NetApp

Configure intercluster LIFs

ONTAP 9

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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
                                                           Speed
   (Mbps)
   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:	`network interface create -vserver` *`system_SVM`* `-lif` *`LIF_name`* `-service -policy default-intercluster -home -node` *`node`* `-home-port port -address` *`port_IP`* `-netmask` *`netmask`*

Option	Description
In ONTAP 9.5 and earlier:	```network interface create -vserver system_SVM -lif LIF_name -role intercluster -home-node node -home -port port -address port_IP -netmask netmask```

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
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
----------- ---------- ---------- ------------------ -------------
------- ----
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
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 `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
                                                        Speed
   (Mbps)
   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
                                    Failover
Vserver          Group             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
In ONTAP 9.6 and later:	`network interface create -vserver` *`system_SVM`* `-lif` *`LIF_name`* `-service -policy default-intercluster -home -node` *`node`* `-home- port` *`port`* `-address` *`port_IP`* `-netmask` *`netmask`* `-failover -group` *`failover_group`*
In ONTAP 9.5 and earlier:	`network interface create -vserver` *`system_SVM`* `-lif` *`LIF_name`* `-role intercluster -home-node` *`node`* `-home -port` *`port`* `-address` *`port_IP`* `-netmask` *`netmask`* `-failover-group` *`failover_group`*

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
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
----------- ---------- ---------- ------------------ -------------
------- ----
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:	`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 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 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
                                                          Speed
(Mbps)
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
                                                      Speed (Mbps)
Node    Port    IPspace   Broadcast Domain Link   MTU    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                                          Update
Name     Domain Name   MTU   Port List                      Status Details
-------  -----------   ----- ----------------------------   --------------
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
In ONTAP 9.6 and later:	`network interface create -vserver` *`system_SVM`* `-lif` *`LIF_name`* `-service -policy default-intercluster -home -node` *`node`* `-home-port` *`port`* `-address` *`port_IP`* `-netmask` *`netmask`*
In ONTAP 9.5 and earlier:	`network interface create -vserver` *`system_SVM`* `-lif` *`LIF_name`* `-role intercluster -home-node` *`node`* `-home -port` *`port`* `-address` *`port_IP`* `-netmask` *`netmask`*

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
         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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