Manage the network

System Manager Classic

NetApp
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Managing the network

You can use System Manager to manage the network of your storage system by creating and managing IPspaces, broadcast domains, subnets, network interfaces, Ethernet ports, and FC/FCoE adapters.

IPspaces

You can use System Manager to create and manage IPspaces.

Related information

Network management

Editing IPspaces

You can use System Manager to rename an existing IPspace.

About this task

- All IPspace names must be unique within a cluster and must not consist of names that are reserved by the system, such as local or localhost.
- The system-defined “Default” IPspace and “Cluster” IPspace cannot be modified.

Steps

1. Click **Network** > **IPspaces**.
2. Select the IPspace that you want to modify, and then click **Edit**.
3. In the **Edit IPspace** dialog box, specify a new name for the IPspace.
4. Click **Rename**.

Deleting IPspaces

You can use System Manager to delete an IPspace when you no longer require the IPspace.

Before you begin

The IPspace that you want to delete must not be associated with any broadcast domains, network interfaces, peer relationships, or storage virtual machines (SVMs).

About this task

The system-defined “Default” IPspace and “Cluster” IPspace cannot be deleted.

Steps

1. Click **Network** > **IPspaces**.
2. Select the IPspace that you want to delete, and then click **Delete**.
3. Select the confirmation check box, and then click **Yes**.

Broadcast domains

You can use System Manager to create and manage broadcast domains.

Related information

Network management

Editing broadcast domain settings

You can use System Manager to modify the attributes of a broadcast domain such as the name, the MTU size, and the ports that are associated with the broadcast domain.

About this task

- You must not modify the MTU size of the broadcast domain to which the management port e0M is assigned.
- You cannot use System Manager to edit broadcast domains in the cluster IPspace.

  You must use the command-line interface (CLI) instead.

Steps

1. Click **Network** > **Broadcast Domains**.
2. Select the broadcast domain that you want to modify, and then click **Edit**.
3. In the **Edit Broadcast Domain** dialog box, modify the broadcast domain attributes as required.
4. Click **Save and Close**.

Related information

Network window

Deleting broadcast domains

You can delete a broadcast domain by using System Manager when you no longer require the broadcast domain.

Before you begin

No subnets must be associated with the broadcast domain that you want to delete.

About this task

- When you delete a broadcast domain, the ports that are associated with the broadcast domain are assigned to the default IPspace, and the MTU settings of the ports are not changed.
- You cannot use System Manager to delete broadcast domains that are in the cluster IPspace.

  You must use the command-line interface (CLI) instead.

Steps

1. Click **Network** > **Broadcast Domains**.
2. Select the broadcast domain that you want to delete, and then click **Delete**.

3. Select the confirmation check box, and then click **Delete**.

Related information

Network window

Subnets

You can use System Manager to manage subnets.

Editing subnet settings

You can use System Manager to modify subnet attributes such as the name, subnet address, range of IP addresses, and gateway address of the subnet.

About this task

- You cannot use System Manager to edit subnets in the cluster IPspace.

  You must use the command-line interface (CLI) instead.

- Modifying the gateway address does not update the route.

  You must use the CLI to update the route.

Steps

1. Click **Network** > **Subnets**.
2. Select the subnet that you want to modify, and then click **Edit**.

   You can modify the subnet even when the LIF in that subnet is still in use.

3. In the **Edit Subnet** dialog box, modify the subnet attributes as required.
4. Click **Save and Close**.

Related information

Network window

Deleting subnets

You can use System Manager to delete a subnet when you no longer require the subnet and you want to reallocate the IP addresses that were assigned to the subnet.

Before you begin

The subnet that you want to delete must not have any LIFs that are using the IP addresses from the subnet.

About this task

You cannot use System Manager to delete subnets in the Cluster IPspace. You must use the command-line interface (CLI) instead.

Steps

1. Click **Network** > **Subnets**.
2. Select the subnet that you want to delete, and then click **Delete**.
3. Select the confirmation check box, and then click **Delete**.

Related information

Network window

Network interfaces

You can use System Manager to create and manage network interfaces.

Related information

ONTAP concepts

Network management

Create network interfaces

You can use System Manager to create a network interface or LIF to access data from storage virtual machines (SVMs), to manage SVMs and to provide an interface for intercluster connectivity.

Before you begin

The broadcast domain that is associated with the subnet must have allocated ports.

About this task

- Dynamic DNS (DDNS) is enabled by default when a LIF is created.

  However, DDNS is disabled if you configure the LIF for intercluster communication using iSCSI, NVMe, or FC/FCoE protocols, or for management access only.

- You can specify an IP address by using a subnet or by not using a subnet.
- You cannot use System Manager to create a network interface if the ports are degraded.

  You must use the command-line interface (CLI) to create a network interface in such cases.

- To create NVMeoF data LIF the SVM must already be set up, the NVMe service must already exist on the SVM and the NVMeoF capable adapters should be available.
- NVMe protocol is enabled only if the selected SVM has the NVMe service configured.

Steps

1. Click **Network** > **Network Interfaces**.
2. Click **Create**.
3. In the **Create Network Interface** dialog box, specify an interface name.
4. Specify an interface role:

If you want to…	Then…
Associate the network interface with a data LIF	a. Select **Serves Data**. b. Select the SVM for the network interface.
Associate the network interface with an intercluster LIF	a. Select **Intercluster Connectivity**. b. Select the IPspace for the network interface.

5. Select the appropriate protocols.

   The interface uses the selected protocols to access data from the SVM.

   If you select the NVMe protocol, the rest of the protocols are disabled. If NAS (CIFS and NFS) protocols are supported then they remain available. The NVMe transports field is displayed when you select the NVMe protocol and FC-NVMe is shown as the transport protocol.

6. If you want to enable management access on the data LIF, select the **Enable Management Access** check box.

   You cannot enable management access for intercluster LIFs or LIFs with FC/FCoE or NVMe protocols.

7. Assign the IP address:

If you want to…	Then…
Specify the IP address by using a subnet	a. Select **Using a subnet**. b. In the Add Details dialog box, select the subnet from which the IP address must be assigned. For intercluster LIF, only the subnets that are associated with the selected IPspace are displayed. c. If you want to assign a specific IP address to the interface, select **Use a specific IP address**, and then type the IP address. The IP address that you specify is added to the subnet if the IP address is not already present in the subnet range. d. Click **OK**.

If you want to…	Then…
Specify the IP address manually without using a subnet	a. Select **Without a subnet**. b. In the Add Details dialog box, perform the following steps: i. Specify the IP address and the network mask or prefix. ii. Optional: Specify the gateway. iii. If you do not want to use the default value for the Destination field, specify a new destination value. If you do not specify a destination value, the Destination field is populated with the default value based on the family of the IP address. If a route does not exist, a new route is automatically created based on the gateway and destination. c. Click **OK**.

8. Select the required ports from the **Port** details area.
   - For data LIFs, the Port details area displays all of the ports from the broadcast domain that is associated with the IPspace of the SVM.
   - For intercluster LIFs, the Port details area displays all of the ports from the broadcast domain that is associated with the required IPspace.
   - The Port details area will display only NVMe capable adapters if the NVMe protocol is selected.
9. Select the **Dynamic DNS (DDNS)** check box to enable DDNS.
10. Click **Create**.

Related information

Network window

Configuring iSCSI protocol on SVMs

Configuring the network details of the nodes

Editing network interface settings

You can use System Manager to modify the network interface to enable management access for a data LIF.

About this task

- You cannot modify the network settings of cluster LIFs, cluster management LIFs, or node management LIFs through System Manager.

- You cannot enable management access for an intercluster LIF.

Steps

1. Click **Network** > **Network Interfaces**.
2. Select the interface that you want to modify, and then click **Edit**.
3. In the **Edit Network Interface** dialog box, modify the network interface settings as required.
4. Click **Save and Close**.

Related information

Network window

Deleting network interfaces

You can use System Manager to delete a network interface to free the IP address of the interface and then use the IP address for a different purpose.

Before you begin

The status of the network interface must be disabled.

Steps

1. Click **Network** > **Network Interfaces**.
2. Select the interface that you want to delete, and then click **Delete**.
3. Select the confirmation check box, and then click **Delete**.

Related information

Network window

Migrating a LIF

You can use System Manager to migrate a data LIF or a cluster management LIF to a different port on the same node or on a different node within the cluster if the source port is faulty or requires maintenance.

Before you begin

The destination node and ports must be operational and must be able to access the same network as the source port.

About this task

- If you are removing the NIC from the node, you must migrate the LIFs that are hosted on the ports belonging to the NIC to other ports in the cluster.
- You cannot migrate iSCSI LIFs or FC LIFs.

Steps

1. Click **Network** > **Network Interfaces**.
2. Select the interface that you want to migrate, and then click **Migrate**.
3. In the **Migrate Interface** dialog box, select the destination port to which you want to migrate the LIF.

4. Select the **Migrate Permanently** check box if you want to set the destination port as the new home port for the LIF.
5. Click **Migrate**.

Ethernet ports

You can use System Manager to create and manage Ethernet ports.

Related information

Network management

ONTAP concepts

Create interface groups

You can use System Manager to create an interface group—single-mode, static multimode, or dynamic multimode (LACP)--to present a single interface to clients by combining the capabilities of the aggregated network ports.

Before you begin

Free ports must be available that do not belong to any broadcast domain or interface group, or that host a VLAN.

Steps

1. Click **Network** > **Ethernet Ports**.
2. Click **Create Interface Group**.
3. In the **Create Interface Group** dialog box, specify the following settings:
   - Name of the interface group
   - Node
   - Ports that you want to include in the interface group
   - Usage mode of the ports: single-mode, static multiple, or dynamic multimode (LACP)
   - Network load distribution: IP-based, MAC address-based, sequential, or port
   - Broadcast domain for the interface group, if required
4. Click **Create**.

Related information

Network window

Create VLAN interfaces

You can create a VLAN to maintain separate broadcast domains within the same network domain by using System Manager.

Steps

1. Click **Network** > **Ethernet Ports**.

2. Click **Create VLAN**.
3. In the **Create VLAN** dialog box, select the node, the physical interface, and the broadcast domain (if required).

   The physical interface list includes only Ethernet ports and interface groups. The list does not display interfaces that are in another interface group or an existing VLAN.

4. Type a VLAN tag, and then click **Add**.

   You must add unique VLAN tags.

5. Click **Create**.

Related information

Network window

Editing Ethernet port settings

You can edit Ethernet port settings such as the duplex mode and speed settings by using System Manager.

Steps

1. Click **Network** > **Ethernet Ports**.
2. Select the physical port, and then click **Edit**.
3. In the **Edit Ethernet Port** dialog box, modify the duplex mode and speed settings to either `manual` or `automatic`.
4. Click **Edit**.

Editing interface group settings

You can use System Manager to add ports to an interface group, to remove ports from an interface group, and to modify the usage mode and load distribution pattern of the ports in an interface group.

About this task

You cannot modify the MTU settings of an interface group that is assigned to a broadcast domain.

Steps

1. Click **Network** > **Ethernet Ports**.
2. Select an interface group, and then click **Edit**.
3. Modify the interface group settings as required, and then click **Save and Close**.

Related information

Network window

Modifying the MTU size of a VLAN

If you want to modify the MTU size of a VLAN interface that is not part of a broadcast domain, you can use System Manager to change the size.

About this task

You must not modify the MTU size of the management port e0M.

Steps

1. Click **Network** > **Ethernet Ports**.
2. Select the VLAN that you want to modify, and then click **Edit**.
3. In the **Edit VLAN** dialog box, modify the MTU size as required, and then click **Save**.

Deleting VLANs

You can delete VLANs that are configured on network ports by using System Manager. You might have to delete a VLAN before removing a NIC from its slot. When you delete a VLAN, the VLAN is automatically removed from all of the failover rules and groups that use the VLAN.

Before you begin

No LIFs must be associated with the VLAN.

Steps

1. Click **Network** > **Ethernet Ports**.
2. Select the VLAN that you want to delete, and then click **Delete**.
3. Select the confirmation check box, and then click **Delete**.

Related information

Network window

Ports and adapters

Ports are grouped under nodes and the nodes are displayed based on the selected protocol category. For example, if the data is served using the FC protocol, then only the nodes with FCP adapters are displayed. The hosted interface count helps you in choosing a port which is less loaded.

FC/FCoE and NVMe adapters

You can use System Manager to manage FC/FCoE and NVMe adapters.

Related information

Network management

Editing the FC/FCoE and NVMe adapter speed settings

You can modify the FC/FCoE and NVMe adapter speed settings by using the Edit FC/FCoE and NVMe Adapter Settings dialog box in System Manager.

Steps

1. Click **Network** > **FC/FCoE and NVMe Adapters**.
2. Select the adapter that you want to edit, and then click **Edit**.
3. In the **Edit FC/FCoE and NVMe adapter settings** dialog box, set the adapter speed to **Manual** or **Automatic**, and then click **Save**.

Related information

Network window

Network window

You can use the Network window to view the list of network components, such as subnets, network interfaces, Ethernet ports, broadcast domains, FC/FCoE and NVMe adapters, and IPspaces, and to create, edit, or delete these components in your storage system.

Tabs

- **Subnet**

  Enables you to view a list of subnets, and create, edit, or delete subnets from your storage system.

- **Network Interfaces**

  Enables you to view a list of network interfaces, create, edit, or delete interfaces from your storage system, migrate the LIFs, change the status of the interface, and send the interface back to the home port.

- **Ethernet Ports**

  Enables you to view and edit the ports of a cluster, and create, edit, or delete interface groups and VLAN ports.

- **Broadcast Domains**

  Enables you to view a list of broadcast domains, and create, edit, or delete domains from your storage system.

- **FC/FCoE and NVMe Adapters**

  Enables you to view the ports in a cluster, and edit the FC/FCoE and NVMe adapter settings.

- **IPspaces**

  Enables you to view a list of IPspaces and broadcast domains, and create, edit, or delete an IPspace from your storage system.

Subnet tab

Command buttons

- **Create**

  Opens the Create Subnet dialog box, which enables you to create new subnets that contain configuration information for creating a network interface.

- **Edit**

  Opens the Edit Subnet dialog box, which enables you to modify certain attributes of a subnet such as the name, subnet address, range of IP addresses, and gateway details.

- **Delete**

  Deletes the selected subnet.

- **Refresh**

  Updates the information in the window.

Subnet list

- **Name**

  Specifies the name of the subnet.

- **Subnet IP/Subnet mask**

  Specifies the subnet address details.

- **Gateway**

  Specifies the IP address of the gateway.

- **Available**

  Specifies the number of IP addresses available in the subnet.

- **Used**

  Specifies the number of IP addresses used in the subnet.

- **Total Count**

  Specifies the total number of IP addresses (available and used) in the subnet.

- **Broadcast domain**

  Specifies the broadcast domain to which the subnet belongs.

- **IPspace**

  Specifies the IPspace to which the subnet belongs.

Details area

The area below the subnet list displays detailed information about the selected subnet, including the subnet range and a graph showing the available, used, and total number of IP addresses.

Limitations of the Network Interfaces tab

- For cluster LIFs, node management LIFs, VIP LIFs, and BGP LIFs, you cannot use System Manager to perform the following actions:
  - Create, edit, delete, enable, or disable the LIFs
  - Migrate the LIFs or send the LIFs back to the home port
- For cluster management LIFs, you can use System Manager to migrate the LIFs, or send the LIFs back to the home port.

  However, you cannot create, edit, delete, enable, or disable the LIFs.
- For intercluster LIFs, you can use System Manager to create, edit, delete, enable, or disable the LIFs.

  However, you cannot migrate the LIFs, or send the LIFs back to the home port.
- You cannot create, edit, or delete network interfaces in the following configurations:
  - A MetroCluster configuration
  - SVMs configured for disaster recovery (DR).

Command buttons

- **Create**

  Opens the Create Network Interface dialog box, which enables you to create network interfaces and intercluster LIFs to serve data and manage SVMs.
- **Edit**

  Opens the Edit Network Interface dialog box, which you can use to enable management access for a data LIF.
- **Delete**

  Deletes the selected network interface.

  This button is enabled only if the data LIF is disabled.
- **Status**

  Open the drop-down menu, which provides the option to enable or disable the selected network interface.
- **Migrate**

  Enables you to migrate a data LIF or a cluster management LIF to a different port on the same node or a different node within the cluster.
- **Send to Home**

Enables you to host the LIF back on its home port.

This command button is enabled only when the selected interface is hosted on a non-home port and when the home port is available.

This command button is disabled when any node in the cluster is down.

- **Refresh**

  Updates the information in the window.

Interface list

You can move the pointer over the color-coded icon to view the operational status of the interface:

- Green specifies that the interface is enabled.
- Red specifies that the interface is disabled.
- **Interface Name**

  Specifies the name of the network interface.

- **Storage Virtual Machine**

  Specifies the SVM to which the interface belongs.

- **IP Address/WWPN**

  Specifies the IP address or worldwide port name (WWPN) of the interface.

- **Current Port**

  Specifies the name of the node and port on which the interface is hosted.

- **Data Protocol Access**

  Specifies the protocol used to access data.

- **Management Access**

  Specifies whether management access is enabled on the interface.

- **Subnet**

  Specifies the subnet to which the interface belongs.

- **Role**

  Specifies the operational role of the interface, which can be data, intercluster, cluster, cluster management, or node management.

Details area

The area below the interface list displays detailed information about the selected interface: failover properties such as the home port, current port, speed of the ports, failover policy, failover group, and failover state, and

general properties such as the administrative status, role, IPspace, broadcast domain, network mask, gateway, and DDNS status.

Ethernet Ports tab

Command buttons

- **Create Interface Group**

  Opens the Create Interface Group dialog box, which enables you create interface groups by choosing the ports, and determining the use of ports and network traffic distribution.

- **Create VLAN**

  Opens the Create VLAN dialog box, which enables you to create a VLAN by choosing an Ethernet port or an interface group, and adding VLAN tags.

- **Edit**

  Opens one of the following dialog boxes:

  - Edit Ethernet Port dialog box: Enables you to modify Ethernet port settings.
  - Edit VLAN dialog box: Enables you to modify VLAN settings.
  - Edit Interface Group dialog box: Enables you to modify interface groups. You can only edit VLANs that are not associated with a broadcast domain.

- **Delete**

  Opens one of the following dialog boxes:

  - Delete VLAN dialog box: Enables you to delete a VLAN.
  - Delete Interface Group dialog box: Enables you to delete an interface group.

- **Refresh**

  Updates the information in the window.

Ports list

You can move the pointer over the color-coded icon to view the operational status of the port:

- Green specifies that the port is enabled.
- Red specifies that the port is disabled.
- **Port**

  Displays the port name of the physical port, VLAN port, or the interface group.

- **Node**

  Displays the node on which the physical interface is located.

- **Broadcast Domain**

Displays the broadcast domain of the port.

- **IPspace**

  Displays the IPspace to which the port belongs.

- **Type**

  Displays the type of the interface such as interface group, physical interface, vip, or VLAN.

Details area

The area below the ports list displays detailed information about the port properties.

- **Details tab**

  Displays administrative details and operational details.

  As part of the operational details, the tab displays the health status of the ports. The ports can be healthy or degraded. A degraded port is a port on which continuous network fluctuations occur, or a port that has no connectivity to any other ports in the same broadcast domain.

  In addition, the tab also displays the interface name, SVM details, and IP address details of the network interfaces that are hosted on the selected port. It also indicates whether the interface is at the home port or not.

- **Performance tab**

  Displays performance metrics graphs of the ethernet ports, including error rate and throughput.

  Changing the client time zone or the cluster time zone impacts the performance metrics graphs. You should refresh your browser to view the updated graphs.

Broadcast Domain tab

Command buttons

- **Create**

  Opens the Create Broadcast Domain dialog box, which enables you to create new broadcast domains to contain ports.

- **Edit**

  Opens the Edit Broadcast Domain dialog box, which enables you to modify the attributes of a broadcast domain, such as the name, MTU size, and associated ports.

- **Delete**

  Deletes the selected broadcast domain.

- **Refresh**

  Updates the information in the window.

Broadcast domain list

- **Broadcast Domain**

  Specifies the name of the broadcast domain.

- **MTU**

  Specifies the MTU size.

- **IPspace**

  Specifies the IPspace.

- **Combined Port Update Status**

  Specifies the status of the port updates when you create or edit a broadcast domain. Any errors in the port updates are displayed in a separate window, which you can open by clicking the associated link.

Details area

The area below the broadcast domain list displays all the ports in a broadcast domain. In a non-default IPspace, if a broadcast domain has ports with update errors, such ports are not displayed in the details area. You can move the pointer over the color-coded icon to view the operational status of the ports:

- Green specifies that the port is enabled.
- Red specifies that the port is disabled.

FC/FCoE and NVMe Adapters tab

Command buttons

- **Edit**

  Opens the Edit FC/FCoE and NVMe Settings dialog box, which enables you to modify the speed of the adapter.

- **Status**

  Enables you to bring the adapter online or take it offline.

- **Refresh**

  Updates the information in the window.

FC/FCoE and NVMe adapters list

- **WWNN**

  Specifies the unique identifier of the FC/FCoE and NVMe adapter.

- **Node Name**

Specifies the name of the node that is using the adapter.

- **Slot**

  Specifies the slot that is using the adapter.

- **WWPN**

  Specifies the FC worldwide port name (WWPN) of the adapter.

- **Status**

  Specifies whether the status of the adapter is online or offline.

- **Speed**

  Specifies whether the speed settings are automatic or manual.

Details area

The area below the FC/FCoE and NVMe adapters list displays detailed information about the selected adapters.

- **Details tab**

  Displays adapter details such as the media type, port address, data link rate, connection status, operation status, fabric status, and the speed of the adapter.

- **Performance tab**

  Displays performance metrics graphs of the FC/FCoE and NVMe adapter, including IOPS and response time.

  Changing the client time zone or the cluster time zone impacts the performance metrics graphs. You should refresh your browser to see the updated graphs.

IPspaces tab

Command buttons

- **Create**

  Opens the Create IPspace dialog box, which enables you to create a new IPspace.

- **Edit**

  Opens the Edit IPspace dialog box, which enables you to rename an existing IPspace.

- **Delete**

  Deletes the selected IPspace.

- **Refresh**

Updates the information in the window.

IPspaces list

- **Name**

  Specifies the name of the IPspace.

- **Broadcast Domains**

  Specifies the broadcast domain.

Details area

The area below the IPspaces list displays the list of storage virtual machines (SVMs) in the selected IPspace.

Related information

Creating network interfaces

Editing network interface settings

Deleting network interfaces

Creating subnets

Editing subnet settings

Deleting subnets

Creating VLAN interfaces

Creating interface groups

Editing the FC/FCoE and NVMe adapter speed settings

Editing interface group settings

Deleting VLANs

Creating broadcast domains

Editing broadcast domain settings

Deleting broadcast domains

Setting up a network when an IP address range is disabled