



## **system ha commands**

### **ONTAP 9.9.1 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
```

	Link		Physical Layer	Link 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 maximum 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 XORORDER Writes: 66735
    IC XORORDER 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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