

## Chapter 4

# Configuring VLANs

This chapter describes how to configure virtual LANs (VLANs). The NMC-RX application supports VLANs on the following modules:

- FE-2, FE-8
- GE, GE-2

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### Overview

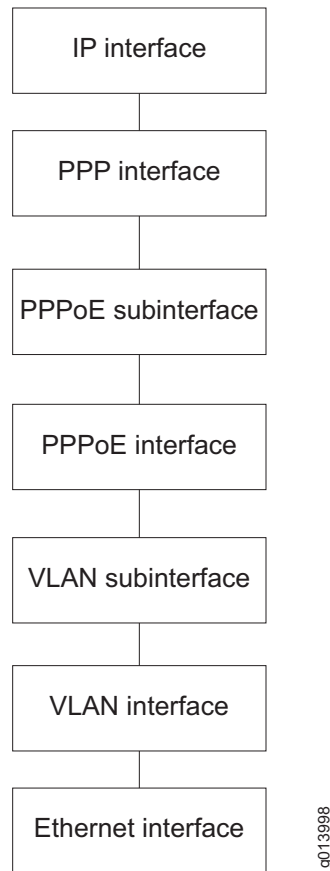
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A VLAN is a logical group of network devices that appear to be on the same LAN, regardless of their physical location. They are configured so that they can communicate as if they were attached to the same physical connection, when in fact they are located on a number of different LAN segments. VLANs can be configured with management software, such as the NMC-RX application, and are extremely flexible because they are based on logical, rather than physical, connections.

A VLAN permits multiplexing multiple IP and/or Point to Point Protocol over Ethernet (PPPoE) interfaces over a single physical Ethernet port. This multiplexing is accomplished through VLAN subinterfaces.

You can create VLAN interfaces and subinterfaces one at a time or you can create multiple interfaces at a time using the VLAN Services Configuration Wizard.

Figure 1 shows a basic VLAN protocol stack.

**Figure 1: Basic VLAN Protocol Stack**

## Configuration Tasks

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To configure a VLAN:

1. Create a VLAN interface.
2. Create a VLAN subinterface.
3. Create an IP interface, PPPoE interface, or Bridged Ethernet interface over the VLAN subinterface.

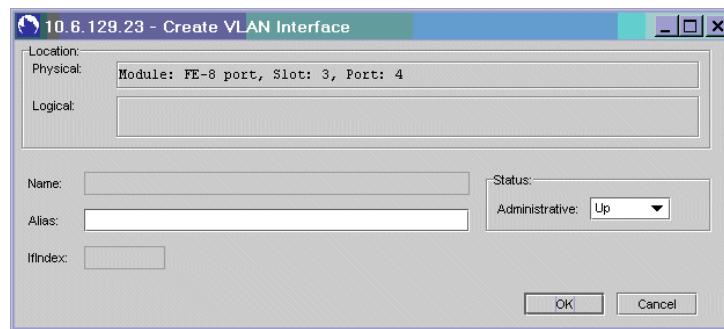
## Creating a VLAN Interface

A VLAN interface can be created on any of the following interface types: Fast Ethernet, Gigabit Ethernet, or Bridged Ethernet. If stacking already exists on the interface, a VLAN interface cannot be created.

To create a VLAN interface:

1. Select an Ethernet interface.
2. Right-click, select Create, and click VLAN interface.

The Create VLAN Interface dialog box appears.



3. Set parameters and click OK. (Table 27)

**Table 27: Create VLAN Interface Parameters**

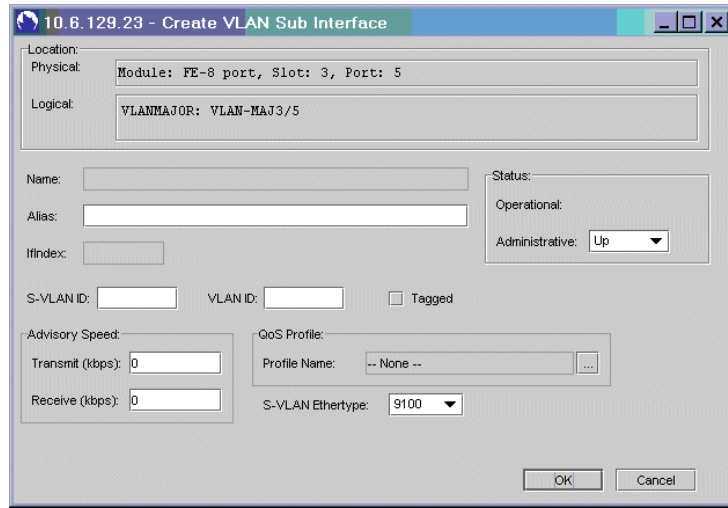
Parameter	Description	Range/Length	Default
Name	ifDescr of the virtual LAN interface; not configurable, created by the router	Not applicable	Not applicable
Alias	ifAlias used for the VLAN major interface being created	0-64 characters	Empty
ifIndex	Not configurable	Not applicable	Not applicable
Administrative Status	Administrative status used for this interface	Up or Down	Up

## Creating a VLAN Subinterface

To create a VLAN subinterface:

1. In the Device-wide Explorer, select Interfaces in the VLAN folder, right-click, and select List All.
2. In the list area, select the VLAN interface you want, right-click, select Create, and click VLAN Sub Interface.

The Create VLAN Sub Interface dialog box appears.



3. Set parameters and click OK. (Table 28)

**Table 28: Create VLAN Sub Interface Parameters**

Field	Description	Range/Length	Default
Name	ifDescr of the VLAN subinterface; not configurable, created by the router	Not applicable	Not applicable
Alias	ifAlias used for the VLAN subinterface being created	0-64 characters	Empty
ifIndex	Not configurable	Not applicable	Not applicable
Operational Status	Operational status of the VLAN Subinterface	Not applicable	Not applicable
Administrative Status.	Administrative status used for this interface	Up or Down	Up
S-VLAN ID	S-VLAN identifier; required for S-VLANs	0-4095	Empty
VLAN ID	VLAN identifier; required for both VLANs and S-VLANs	0-4095	Empty
Tagged	Indicates if this VLAN is tagged or untagged; untagged is only applicable for a VLAN with the ID of 0	Not applicable	Selected
Advisory Speed Transmit	Advisory transmit speed for the VLAN subinterface being created	0-2147483647	0
Advisory Speed Receive	Advisory receive speed for the VLAN subinterface being created	0-2147483647	0
QoS Profile Name	Name of the QoS profile to attach to this VLAN subinterface	Not applicable	None
Ethertype	S-VLAN Ethertype of the customer premises equipment to which the router connects.	8100, 88a8, 9100	9100

## Creating Multiple VLANs and S-VLANs Using the Configuration Wizard

You can rapidly provision large numbers of VLAN and S-VLAN services by using the VLAN Services Configuration Wizard. The wizard enables you to specify a single set of parameters that can be used for the provisioning of one or more VLAN/S-VLAN stackings.

After the first VLAN/S-VLAN IDs are specified, subsequent IDs can automatically be created sequentially or by using a formula. For example: create 2000 VLANs on an interface, start with VLAN ID 25, and increment each VLAN ID by two. Any existing VLAN-S-VLAN services that are in the ranges specified in the wizard remain unchanged and are cited as a warning in the summary results.

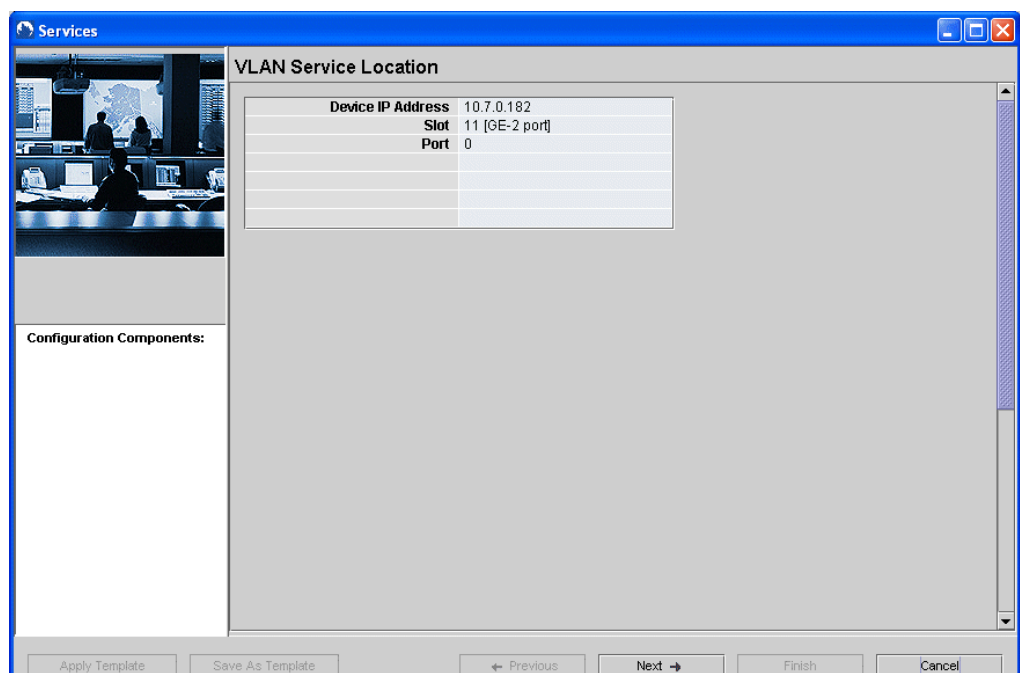
The VLAN Services Configuration wizard can be started from these interfaces:

- Fast Ethernet
- Gigabit Ethernet
- VLAN Major
- Bridged Ethernet

To create VLAN services:

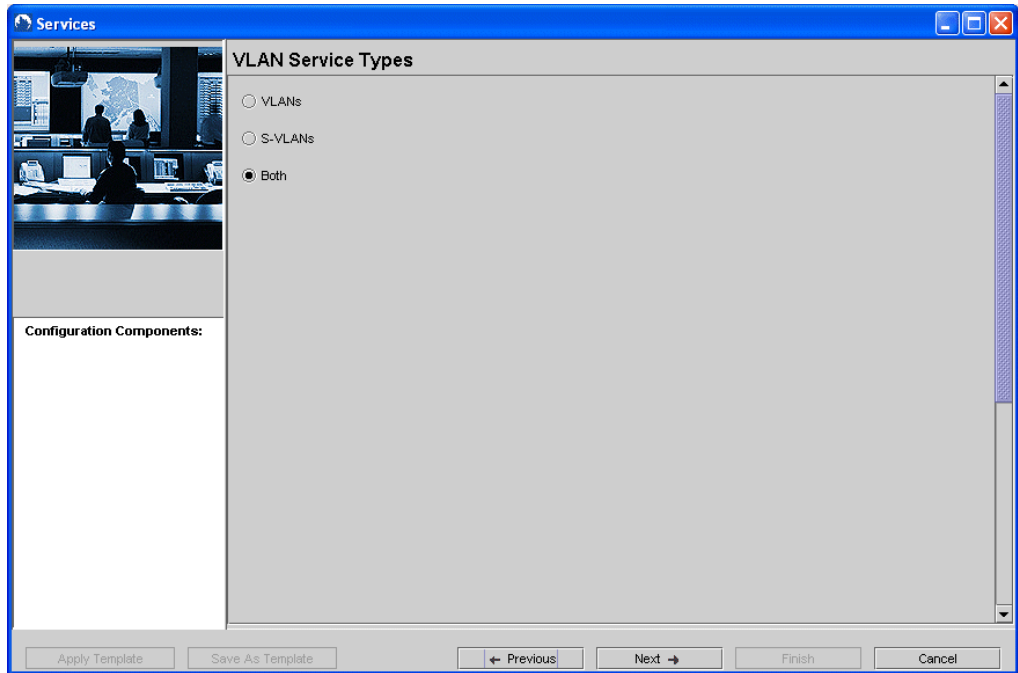
1. Right-click a valid interface and select Configure VLAN Services.

The wizard starts and the VLAN Service Location screen shows the location of where the VLAN Services will be created.



2. Click Next to confirm that this is the correct location to create VLAN Services.

The VLAN Service Types screen appears.



3. Select which service type you want to create and click Next.

The VLAN Service Ranges dialog appears. Note that depending on your choice, a different screen is displayed.

For example, selecting Both displays this screen:

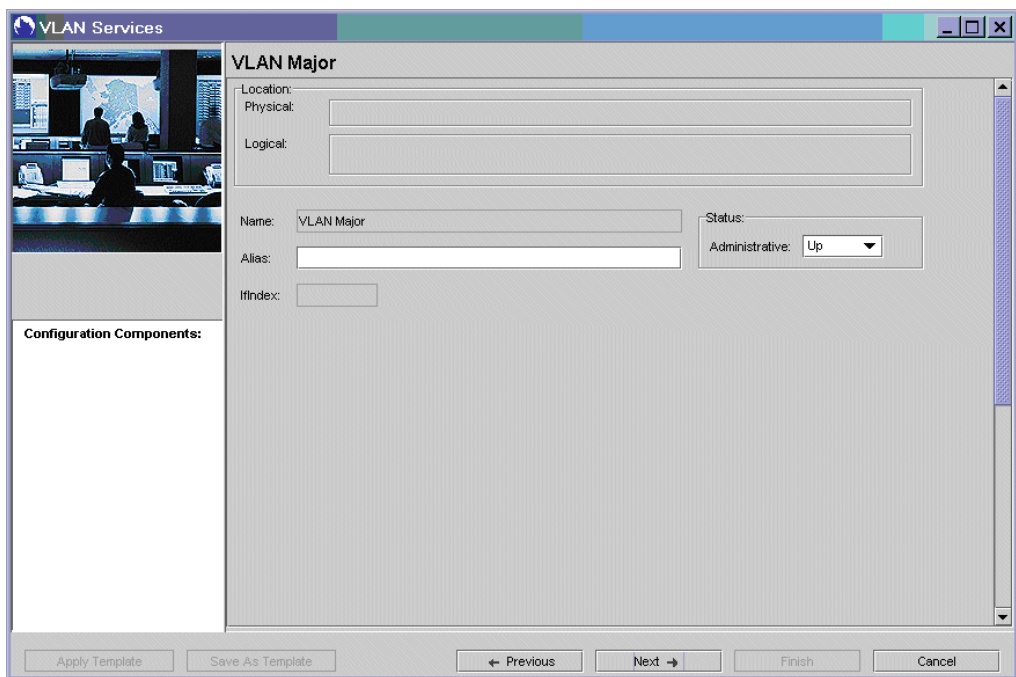
4. Set the VLAN Service Ranges parameters. (Table 29)

**Table 29: VLAN Service Ranges Parameters**

Field	Description	Range/Length	Default
<b>VLAN Range</b>			
Total Number of VLANs to create	Number of VLANs that should be created	1-4096	1
VLAN ID start Value	VLAN ID of the first VLAN to be created	0-4095	0
VLAN ID Increment Value	Value to increment for each VLAN ID being created	1-4096	1
VLAN ID Upper Bound	Last VLAN ID that will be used; read-only calculated value field	Not applicable	Not applicable
VLAN ID 0 Type	VLANs with ID 0 can either be tagged or untagged; allows you to specify which type to create	Tagged or Untagged	Tagged
<b>S-VLAN Range</b>			
Total number of VLANs to create	Number of VLANs that should be created	0-16,384	1
Number of VLANs to Distribute per S-VLAN	Number of VLAN IDs that will be created per S-VLAN	1-4096	1
Number of S-VLANs Required	Read-only field that specifies how many S-VLANs will be created; calculated by dividing the total number of VLANs to be created by the distribution of VLANs per S-VLAN	Not applicable	Not applicable

Field	Description	Range/Length	Default
S-VLAN ID Start Value	First ID to be used for the S-VLANs being created	0-4095	0
S-VLAN Increment Value	Value to increment each S-VLAN ID	1-4096	1
S-VLAN ID Upper Bound	Last value that will be used for the S-VLANs being created; read-only calculated value field	Not applicable	Not applicable
VLAN ID Start Value	First VLAN ID to be used for each S-VLAN being created	0-4095	0
VLAN Increment Value	Value to increment each VLAN ID	1-4096	1
VLAN ID Upper Bound	Last VLAN ID that will be used for the S-VLAN being created; read-only calculated value field	Not applicable	Not applicable

- Click Next. If a VLAN major interface does not already exist, the VLAN Major screen appears. If one does exist, the VLAN Sub Interface screen appears. (Go to Step 8.)



- Set VLAN major parameters. (Table 30)

**Table 30: VLAN Major Parameters**

Field	Description	Range/Length	Default
Name	ifDescr of the virtual LAN; not configurable, created by the router	Not applicable	Not applicable
Alias	ifAlias used for the VLAN major interface being created	0-64 characters	Empty
ifIndex	Not configurable	Not applicable	Not applicable
Administrative Status.	Administrative status used for the VLAN major interface and VLAN subinterfaces being created	Up or Down	Up

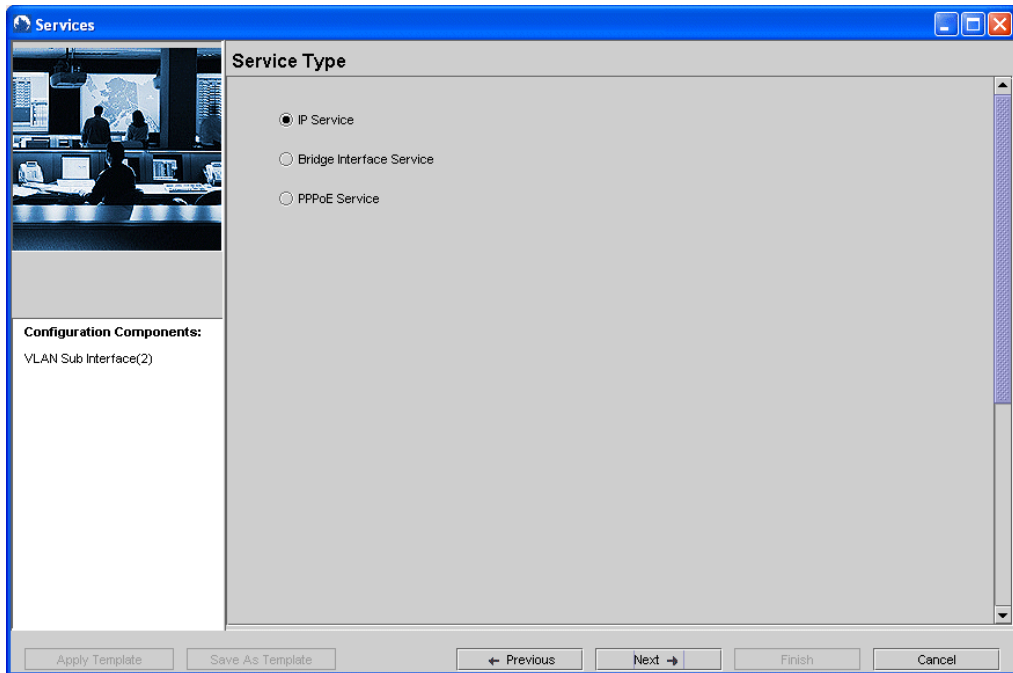
7. Click Next. The VLAN Sub Interface screen appears.

8. Set VLAN Sub Interface parameters. (Table 31)

**Table 31: VLAN Sub Interface Parameters**

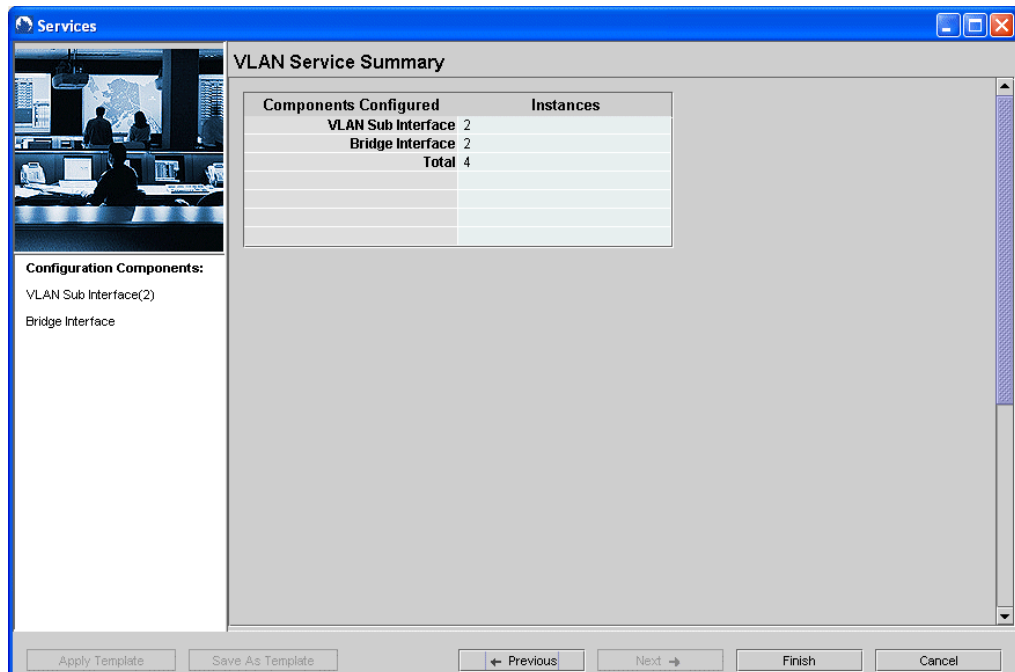
Field	Description	Range/Length	Default
Name	ifDescr of the VLAN Sub Interface; not configurable, created by the router	Not applicable	Not applicable
Alias	ifAlias used for the VLAN subinterfaces being created	0-64 characters	Empty
ifIndex	Not configurable	Not applicable	Not applicable
Operational Status	Not configurable	Not applicable	Not applicable
Administrative Status	Administrative status used for the VLAN major interface and VLAN subinterfaces being created	Up or Down	Up
Advisory Speed Transmit	Advisory transmit speed for the VLAN subinterface being created.	0-2147483647	0
Advisory Speed Receive	Advisory Receive speed for the VLAN subinterface being created.	0-2147483647	0
QoS Profile Name	Name of the QoS Profile attached to the VLAN Subinterfaces created	Not applicable	Not applicable
S-VLAN Ethertype	Ethertype set for the VLAN subinterfaces created; only present if the subinterfaces are configured with S-VLANs	8100, 88a8, 9100	9100

9. If you do not want to configure a service type (IP service, bridged interface service, or PPPoE service), click Finish and go to Step 11. Otherwise, click Next. The Service Type screen appears.



10. Select a service type, click Next, and set parameters. See the following for additional parameter information:
  - *Chapter 6, Configuring IP*
  - *NMC-RX User Guide, Vol. 1, Chapter 19, Configuring Bridge Interfaces*
  - *NMC-RX User Guide, Vol. 1, Chapter 28, Configuring PPP over Ethernet*

11. When you have set service type parameters, the VLAN Service Summary screen appears. Click Finish to create the objects.



The Services Wizard Complete dialog box appears when the process ends.

