -----------
ib0a  192.0.3.236        0x0
ib0b  192.0.3.237        0x0
Node: ic-f8040-02
          Interconnect Type: Infiniband (Mellanox ConnectX)
            Local System ID: 536875678
          Partner System ID: 536875713
       Connection Initiator: partner
                  Interface: backplane

Port   IP Address         Flags
----  -----------------  -----------
ib0a  192.0.3.96         0x0
ib0b  192.0.3.97         0x0

2 entries were displayed.
```

The following example displays the HA interconnect configuration information on FAS2500 series nodes in the cluster:

```
cluster1::*> system ha interconnect config show
Node: ic-f2554-03
          Interconnect Type: Infiniband (Mellanox Sinai)
            Local System ID: 1781036608
          Partner System ID: 1780360209
       Connection Initiator: local
                  Interface: backplane

Port   IP Address         Flags
----  -----------------  -----------
ib0a  ib0a               -
Node: ic-f2554-04
          Interconnect Type: Infiniband (Mellanox Sinai)
            Local System ID: 1780360209
          Partner System ID: 1781036608
       Connection Initiator: partner
                  Interface: backplane

Port   IP Address         Flags
----  -----------------  -----------
ib0a  ib0a               -

2 entries were displayed.
```

system ha interconnect link off

Turn off the interconnect link

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect link off` command turns off the specified link on the high-availability interconnect device. For the nodes in the cluster with two external high-availability interconnect links, you must specify the link number (0-based) to turn off the specified link. For the nodes in the cluster with interconnect links over the backplane, you must specify the link number 1 to turn off the link.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies the node on which the interconnect link is to be turned off. The value "local" specifies the current node.

`-link {0|1}` - Link (privilege: advanced)

This mandatory parameter specifies the interconnect link number (0-based) to turn off.

Examples

The following example displays output of the command on the nodes with a single interconnect link or nodes with interconnect links over the backplane:

```
cluster1::*> system ha interconnect link off -node ic-f3250-02 -link 0

Error: command failed: Invalid link value 0. Specify 1.

cluster1::*> system ha interconnect link off -node ic-f3250-02 -link 1
```

The following example displays output of the command on the nodes with two interconnect links connected externally:

```
cluster1::*> system ha interconnect link off -node ic-f3250-02 -link 0

cluster1::*> system ha interconnect link off -node ic-f3250-02 -link 1
```

system ha interconnect link on

Turn on the interconnect link

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect link on` command turns on the specified link on the high-availability interconnect device. For the nodes in the cluster with two external high-availability interconnect links, you must specify the link number (0-based) to turn on the specified link. For the nodes in the cluster with interconnect links over the backplane, you must specify the link number 1 to turn on the link.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies the node on which the interconnect link is to be turned on. The value "local" specifies the current node.

`-link {0|1}` - Link (privilege: advanced)

This mandatory parameter specifies the interconnect link number (0-based) to turn on.

Examples

The following example displays output of the command on the nodes with a single interconnect link or nodes with interconnect links over the backplane:

```
cluster1::*> system ha interconnect link on -node ic-f3250-02 -link 0

Error: command failed: Invalid link value 0. Specify 1.

cluster1::*> system ha interconnect link on -node ic-f3250-02 -link 1
```

The following example displays output of the command on the nodes with two interconnect links connected externally:

```
cluster1::*> system ha interconnect link on -node ic-f3250-02 -link 0

cluster1::*> system ha interconnect link on -node ic-f3250-02 -link 1
```

system ha interconnect ood clear-error-statistics

Clear error statistics

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood clear-error-statistics` command enables you to clear all the error statistics collected for the out-of-order delivery-capable high-availability interconnect device. This command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will have the error statistics cleared. The value "local" specifies the current node.

Examples

```
cluster1::*> system ha interconnect ood clear-error-statistics -node ic-
f2554-03
```

system ha interconnect ood clear-performance-statistics

Clear performance statistics

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood clear-performance-statistics` command enables you to clear all the performance statistics collected for the out-of-order delivery-capable high-availability interconnect device. This command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will have the performance statistics cleared. The value "local" specifies the current node.

Examples

```
cluster1::*> system ha interconnect ood clear-performance-statistics -node
ic-f2554-03
```

system ha interconnect ood disable-optimization

Disable coalescing work requests

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood disable-optimization` command disables the optimization capability on the high-availability interconnect device. The command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will have the optimization disabled. The value "local" specifies the current node.

Examples

```
cluster1::*> system ha interconnect ood disable-optimization -node ic-
f2554-03
```

system ha interconnect ood disable-statistics

Disable detailed statistics collection

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood disable-statistics` command disables collection of the statistics on the out-of-order delivery-capable high-availability interconnect device. This command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will have the statistics collection disabled. The value "local" specifies the current node.

Examples

```
cluster1::*> system ha interconnect ood disable-statistics -node ic-f2554-
03
```

system ha interconnect ood enable-optimization

Enable coalescing work requests

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood enable-optimization` command enables you to turn on optimization (coalescing out-of-order delivery requests) on the high-availability interconnect device. This command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will have the optimization enabled. The value "local" specifies the current node.

Examples

```
cluster1::*> system ha interconnect ood enable-optimization -node ic-
f2554-03
```

system ha interconnect ood enable-statistics

Enable detailed statistics collection

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood enable-statistics` command enables collection of the statistics on the out-of-order delivery-capable high-availability interconnect device. This command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will have the statistics collection enabled. The value "local" specifies the current node.

Examples

```
cluster1::*> system ha interconnect ood enable-statistics -node ic-f2554-
03
```

system ha interconnect ood send-diagnostic-buffer

Send diagnostic buffer to partner

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood send-diagnostic-buffer` command enables you to run a short out-of-order delivery diagnostic test. The command sends a buffer to the partner controller over the high-availability interconnect. This command is only supported on FAS2500 series nodes in the cluster.

Parameters

`-node <nodename>` - Node (privilege: advanced)

This mandatory parameter specifies which node will send the diagnostic buffer to its partner. The value "local" specifies the current node.

Examples

The following example demonstrates how to use this command to send a diagnostic buffer to the partner:

```
cluster1::*> system ha interconnect ood send-diagnostic-buffer -node ic-
f2554-03
```

system ha interconnect ood status show

Display the high-availability interconnect device out-of-order delivery (OOD) information

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect ood status show` command displays configuration information of the out-of-order delivery-capable high-availability interconnect devices. This command is supported only on FAS2500 series nodes in the cluster.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command displays only the fields that you specify.

| [-instance] }

Use this parameter to display all the fields from all nodes in cluster.

[-node {<nodename>|local}] - Node (privilege: advanced)

Use this parameter to display all the fields from the specified node in the cluster.

[-is-ood-enabled {true|false}] - Is OOD Enabled (privilege: advanced)

Selects the nodes that match this parameter value.

[-is-coalescing-enabled {true|false}] - Is Coalescing Enabled (privilege: advanced)

Selects the nodes that match this parameter value.

Examples

The following example displays the HA interconnect device out-of-order delivery configuration information on FAS2500 series nodes in the cluster.

```
cluster1::*> system ha interconnect ood status show
Node: ic-f2554-03
              NIC Used: 0
        Is OOD Enabled: true
 Is Coalescing Enabled: true
Node: ic-f2554-04
              NIC Used: 0
        Is OOD Enabled: true
 Is Coalescing Enabled: true
2 entries were displayed.
```

system ha interconnect port show

Display the high-availability interconnect device port information

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect port show` command displays the high-availability interconnect device port physical layer and link layer status information.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command displays only the fields that you specify.

| [-instance] }

Use this parameter to display all the fields from all nodes in the cluster.

[-node {<nodename>|local}] - Node (privilege: advanced)

Use this parameter to display all the fields from the specified node in the cluster.

[-link-monitor {on|off}] - Link Monitor Detection (privilege: advanced)

Selects the nodes that match this parameter value.

[-port <integer>,…] - Port Number (privilege: advanced)

Selects the nodes that match this parameter value.

[-phy-layer-state {invalid|sleep|polling|disabled|port-configuration-testing|linkup|link-error-recovery|phytest|reserved}] - Physical Layer State (privilege: advanced)

Selects the nodes that match this parameter value.

[-link-layer-state {invalid|down|initialize|armed|active|reserved}] - Link Layer State (privilege: advanced)

Selects the nodes that match this parameter value.

[-phy-link-up-count <integer>,…] - Physical Link Up Count (privilege: advanced)

Selects the nodes that match this parameter value. The value is total number of times the link on a given port is transitioned up.

[-phy-link-down-count <integer>,…] - Physical Link Down Count (privilege: advanced)

Selects the nodes that match this parameter value. The value is total number of times the link on a given port is transitioned down.

[-is-active-link {true|false}] - Is the Link Active (privilege: advanced)

Selects the nodes that match this parameter value. The value *true* means the interconnect data channels are established on this link.

Examples

The following example displays the HA interconnect device port information on FAS8000 series nodes in the cluster:

```
cluster1::*> system ha interconnect port show
                               Physical  Link
                Link           Layer     Layer      Physical   Physical
Active
Node            Monitor  Port  State     State       Link Up  Link Down
Link
--------------  -------  ----  --------  ---------  --------  ---------
------
ic-f8040-01     on
                            0  linkup    active            1          0
true
                            1  linkup    active            1          0
false
ic-f8040-02     on
                            0  linkup    active            1          0
true
                            1  linkup    active            1          0
false
2 entries were displayed.
```

system ha interconnect statistics clear-port-symbol-error

Clear the high-availability interconnect port symbol errors

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect statistics clear-port-symbol-error` command clears the high-availability interconnect device port symbol errors. This command is supported only on FAS2500 series nodes in the cluster.

To display the high-availability interconnect device port statistics, use the statistics show -object ic_hw_port_stats command.

Parameters

`-node <nodename>` - Node (privilege: advanced)

Selects the nodes that match this parameter value.

Examples

```
cluster1::*> system ha interconnect statistics clear-port-symbol-error
-node ic-f2554-03
```

Related Links

- statistics show

system ha interconnect statistics clear-port

Clear the high-availability interconnect port counters

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect statistics clear-port` command clears the high-availability interconnect device port statistics. This command is supported only on FAS2500 series and FAS8000 series nodes in the cluster.

To display the high-availability interconnect device port statistics, use the statistics show -object ic_hw_port_stats command.

Parameters

`-node <nodename>` - Node (privilege: advanced)

Selects the nodes that match this parameter value.

Examples

```
cluster1::*> system ha interconnect statistics clear-port -node ic-f8040-
01
```

Related Links

- statistics show

system ha interconnect statistics show-scatter-gather-list

Display the high-availability interconnect scatter-gather list entry statistics

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect statistics show-scatter-gather-list` command displays the high-availability interconnect device scatter-gather list entry statistics. Out of all possible 32 entries in a scatter-gather list, the command displays only the entries that have valid data.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command displays only the fields that you specify.

| [-instance] }

Use this parameter to display all the fields from all nodes in cluster.

[-node {<nodename>|local}] - Node (privilege: advanced)

Use this parameter to display all the fields from the specified node in the cluster.

[-sge <integer>,…] - Scatter-Gather Entry (privilege: advanced)

Selects the nodes that match this scatter-gather element index value.

[-total-count <integer>,…] - Total Count (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of times a particular scatter-gather list element is used.

[-total-size <integer>,…] - Total Size (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of bytes written by the high-availability interconnect device using a particular scatter-gather list element.

Examples

```
cluster1::*> system ha interconnect statistics show-scatter-gather-list
Node: ic-f8040-01
Entry              Count               Size
-----  -----------------  ----------------
    1             410925           77344493
    2                988            1246987
    3                 72             747325
    4              93264         1527155579
    8                  9             294912
    9                  9             294912

Node: ic-f8040-02
Entry              Count               Size
-----  -----------------  ----------------
    1            1544405          310004390
    2               6217           16779908
    3               1222           12003411
    4             338606         5543436659
    6                  2              41980
    7                  2              46136
    8                 18             589824
    9                 18             589824

2 entries were displayed.
```

system ha interconnect statistics performance show

Display the high-availability interconnect device performance statistics

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect statistics performance show` command displays the high-availability interconnect device performance statistics.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command displays only the fields that you specify.

| [-instance] }

Use this parameter to display all the fields from all nodes in cluster.

[-node {<nodename>|local}] - Node (privilege: advanced)

Use this parameter to display all the fields from the specified node in the cluster.

[-elapsed <integer>] - Elapsed Time (secs) (privilege: advanced)

Selects the nodes that match this parameter value. Displays the total elapsed time between statistics collection start time to end time. During the initialization stage, statistics collection starts when the partner node is up and ready. After the initialization stage, the statistics collection start time is reset after every execution of this command. This means that after the initialization stage, elapsed time represents the time between current command execution and previous command execution.

[-qmax-wait <integer>] - Maximum Queue Wait Count (privilege: advanced)

Selects the nodes that match this wait value. The queue maximum wait value is the total number of times the interconnect device waited to post requests on the send queue.

[-qmax-wait-time <integer>] - Average Queue Wait Time (usecs) (privilege: advanced)

Selects the nodes that match this average wait time value. The queue maximum wait time is the average amount of time the interconnect device waited to post requests on the send queue.

[-qmax-timeout <integer>] - Maximum Queue Timeouts (privilege: advanced)

Selects the nodes that match this parameter value. The queue maximum timeout value is the total number of times the interconnect device timed out waiting to post requests on the send queue.

[-preempt-timeout <integer>] - Preempt Timeouts (privilege: advanced)

Selects the nodes that match this parameter value. The timeout value is the total number of times polling on the given transfer ID is preempted.

[-nonpreempt-timeout <integer>] - Non-Preempt Timeouts (privilege: advanced)

Selects the nodes that match this parameter value. The timeout value is the total number of times polling on the given transfer ID stopped due to interconnect device read/write timeout.

[-notify-timeout <integer>] - Notify Timeouts (privilege: advanced)

Selects the nodes that match this parameter value. The timeout value is the total number of times data transfer on the HA interconnect timed out.

[-avg-rnv-msgs-time <integer>] - Remote NV Messages Average Time (usecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average time between remote NV messages.

[-rnv-transfers <integer>] - Total Remote NV Transfers (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of remote NV transfers attempted.

[-avg-rnv-transfer-size <integer>] - Remote NV Average Transfer Size (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average remote NV message transfer size.

[-avg-rnv-transfer-time <integer>] - Remote NV Transfers Average Time (usecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average transfer time taken by remote NV messages.

[-ic-waits <integer>] - Total Count of IC waits for Given ID (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of times the interconnect device waits until the transfer of a given ID is successful.

[-ic-waitdone-time <integer>] - Average IC Waitdone Time (usecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average time the interconnect device spent waiting for the IDs to be transferred successfully.

[-ic-isdone <integer>] - Total IC isdone Checks (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of times the interconnect client checked for the completion of a given transfer ID.

[-ic-isdone-pass <integer>] - Total IC isdone Checks Success (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of times the check for the completion of a given transfer ID is successful.

[-ic-isdone-fail <integer>] - Total IC isdone Checks Failed (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of times the check for the completion of a given transfer ID is not successful.

[-ic-small-writes <integer>] - IC Small Writes (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of <4K size writes performed by the interconnect device.

[-ic-4k-writes <integer>] - IC 4K Writes (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of 4K size writes performed by the interconnect device.

[-ic-8k-writes <integer>] - IC 8K Writes (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of 8K size writes performed by the interconnect device.

[-ic-16k-writes <integer>] - IC 16K+ Writes (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of 16K or more size writes performed by the interconnect device.

[-ic-xorder-writes <integer>] - IC XORDER Writes (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of out-of-order writes performed by the interconnect device.

[-ic-xorder-reads <integer>] - IC XORDER Reads (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of out-of-order reads performed by the interconnect device.

[-rdma-read <integer>] - RDMA Reads Count (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of RDMA reads performed by the interconnect device.

[-rdma-read-waitdone-time <integer>] - Average IC Waitdone RDMA-READ Time (usecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average time the interconnect device spent polling for transfer IDs on the RDMA-read channel.

[-avg-mbytes-second <text>] - Average MegaBytes Transferred per second (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average megabytes (MB) transferred per second.

[-avg-bytes-transfer <integer>] - Average Bytes per Transfer (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average amount of bytes sent per transfer.

[-total-transfers <integer>] - Total Transfers (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of transfers made through the interconnect device.

[-avg-nvlog-sync-time <integer>] - Average Time for NVLOG Sync (msecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average time taken to sync NVLOG between HA partner nodes.

[-max-nvlog-sync-time <integer>] - Maximum Time for NVLOG Sync (msecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the maximum time taken to sync NVLOG between HA partner nodes.

[-max-sgl-length <integer>] - Maximum Scatter-Gather Elements in a List (privilege: advanced)

Selects the nodes that match this parameter value. The value is the maxmimum length of the scatter-gather list supported by the interconnect device.

[-ic-recq-waits <integer>] - Total Receive Queue Waits to Post Buffer (privilege: advanced)

Selects the nodes that match this parameter value. The value is the total number of times the interconnect device waited to post an empty buffer into the receive queue.

[-avg-recq-wait-time <integer>] - Average Time Receive Queue Waited (usecs) (privilege: advanced)

Selects the nodes that match this parameter value. The value is the average amount of time the interconnect device waited to post an empty buffer into the receive queue.

Examples

The following example displays the HA interconnect device performance statistics for FAS8000 series nodes in the cluster:

```
cluster1::*> system ha interconnect statistics performance show
                                        Node: ic-f8040-01
                          Elapsed Time (secs): 6
                     Maximum Queue Wait Count: 33
              Average Queue Wait Time (usecs): 30
    Remote NV Messages Average Time (usecs): 1437
                  Total Remote NV Transfers: 9297
              Remote NV Average Transfer Size: 348
```

```
   Remote NV Transfers Average Time (usecs): 680
               Total IC waits for Given ID: 159
          Average IC Waitdone Time (usecs): 5
                    Total IC isdone Checks: 608
             Total IC isdone Checks Success: 608
              Total IC isdone Checks Failed: 0
                           IC Small Writes: 10129
                              IC 4K Writes: 10
                              IC 8K Writes: 54
                            IC 16K+ Writes: 92
                          IC XORDER Writes: 4855
                           IC XORDER Reads: 0
                           RDMA Read Count: 172
 Average IC Waitdone RDMA-READ Time (usecs): 0
                              Average MB/s: 0.98114
                Average Bytes per Transfer: 180
                           Total Transfers: 20720
       Average Time for NVLOG Sync (msecs): 1409
       Maximum Time for NVLOG Sync (msecs): 1409
  Maximum Scatter-Gather Elements in a List: 32
   Total Receive Queue Waits to Post Buffer: 0
Node: ic-f8040-02
                       Elapsed Time (secs): 12
                  Maximum Queue Wait Count: 29
            Average Queue Wait Time (usecs): 68
    Remote NV Messages Average Time (usecs): 1386
                Total Remote NV Transfers: 19190
           Remote NV Average Transfer Size: 375
   Remote NV Transfers Average Time (usecs): 670
               Total IC waits for Given ID: 304
          Average IC Waitdone Time (usecs): 5
                    Total IC isdone Checks: 1409
             Total IC isdone Checks Success: 1409
              Total IC isdone Checks Failed: 0
                           IC Small Writes: 20964
                              IC 4K Writes: 5
                              IC 8K Writes: 99
                            IC 16K+ Writes: 229
                          IC XORDER Writes: 10261
                           IC XORDER Reads: 0
                           RDMA Read Count: 337
 Average IC Waitdone RDMA-READ Time (usecs): 0
                              Average MB/s: 0.57080
                Average Bytes per Transfer: 187
                           Total Transfers: 42883
       Average Time for NVLOG Sync (msecs): 1009
```

```
        Maximum Time for NVLOG Sync (msecs): 1009
  Maximum Scatter-Gather Elements in a List: 32
   Total Receive Queue Waits to Post Buffer: 0

2 entries were displayed
```

The following example displays the HA interconnect device performance statistics for FAS2500 series nodes in the cluster:

```
cluster1::*> system ha interconnect statistics performance show
                                        Node: ic-f2554-03
                          Elapsed Time (secs): 253
                    Maximum Queue Wait Count: 11
             Average Queue Wait Time (usecs): 6837
                      Maximum Queue Timeouts: 0
                            Preempt Timeouts: 0
                        Non-Preempt Timeouts: 0
                             Notify Timeouts: 0
    Remote NV Messages Average Time (usecs): 3343
                  Total Remote NV Transfers: 59643
           Remote NV Average Transfer Size: 8715
   Remote NV Transfers Average Time (usecs): 4258
                Total IC waits for Given ID: 180
          Average IC Waitdone Time (usecs): 3187
                    Total IC isdone Checks: 499981
             Total IC isdone Checks Success: 59922
              Total IC isdone Checks Failed: 440059
                           IC Small Writes: 98722
                              IC 4K Writes: 5747
                              IC 8K Writes: 7719
                            IC 16K+ Writes: 25793
                          IC XORDER Writes: 66735
                           IC XORDER Reads: 0
                           RDMA Read Count: 574
 Average IC Waitdone RDMA-READ Time (usecs): 229
                              Average MB/s: 2.1207
                 Average Bytes per Transfer: 4680
                           Total Transfers: 138302
        Average Time for NVLOG Sync (msecs): 1236
        Maximum Time for NVLOG Sync (msecs): 1236
  Maximum Scatter-Gather Elements in a List: 27
Node: ic-f2554-04
                          Elapsed Time (secs): 257
                    Maximum Queue Wait Count: 7
             Average Queue Wait Time (usecs): 10172
                      Maximum Queue Timeouts: 0
```

```
                           Preempt Timeouts: 0
                       Non-Preempt Timeouts: 0
                            Notify Timeouts: 0
    Remote NV Messages Average Time (usecs): 4237
                  Total Remote NV Transfers: 47134
             Remote NV Average Transfer Size: 9559
   Remote NV Transfers Average Time (usecs): 5463
                Total IC waits for Given ID: 178
           Average IC Waitdone Time (usecs): 1890
                     Total IC isdone Checks: 393191
              Total IC isdone Checks Success: 47382
               Total IC isdone Checks Failed: 345809
                           IC Small Writes: 78369
                              IC 4K Writes: 3815
                              IC 8K Writes: 6005
                            IC 16K+ Writes: 22993
                          IC XORDER Writes: 53529
                           IC XORDER Reads: 0
                           RDMA Read Count: 524
 Average IC Waitdone RDMA-READ Time (usecs): 62
                              Average MB/s: 2.3682
                Average Bytes per Transfer: 5143
                           Total Transfers: 111501
       Average Time for NVLOG Sync (msecs): 822
       Maximum Time for NVLOG Sync (msecs): 822
  Maximum Scatter-Gather Elements in a List: 27

2 entries were displayed.
```

system ha interconnect status show

Display the high-availability interconnect connection status

Availability: This command is available to *cluster* administrators at the *advanced* privilege level.

Description

The `system ha interconnect status show` command displays the high-availability interconnect connection status. Connection status information displayed by this command varies by controller model. For nodes with two HA interconnect links over the backplane or connected externally, this command displays the following information:

- Node
- Link status on the first port
- Link status on the second port
- Is the link on first port active?

- Is the link on second port active?
- Interconnect RDMA status

For nodes with a single HA interconnect link, this command displays following the information:

- Node
- Link status
- Interconnect RDMA status

Running the command with the `-instance` or `-node` parameter displays detailed information about the interconnect device and its ports.

Parameters

{ [-fields <fieldname>,…]

If you specify the `-fields <fieldname>,…` parameter, the command displays only the fields that you specify.

| [-instance] }

Use this parameter to display all the fields for the specified node or all the nodes.

[-node {<nodename>|local}] - Node (privilege: advanced)

Use this parameter to display all the fields for the specified node.

[-link-status {up|down}] - Link Status (privilege: advanced)

Selects the nodes that match this parameter value. The value *up* means link is online.

[-link0-status {up|down}] - Link 0 Status (privilege: advanced)

Selects the nodes that match this parameter value. The value *up* means link is online.

[-link1-status {up|down}] - Link 1 Status (privilege: advanced)

Selects the nodes that match this parameter value. The value *up* means link is online.

[-ic-rdma {up|down}] - IC RDMA Connection (privilege: advanced)

Selects the nodes that match this parameter value. The value *up* means active interconnect connection with its partner.

[-is-link0-active {true|false}] - Is Link 0 Active (privilege: advanced)

Selects the nodes that match this parameter value. The value *true* means the interconnect data channels are established on this link.

[-is-link1-active {true|false}] - Is Link 1 Active (privilege: advanced)

Selects the nodes that match this parameter value. The value *true* means the interconnect data channels are established on this link.

[-slot <integer>] - Slot Number (privilege: advanced)

Selects the nodes that match this PCI slot number.

[-driver-name <text>] - Driver Name (privilege: advanced)

Selects the nodes that match this interconnect device driver name.

[-firmware <text>] - Firmware Revision (privilege: advanced)

Selects the nodes that match this firmware version.

[-version <text>] - Version Number (privilege: advanced)

Selects the nodes that match this parameter value.

[-device-type <text>] - Device Type (privilege: advanced)

Selects the nodes that match this interconnect device type.

[-serial-number <text>] - Serial Number (privilege: advanced)

Selects the nodes that match this interconnect device serial number.

[-debug-firmware {yes|no}] - Debug Firmware (privilege: advanced)

Selects the nodes that match this parameter value.

[-command-revision <integer>] - Command Revision (privilege: advanced)

Selects the nodes that match this interconnect device command revision.

[-hardware-revision <integer>] - Hardware Revision (privilege: advanced)

Selects the nodes that match this interconnect device hardware revision.

[-port1 <integer>] - Port Number 1 (privilege: advanced)

Selects the nodes that match this parameter value.

[-port1-port-name <text>] - Port Name (privilege: advanced)

Selects the nodes that match this port name.

[-port1-gid <text>] - Global Identifier (privilege: advanced)

Selects the nodes that match this global identifier value.

[-port1-base-lid <text>] - Base Local Identifier (privilege: advanced)

Selects the nodes that match this base local identifier value.

[-port1-rm-lid <text>] - Remote Local Identifier (privilege: advanced)

Selects the nodes that match this remote local identifier value.

[-port1-mtu <integer>] - Maximum Transmission Unit (privilege: advanced)

Selects the nodes that match this parameter value.

[-port1-data-rate <text>] - Data Rate (privilege: advanced)

Selects the nodes that match this parameter value.

[-port1-link-info <text>] - Link Information (privilege: advanced)

Selects the nodes that match this parameter value.

[-port1-qsfp-vendor <text>] - QSFP Vendor (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) vendor name.

[-port1-qsfp-part-number <text>] - QSFP Part Number (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) part-number.

[-port1-qsfp-type <text>] - QSFP Type (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) type.

[-port1-qsfp-serial-number <text>] - QSFP Serial Number (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) serial number.

[-port2 <integer>] - Port Number 2 (privilege: advanced)

Selects the nodes that match this parameter value.

[-port2-port-name <text>] - Port Name (privilege: advanced)

Selects the nodes that match this port name.

[-port2-gid <text>] - Global Identifier (privilege: advanced)

Selects the nodes that match this global identifier value.

[-port2-base-lid <text>] - Base Local Identifier (privilege: advanced)

Selects the nodes that match this base local identifier value.

[-port2-rm-lid <text>] - Remote Local Identifier (privilege: advanced)

Selects the nodes that match this remote local identifier value.

[-port2-mtu <integer>] - Maximum Transmission Unit (privilege: advanced)

Selects the nodes that match this parameter value.

[-port2-data-rate <text>] - Data Rate (privilege: advanced)

Selects the nodes that match this parameter value.

[-port2-link-info <text>] - Link Information (privilege: advanced)

Selects the nodes that match this parameter value.

[-port2-qsfp-vendor <text>] - QSFP Vendor (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) vendor name.

[-port2-qsfp-part-number <text>] - QSFP Part Number (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) part number.

[-port2-qsfp-type <text>] - QSFP Type (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) type.

[-port2-qsfp-serial-number <text>] - QSFP Serial Number (privilege: advanced)

Selects the nodes that match this QSFP (Quad Small Form-factor Pluggable) serial number.

Examples

The following example displays status information about the HA interconnect connection on FAS8000 series nodes with two HA interconnect links in the cluster:

```
cluster1::*> system ha interconnect status show
Node: ic-f8040-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: false
         IC RDMA Connection: up
Node: ic-f8040-02
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: false
         IC RDMA Connection: up
2 entries were displayed.
```

The following example displays status information about the HA interconnect connection on FAS2500 series nodes with a single HA interconnect link in the cluster:

```
cluster1::*> system ha interconnect status show
Node: ic-f2554-01
                Link Status: up
         IC RDMA Connection: up
Node: ic-f2554-02
                Link Status: up
         IC RDMA Connection: up
2 entries were displayed.
```

The following example displays detailed information about the HA interconnect link when parameters like `-instance` , `-node` are used with the `system ha interconnect status show ` command

```
cluster1::*> system ha interconnect status show -instance -node ic-f8040-
01
Node: ic-f8040-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: false
         IC RDMA Connection: up
                       Slot: 0
                Driver Name: IB Host Adapter i0 (Mellanox ConnectX MT27518
rev. 0)
                   Firmware: 2.11.534
             Debug Firmware: no

Interconnect Port 0 :
                  Port Name: ib0a
                        GID: fe80:0000:0000:0000:00a0:9800:0030:33ec
                   Base LID: 0x3ec
                        MTU: 4096
                  Data Rate: 40 Gb/s (4X) QDR
           Link Information: ACTIVE

Interconnect Port 1 :
                  Port Name: ib0b
                        GID: fe80:0000:0000:0000:00a0:9800:0030:33ed
                   Base LID: 0x3ed
                        MTU: 4096
                  Data Rate: 40 Gb/s (4X) QDR
           Link Information: ACTIVE
```

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