



# **Configure intercluster LIFs**

## **ONTAP 9**

NetApp  
April 16, 2022

# Table of Contents

- Configure intercluster LIFs ..... 1
  - Configure intercluster LIFs on shared data ports ..... 1
  - Configure intercluster LIFs on dedicated ports ..... 4
  - Configure intercluster LIFs in custom IPspaces ..... 8

# Configure intercluster LIFs

## Configure intercluster LIFs on shared data ports

You can configure intercluster LIFs on ports shared with the data network. Doing so reduces the number of ports you need for intercluster networking.

### Steps

1. List the ports in the cluster:

```
network port show
```

For complete command syntax, see the man page.

The following example shows the network ports in `cluster01`:

```
cluster01::> network port show
```

| (Mbps)       |       |         |                  |       | Speed |            |
|--------------|-------|---------|------------------|-------|-------|------------|
| Node         | Port  | IPspace | Broadcast Domain | Link  | MTU   | Admin/Oper |
| -----        | ----- | -----   | -----            | ----- | ----- |            |
| cluster01-01 |       |         |                  |       |       |            |
|              | e0a   | Cluster | Cluster          | up    | 1500  | auto/1000  |
|              | e0b   | Cluster | Cluster          | up    | 1500  | auto/1000  |
|              | e0c   | Default | Default          | up    | 1500  | auto/1000  |
|              | e0d   | Default | Default          | up    | 1500  | auto/1000  |
| cluster01-02 |       |         |                  |       |       |            |
|              | e0a   | Cluster | Cluster          | up    | 1500  | auto/1000  |
|              | e0b   | Cluster | Cluster          | up    | 1500  | auto/1000  |
|              | e0c   | Default | Default          | up    | 1500  | auto/1000  |
|              | e0d   | Default | Default          | up    | 1500  | auto/1000  |

2. Create intercluster LIFs on the system SVM:

| Option                  | Description  |
|-------------------------|--|
| In ONTAP 9.6 and later: | <pre>network interface create -vserver system_SVM -lif LIF_name -service -policy default-intercluster -home -node node -home-port port -address port_IP -netmask netmask</pre> |

| Option                           | Description  |
|----------------------------------|--|
| <b>In ONTAP 9.5 and earlier:</b> | <code>network interface create -vserver <i>system_SVM</i> -lif <i>LIF_name</i> -role intercluster -home-node <i>node</i> -home-port <i>port</i> -address <i>port_IP</i> -netmask <i>netmask</i></code> |

For complete command syntax, see the man page.

The following example creates intercluster LIFs `cluster01_icl01` and `cluster01_icl02`:

```
cluster01::> network interface create -vserver cluster01 -lif
cluster01_icl01 -service-
policy default-intercluster -home-node cluster01-01 -home-port e0c
-address 192.168.1.201
-netmask 255.255.255.0

cluster01::> network interface create -vserver cluster01 -lif
cluster01_icl02 -service-
policy default-intercluster -home-node cluster01-02 -home-port e0c
-address 192.168.1.202
-netmask 255.255.255.0
```

### 3. Verify that the intercluster LIFs were created:

| Option                           | Description  |
|----------------------------------|--|
| <b>In ONTAP 9.6 and later:</b>   | <code>network interface show -service-policy default-intercluster</code> |
| <b>In ONTAP 9.5 and earlier:</b> | <code>network interface show -role intercluster</code>                   |

For complete command syntax, see the man page.

```

cluster01::> network interface show -service-policy default-intercluster
          Logical      Status      Network      Current
Current Is
Vserver   Interface  Admin/Oper Address/Mask      Node      Port
Home
-----
cluster01
          cluster01_icl01
                up/up      192.168.1.201/24  cluster01-01  e0c
true
          cluster01_icl02
                up/up      192.168.1.202/24  cluster01-02  e0c
true

```

#### 4. Verify that the intercluster LIFs are redundant:

| Option                           | Description  |
|----------------------------------|--|
| <b>In ONTAP 9.6 and later:</b>   | <code>network interface show -service-policy default-intercluster -failover</code> |
| <b>In ONTAP 9.5 and earlier:</b> | <code>network interface show -role intercluster -failover</code>                   |

For complete command syntax, see the man page.

The following example shows that the intercluster LIFs `cluster01_icl01` and `cluster01_icl02` on the `e0c` port will fail over to the `e0d` port.

```

cluster01::> network interface show -service-policy default-intercluster
-failover
          Logical      Home      Failover      Failover
Vserver   Interface      Node:Port      Policy      Group
-----
cluster01
          cluster01_icl01  cluster01-01:e0c  local-only
192.168.1.201/24
                                Failover Targets: cluster01-01:e0c,
                                                cluster01-01:e0d
          cluster01_icl02  cluster01-02:e0c  local-only
192.168.1.201/24
                                Failover Targets: cluster01-02:e0c,
                                                cluster01-02:e0d

```

# Configure intercluster LIFs on dedicated ports

You can configure intercluster LIFs on dedicated ports. Doing so typically increases the available bandwidth for replication traffic.

## Steps

1. List the ports in the cluster:

```
network port show
```

For complete command syntax, see the man page.

The following example shows the network ports in `cluster01`:

```
cluster01::> network port show
```

| (Mbps)       |      |         |                  |      | Speed |            |
|--------------|------|---------|------------------|------|-------|------------|
| Node         | Port | IPspace | Broadcast Domain | Link | MTU   | Admin/Oper |
| -----        |      |         |                  |      |       |            |
| -----        |      |         |                  |      |       |            |
| cluster01-01 |      |         |                  |      |       |            |
|              | e0a  | Cluster | Cluster          | up   | 1500  | auto/1000  |
|              | e0b  | Cluster | Cluster          | up   | 1500  | auto/1000  |
|              | e0c  | Default | Default          | up   | 1500  | auto/1000  |
|              | e0d  | Default | Default          | up   | 1500  | auto/1000  |
|              | e0e  | Default | Default          | up   | 1500  | auto/1000  |
|              | e0f  | Default | Default          | up   | 1500  | auto/1000  |
| cluster01-02 |      |         |                  |      |       |            |
|              | e0a  | Cluster | Cluster          | up   | 1500  | auto/1000  |
|              | e0b  | Cluster | Cluster          | up   | 1500  | auto/1000  |
|              | e0c  | Default | Default          | up   | 1500  | auto/1000  |
|              | e0d  | Default | Default          | up   | 1500  | auto/1000  |
|              | e0e  | Default | Default          | up   | 1500  | auto/1000  |
|              | e0f  | Default | Default          | up   | 1500  | auto/1000  |

2. Determine which ports are available to dedicate to intercluster communication:

```
network interface show -fields home-port,curr-port
```

For complete command syntax, see the man page.

The following example shows that ports `e0e` and `e0f` have not been assigned LIFs:

```
cluster01::> network interface show -fields home-port,curr-port
vserver lif                home-port curr-port
-----
Cluster cluster01-01_clus1  e0a      e0a
Cluster cluster01-01_clus2  e0b      e0b
Cluster cluster01-02_clus1  e0a      e0a
Cluster cluster01-02_clus2  e0b      e0b
cluster01
      cluster_mgmt          e0c      e0c
cluster01
      cluster01-01_mgmt1    e0c      e0c
cluster01
      cluster01-02_mgmt1    e0c      e0c
```

### 3. Create a failover group for the dedicated ports:

```
network interface failover-groups create -vserver system_SVM -failover-group
failover_group -targets physical_or_logical_ports
```

The following example assigns ports e0e and e0f to the failover group intercluster01 on the system SVM cluster01:

```
cluster01::> network interface failover-groups create -vserver cluster01
-failover-group
intercluster01 -targets
cluster01-01:e0e,cluster01-01:e0f,cluster01-02:e0e,cluster01-02:e0f
```

### 4. Verify that the failover group was created:

```
network interface failover-groups show
```

For complete command syntax, see the man page.

```
cluster01::> network interface failover-groups show
```

| Vserver   | Group          | Failover<br>Targets  |
|-----------|----------------|--|
| Cluster   | Cluster        | cluster01-01:e0a, cluster01-01:e0b,<br>cluster01-02:e0a, cluster01-02:e0b  |
| cluster01 | Default        | cluster01-01:e0c, cluster01-01:e0d,<br>cluster01-02:e0c, cluster01-02:e0d,<br>cluster01-01:e0e, cluster01-01:e0f<br>cluster01-02:e0e, cluster01-02:e0f |
|           | intercluster01 | cluster01-01:e0e, cluster01-01:e0f<br>cluster01-02:e0e, cluster01-02:e0f   |

5. Create intercluster LIFs on the system SVM and assign them to the failover group.

| Option                           | Description  |
|----------------------------------|--|
| <b>In ONTAP 9.6 and later:</b>   | <code>network interface create -vserver <i>system_SVM</i> -lif <i>LIF_name</i> -service -policy default-intercluster -home -node <i>node</i> -home- port <i>port</i> -address <i>port_IP</i> -netmask <i>netmask</i> -failover -group <i>failover_group</i></code> |
| <b>In ONTAP 9.5 and earlier:</b> | <code>network interface create -vserver <i>system_SVM</i> -lif <i>LIF_name</i> -role intercluster -home-node <i>node</i> -home -port <i>port</i> -address <i>port_IP</i> -netmask <i>netmask</i> -failover-group <i>failover_group</i></code>                      |

For complete command syntax, see the man page.

The following example creates intercluster LIFs `cluster01_icl01` and `cluster01_icl02` in the failover group `intercluster01`:



```

cluster01::> network interface create -vserver cluster01 -lif
cluster01_icl01 -service-
policy default-intercluster -home-node cluster01-01 -home-port e0e
-address 192.168.1.201
-netmask 255.255.255.0 -failover-group intercluster01

cluster01::> network interface create -vserver cluster01 -lif
cluster01_icl02 -service-
policy default-intercluster -home-node cluster01-02 -home-port e0e
-address 192.168.1.202
-netmask 255.255.255.0 -failover-group intercluster01

```

6. Verify that the intercluster LIFs were created:

| Option                           | Description   |
|----------------------------------|---|
| <b>In ONTAP 9.6 and later:</b>   | network interface show -service-policy default-intercluster |
| <b>In ONTAP 9.5 and earlier:</b> | network interface show -role intercluster                   |

For complete command syntax, see the man page.

```

cluster01::> network interface show -service-policy default-intercluster

```

|            | Logical         | Status     | Network          | Current          |
|------------|-----------------|------------|------------------|------------------|
| Current Is |                 |            |                  |                  |
| Vserver    | Interface       | Admin/Oper | Address/Mask     | Node             |
| Home       |                 |            |                  | Port             |
| cluster01  | cluster01_icl01 | up/up      | 192.168.1.201/24 | cluster01-01 e0e |
| true       | cluster01_icl02 | up/up      | 192.168.1.202/24 | cluster01-02 e0f |
| true       |                 |            |                  |                  |

7. Verify that the intercluster LIFs are redundant:

| Option                    | Description  |
|---------------------------|--|
| In ONTAP 9.6 and later:   | <code>network interface show -service-policy default-intercluster -failover</code> |
| In ONTAP 9.5 and earlier: | <code>network interface show -role intercluster -failover</code>                   |

For complete command syntax, see the man page.

The following example shows that the intercluster LIFs `cluster01_icl01` and `cluster01_icl02` on the SVM `e0e` port will fail over to the `e0f` port.

```
cluster01::> network interface show -service-policy default-intercluster
-failover
```

| Vserver        | Logical<br>Interface | Home<br>Node:Port | Failover<br>Policy                                      | Failover<br>Group |
|----------------|----------------------|-------------------|---|-------------------|
| cluster01      | cluster01_icl01      | cluster01-01:e0e  | local-only  |                   |
| intercluster01 |                      |                   | Failover Targets: cluster01-01:e0e,<br>cluster01-01:e0f |                   |
| cluster01      | cluster01_icl02      | cluster01-02:e0e  | local-only  |                   |
| intercluster01 |                      |                   | Failover Targets: cluster01-02:e0e,<br>cluster01-02:e0f |                   |

## Configure intercluster LIFs in custom IPspaces

You can configure intercluster LIFs in custom IPspaces. Doing so allows you to isolate replication traffic in multitenant environments.

When you create a custom IPspace, the system creates a system storage virtual machine (SVM) to serve as a container for the system objects in that IPspace. You can use the new SVM as the container for any intercluster LIFs in the new IPspace. The new SVM has the same name as the custom IPspace.

### Steps

1. List the ports in the cluster:

```
network port show
```

For complete command syntax, see the man page.

The following example shows the network ports in `cluster01`:

```
cluster01::> network port show
```

| (Mbps)       |      |         |                  |      |      | Speed      |
|--------------|------|---------|------------------|------|------|------------|
| Node         | Port | IPspace | Broadcast Domain | Link | MTU  | Admin/Oper |
| -----        |      |         |                  |      |      |            |
| -----        |      |         |                  |      |      |            |
| cluster01-01 |      |         |                  |      |      |            |
|              | e0a  | Cluster | Cluster          | up   | 1500 | auto/1000  |
|              | e0b  | Cluster | Cluster          | up   | 1500 | auto/1000  |
|              | e0c  | Default | Default          | up   | 1500 | auto/1000  |
|              | e0d  | Default | Default          | up   | 1500 | auto/1000  |
|              | e0e  | Default | Default          | up   | 1500 | auto/1000  |
|              | e0f  | Default | Default          | up   | 1500 | auto/1000  |
| cluster01-02 |      |         |                  |      |      |            |
|              | e0a  | Cluster | Cluster          | up   | 1500 | auto/1000  |
|              | e0b  | Cluster | Cluster          | up   | 1500 | auto/1000  |
|              | e0c  | Default | Default          | up   | 1500 | auto/1000  |
|              | e0d  | Default | Default          | up   | 1500 | auto/1000  |
|              | e0e  | Default | Default          | up   | 1500 | auto/1000  |
|              | e0f  | Default | Default          | up   | 1500 | auto/1000  |

## 2. Create custom IPspaces on the cluster:

```
network ipspace create -ipspace ipspace
```

The following example creates the custom IPspace `ipspace-IC1`:

```
cluster01::> network ipspace create -ipspace ipspace-IC1
```

## 3. Determine which ports are available to dedicate to intercluster communication:

```
network interface show -fields home-port,curr-port
```

For complete command syntax, see the man page.

The following example shows that ports `e0e` and `e0f` have not been assigned LIFs:

```
cluster01::> network interface show -fields home-port,curr-port
vserver lif                home-port curr-port
-----
Cluster cluster01_clus1    e0a      e0a
Cluster cluster01_clus2    e0b      e0b
Cluster cluster02_clus1    e0a      e0a
Cluster cluster02_clus2    e0b      e0b
cluster01
      cluster_mgmt          e0c      e0c
cluster01
      cluster01-01_mgmt1    e0c      e0c
cluster01
      cluster01-02_mgmt1    e0c      e0c
```

#### 4. Remove the available ports from the default broadcast domain:

```
network port broadcast-domain remove-ports -broadcast-domain Default -ports
ports
```

A port cannot be in more than one broadcast domain at a time. For complete command syntax, see the man page.

The following example removes ports e0e and e0f from the default broadcast domain:

```
cluster01::> network port broadcast-domain remove-ports -broadcast
-domain Default -ports
cluster01-01:e0e,cluster01-01:e0f,cluster01-02:e0e,cluster01-02:e0f
```

#### 5. Verify that the ports have been removed from the default broadcast domain:

```
network port show
```

For complete command syntax, see the man page.

The following example shows that ports e0e and e0f have been removed from the default broadcast domain:

```
cluster01::> network port show
```

| Node         | Port | IPspace | Broadcast Domain | Link | MTU  | Speed (Mbps)<br>Admin/Oper |
|--------------|------|---------|------------------|------|------|----------------------------|
| -----        |      |         |                  |      |      |                            |
| cluster01-01 |      |         |                  |      |      |                            |
|              | e0a  | Cluster | Cluster          | up   | 9000 | auto/1000                  |
|              | e0b  | Cluster | Cluster          | up   | 9000 | auto/1000                  |
|              | e0c  | Default | Default          | up   | 1500 | auto/1000                  |
|              | e0d  | Default | Default          | up   | 1500 | auto/1000                  |
|              | e0e  | Default | -                | up   | 1500 | auto/1000                  |
|              | e0f  | Default | -                | up   | 1500 | auto/1000                  |
|              | e0g  | Default | Default          | up   | 1500 | auto/1000                  |
| cluster01-02 |      |         |                  |      |      |                            |
|              | e0a  | Cluster | Cluster          | up   | 9000 | auto/1000                  |
|              | e0b  | Cluster | Cluster          | up   | 9000 | auto/1000                  |
|              | e0c  | Default | Default          | up   | 1500 | auto/1000                  |
|              | e0d  | Default | Default          | up   | 1500 | auto/1000                  |
|              | e0e  | Default | -                | up   | 1500 | auto/1000                  |
|              | e0f  | Default | -                | up   | 1500 | auto/1000                  |
|              | e0g  | Default | Default          | up   | 1500 | auto/1000                  |

6. Create a broadcast domain in the custom IPspace:

```
network port broadcast-domain create -ipspace ipspace -broadcast-domain  
broadcast_domain -mtu MTU -ports ports
```

The following example creates the broadcast domain `ipspace-IC1-bd` in the IPspace `ipspace-IC1`:

```
cluster01::> network port broadcast-domain create -ipspace ipspace-IC1  
-broadcast-domain  
ipspace-IC1-bd -mtu 1500 -ports cluster01-01:e0e,cluster01-01:e0f,  
cluster01-02:e0e,cluster01-02:e0f
```

7. Verify that the broadcast domain was created:

```
network port broadcast-domain show
```

For complete command syntax, see the man page.

```

cluster01::> network port broadcast-domain show
IPspace Broadcast
Name      Domain Name      MTU      Port List
-----
Cluster Cluster      9000
      cluster01-01:e0a      complete
      cluster01-01:e0b      complete
      cluster01-02:e0a      complete
      cluster01-02:e0b      complete
Default Default      1500
      cluster01-01:e0c      complete
      cluster01-01:e0d      complete
      cluster01-01:e0f      complete
      cluster01-01:e0g      complete
      cluster01-02:e0c      complete
      cluster01-02:e0d      complete
      cluster01-02:e0f      complete
      cluster01-02:e0g      complete
ipspace-IC1
      ipspace-IC1-bd
      1500
      cluster01-01:e0e      complete
      cluster01-01:e0f      complete
      cluster01-02:e0e      complete
      cluster01-02:e0f      complete

```

8. Create intercluster LIFs on the system SVM and assign them to the broadcast domain:

| Option                           | Description  |
|----------------------------------|--|
| <b>In ONTAP 9.6 and later:</b>   | <pre> network interface create -vserver system_SVM -lif LIF_name -service -policy default-intercluster -home -node node -home-port port -address port_IP -netmask netmask </pre> |
| <b>In ONTAP 9.5 and earlier:</b> | <pre> network interface create -vserver system_SVM -lif LIF_name -role intercluster -home-node node -home -port port -address port_IP -netmask netmask </pre>                    |

The LIF is created in the broadcast domain that the home port is assigned to. The broadcast domain has a default failover group with the same name as the broadcast domain. For complete command syntax, see the man page.

The following example creates intercluster LIFs `cluster01_icl01` and `cluster01_icl02` in the broadcast domain `ipspace-IC1-bd`:

```
cluster01::> network interface create -vserver ipspace-IC1 -lif
cluster01_icl01 -service-
policy default-intercluster -home-node cluster01-01 -home-port e0e
-address 192.168.1.201
-netmask 255.255.255.0

cluster01::> network interface create -vserver ipspace-IC1 -lif
cluster01_icl02 -service-
policy default-intercluster -home-node cluster01-02 -home-port e0e
-address 192.168.1.202
-netmask 255.255.255.0
```

9. Verify that the intercluster LIFs were created:

| Option                    | Description   |
|---------------------------|---|
| In ONTAP 9.6 and later:   | network interface show -service-policy default-intercluster |
| In ONTAP 9.5 and earlier: | network interface show -role intercluster                   |

For complete command syntax, see the man page.

```
cluster01::> network interface show -service-policy default-intercluster
Logical      Status      Network      Current
Current Is
Vserver      Interface  Admin/Oper  Address/Mask      Node      Port
Home
-----
-----
ipspace-IC1
      cluster01_icl01
              up/up      192.168.1.201/24  cluster01-01  e0e
true
      cluster01_icl02
              up/up      192.168.1.202/24  cluster01-02  e0f
true
```

10. Verify that the intercluster LIFs are redundant:

| Option                    | Description   |
|---------------------------|---|
| In ONTAP 9.6 and later:   | network interface show -service-policy default-intercluster -failover |
| In ONTAP 9.5 and earlier: | network interface show -role intercluster -failover                   |

For complete command syntax, see the man page.

The following example shows that the intercluster LIFs cluster01\_icl01 and cluster01\_icl02 on the SVM e0e port fail over to the e0f port:

```
cluster01::> network interface show -service-policy default-intercluster
-failover
```

| Vserver        | Logical<br>Interface | Home<br>Node:Port | Failover<br>Policy | Failover<br>Group |
|----------------|----------------------|-------------------|--------------------|-------------------|
| -----          | -----                | -----             | -----              | -----             |
| ipspace-IC1    |                      |                   |                    |                   |
|                | cluster01_icl01      | cluster01-01:e0e  | local-only         |                   |
| intercluster01 |                      |                   |                    |                   |
|                |                      | Failover Targets: | cluster01-01:e0e,  |                   |
|                |                      |                   | cluster01-01:e0f   |                   |
|                | cluster01_icl02      | cluster01-02:e0e  | local-only         |                   |
| intercluster01 |                      |                   |                    |                   |
|                |                      | Failover Targets: | cluster01-02:e0e,  |                   |
|                |                      |                   | cluster01-02:e0f   |                   |



## Copyright Information

Copyright © 2022 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.