



## **ONTAP 9.8 and later**

### **ONTAP 9**

NetApp

November 01, 2023

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# ONTAP 9.8 and later

## About broadcast domains for 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).
- 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.

### 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

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](#)

## Split broadcast domains

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

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

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.
- `ipospace` 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

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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