Configure subnets (cluster administrators only)

ONTAP 9

NetApp
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Overview

Subnets enable you to allocate specific blocks, or pools, of IP addresses for your ONTAP network configuration. This enables you to create LIFs more easily when using the `network interface create` command, by specifying a subnet name instead of having to specify IP address and network mask values.

A subnet is created within a broadcast domain, and it contains a pool of IP addresses that belong to the same layer 3 subnet. IP addresses in a subnet are allocated to ports in the broadcast domain when LIFs are created. When LIFs are removed, the IP addresses are returned to the subnet pool and are available for future LIFs.

It is recommended that you use subnets because they make the management of IP addresses much easier, and they make the creation of LIFs a simpler process. Additionally, if you specify a gateway when defining a subnet, a default route to that gateway is added automatically to the SVM when a LIF is created using that subnet.

Create a subnet

After you create the broadcast domain, you can create a subnet to allocate specific blocks of IPv4 or IPv6 addresses to be used later when you create LIFs for the SVM.

This enables you to create LIFs more easily by specifying a subnet name instead of having to specify IP address and network mask values for each LIF.

Before you begin

You must be a cluster administrator to perform this task.

Steps

1. Create a subnet.

   ```
   network subnet create -broadcast-domain ipspace1 -ipspace ipspace1
   -subnet-name ipspace1 -subnet 10.0.0.0/24 -gateway 10.0.0.1 -ip-ranges
   "10.0.0.128-10.0.0.130,10.0.0.132"
   ```

   The subnet name can be either a subnet IP value such as `192.0.2.0/24` or a string such as `ipspace1` like the one used in this example.

2. Verify that the subnet configuration is correct.

   The output from this example shows information about the subnet named ipspace1 in the ipspace1 IPspace. The subnet belongs to the broadcast domain name ipspace1. You can assign the IP addresses in this subnet to data LIFs for SVMs created in the ipspace1 IPspace.

   ```
   network subnet show -ipspace ipspace1
   ```

Add or remove IP addresses from a subnet

You can add IP addresses when initially creating a subnet, or you can add IP addresses to a subnet that already exists. You can also remove IP addresses from an existing subnet. This enables you to allocate only the required IP addresses for SVMs.

About this task

When adding IP addresses, you will receive an error if any service processor or network interfaces are using the IP addresses in the range being added. If you want to associate any manually addressed interfaces with the current subnet, you can set the "-force-update-lif-associations" option to true.

When removing IP addresses, you will receive an error if any service processor or network interfaces are using the IP addresses being removed. If you want the interfaces to continue to use the IP addresses after they are removed from the subnet, you can set the "-force-update-lif-associations" option to true.

Step

Add or remove IP addresses from a subnet:

If you want to…	Use this command…
Add IP addresses to a subnet	network subnet add-ranges
Remove IP addresses from a subnet	network subnet remove-ranges

For more information about these commands, see the man pages.

The following command adds IP addresses 192.0.2.82 through 192.0.2.85 to subnet sub1:

```
network subnet add-ranges -subnet-name <sub1> -ip-ranges <192.0.2.82-
192.0.2.85>
```

The following command removes IP address 198.51.100.9 from subnet sub3:

```
network subnet remove-ranges -subnet-name <sub3> -ip-ranges <198.51.100.9>
```

If the current range includes 1 through 10 and 20 through 40, and you want to add 11 through 19 and 41 through 50 (basically allowing 1 through 50), you can overlap the existing range of addresses by using the following command. This command adds only the new addresses and does not affect the existing addresses:

```
network subnet add-ranges -subnet-name <sub3> -ip-ranges <198.51.10.1-
198.51.10.50>
```

Change subnet properties

You can change the subnet address and mask value, gateway address, or range of IP addresses in an existing subnet.

About this task

- When modifying IP addresses, you must ensure there are no overlapping IP addresses in the network so that different subnets, or hosts, do not attempt to use the same IP address.
- If you add or change the gateway IP address, the modified gateway is applied to new SVMs when a LIF is created in them using the subnet. A default route to the gateway is created for the SVM if the route does not already exist. You may need to manually add a new route to the SVM when you change the gateway IP address.

Step

Modify subnet properties:

```
network subnet modify -subnet-name <subnet_name> [-ipspace <ipspace_name>]
[-subnet <subnet_address>] [-gateway <gateway_address>] [-ip-ranges
<ip_address_list>] [-force-update-lif-associations <true>]
```

- `subnet_name` is the name of the subnet you want to modify.
- `ipspace` is the name of the IPspace where the subnet resides.
- `subnet` is the new address and mask of the subnet, if applicable; for example, 192.0.2.0/24.
- `gateway` is the new gateway of the subnet, if applicable; for example, 192.0.2.1. Entering **""** removes the gateway entry.
- `ip_ranges` is the new list, or range, of IP addresses that will be allocated to the subnet, if applicable. The IP addresses can be individual addresses, a range or IP addresses, or a combination in a comma-separated list. The range specified here replaces the existing IP addresses.
- `force-update-lif-associations` is required when you change the IP address range. You can set the value to **true** for this option when modifying the range of IP addresses. This command fails if any service processor or network interfaces are using the IP addresses in the specified range. Setting this value to **true** associates any manually addressed interfaces with the current subnet and allows the command to succeed.

The following command modifies the gateway IP address of subnet sub3:

```
network subnet modify -subnet-name <sub3> -gateway <192.0.3.1>
```

Display subnets

You can display the list of IP addresses that are allocated to each subnet within an IPspace. The output also shows the total number of IP addresses that are available in each subnet, and the number of addresses that are currently being used.

Step

Display the list of subnets and the associated IP address ranges that are used in those subnets:

```
network subnet show
```

The following command displays the subnets and the subnet properties:

```
network subnet show

IPspace: Default
Subnet                  Broadcast               Avail/
Name   Subnet           Domain    Gateway       Total   Ranges
-----  ---------------- --------- ------------ --------
------------------------
sub1   192.0.2.0/24     bcast1   192.0.2.1     5/9     192.0.2.92-
192.0.2.100
sub3   198.51.100.0/24  bcast3   198.51.100.1   3/3
198.51.100.7,198.51.100.9
```

Delete a subnet

If you no longer need a subnet and want to deallocate the IP addresses that were assigned to the subnet, you can delete it.

About this task

You will receive an error if any service processor or network interfaces are currently using IP addresses in the specified ranges. If you want the interfaces to continue to use the IP addresses even after the subnet is deleted, you can set the -force-update-lif-associations option to true to remove the subnet's association with the LIFs.

Step

Delete a subnet:

```
network subnet delete -subnet-name subnet_name [-ipspace ipspace_name] [-
force-update-lif- associations true]
```

The following command deletes subnet sub1 in IPspace ipspace1:

```
network subnet delete -subnet-name sub1 -ipspace ipspace1
```