



# Configure intercluster LIFs

ONTAP 9

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# Configure intercluster LIFs

## Configure ONTAP 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
```

Learn more about `network port show` in the [ONTAP command reference](#).

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

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

(Mbps)	Node	Port	IPspace	Broadcast Domain	Link	MTU	Speed	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 either an admin SVM (Default IPspace) or a system SVM (custom IPspace):

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>

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>

Learn more about `network interface create` in the [ONTAP command reference](#).

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>

Learn more about `network interface show` in the [ONTAP command reference](#).

```

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>

Learn more about `network interface show` in the [ONTAP command reference](#).

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 ONTAP 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
```

Learn more about `network port show` in the [ONTAP command reference](#).

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

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

(Mbps)	Node	Port	IPspace	Broadcast Domain	Link	MTU	Speed	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
```

Learn more about `network interface show` in the [ONTAP command reference](#).

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
```

Learn more about `network interface failover-groups show` in the [ONTAP command reference](#).

```

cluster01::> network interface failover-groups show

```

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

Learn more about `network interface create` in the [ONTAP command reference](#).

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

Learn more about `network interface show` in the [ONTAP command reference](#).

```

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  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>

Learn more about `network interface show` in the [ONTAP command reference](#).

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
          Logical          Home          Failover          Failover
Vserver  Interface          Node:Port          Policy            Group
-----
cluster01
          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
```

## Configure ONTAP 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
```

Learn more about `network port show` in the [ONTAP command reference](#).

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
```

Learn more about `network ipspace create` in the [ONTAP command reference](#).

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

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

Learn more about `network interface show` in the [ONTAP command reference](#).

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. Learn more about `network port broadcast-domain remove-ports` in the [ONTAP command reference](#).

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

```

Learn more about `network port show` in the [ONTAP command reference](#).

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) 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
```

Learn more about `network port broadcast-domain show` in the [ONTAP command reference](#).

```

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>	<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></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></code>

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. Learn more about `network interface create` in the [ONTAP command reference](#).

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
<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>

Learn more about `network interface show` in the [ONTAP command reference](#).

```
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

Learn more about `network interface show` in the [ONTAP command reference](#).

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
          Logical          Home          Failover          Failover
Vserver  Interface          Node:Port          Policy            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
```

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