



Broadcast domain (ONTAP 9.8 and later)

ONTAP 9

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Broadcast domain (ONTAP 9.8 and later)

Broadcast domain overview (ONTAP 9.8 and later)

Broadcast domains are intended to group network ports that belong to the same layer 2 network. The ports in the group can then be used by a storage virtual machine (SVM) for data or management traffic.

A broadcast domain resides in an IPspace. During cluster initialization, the system creates two default broadcast domains:

- The "Default" broadcast domain contains ports that are in the "Default" IPspace.

These ports are used primarily to serve data. Cluster management and node management ports are also in this broadcast domain.

- The "Cluster" broadcast domain contains ports that are in the "Cluster" IPspace.

These ports are used for cluster communication and include all cluster ports from all nodes in the cluster.

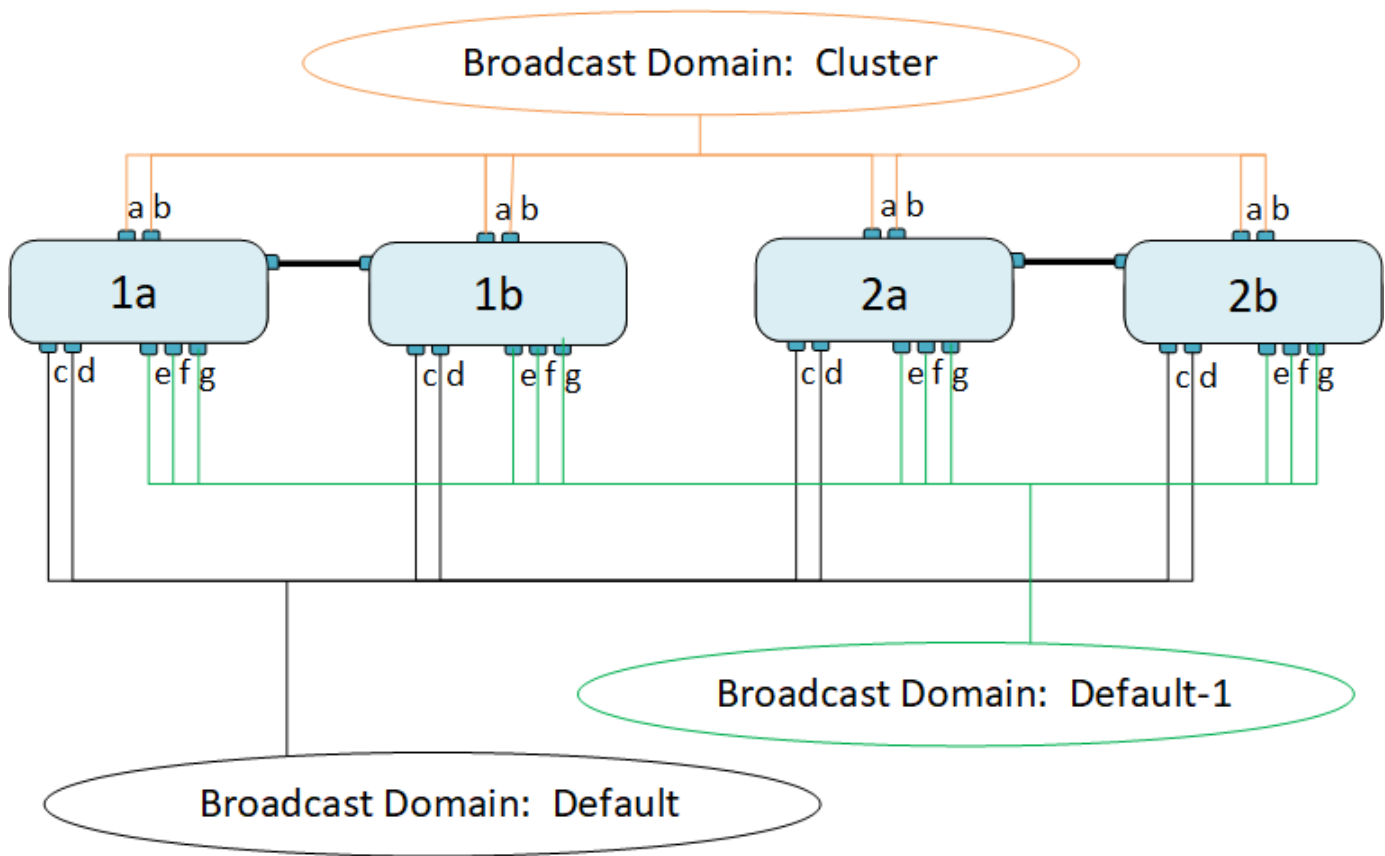
The system creates additional broadcast domains in the Default IPspace when necessary. The "Default" broadcast domain contains the home-port of the management LIF, plus any other ports that have layer 2 reachability to that port. Additional broadcast domains are named "Default-1", "Default-2", and so forth.

Example of using broadcast domains

A broadcast domain is a set of network ports in the same IPspace that also has layer 2 reachability to one another, typically including ports from many nodes in the cluster.

The illustration shows the ports assigned to three broadcast domains in a four-node cluster:

- The "Cluster" broadcast domain is created automatically during cluster initialization, and it contains ports a and b from each node in the cluster.
- The "Default" broadcast domain is also created automatically during cluster initialization, and it contains ports c and d from each node in the cluster.
- The system automatically creates any additional broadcast domains during cluster initialization based on layer 2 network reachability. These additional broadcast domains are named Default-1, Default-2, and so forth.



A failover group of the same name and with the same network ports as each of the broadcast domains is created automatically. This failover group is automatically managed by the system, meaning that as ports are added or removed from the broadcast domain, they are automatically added or removed from this failover group.

Add a broadcast domain

Broadcast domains group network ports in the cluster that belong to the same layer 2 network. The ports can then be used by SVMs.

Beginning with ONTAP 9.8, broadcast domains are automatically created during the cluster create or join operation. Beginning with ONTAP 9.12.0, in addition to the automatically created broadcast domains, you can manually add a broadcast domain in System Manager.

Before you begin

The ports you plan to add to the broadcast domain must not belong to another broadcast domain. If the ports you want to use belong to another broadcast domain, but are unused, remove those ports from the original broadcast domain.

About this task

- All broadcast domain names must be unique within an IPspace.
- The ports added to a broadcast domain can be physical network ports, VLANs, or link aggregation groups/interface groups (LAGs/ifgrps).
- If the ports you want to use belong to another broadcast domain, but are unused, remove them from existing broadcast domain before adding them to the new one.
- The maximum transmission unit (MTU) of the ports added to a broadcast domain are updated to the MTU

value set in the broadcast domain.

- The MTU value must match all the devices connected to that layer 2 network except for the e0M port handling management traffic.
- If you do not specify an IPspace name, the broadcast domain is created in the "Default" IPspace.

To make system configuration easier, a failover group of the same name is created automatically that contains the same ports.

System Manager

Steps

1. Select **Network > Overview > Broadcast domain**.
2. Click **+ Add**
3. Name the broadcast domain.
4. Set the MTU.
5. Select the IPspace.
6. Save the broadcast domain.

You can edit or delete a broadcast domain after it has been added.

CLI

In ONTAP 9.7 or earlier, you can manually create a broadcast domain.

If you are using ONTAP 9.8 and later, broadcast domains are created automatically based on layer-2 reachability. For more information, see [Repair port reachability](#).

Steps

1. View the ports that are not currently assigned to a broadcast domain:

```
network port show
```

If the display is large, use the `network port show -broadcast-domain` command to view only unassigned ports.

2. Create a broadcast domain:

```
network port broadcast-domain create -broadcast-domain  
broadcast_domain_name -mtu mtu_value [-ipspace ipspace_name] [-ports  
ports_list]
```

a. `broadcast_domain_name` is the name of the broadcast domain you want to create.

b. `mtu_value` is the MTU size for IP packets; 1500 and 9000 are typical values.

This value is applied to all ports that are added to this broadcast domain.

c. `ipspace_name` is the name of the IPspace to which this broadcast domain will be added.

The "Default" IPspace is used unless you specify a value for this parameter.

d. `ports_list` is the list of ports that will be added to the broadcast domain.

The ports are added in the format `node_name:port_number`, for example, `node1:e0c`.

3. Verify that the broadcast domain was created as desired:

```
network port show -instance -broadcast-domain new_domain
```

Example

The following command creates broadcast domain `bcast1` in the Default IPspace, sets the MTU to 1500, and adds four ports:

```
network port broadcast-domain create -broadcast-domain bcast1 -mtu 1500 -ports  
cluster1-01:e0e,cluster1-01:e0f,cluster1-02:e0e,cluster1-02:e0f
```

After you finish

You can define the pool of IP addresses that will be available in the broadcast domain by creating a subnet, or you can assign SVMs and interfaces to the IPspace at this time. For more information, see [Cluster and SVM peering](#).

If you need to change the name of an existing broadcast domain, use the `network port broadcast-domain rename` command.

Add or remove ports from a broadcast domain (ONTAP 9.8 and later)

Broadcast domains are automatically created during the cluster create or join operation. You do not need to manually remove ports from broadcast domains.

If network port reachability has changed, either through physical network connectivity or switch configuration, and a network port belongs in a different broadcast domain, see the following topic:


[Repair port reachability](#)

System Manager

Beginning with ONTAP 9.14.1, you can use System Manager to reassign Ethernet ports across broadcast domains. It is recommended that you assign every Ethernet port to a broadcast domain. So, if you unassign an Ethernet port from a broadcast domain, you must reassign it to a different broadcast domain.

Steps

To reassign Ethernet ports, perform the following steps:

1. Select **Network > Overview**.
2. In the **Broadcast Domains** section, select  next to the domain name.
3. In the drop-down menu, select **Edit**.
4. On the **Edit Broadcast Domain** page, deselect the Ethernet ports that you want to reassign to another domain.
5. For each deselected port, the **Reassign Ethernet Port** window displays. Select the broadcast domain to which you want to reassign the port, and then select **Reassign**.
6. Select all the ports that you want to assign to the current broadcast domain and save your changes.

CLI

If network port reachability has changed, either through physical network connectivity or switch configuration, and a network port belongs in a different broadcast domain, see the following topic:

[Repair port reachability](#)

Alternately, you can manually add or remove ports from broadcast domains using the `network port broadcast-domain add-ports` or the `network port broadcast-domain remove-ports` command.

Before you begin

- You must be a cluster administrator to perform this task.
- Ports you plan to add to a broadcast domain must not belong to another broadcast domain.
- Ports that already belong to an interface group cannot be added individually to a broadcast domain.

About this task

The following rules apply when adding and removing network ports:

When adding ports...	When removing ports...
The ports can be network ports, VLANs, or interface groups (ifgrps).	N/A
The ports are added to the system-defined failover group of the broadcast domain.	The ports are removed from all failover groups in the broadcast domain.
The MTU of the ports is updated to the MTU value set in the broadcast domain.	The MTU of the ports is unchanged.
The IPspace of the ports is updated to the IPspace value of the broadcast domain.	The ports are moved to the 'Default' IPspace with no broadcast domain attribute.



If you remove the last member port of an interface group using the `network port ifgrp remove-port` command, it causes the interface group port to be removed from the broadcast domain because an empty interface group port is not allowed in a broadcast domain.

Steps

1. Display the ports that are currently assigned or unassigned to a broadcast domain by using the `network port show` command.
2. Add or remove network ports from the broadcast domain:

If you want to...	Use...
Add ports to a broadcast domain	<code>network port broadcast-domain add-ports</code>
Remove ports from a broadcast domain	<code>network port broadcast-domain remove-ports</code>

3. Verify that the ports were added or removed from the broadcast domain:

```
network port show
```

For more information about these commands, see [ONTAP 9 commands](#).

Examples of adding and removing ports

The following command adds port e0g on node cluster-1-01 and port e0g on node cluster-1-02 to broadcast domain bcast1 in the Default IPspace:

```
cluster-1::> network port broadcast-domain add-ports -broadcast-domain bcast1  
-ports cluster-1-01:e0g,cluster1-02:e0g
```

The following command adds two cluster ports to broadcast domain Cluster in the Cluster IPspace:

```
cluster-1::> network port broadcast-domain add-ports -broadcast-domain Cluster  
-ports cluster-2-03:e0f,cluster2-04:e0f -ipspace Cluster
```

The following command removes port e0e on node cluster1-01 from broadcast domain bcast1 in the Default IPspace:

```
cluster-1::> network port broadcast-domain remove-ports -broadcast-domain  
bcast1 -ports cluster-1-01:e0e
```

Move broadcast domains into IPspaces (ONTAP 9.8 and later)

Move the broadcast domains that the system created based on layer 2 reachability into the IPspaces you created.

Before you move the broadcast domain, you must verify the reachability of the ports in your broadcast

domains.

The automatic scanning of ports can determine which ports can reach each other and place them in the same broadcast domain, but this scanning is unable to determine the appropriate IPspace. If the broadcast domain belongs in a non-default IPspace, then you must move it manually using the steps in this section.

Before you begin

Broadcast domains are automatically configured as part of cluster create and join operations. ONTAP defines the "Default" broadcast domain to be the set of ports that have layer 2 connectivity to the home port of the management interface on the first node created in the cluster. Other broadcast domains are created, if necessary, and are named **Default-1**, **Default-2**, and so forth.

When a node joins an existing cluster, their network ports automatically join existing broadcast domains based on their layer 2 reachability. If they do not have reachability to an existing broadcast domain, the ports are placed into one or more new broadcast domains.

About this task

- Ports with cluster LIFs are automatically placed into the "Cluster" IPspace.
- Ports with reachability to the home port of the node-management LIF are placed into the "Default" broadcast domain.
- Other broadcast domains are created by ONTAP automatically as part of the cluster create or join operation.
- As you add VLANs and interface groups, they are automatically placed into the appropriate broadcast domain about a minute after they are created.

Steps

1. Verify the reachability of the ports in your broadcast domains. ONTAP automatically monitors layer 2 reachability. Use the following command to verify each port has been added to a broadcast domain and has "ok" reachability.

```
network port reachability show -detail
```

2. If necessary, move broadcast domains into other IPspaces:

```
network port broadcast-domain move
```

For example, if you want to move a broadcast domain from "Default" to "ips1":

```
network port broadcast-domain move -ipspace Default -broadcast-domain Default  
-to-ipspace ips1
```

Move broadcast domains into IPspaces (ONTAP 9.8 and later)

Move the broadcast domains that the system created based on layer 2 reachability into the IPspaces you created.

Before you move the broadcast domain, you must verify the reachability of the ports in your broadcast domains.

The automatic scanning of ports can determine which ports can reach each other and place them in the same

broadcast domain, but this scanning is unable to determine the appropriate IPspace. If the broadcast domain belongs in a non-default IPspace, then you must move it manually using the steps in this section.

Before you begin

Broadcast domains are automatically configured as part of cluster create and join operations. ONTAP defines the "Default" broadcast domain to be the set of ports that have layer 2 connectivity to the home port of the management interface on the first node created in the cluster. Other broadcast domains are created, if necessary, and are named **Default-1**, **Default-2**, and so forth.

When a node joins an existing cluster, their network ports automatically join existing broadcast domains based on their layer 2 reachability. If they do not have reachability to an existing broadcast domain, the ports are placed into one or more new broadcast domains.

About this task

- Ports with cluster LIFs are automatically placed into the "Cluster" IPspace.
- Ports with reachability to the home port of the node-management LIF are placed into the "Default" broadcast domain.
- Other broadcast domains are created by ONTAP automatically as part of the cluster create or join operation.
- As you add VLANs and interface groups, they are automatically placed into the appropriate broadcast domain about a minute after they are created.

Steps

1. Verify the reachability of the ports in your broadcast domains. ONTAP automatically monitors layer 2 reachability. Use the following command to verify each port has been added to a broadcast domain and has "ok" reachability.

```
network port reachability show -detail
```

2. If necessary, move broadcast domains into other IPspaces:

```
network port broadcast-domain move
```

For example, if you want to move a broadcast domain from "Default" to "ips1":

```
network port broadcast-domain move -ipspace Default -broadcast-domain Default  
-to-ipspace ips1
```

Split broadcast domains (ONTAP 9.8 and later)

If network port reachability has changed, either through physical network connectivity or switch configuration, and a group of network ports previously configured in a single broadcast domain has become partitioned into two different reachability sets, you can split a broadcast domain to synchronize the ONTAP configuration with the physical network topology.

To determine if a network port broadcast domain is partitioned into more than one reachability set, use the `network port reachability show -details` command and pay attention to which ports do not have connectivity to one another ("Unreachable ports"). Typically, the list of unreachable ports defines the set of ports that should be split into another broadcast domain, after you have verified that the physical and switch

configuration is accurate.

Step

Split a broadcast domain into two broadcast domains:

```
network port broadcast-domain split -ipspace <ipspace_name> -broadcast
-domain <broadcast_domain_name> -new-broadcast-domain
<broadcast_domain_name> -ports <node:port,node:port>
```

- `ipspace_name` is the name of the ipspace where the broadcast domain resides.
- `-broadcast-domain` is the name of the broadcast domain that will be split.
- `-new-broadcast-domain` is the name of the new broadcast domain that will be created.
- `-ports` is the node name and port to be added to the new broadcast domain.

Merge broadcast domains (ONTAP 9.8 and later)

If network port reachability has changed, either through physical network connectivity or switch configuration, and two group of network ports previously configured in multiple broadcast domains now all share reachability, then merging two broadcast domains can be used to synchronize the ONTAP configuration with the physical network topology.

To determine if multiple broadcast domains belong to one reachability set, use the "network port reachability show -details" command and pay attention to which ports that are configured in another broadcast domain actually have connectivity to one another ("Unexpected ports"). Typically, the list of unexpected ports defines the set of ports that should be merged into the broadcast domain after you have verified that the physical and switch configuration is accurate.

Step

Merge the ports from one broadcast domain into an existing broadcast domain:

```
network port broadcast-domain merge -ipspace <ipspace_name> -broadcast
-domain <broadcast_domain_name> -into-broadcast-domain
<broadcast_domain_name>
```

- `ipspace_name` is the name of the ipspace where the broadcast domains reside.
- `-broadcast-domain` is the name of the broadcast domain that will be merged.
- `-into-broadcast-domain` is the name of the broadcast domain that will receive additional ports.

Change the MTU value for ports in a broadcast domain (ONTAP 9.8 and later)

You can modify the MTU value for a broadcast domain to change the MTU value for all ports in that broadcast domain. This can be done to support topology changes that have

been made in the network.

Before you begin

The MTU value must match all the devices connected to that layer 2 network except for the e0M port handling management traffic.

About this task

Changing the MTU value causes a brief interruption in traffic over the affected ports. The system displays a prompt that you must answer with y to make the MTU change.

Step

Change the MTU value for all ports in a broadcast domain:

```
network port broadcast-domain modify -broadcast-domain  
<broadcast_domain_name> -mtu <mtu_value> [-ipspace <ipspace_name>]
```

- `broadcast_domain` is the name of the broadcast domain.
- `mtu` is the MTU size for IP packets; 1500 and 9000 are typical values.
- `ipspace` is the name of the IPspace in which this broadcast domain resides. The "Default" IPspace is used unless you specify a value for this option. The following command changes the MTU to 9000 for all ports in the broadcast domain `bcast1`:

```
network port broadcast-domain modify -broadcast-domain <Default-1> -mtu <  
9000 >
```

Warning: Changing broadcast domain settings will cause a momentary data-serving interruption.

Do you want to continue? {y|n}: <y>

Display broadcast domains (ONTAP 9.8 and later)

You can display the list of broadcast domains within each IPspace in a cluster. The output also shows the list of ports and the MTU value for each broadcast domain.

Step

Display the broadcast domains and associated ports in the cluster:

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

The following command displays all the broadcast domains and associated ports in the cluster:

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

IPspace	Broadcast			Update
Name	Domain Name	MTU	Port List	Status Details
-----	-----	-----	-----	-----
Cluster	Cluster	9000		
			cluster-1-01:e0a	complete
			cluster-1-01:e0b	complete
			cluster-1-02:e0a	complete
			cluster-1-02:e0b	complete
Default	Default	1500		
			cluster-1-01:e0c	complete
			cluster-1-01:e0d	complete
			cluster-1-02:e0c	complete
			cluster-1-02:e0d	complete
	Default-1	1500		
			cluster-1-01:e0e	complete
			cluster-1-01:e0f	complete
			cluster-1-01:e0g	complete
			cluster-1-02:e0e	complete
			cluster-1-02:e0f	complete
			cluster-1-02:e0g	complete

The following command displays the ports in the Default-1 broadcast domain that have an update status of error, which indicate that the port could not be updated properly:

```
network port broadcast-domain show -broadcast-domain Default-1 -port
-update-status error
```

IPspace	Broadcast			Update
Name	Domain Name	MTU	Port List	Status Details
-----	-----	-----	-----	-----
Default	Default-1	1500		
			cluster-1-02:e0g	error

For more information, see [ONTAP 9 commands](#).

Delete a broadcast domain

If you no longer need a broadcast domain, you can delete it. This moves the ports associated with that broadcast domain to the "Default" IPspace.

Before you begin

There must be no subnets, network interfaces, or SVMs associated with the broadcast domain you want to delete.

About this task

- The system-created "Cluster" broadcast domain cannot be deleted.
- All failover groups related to the broadcast domain are removed when you delete the broadcast domain.


The procedure you follow depends on the interface that you use—System Manager or the CLI:

System Manager

Beginning with ONTAP 9.12.0, you can use System Manager to delete a broadcast domain

The delete option is not shown when the broadcast domain contains ports or is associated with a subnet.

Steps

1. Select **Network > Overview > Broadcast domain**.
2. Select  > **Delete** beside the broadcast domain you want to remove.

CLI

Use the CLI to delete a broadcast domain

Step

Delete a broadcast domain:

```
network port broadcast-domain delete -broadcast-domain broadcast_domain_name
[-ipspace ipspace_name]
```

The following command deletes broadcast domain Default-1 in IPspace ipspace1:

```
network port broadcast-domain delete -broadcast-domain Default-1 -ipspace
ipspace1
```

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