



CHAPTER 13

Designing Service Networks

This chapter provides detailed information about service network design, and includes the following sections:

- [Designing Service Networks—Basic Workflow](#), page 13-1
- [Understanding Service Network Design](#), page 13-2
- [Designing a Service Network—Scenario](#), page 13-3
- [Working with Service Networks](#), page 13-8
- [Service Networks Reference](#), page 13-16

Designing Service Networks—Basic Workflow

[Table 13-1](#) is an overview of the steps you take to design a service network in VFrame.

Table 13-1 *Designing Service Networks—Basic Workflow*

	Task
Step 1	<p>Create a service network (see Creating and Modifying Service Networks, page 13-8).</p> <p>As part of this task and depending on your service network design, define the following element and endpoint parameters, as required:</p> <ul style="list-style-type: none">• Network variables (see Defining Network Variables, page 13-9).• Block variables (see Defining Block Variables, page 13-9).• Port variable values (see Defining Port Variables, page 13-10).• Assigning resource pools (see Assigning Resource Pools, page 13-11).• NAS storage (see Adding NAS Storage, page 13-11).• SAN storage (see Adding SAN Storage, page 13-12).• Settings (see Configuring Settings, page 13-12).• Teaming parameters (see Defining Teaming Parameters, page 13-13).
Step 2	<p>Save your service network design (see Saving Service Networks, page 13-15).</p>

Understanding Service Network Design

You create service networks based on service network templates. The template identifies generic information, and the service network identifies the actual resources (resource pools, variable values, server configuration, and so on) that are required to start and operate your service network.

In some service network designs, there are special considerations pertaining to network virtualization.

This section describes key concepts that help you design your service network, and includes the following topics:

- [Understanding Service Network Design Elements, page 13-2](#)
- [Changing Service Networks, page 13-2](#)

Understanding Service Network Design Elements

Before designing your service network, it is helpful to understand the following service network design elements:

- **Block Variables**—Most logical elements have system actions or macros associated with them, and these system actions or macros have variables. You must supply the values for these variables. The values are substituted for the variables in the system actions or macros at run time.

An example of a block variable is the VLAN variable required for defining a VLAN in a service network.

- **Pool Selection**— All logical elements, except VLAN and Storage, require that you choose the resource or resource pool to use when the service network is deployed. When you deploy your service network, resources are acquired based on the resource or resource pool you have selected. For more details about resource pools, see [Resource Pool Overview, page 9-1](#).



Note A server will automatically acquire any Layer 2 switch connected to it.

- **Server Group Definition**—For VFrame to create and image the servers in your service network, you must define the server group parameters such as the storage type, location and golden image. This information is used to create, image, and start your servers when you deploy your service network.

Changing Service Networks

After you define and deploy a service network, you can add and remove resources and resource pools. However, the change does not take effect until the next time the service network tries to acquire a resource from the assigned resources or resource pools.

You can change certain variable values in a service network while the network is running. The variable values you can change are those to which VFrame does not attach any specific meanings or relationships, for example, strings, numbers, or Boolean values. These are called primitive variables.

Another variable type, called resource variables, can also be changed; however, changes do not take effect until the next time the service network attempts to acquire resources. Resource variables are those that require a resource, such as an IP address, VLAN, or storage resource (LUN or Qtree).

Designing a Service Network—Scenario

This scenario builds upon the service network template you created in [Chapter 11, “Designing Templates.”](#) The template is based on a sample network design in which you have a switch with a CSM connected in single subnet (bridge) mode to a group of servers, as shown in [Figure 11-12](#).

This scenario assumes that the VFrame administrator has already completed all of the prerequisites for creating a service network template and created the CSM service network template. For details on these prerequisites, see [Creating a Service Network Template—Scenario, page 11-33](#).

This section provides a scenario for building a service network, and includes the following topics:

- [Define Resource Pools, page 13-3](#)
- [Create the Service Network, page 13-3](#)
- [Define Service Network Settings, page 13-4](#)

Define Resource Pools

Following are the resource pools you will use when you design the service network. Ensure that all of them are fully defined:

- Cisco Catalyst 6500 (Layer 3 Enabled)
- IP Address Range
- VLAN (VFrame Created)



Note You create these VLANs using the Resource Pools tab.

- Content Switching Module
- Server
- NFS Volume

Create the Service Network

You create service networks based on service network templates. The template identifies the logical elements and connections, and the service network uses the configured logical elements to identify the actual resources (resource pools, variable values, server configuration) that are required to deploy your service network.

In this scenario, you create a service network called `csmNetwork` from the template called `csmTemplate`. When you first create the network, you will see small red icons next to most of the logical elements in the network. These icons indicate that the element they are next to is not configured properly. Use the fields and drop-down lists on the pages that appear when you chose an element to configure that element.

Procedure

- Step 1** Choose **View > Service Networks**.
- Step 2** Click **csmTemplate** and then click **New**.
The Input dialog box appears.

Step 3 Enter **csmNetwork** in the Network name field.

Step 4 Click **OK**.

The service network opens, and it appears in the Service Networks selector, in the Opened Service Network selector, and in a tab above the work area.

Define Service Network Settings

Service Network Settings

Procedure

Step 1 (Optional) Check the **Enable Root Bridge Setting** check box to enable root bridging.

Step 2 (Optional) Enter a description of the network in the **Service Network Description** field.

Step 3 Click **Save**.



Note By enabling the root bridge feature, VFrame will find a switch that will be the root bridge.

ServerGroup Logical Element

Procedure

Step 1 Click the **ServerGroup** logical element.

Step 2 Click the **Settings** tab.

Step 3 Choose a golden image in the Image scroll-down list:

- a. Click the down arrow.
- b. Choose an image.

The image appears in the Image scroll-down list.

Step 4 Click the **Block Variables** tab.

Step 5 Enter a name in the HostName field.

Step 6 Click the **Pool Selection** tab.

Step 7 Choose one or more servers from the server resource pool:

- a. Click the **Select** button.
The Resource Selection dialog box appears.
- b. Choose one or more servers from the Available area.
- c. Click the move-right button.
- d. Click **OK**.

The server(s) appear in the Element Name : ServerGroup area.

- Step 8** Click the **To_VLAN** port group under the ServerGroup logical element.
- Step 9** Click the **Port Variables** tab.
- Step 10** Choose an IP address range in the IPAddress (Primary) scroll-down list:
- Click the down arrow.
 - Choose an IP address range.
 - Click the move-right button.
 - Click **OK**.
- Step 11** Click **Save**.
- The IP address range appears in the IPAddress (Primary) scroll-down list. The ServerGroup logical element is defined.
-

LoadBalancer Logical Element

- Step 1** Click the **LoadBalancer** logical element.
- Step 2** Click the **Pool Selection** tab.
- Step 3** Choose a load balancer from the load balancer resource pool:
- Click the **Select** button.
The Resource Selection dialog box appears.
 - Choose one load balancer from the Available area.
 - Click the move-right button.
 - Click **OK**.
The load balancer appears in the Element Name : LoadBalancer area.
- Step 4** Click the **Block Variables** tab.
- Step 5** Enter **VS1** in the VServerName text box.
- Step 6** Enter **SF1** in the ServerFarmName text box.
- Step 7** Choose an IP address range in the IPAddress (Primary) scroll-down list in the VServerIP area:
- Click the down arrow.
 - Choose an IP address range.
 - Click the move-right button.
 - Click **OK**.
- Step 8** Click the To_Layer3Switch endpoint.
- Step 9** Choose **Admin Context: ALL VLAN (VFrame Created)** in the Vlan (Primary) scroll-down list:
- Click the down arrow.
 - Choose the **Admin Context: ALL VLAN (VFrame Created)** folder.
 - Click the move-right button.
 - Click **OK**.
The name of the folder appears in the Vlan (Primary) scroll-down list.

- Step 10** Enter client in the InterfaceType (Primary) text box.
- Step 11** Click the To_VLAN endpoint under the LoadBalancer logical element.
- Step 12** Choose **Admin Context: ALL VLAN (VFrame Created)** in the Vlan (Primary) scroll-down list:
- Click the down arrow.
 - Choose the **Admin Context: ALL VLAN (VFrame Created)** folder.
 - Click the move-right button.
 - Click OK.

The name of the folder appears in the Vlan (Primary) scroll-down list.

- Step 13** Enter server in the InterfaceType (Primary) text box.
- Step 14** Choose an IP address range in the IPAddress (Primary) scroll-down list:
- Click the down arrow.
 - Choose an IP address. range
 - Click the move-right button.
 - Click **OK**.
- Step 15** Click **Save**.

The IP address range appears in the IPAddress (Primary) scroll-down list. The LoadBalancer logical element is defined.

NAS Storage Logical Element

Procedure

- Step 1** Click the **NAS Storage** logical element.
- Step 2** Click the storage definition in the Storage Definitions area.
- Step 3** Click the edit button.
- Step 4** Choose a partition from the volumes resource pool:
- Click the **Select** button.
The Select Volumes dialog box appears.
 - Choose **kennethvol1 | vcc-filer2:/vol/kennethvol1** from the Available area.
 - Click the move-right button.
 - Click **OK** then click **OK** to close the Edit NAS Group RootStorageElement dialog box.

- Step 5** Click **Save**.
The volume appears in the Storage Definitions area.
-

Layer3Switch Logical Element

Procedure

- Step 1** Click the **Layer3Switch** logical element.
- Step 2** Choose a Layer 3 switch from the Layer 3 switch resource pool:
- Click the **Select** button.
The Resource Selection dialog box appears.
 - Choose **10.100.0.2** from the Available area.
 - Click the move-right button.
 - Click **OK**.
The IP address appears in the Element Name : Layer3Switch area.
- Step 3** Click the **To_LoadBalancer** endpoint.
- Step 4** Choose an IP address in the IPAddress (Primary) scroll-down list in the SviIpAddressGroup area:
- Click the down arrow.
 - Choose **10.100.40.20** from the Available area.
 - Click the move-right button.
 - Click **OK**.
- Step 5** Click **Save**.
The IP address range appears in the IPAddress (Primary) scroll-down list. The Layer3Switch logical element is defined.
The service network is designed.
-

Verify Your Service Network Definitions

Procedure

- Step 1** Click **Details**.
The Service Network Summary dialog box appears.
- Step 2** Verify that the variable values you selected are correct.
- Step 3** Click **OK**.
- Step 4** Click **Save**.
- Step 5** See [Operating a Service Network—Scenario, page 14-12](#) to continue to design your service network.
The service network is verified.
-

Working with Service Networks

This section helps you work with and design service network templates, and includes the following topics:

- [Creating and Modifying Service Networks, page 13-8](#)
- [Saving Service Networks, page 13-15](#)
- [Displaying Summary Information for Service Networks, page 13-16](#)

Creating and Modifying Service Networks

You can create service networks based on the published templates, and when necessary, you can modify them.

Before You Begin

- Determine which template best fits your service network design. If necessary, create a template that meets your needs. For more information, see [Creating and Modifying Service Network Templates, page 11-49](#).
- Determine the variable values you will need to supply.

Procedure

Step 1 Choose **View > Service Networks**.

Step 2 On the Service Networks tab, do one of the following:

- To create a new service network, click the template that you want to use as a base and click **New**. The Input dialog box appears. Enter the service network name in Network name field. The service network opens, and its name appears in the Service Networks selector, in the service network elements selector (specified by the service network name), and in a tab above the work area.
- To modify an existing service network, double-click the appropriate service network in the Service Network selector. The service network opens, and its name appears in the Service Networks selector, in the service network elements selector (specified by the service network name), and in a tab above the work area.

Step 3 Depending on your service network design, define variables, and element and end-point parameters by selecting elements or endpoints in the Elements selector or in the service network map and doing any of the following:



Note Tabs that are displayed depend on what is selected.

- Click the **Block Variables** tab to define the variables for logical elements within your service network. For details, see [Defining Block Variables, page 13-9](#).
- Click the **Port Variables** tab to define the variables for endpoints within your service network. For details, see [Defining Port Variables, page 13-10](#).
- Click the **Pool Selection** tab to select resources available to your service network when you deploy it. For details, see [Assigning Resource Pools, page 13-11](#).
- Click the **NAS Storage** tab to add NAS storage groups. For details, see [Adding NAS Storage, page 13-11](#).

- Click the **Settings** tab to define parameters for the SAN Fabric, SAN Storage, ServerGroup with a VLAN connection (To_VLAN), Virtual Switch logical elements, and ESX server port groups. For details, see [Adding SAN Storage, page 13-12](#), [Configuring Settings, page 13-12](#), and [Defining Port Groups, page 13-15](#).
- Click the **Teaming** tab to define teaming parameters for multiple Ethernet connections. For details, see [Defining Teaming Parameters, page 13-13](#).



Note Red X icons appear next to each required tab and parameter. As you define these required parameters, these icons disappear. When all red icons are gone, your service network template is ready to be deployed.

- Step 4** After you finish defining or modifying your service network, click **Save**. The service network is saved to the database.

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Service Networks Tab, page 13-16](#)

Defining Network Variables

You can define values for network variables according to your service network design.

Procedure

- Step 1** Choose **View > Service Network**.
- Step 2** Open a service network, then click the service network in the Service Network Elements selector. The Network Settings tab opens. For details, see [Network Settings Tab, page 13-20](#).
- Step 3** Check the **Enable Root Bridge Setting** check box to enable the root bridge setting, if desired. Otherwise, leave it unchecked.
- If the check box is checked, VFrame configures a switch to become the root for the specified VLAN.

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Service Networks Tab, page 13-16](#)

Defining Block Variables

When the template associated to your service network was created, variables were created for the service network. You can define the actual values for these variables according to your service network design.

Procedure

-
- Step 1** Choose **View > Service Network**.
- Step 2** Open a service network and click an element.
- Step 3** Click the **Block Variables** tab.
- Step 4** For each variable, click the appropriate value into the variable drop-down list.
- Step 5** (Optional in ESX) Configure the following variables:
- VMKernelDefaultGateway
 - EsxCluster
 - EsxLicenseServerGroup
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Block Variables Tab, page 13-21](#)

Defining Port Variables

When the template associated to your service network was created, variables were defined for the endpoints. You can define the actual values for these endpoints according to your service network design.

Procedure

-
- Step 1** Choose **View > Service Networks**.
- Step 2** Open a service network and click an endpoint.
- Step 3** Click the **Port Variables** tab.
- Step 4** For each variable, click the appropriate value into the variable drop-down list.
- Step 5** (Optional in ESX) Configure the following:
- Step 6** Enter a switch port description in SwitchportDescription for the layer2Etherchannel and layer2Ports variables.
- Step 7** Check the **CDP Enabled** check box to enable CDP.
- Step 8** Click the **ip** logical elements.
- Step 9** Click an IP address range in the IPAddress drop-down list.
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Port Variables Tab, page 13-21](#)

Assigning Resource Pools

You can select resources or resource pools that will be available to your service network when it is deployed.

Procedure

- Step 1** Choose **View > Service Networks**.
- Step 2** Open a service network and click an element.
- Step 3** Click on the **Pool Selection** tab.
- Step 4** Click **Selection**.
- The **Resource Selection** dialog box appears.
- Step 5** Click a resource pool or group of resource pools then click the > button to move the resources from the Available area to the Selected area.



Tip Click a resource to display additional information about it.

- Step 6** Click **OK**.
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Pool Selection Tab, page 13-22](#)

Adding NAS Storage

You can add NAS storage to your service network.

Procedure

- Step 1** Choose **Design > Service Networks**.
- Step 2** Open a service network and click a NAS Storage logical element.
- The NAS Storage tab opens.
- Step 3** Do any of the following:
- Enter a description of a storage group in **Description**.
 - Click **New**.
- The New NAS Storage Group dialog box appears. Use the various elements to define a new storage group.
- Click **Edit**.
- The Edit NAS Storage Group dialog box appears. Use the various elements to edit an existing storage group.

- Click **Delete** to delete a NAS storage group.
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Block Variables Tab, page 13-21](#)

Adding SAN Storage

You can add SAN storage to your service network.

Step 1 Choose **Design > Service Networks**.

Step 2 Open a service network and click the **SAN Storage** logical element.

The Settings tab opens.

Step 3 Do any of the following:

- Enter a description of a storage group in Description.
- Click **New**.

The New SAN Storage Group dialog box appears. Use the various elements to define a new storage group.

- Click **Edit**.

The Edit SAN Storage Group dialog box appears. Use the various elements to edit an existing storage group.

- Click **Delete** to delete a SAN storage group.



Note You can add or remove resources in a LUN group at any time.

Configuring Settings

You can configure server group and To_VLAN settings for your service network.

Procedure

Step 1 Choose **View > Service Networks**.

Step 2 Open a service network and click a ServerGroup or To_VLAN logical element.

The Settings tab opens.

Step 3 For each setting, click the appropriate value into the variable drop-down list.

Related Topics

- [Understanding Service Network Design, page 13-2](#)

- [Creating and Modifying Service Networks](#), page 13-8
- [Block Variables Tab](#), page 13-21

Defining Teaming Parameters

Teaming mode is enabled if you designate more than one Ethernet link for your server group. When teaming mode is enabled, you can define teaming parameters. This section describes how to define teaming parameters for a server group, and includes the following topics:

- [Defining Teaming Parameters For a Linux or Windows Server Group](#), page 13-13
- [Defining Teaming Parameters For An ESX Server Group](#), page 13-14

Defining Teaming Parameters For a Linux or Windows Server Group

When you designate more than one Ethernet link for your Linux or Windows server group, you can define teaming parameters it.

Before You Begin

You can only define teaming parameters after teaming mode has been enabled for your server group. To enable teaming mode, choose **Design > Service Networks**, open a service network, click the To_VLAN logical element, click the **Settings** tab, and from the Ethernet Links drop-down list choose a value of **2**, **3**, or **4**.

Procedure

-
- Step 1** Choose **Design > Service Networks**.
 - Step 2** Open a service network and click a To_VLAN logical element. The Settings tab opens by default.
 - Step 3** Click the **Teaming** tab.
 - Step 4** On the Teaming tab, do any of the following:
 - From the **Teaming Mode** drop-down list, choose one of the following teaming modes:
 - Active Backup
 - Balance TLB
 - 802.3ad Dynamic
 - Check the **Switch HA Required** check box.
 - Check the **Enable NIC HA Required** check box.



Note If NIC HA is enabled, the acquired server Ethernet ports must be on separate NIC cards.

- Add or edit the value of a parameter:
 - Click a parameter in the Parameter Name field.
 - Click **Add** to add a parameter or click **Edit** to edit a parameter.
 - Click **Remove** to delete a parameter.
-

**Note**

Only user-defined entries can be deleted.

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Teaming Tab, page 13-29](#)

Defining Teaming Parameters For An ESX Server Group

When you designate more than one Ethernet link for your ESX server group, you can define teaming parameters it.

Before You Begin

You can only define teaming parameters after teaming mode has been enabled for your server group. To enable teaming mode, choose **Design > Service Networks**, open a service network, click the **To_VLAN** logical element, click the **Settings** tab, and from the Ethernet Links drop-down list choose a value of **2**, **3**, or **4**.

Procedure

-
- Step 1** Choose **Design > Service Networks**.
- Step 2** Open a service network and click a vSwitch logical element. The Settings tab opens by default.
- Step 3** Click the **Teaming** tab.
- Step 4** On the Teaming tab, do any of the following:
- From the **Teaming Mode** drop-down list, choose one of the following teaming modes:
 - Active Backup
 - N Active Links
 - 802.3ad Static
 - Check the **Switch HA Required** check box.
 - Check the **Enable Switch HA** check box.

**Note**

If switch HA is enabled, the acquired server ports must be connected to different Layer 2 switches.

- Check the **Notify Switches** check box
 - Check the **Check Beacon** check box.
 - Check the **Rolling Failover** check box.
 - Check the **Error Percent** check box and specify a percent value.
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)

- [Creating and Modifying Service Networks, page 13-8](#)
- [Teaming Tab, page 13-29](#)

Defining Port Groups

-
- Step 1** Choose **Design > Service Networks**.
- Step 2** Open a service network and click a port group logical element.
The Settings tab opens.
- Step 3** Do any of the following on the Settings tab:
- Configure security in the Security area.
 - Configure Quality of Service in the QoS area.
 - Expand the server group by right-clicking it and then clicking **Expand Block**.
- Step 4** Click the **VMKernel** port group.
- Step 5** Click **Port Variables**.
- Step 6** Check the **Server VMotion Enabled** check box if you want to enable VMotion on this interface.
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Creating and Modifying Service Networks, page 13-8](#)
- [Block Variables Tab, page 13-21](#)

Saving Service Networks

You can save your service network template when you are done making changes, and open it again later to make additional changes.

Before You Begin

Provide values and definitions for the required fields. Red X icons appear next to each required tab and parameter. As you define these required parameters, these icons disappear. When all red icons have disappeared, your service network is ready to be deployed.

Procedure

-
- Step 1** Choose **View > Service Networks**.
- Step 2** On the Service Networks tab, create a new or open an existing service network (see [Creating and Modifying Service Networks, page 13-8](#)).
- Step 3** Click **Save**.
-

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Service Networks Tab, page 13-16](#)

Displaying Summary Information for Service Networks

You can display a summary of the network elements and their current configuration settings.

Procedure

-
- Step 1** Choose **View > Service Networks**.
 - Step 2** On the Service Networks tab, create a new or open an existing service network (see [Creating and Modifying Service Networks, page 13-8](#)).
 - Step 3** Right-click the service network.
 - Step 4** Click **Details**.

The Service Network Summary dialog box appears.

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Service Networks Tab, page 13-16](#)

Service Networks Reference

This section describes the tabs and dialog boxes you use when managing service networks, and includes the following topics:

- [Service Networks Tab, page 13-16](#)
- [Network Settings Tab, page 13-20](#)
- [Block Variables Tab, page 13-21](#)
- [Port Variables Tab, page 13-21](#)
- [Pool Selection Tab, page 13-22](#)
- [NAS Tab, page 13-22](#)
- [Settings Tab, page 13-26](#)
- [Teaming Tab, page 13-29](#)

Service Networks Tab

Use the Service Networks tab to create service networks.

How to Get to This Tab

Choose **View > Service Networks** to open the Service Networks tab.

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Working with Service Networks, page 13-8](#)

Field Reference**Table 13-2** *Service Networks Tab*

Element	Description
Buttons	
New button	Click this button to create a new service network.
Open button	Click this button to open a service network.
Save button	Click this button to save changes made to the selected service network.
Delete button	Click this button to delete the selected service network.
Details button	Click this button to list the service network elements and their configuration settings.
Selectors	
Service Networks selector	Lists the service network templates and service networks that have been created. Click a service network to open the element selector, the service network map tab, and the Network Settings tab.
Elements selector	Lists elements such as Firewall Services Modules, switches, load balancers, and links that have been assigned to the selected service network.

Table 13-2 Service Networks Tab (continued)

Element	Description
Service Networks Work Area—Displays the service network map.	
Tools	<p>Click a button to perform the appropriate action:</p> <ul style="list-style-type: none"> • Pan button—Click this button to move the viewable area of the template. Click Pan and then click and hold the left mouse button and drag the image to the desired position. • Select button—Click Select to choose the template or an item (element or link) within the template. Click Select and then right-click the template topology work area to choose the template or the desired item. To select multiple items within a template, right-click the item then hold down the Shift key while right-clicking additional items. • Select the template or an element within the template to display its corresponding information in the tabs below. Select multiple elements to display corresponding information for the last element selected. No information is provided for links. • Zoom In Rect button—Click this button to zoom in on a selected area. Click Zoom In Rect and then click and hold the left mouse button and drag it. A rectangle forms. Select the items you want to zoom in on. Release the left mouse button. The view zooms into the area contained by the rectangle. • Zoom In button—Click this button to increase the size of the items displayed. • Zoom Out button—Click this button to decrease the size of the items displayed. • Fit to View button—Click this button to resize all items and display them within the viewable work area.

Table 13-2 Service Networks Tab (continued)

Element	Description
	<ul style="list-style-type: none"> • Page Setup button—Click this button to set up the template topology work area for printing. <p>Use the Page Layout tab to set up the page layout:</p> <ul style="list-style-type: none"> – Orientation—Use the Orientation area to set the orientation of the printed page. Check either the Portrait or Landscape check box. – Margins—Use the Margins area to set the margins for the printed page. Enter in inches the left, right, top and bottom margins. – Paper—Use the Paper area to set the size of the printed page. Click either Letter, Legal, Invoice, Executive, A0 (ISO/DIN & JIS), A1 (ISO/DIN & JIS), A2 (ISO/DIN & JIS), or A3 (ISO/DIN & JIS). <p>Use the Header/Footer tab to create custom headers and footers:</p> <ul style="list-style-type: none"> – Header—Your custom header will appear in this area once it is created. – Custom Header—Click Custom Header to create a custom header. The Header dialog box appears. Use the Font, Page, Pages, Time, Date and File tools to create a custom header. When you click the Font tool, the Font dialog box appears. Use it to set the appropriate font. Use the Right Section, Center Section and Left Section areas to manually edit your header. – Footer—Your custom footer will appear in this area once it is created. – Custom Footer—Click Custom Footer to create a custom footer. The Footer dialog box appears. Use the Font, Page, Pages, Time, Date and File tools to create a custom footer. When you click the Font tool, the Font dialog box appears. Use it to set the appropriate font. Use the Right Section, Center Section and Left Section areas to manually edit your footer. <p>Use the Sheet tab to set the network map paging parameters:</p> <ul style="list-style-type: none"> – Area—Click Full Area or use the Left, Top, Right and Bottom fields to manually set the area. – Scaling—Use the Fit To fields to set the scaling of the network map. – Page Order—Click Down, Then Over or Over, Then Down to specify the page order. <ul style="list-style-type: none"> • Print—Click this button to print the template topology work area.

Table 13-2 Service Networks Tab (continued)

Element	Description
Parameters— Define parameters for the service network or selected element.	
Element	<p>Click a service network in the Elements selector, and then click the desired tab to open and define parameters:</p> <p>Note You cannot select endpoints in the work area. Attempting to select the endpoints in the work area selects the link and displays template information, not link or end-point information.</p> <ul style="list-style-type: none"> • Network Settings tab—Enables you to enable or disable the root bridge setting. • Block Variables tab—Enables you to define the variable values of devices within your service network. For detailed reference information, see Block Variables Tab, page 13-21. • Pool Selection tab—Enables you to select resources that will be available to your service network when it is deployed. For detailed reference information, see Pool Selection Tab, page 13-22. • Port Variables tab—Enables you to define the variable values of endpoints within your service network. For detailed reference information, see Port Variables Tab, page 13-21. • NAS Storage tab—Enables you to add NAS storage to your network. For detailed reference information, see NAS Tab, page 13-22. • Settings tab—Enables you add SAN storage to your network, and configure server group settings. For detailed reference information, see Settings Tab, page 13-26. • Teaming tab—Enables you to configure teaming modes. For detailed reference information, see Teaming Tab, page 13-29.

Network Settings Tab

Use the Network Variables tab to enable or disable the root bridge setting on your service network.

How to Get to This Tab

Choose **View > Service Networks**, and create a new service network or open an existing service network.

Related Topics

- [Understanding Service Network Design, page 13-2](#)
- [Working with Service Networks, page 13-8](#)

Field Reference**Table 13-3** *Network Variables Tab*

Element	Description
Enable Root Bridge Setting	Check this check box for VFrame to configure the root bridge setting for all Layer 2 switches in your service network. If the check box is checked, VFrame configures a switch to become the root for the specified VLAN.
Service Network Description	See a features list for the service network in this drop-down list.

Block Variables Tab

Certain logical elements have system actions associated with them. These system actions might include default variables. In addition, the template designer might have included additional user macros with their own set of variables.

Use this tab to define the values for these variables as they pertain to the devices within your service network.

How to Get to This Tab

On the Service Networks tab, open a service network and click a logical element. If applicable, the Block Variables tab opens.

Related Topics

- [Service Networks Tab, page 13-16](#)
- [Understanding Service Network Design, page 13-2](#)

Field Reference

The variable value is a blank field. For each variable, click or enter the appropriate value into the variable value field that corresponds to your service network design.

For details about the default variables associated with each logical element, see [Appendix A, “System Actions, Default Variables, and Resource Attribute Variables.”](#)

Port Variables Tab

Certain logical elements have default system actions associated with them. These system actions might include default variables. In addition, the template designer might have included additional user macros with their own set of variables.

Use this tab to define the values for these variables as they pertain to endpoints within your service network.

How to Get to This Tab

On the Service Networks tab, open a service network and click an endpoint. If applicable, the Port Variables tab opens.

Related Topics

- [Service Networks Tab, page 13-16](#)
- [Understanding Service Network Design, page 13-2](#)

Field Reference

The variable value is a blank field. For each variable, click the appropriate value in the variable value field that corresponds to your service network design.

For details about the default variables associated with each logical element, see [Appendix A, “System Actions, Default Variables, and Resource Attribute Variables.”](#)

Pool Selection Tab

Use this tab to choose the resources you want to be available to your service network when it is deployed.

How to Get to This Tab

On the Service Networks tab, open a service network and click a logical element. If applicable, the Pool Selection tab opens, or click **Pool Selection**.

Related Topics

- [Service Networks Tab, page 13-16](#)
- [Understanding Service Network Design, page 13-2](#)

Field Reference

Table 13-4 *Pool Selection Tab*

Element	Description
Select button	Click Select to choose servers for your pool. When you click the button, the Resource Selection dialog box appears.
Resource Selection dialog box	Use the Resource Selection dialog box to choose servers for your pool: <ul style="list-style-type: none"> • Available area—This is an area for the Admin Context: All Servers drop-down list. • Admin Context: All Servers list—This is a drop-down list of all the available servers. • Double arrows button (left and right)—Click these buttons to move all the servers left or right. • Single arrows button (left and right)—Click this button to move a server left or right. • Selected area—This is an area for all the servers chosen for the pool.

NAS Tab

Use this tab to add NAS storage to your network.

How to Get to This Tab

On the Service Networks tab, open a service network and click the NAS logical element. The NAS tab opens.

Related Topics

- [Service Networks Tab, page 13-16](#)
- [Understanding Service Network Design, page 13-2](#)

Field Reference**Table 13-5** *NAS Tab*

Element	Description
Description	Enter a description of the storage group.
Storage Groups	<p>This area contains the following fields that are automatically filled when you add or edit a NAS storage group:</p> <ul style="list-style-type: none"> • Name—The name of the NAS storage group. • Type—The storage type. • Mode—The storage mode. • Storage Type—The storage protocol type. • Part/Server—The initial partitions per server. • Description—The description of the NAS storage group.

Table 13-5 NAS Tab (continued)

Element	Description
Add	<p>Click this button to add NAS storage. When you click this button, the New NAS Storage Group dialog box appears:</p> <ul style="list-style-type: none"> • Type—Click either Shared or Additional. • Mode—Click either Create Storage or Use Existing Storage. • Group Name—Enter the name of the NAS storage group. • Description—Enter a description of the NAS storage group. • Volumes—This area shows the volume type chosen. • Select—Click Select to choose a volume type. <p>When you click Select the Select Volumes dialog box appears:</p> <ul style="list-style-type: none"> – Available area—This is an area for the Admin Context: All Servers drop-down list. – Admin Context: All Servers list—This is a drop-down list of all the available servers. – Double arrows button (left and right)—Click these buttons to move all the servers left or right. – Single arrows button (left and right)—Click this button to move a server left or right. – Selected area—This is an area for all the servers chosen for the pool. <ul style="list-style-type: none"> • Mount Interfaces—Use the Mount Interfaces area to choose interfaces: <ul style="list-style-type: none"> – For a standard operating system service network, check the To_VLAN check box to choose an interface. – For an ESX operating system, check the IP_0 or IP_1 check box to choose an interface. • Permissions—Use this area to set permissions: <ul style="list-style-type: none"> – Root—Check the Root check box to set the permissions to Root. – Read Only—Check the Read Only check box to set the permissions to Read Only. – Read/Write—Check the Read/Write check box to set the permissions to Read/Write. • Protocol—Click either NFS or CIFS. • Init/Partitions Server—Enter the number of partitions. • Max Size/Partition—Click the maximum size of the partition. The default is Unlimited. • Max Files/Partition—Click the maximum number of files per partition. The default is Unlimited.

Table 13-5 NAS Tab (continued)

Element	Description
Edit	<p>Click this button to edit existing NAS storage. When you click this button, the Edit NAS Storage Group dialog box appears:</p> <ul style="list-style-type: none"> • Description—Enter a description of the NAS storage group. • Volumes—This area shows the volume type chosen. • Select—Click Select to choose a volume type. <p>When you click Select, the Select Volumes dialog box appears:</p> <ul style="list-style-type: none"> – Available area—This is an area for the Admin Context: All Servers drop-down list. – Admin Context: All Servers list—This is a drop-down list of all the available servers. – Double arrows button (left and right)—Click these buttons to move all the servers left or right. – Single arrows button (left and right)—Click this button to move a server left or right. – Selected area—This is an area that displays all the servers chosen for the pool. <ul style="list-style-type: none"> • Mount Interfaces—Use the Mount Interfaces area to choose interfaces: <ul style="list-style-type: none"> – For a standard operating system service network, check the To_VLAN check box to choose an interface. – For an ESX operating system, check the IP_0 or IP_1 check box to choose an interface. • Permissions—Use this area to set permissions: <ul style="list-style-type: none"> – Root—Check the Root check box to set the permissions to Root. – Read Only—Check the Read Only check box to set the permissions to Read Only. – Read/Write—Check the Read/Write box to set the permissions to Read/Write. • Protocol—Click either NFS or CIFS. • Init/Partitions Server—Enter the number of partitions. • Max Size/Partition—Click the maximum size of the partition. The default is Unlimited. • Max Files/Partition—Click the maximum number of files per partition. The default is Unlimited.
Delete	Click this button to delete a storage group.

Settings Tab

Use this tab to configure SAN and server group settings.

How to Get to This Tab

On the Service Networks tab, open a service network and click either the SAN Fabric, SAN Storage, Server Group, To_VLAN or Virtual Switch logical elements. The Settings tab opens.

Related Topics

- [Service Networks Tab, page 13-16](#)
- [Understanding Service Network Design, page 13-2](#)

Field Reference

Table 13-6 Settings Tab

Element	Description
Settings Tab for SAN Fabric	
Description	Enter a description of the SAN fabric.
SAN Mode	Click a SAN mode. The default is VFrame Configured and is the only choice.
Fabric 1 VSAN	Choose a fabric from the VSAN Selection drop-down list.
Fabric 2 VSAN	Choose a second fabric from the VSAN Selection drop-down list.
Settings Tab for SAN Storage	
Description	Enter a description of the SAN storage.
Storage Groups	This area contains the following fields that are automatically filled when you add or edit SAN storage: <ul style="list-style-type: none"> • Name—The name of the storage. • Type—The type of storage. • LUN/Server—The number of LUNs or servers. • Description—The description of the storage.

Table 13-6 Settings Tab (continued)

Element	Description
Add button	<p>Click this button to add a SAN storage group. When you click this button, the New SAN Storage Group dialog box appears:</p> <ul style="list-style-type: none"> • Type—Click either Additional or Shared. • Group Name—Enter a group name. • Description—Enter a description of the storage group. • Initial LUNs/Server—Enter the number of initial LUNs or servers. • LUNs—This area shows the LUNs chosen. • Fabric 1 Array Ports—This area shows the Fabric 1 ports chosen. • Fabric 2 Array Ports—This area shows the Fabric 2 ports chosen. • Select—Click this button to choose LUNs, Fabric Array 1 Ports, or Fabric Array 2 Ports. <p>When you click Select, the Select LUNs, Select Array Ports Fabric 1, or the Select Array Ports Fabric 2 dialog box appears:</p> <ul style="list-style-type: none"> - Available area—This is an area for the Admin Context: All Storage LUN drop-down list or the Admin Context: All Storage Port drop-down list. <ul style="list-style-type: none"> Admin Context: All Storage LUN list—This is a drop-down list of all the available LUNs. Admin Context: All Storage Port list—This is a drop-down list of all the available ports. - Double arrows button (left and right)—Click these buttons to move all the LUNs or ports left or right. - Single arrows button (left and right)—Click this button to move a LUN or port left or right. - Selected area—This is an area that displays all the LUNs or ports chosen for the SAN storage group.

Table 13-6 Settings Tab (continued)

Element	Description
Edit button	<p>Click this button to edit a SAN storage group. When you click this button, the Edit SAN Storage Group dialog box appears:</p> <ul style="list-style-type: none"> • Description—Enter a description of the storage group. • Initial LUNs/Server—Enter the number of initial LUNs or servers. • LUNs—This area shows the LUNs chosen. • Fabric 1 Array Ports—This area shows the Fabric 1 ports chosen. • Fabric 2 Array Ports—This area shows the Fabric 2 ports chosen. • Select—Click Select to choose LUNs, Fabric Array 1 Ports, or Fabric Array 2 Ports. <p>When you click Select, the Select LUNs, Select Array Ports Fabric 1, or the Select Array Ports Fabric 2 dialog box appears:</p> <ul style="list-style-type: none"> – Available area—This is an area for the Admin Context: All Storage LUN drop-down list or the Admin Context: All Storage Port drop-down list. <p>Admin Context: All Storage LUN list—This is a drop-down list of all the available LUNs.</p> <p>Admin Context: All Storage Port list—This is a drop-down list of all the available ports.</p> <ul style="list-style-type: none"> – Double arrows button (left and right)—Click these buttons to move all the LUNs or ports left or right. – Single arrows button (left and right)—Click this button to move a LUN or port left or right. – Selected area—This is an area that displays all the LUNs or ports chosen for the SAN storage group.
Delete button	Click this button to delete storage.
Settings Tab for Server Group	
Description	Enter a description of the server group.
Image	Click a Linux, Windows or ESX image.
Sysprep File	Click a sysprep file.
Service Console Routing Table	Click this button to add, edit or delete service console routes.
VMKernel Routing Table	Click this button to add, edit or delete VM kernel routes.
Settings Tab for To_VLAN (Server Group connection to a Layer 2 switch)	
Description	Enter a description of the connection.
Ethernet Links	Click a value from 1 to 4 .
Minimum Interface Speed	Click a value, either 100 , 1000 , or 10000 .
On PXE Boot Interface	Check the On PXE Boot Interface check box to boot on the PXE interface.

Table 13-6 Settings Tab (continued)

Element	Description
Enable Port Fast on Switchport	Check this check box to enable Port Fast on Switch Port.
Settings Tab for vSwitch (ESX service network)	
Description	Enter a description of the connection.
Ethernet Links	Click a value from 1 to 4 .
Minimum Interface Speed	Click a value, either 100 , 1000 , or 10000 .
On PXE Boot Interface	Check this check box to boot on the PXE interface.
Enable Port Fast on Switchport	Check this check box to enable Port Fast on Switch Port.
Virtual Switch	<p>This is an area where you can configure a virtual switch:</p> <ul style="list-style-type: none"> • Number of Ports—Click the number of ports for the virtual switch. • Security—This is an area where you can set the security profile for the ports on the virtual switch: <ul style="list-style-type: none"> – Allow Promiscuous Mode—Check this check box to set the virtual switch to pass all traffic it receives. – Allow MAC Address Changes—Check this check box to protect against MAC impersonation. – Allow Forged Transmits—Check this check box to protect against MAC impersonation. • QoS—This is an area where you can set up Quality of Service: <ul style="list-style-type: none"> – Enable Traffic Shaping—Check this check box to enable the QoS options. – Average Bandwidth—Click an appropriate value. – Peak Bandwidth—Click an appropriate value. – Burst Size—Click an appropriate value.

Teaming Tab

Use this tab to configure teaming modes (grouping adapters together).

How to Get to This Tab

On the Service Networks tab, open a service network and click the To_VLAN logical element. From the Ethernet Links drop-down list, click **2**, **3** or **4**, and then click the **Teaming** tab.

Related Topics

- [Service Networks Tab, page 13-16](#)
- [Understanding Service Network Design, page 13-2](#)

Field Reference

Table 13-7 Teaming Tab

Element	Description
Teaming Mode	<p>From the Teaming Mode drop-down list, choose one of the following teaming modes:</p> <ul style="list-style-type: none"> • Active Backup—Provides link backup. The backup link becomes active only when the first active link fails. • Balance TLB—Transmit load balancing. Outgoing traffic is load balanced across the links. This mode is available only for Linux or Windows server groups. • 802.3ad Dynamic (Linux or Windows only)—Creates one or more teams using dynamic link aggregation. This mode is available only for Linux or Windows server groups. • N Active Links (ESX only)—Creates a team with multiple, non-aggregated links. This mode is available only for ESX server groups. • 802.3ad Static (ESX only)—Creates a single team using static link aggregation. This mode is available only for ESX server groups.
Switch HA Required	Check this check box to require that the acquired server Ethernet ports must be connected to different layer 2 switches.
Enable NIC HA Required	Check this check box to require that the acquired server Ethernet ports must be on separate NICs.
Add	<p>Click this button to add teaming parameters. When you click this button, the New Teaming Parameter Entry dialog box appears:</p> <ul style="list-style-type: none"> • Parameter Name—Enter the name of the parameter. • Value—Enter the value of the parameter. <p>This button is available only for Linux and Windows server groups.</p>
Remove	Click this button to delete a teaming parameter entry. This button is available only for Linux and Windows server groups.

Table 13-7 *Teaming Tab (continued)*

Element	Description
Edit	<p>Click this button to add teaming parameters. When you click this button, the Modify Teaming Parameter Entry dialog box appears:</p> <ul style="list-style-type: none"> • Parameter Name—Enter the name of the parameter. • Value—Enter the value of the parameter. <p>This button is available only for Linux and Windows server groups.</p>
NIC Teaming Properties group	<p>Check any of the following check boxes:</p> <ul style="list-style-type: none"> • Notify Switches—If a failover event occurs, notification is sent to update the lookup tables on physical switches. • Check Beacon—Checks for beacon probes to detect upstream link failures. • Rolling Failover—Leaves a failed link in an inactive state even after recovery until another currently active links fails. • Check Error Percent—Determines that a link failure occurs when the error percentage exceeds the value that you specify. <p>The NIC Teaming Properties group is available only for ESX server groups.</p>

