CHAPTER 3

Viewing Network Element Properties

The following topics describe the user access roles required to use Cisco ANA NetworkVision and how to view network element physical and logical properties in any mapped network:

Note The inventory window also enables you to view all the tickets that are collected on the selected NE in the ticket pane. For more information, see Ticket Pane, page 3-9.

Note Cisco ANA maintains continuous, real-time discovery of all the physical and logical entities of the network inventory and the relationships among them. The Cisco ANA distributed system inventory automatically reflects every addition, deletion, and modification that occurs in the network.

User Roles Required to Work with Cisco ANA NetworkVision

Table 3-1 identifies the roles that are required to work with Cisco ANA NetworkVision. Cisco ANA determines whether you are authorized to perform a task as follows:

- For GUI-based tasks (tasks that do not affect devices), authorization is based on the default permission that is assigned to your user account.
- For device-based tasks (tasks that do affect devices), authorization is based on the default permission that is assigned to your account. That is, whether the device is in one of your assigned scopes and whether you meet the minimum security level for that scope.

For more information on user authorization, see the *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.

Table 3-1 Default Permission/Security Level Required for Cisco ANA NetworkVision Functions

Task	Viewer	Operator	OperatorPlus	Configurator	Administrator
View maps	X	X	X	X	X
View device properties	X	X	X	X	X
View network element properties in logical and physical inventory	X	X	X	X	X
View VNE properties	X	X	X	X	X
Open the Port Utilization Graph	X	X	X	X	X
Enable and disable port alarms	—	—	—	X	X

Viewing the Properties of a Device

Cisco ANA NetworkVision enables you to view the properties of a selected device using the Properties window. For example, in the Properties window you can view the vendor and location of a device.

To view device properties:

Step 1 Right-click a device in the navigation pane, content pane, or device view, and choose **Properties**.

The Properties window is displayed as shown in Figure 3-1.

Figure 3-1 Properties Window

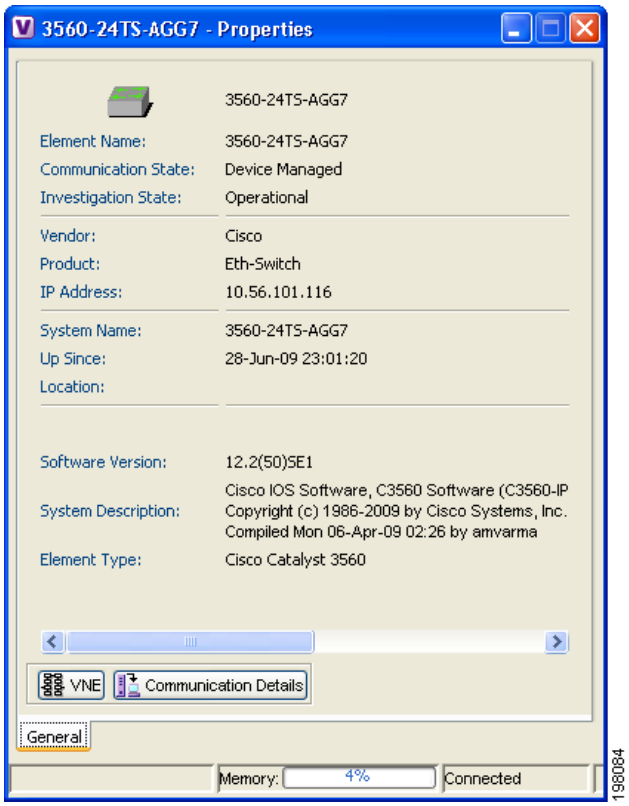


Table 3-2 describes the information displayed in the Properties window.

Table 3-2 Properties Window

Field	Description
Communication State	The ability of the VNE to reach the network element, according to the health of the device. For more information about communication states, see the *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.
Investigation State	The level of network element discovery that has been performed or is being performed by the VNE. For more information about investigation states, see the *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.
Device icon	An icon representing the device in Cisco ANA and displaying the current color associated with the device operational health. For more information on severity colors, see Network Element Status Indicators, page 2-17. The device icon might include a badge (such as a bell or other symbol) that indicates an alarm or another item of interest associated with the device.
Vendor	The vendor name, as defined in the device MIB.
Product	The product name of the device, as defined in the device MIB; for example, Router.

Table 3-2 Properties Window (continued)

Field	Description
Element Name	A name assigned to the element for ease of identification.
IP Address	The IP address used for managing the device.
System Name	The name of the device, as defined in the device MIB.
Up Since	The date and time the device was last reset.
Location	The physical location of the device, as defined in the device MIB.
Software Version	The software version running on the device.
Software Description	A description of the system taken from the device.
Element Type	The device type with the manufacturer's name, such as Cisco 7200.
Buttons	
VNE	Opens the VNE Properties dialog box, where you can edit the VNE's properties, start and stop the VNE, perform maintenance, and configure polling rates. For more information, see: • Viewing VNE Properties, page 3-4 • *Cisco Active Network Abstraction 3.7.1 Administrator Guide*
Communication Details	Opens the Communication Details window, which displays the status of the device protocols and whether the device is sending traps and syslogs. For more information, see Viewing VNE Communication Details, page 3-5.

Step 2 To close the Properties window, click  .

Viewing VNE Properties

To view VNE properties, open the inventory window (**Node > Inventory**) or Properties window (**Node > Properties**) for the required element, and then click **VNE**.

If the VNE for the element has been stopped, a message is displayed at the top of the inventory window letting you know that the VNE was stopped. The message includes a Refresh button so that you can refresh the information if the VNE has restarted. If the VNE is still down when you click **Refresh**, a VNE Unreachable message is displayed and the inventory window is closed. For more information about starting VNEs, stopping VNEs, adding new VNEs to a network, or modifying the status of a VNE, see the *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.

Note The window displayed for all the devices is similar in appearance, but the information that is displayed varies according to the selected entity.

The inventory window also enables you to view all tickets that are collected on the selected NE in the ticket pane. For more information, see Ticket Pane, page 3-9.

Viewing VNE Communication Details

To view VNE communication details:

Step 1 In Cisco ANA NetworkVision, select the required element.

Step 2 Open the inventory window (**Node > Inventory**) or Properties window (**Node > Properties**) for the selected item.

Step 3 Click **Communication Details**.

The Communication Details window is displayed as shown in Figure 3-2.

Figure 3-2 Communication Details Window

The Communication Details window provides information about:

- Management connectivity state
- SNMP connectivity
- Telnet connectivity
- ICMP connectivity
- Syslog connectivity
- Trap connectivity

For more information about the Communication Detail window, see the *Cisco Active Network Abstraction 3.7.1 Administrator Guide*.

Opening the Inventory Window

The inventory window enables you to:

- View physical and logical inventory information.
- View tickets for a device.
- Open the Port Utilization graph for physical ports.
- Open Cisco ANA PathTracer.
- Add or remove links.
- Manage the alarms being sent on a port.
- Open the Cisco ANA Command Builder to create customized commands.
- Open the Cisco ANA Soft Properties Manager to extend the amount of information displayed. For more information, see the *Cisco Active Network Abstraction 3.7.1 Customization User Guide*.
- View VNE properties. For more information, see Viewing VNE Properties, page 3-4.
- View VNE communication details. For more information, see Viewing VNE Communication Details, page 3-5.

For more information on specific technologies, see:

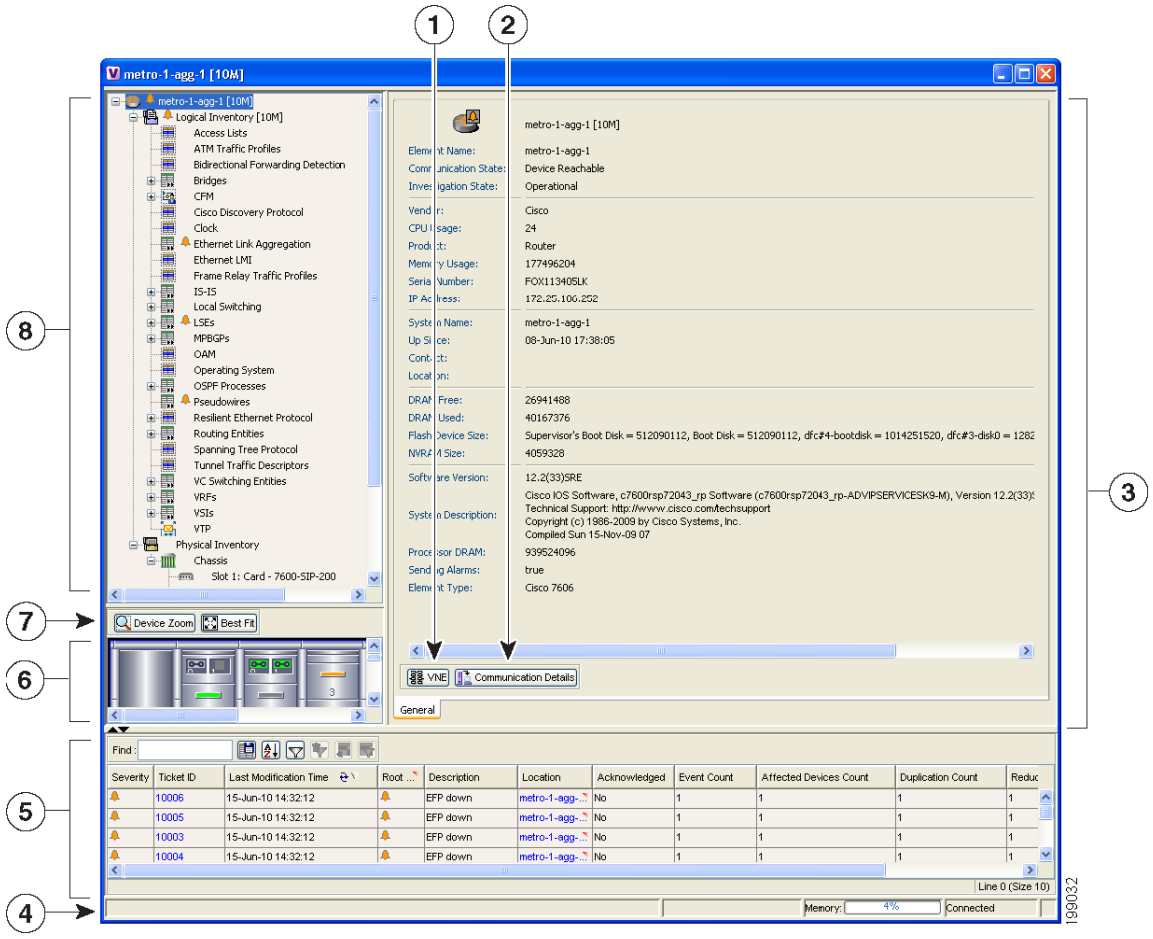
- Chapter 12, “Monitoring Carrier Ethernet Services”
- Chapter 13, “Monitoring Carrier Grade NAT Properties”
- Chapter 14, “Monitoring DWDM Properties”
- Chapter 15, “Viewing Ethernet Operations, Administration, and Maintenance Tool Properties”
- Chapter 16, “IPv6 and IPv6 VPN over MPLS”
- Chapter 17, “Monitoring MPLS Services”
- Chapter 18, “Monitoring MToP Services”
- *Cisco Active Network Abstraction 3.7.1 Reference Guide*

To open the inventory window, do one of the following:

- Select an element in the navigation pane or in a map, and then choose **Node > Inventory**.
- Double-click an item in the navigation pane or in a map.
- Right-click an element in the navigation pane or in a map to display the shortcut menu and then choose **Inventory**.

Figure 3-3 shows an example of an inventory window.

Figure 3-3 Inventory Window



1	VNE button	**5**	Ticket pane
2	Communication Details button	**6**	Device view pane
3	Content pane	**7**	Device view pane toolbar
4	Status bar	**8**	Navigation pane

The inventory window displays the physical and logical inventory for the selected item. The inventory window is divided into the following areas:

- Navigation Pane, page 3-8
- Device View Pane, page 3-8
- Device View Pane Toolbar, page 3-9
- Ticket Pane, page 3-9
- Content Pane, page 3-10

All areas displayed in the inventory window are correlated; this means that selecting an option in one area affects the information displayed in the other areas.

The information displayed in the inventory window varies according to the item selected in the navigation pane.

To view physical inventory information, open the physical inventory branch.

To view logical inventory information, open the logical inventory branch. For more information about logical inventory information, see Viewing the Logical Properties of a Network Element, page 3-13.

If the selected VNE is shutting down when the inventory window is opened, a Refresh button is displayed in the inventory window so you can refresh the display when the VNE is available again.

Click the top right corner to close the inventory window.

For more information about the right-click shortcut menus that are available in the inventory window, see Cisco ANA NetworkVision Shortcut Menus, page 2-29.

Navigation Pane

The navigation pane in the inventory window displays a tree-and-branch representation of the selected device and its modules. The navigation pane contains two main branches: logical inventory and physical inventory.

The logical inventory branch includes logical items related to the selected element, such as access lists, ATM traffic profiles, and routing entities. The physical inventory branch includes the different NE components, such as chassis, cards, subslots, and so on. When you select an NE component in the navigation pane, the information displayed in the content pane is updated. The branches in the navigation pane can be expanded and collapsed to display and hide information as needed.

The window heading and the highest level in the navigation pane display the name of the VNE given to the device as defined in Cisco ANA Manage. The highest level in the navigation pane also displays the device icon and status.

The color of the device icon in the navigation pane reflects its operational health and is the same as the color of the NE component in the device view panel. For more information about indicators of operational health and status, see Network Element Status Indicators, page 2-17.

You can attach a business tag to an NE component by right-clicking it and then choosing **Attach Business Tag**. For more information about business tags, see Chapter 6, “Working with Business Tags and Business Elements.”

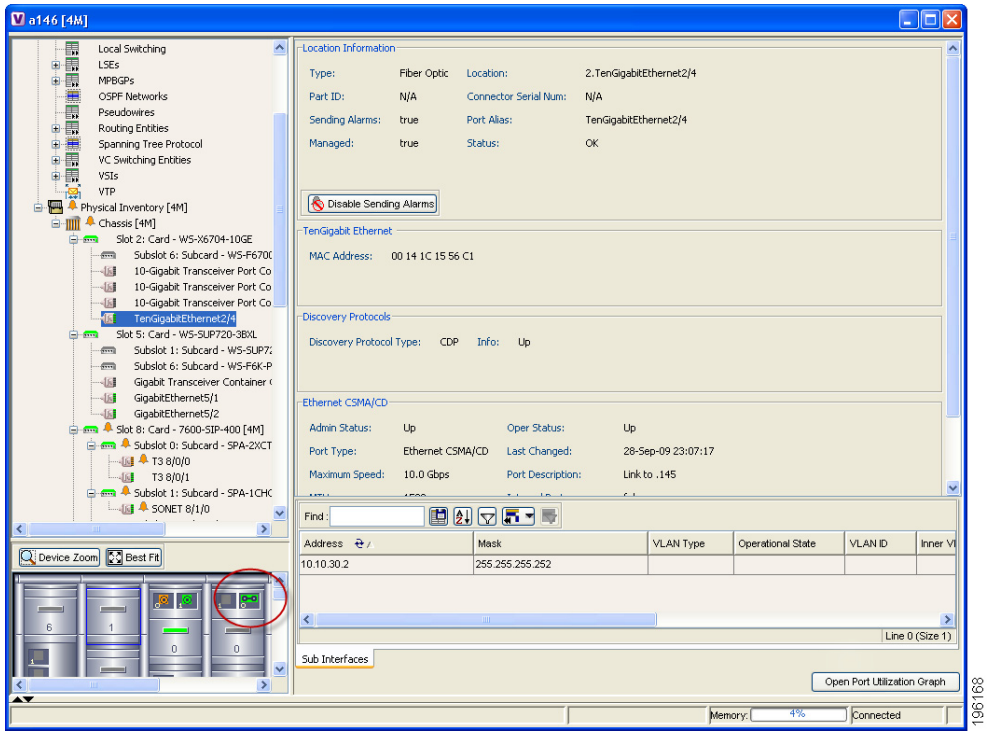
For more information about the right-click menus that are available, see Cisco ANA NetworkVision Shortcut Menus, page 2-29.

Device View Pane

The device view pane enables you to visually locate NEs in the chassis and identify their status. All occupied slots in the chassis are rendered in the device view pane. If a port is down, it is shown in red in both the navigation pane and the device view pane, allowing you to quickly pinpoint the problem.

Figure 3-4 provides an example of the device view pane for a Cisco device. The four slots in the device view pane correspond to the four slots in the physical inventory navigation pane. If you click a port in the device view pane (see the circled port), Cisco ANA displays both the element’s properties and its location in the physical inventory.

Figure 3-4 Device View Pane



Device View Pane Toolbar

The inventory window contains the following tools for working with the device view pane:

Icon	Description
	Displays an enhanced view of the network element components within the device in a browse box as you move over the device view panel with the selection tool.
	Fits the entire view of the device displayed in the device view panel.

Ticket Pane

The ticket pane is displayed at the bottom of the inventory window. The tickets displayed relate to the element selected in the navigation pane. For more information about the ticket pane, see Ticket Pane, page 2-15.

Note The ticket pane can be displayed or hidden by clicking the arrows displayed below the device view panel.

Content Pane

The content pane contains physical or logical inventory information specific to the item you select in the navigation pane or device view panel; for example, chassis or port information.

The content pane can also display context-sensitive tabs and toolbars; the tools displayed depend on your selection in the navigation pane or device view panel. For example, when an ATM port is selected, the Show VC Table tool is displayed on the toolbar.

In addition, you can view the properties of a row in a table by double-clicking the row in the table or by right-clicking it and choosing **Properties**.

For information about tables that appear in the content pane, see Working with Cisco ANA Tables, page 2-40.

Viewing the Physical Properties of a Device

Each device that is managed by Cisco ANA is modeled in the same manner. The physical inventory reflects the physical components of the managed network element. Cisco ANA NetworkVision enables you to view physical inventory information for the following entities:

- Device
- Chassis
- Shelves
- Slots
- Subslots
- Ports, including logical ports

Table 3-3 identifies the icons used to display physical inventory components in the navigation pane.

Table 3-3 Physical Inventory Icons

Icon	Device
	Chassis
	Shelf
	Slot/Subslot
	Port/Logical Port
	Unmanaged Port

Pluggable transceiver modules on Cisco equipment are displayed in a three-level hierarchy:

Container object

Module (such as an SFP container)

Port (such as an SFP or GBIC port)

Physical inventory is continuously updated for both status and configuration. The addition of a new card, the removal of a card, or any change to the device is reflected by the VNE and updated instantly.

For Cisco CRS devices only, fans and power supplies are displayed in physical inventory if they are field replacable units (FRUs). The manner in which the fans are displayed depends on whether the fans are separable or not:

- If the fans under the fan trays are inseparable, only the fan trays are represented.
- If the fans under the fan trays are separable, they are shown as separate items in physical inventory.

The system also includes built-in system properties for each network element. This includes information such as MAC address, maximum transmission unit (MTU), and media type.

Note The window displayed for all the devices is similar in appearance. However, the components contained in each device can vary.

The information displayed in the content area changes according to the device type, device, and component selected in the navigation pane.

The following buttons might be displayed in the inventory window for physical inventory:

- Disable Sending Alarms—Enables you to manage the alarms on a port. For more information, see Managing Port Alarms, page 3-12.
- Open Port Utilization Graph—Displays the selected port traffic statistics: Rx/Tx Rate and Rx/Tx Rate History. For more information, see Opening the Port Utilization Graph, page 3-11.
- Show Encapsulation—Displays encapsulation information for incoming and outgoing traffic for the selected item; for example, for L2 or ATM encapsulation.
- Show Cross-Connect Table—Displays cross-connect information for incoming and outgoing ports.
- Show DLCI Table—Displays data-link connection identifier (DCLI) information for the selected port.
- Show VC Table—Displays virtual circuit (VC) information for the selected port.

For information about configuring topology from a port, see Adding Static Links, page 5-12.

For a detailed description of device properties, see Viewing the Properties of a Device, page 3-2.

Opening the Port Utilization Graph

Cisco ANA NetworkVision enables you to view the Rx/Tx Rate and Rx/Tx Rate History of a port.

Note

- Port utilization graphs are for physical ports only.
- Port utilization graphs are not available for ATM, E1/T1, or ATM IMA interfaces that are included in an IMA group.

To view port utilization statistics:

Step 1 Open the inventory window and double-click the required port.

Step 2 Click **Open Port Utilization Graph** in the Port Connector Properties window.

The following information is displayed in the Port Statistics dialog box:

- Rx Rate—The reception rate as a percentage.
- Rx Rate History—The reception rate history is displayed as a graph.
- Tx Rate—The transmission rate as a percentage.
- Tx Rate History—The transmission rate history is displayed as a graph.

Step 3 Click  to close the Port Statistics dialog box.

Managing Port Alarms

You can enable or disable the alarms on a selected port. By default, alarms are enabled on all ports. When the alarms are disabled on a port, no alarms are generated for the port and they are not displayed in the ticket pane.

Disabling Alarms

To disable alarms:

Step 1 Open the inventory window for the required device.

Step 2 Do one of the following in the navigation pane:

- Right-click the required port and choose **Disable Sending Alarms**,
- Select the port and then click **Disable Sending Alarms** in the context pane.

The Sending Alarms field in the Location Information section of the content pane displays the value false. This indicates that the alarm for the required port has been disabled. In addition, the toolbar in the content pane displays the Enable Sending Alarms tool.

Enabling Alarms

You can enable the alarms on a port at any time.

To enable alarms:

Step 1 Open the inventory window for the required device.

Step 2 In the navigation pane, select the port and then click **Enable Sending Alarms**.

The Sending Alarms field in the Location Information section of the content pane displays the value true. This indicates that the alarm for the required port has been enabled. In addition, the toolbar in the content pane now displays the Disable Sending Alarms tool.

Viewing the Logical Properties of a Network Element

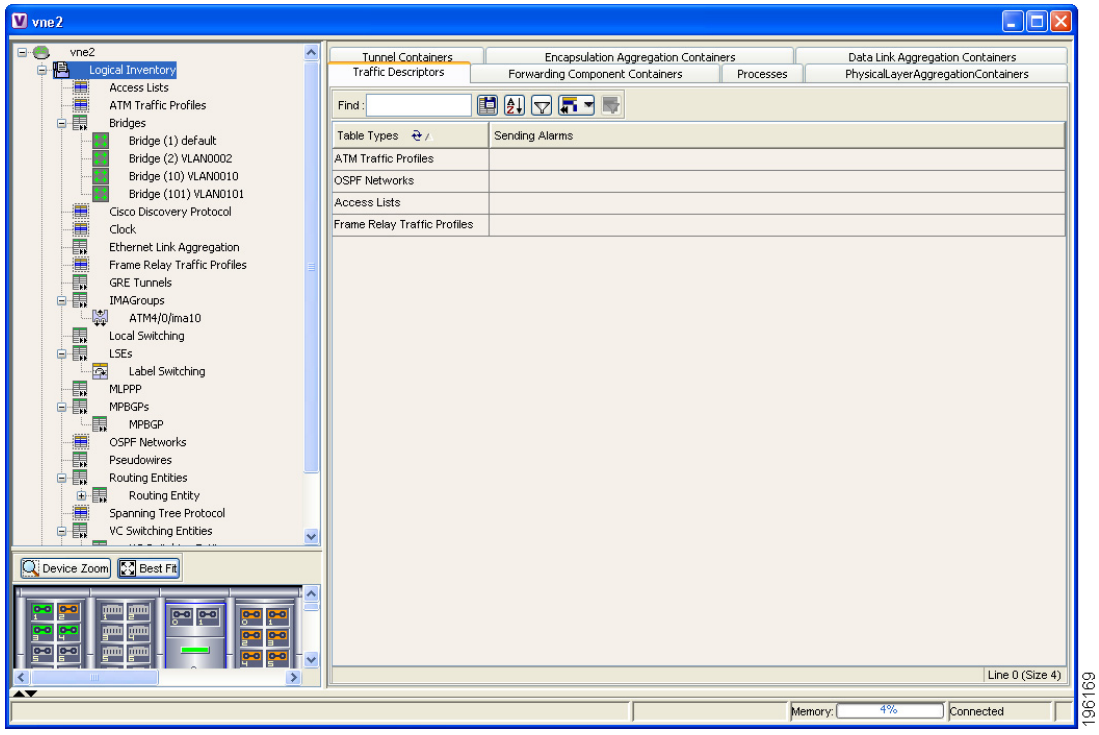
Cisco ANA NetworkVision enables you to view logical inventory information. Cisco ANA maintains logical inventory for each device. The logical inventory reflects dynamic data such as configuration data, forwarding, and service-related components that affect traffic handling in the device.

The information displayed in the inventory window changes according to the device type and branch selected in the navigation pane.

Logical Inventory Window

Logical inventory information is displayed in the inventory window as shown in Figure 3-5.

Figure 3-5 Logical Inventory Information Displayed in the Inventory Window



Note For more information about opening the inventory window, see Opening the Inventory Window, page 3-6.

Logical Inventory Navigation Pane Branches

Table 3-4 describes the branches that appear in the logical inventory navigation pane.

Table 3-4 Logical Inventory Navigation Pane Branches

Name	Description
Access Lists	Provides details on access lists.
ATM Traffic Profiles	Provides details on traffic profiles for ATM.
Bidirectional Forwarding Detection	Provides details related to Bidirectional Forwarding Detection.
Bridges	Provides details on configured VLANs.
Carrier Grade NAT	Provides details on Carrier Grade Name Address Translation (NAT).
CFM	Provides details related to Connectivity Fault Management (CFM).
Cisco Discovery Protocol	Provides details on NEs using Cisco Discovery Protocol (CDP).
Clock	Provides details on network clock service, clock recovery, and Precision Time Protocol (PTP) configuration.
Ethernet Link Aggregation	Provides details on Ethernet aggregation groups.
Frame Relay Traffic Profiles	Provides details on traffic profiles for Frame Relay.
GRE Tunnels	Provides details on generic routing encapsulation (GRE) tunneling protocol for IP tunnels.
IMA Groups	Provides details on Inverse Multiplexing over ATM (IMA) groups.
Link Layer Discovery Protocol	Provides details on Link Layer Discovery Protocol (LLDP).
Local Switching	Provides details on local switching.
LSEs	Provides details on local switching for MPLS interfaces.
MLPPP	Provides details on Multilink Point-to-Point (MLPPP) configurations.
Modular OS	Provide details on modular operating systems for Cisco IOX XR devices.
MPBGPs	Details properties associated with provider edge (PE) network elements. The Multiprotocol Border Gateway Protocols (MP BGPs) inventory folder contains information such as BGP identifier, local and remote Autonomous System (AS), VRF name, cross-VRF routing, and so on.
Operating System	Provides information on the operating system for Cisco IOS devices.
OSPF Processes	Provides details on OSPF processes, such as the Shortest Path First (SPF) timer settings, OSPF neighbors, and OSPF interfaces.
Pseudowires	Provides details on pseudowire end-to-end emulation (PW3E) tunnels.
Resilient Ethernet Protocol	Provides details on Resilient Ethernet Protocol (REP).
Routing Entities	Provides details on routing table entries and IP interfaces.

Table 3-4 Logical Inventory Navigation Pane Branches (continued)

Name	Description
Session Border Controller	Provides details on Session Border Controller (SBC) configuration.
Spanning Tree Protocol	Provides details on STP and Multiple Spanning Tree Protocol (MSTP) configurations.
Traffic Engineering Tunnels	Provides details on traffic engineering (TE) tunnels.
VC Switching Entities	Provides details on cross-connects and VC traffic.
VRFs	Provides details on Virtual Routing and Forwarding (VRF).
VSIs	Provides details on Virtual Switch Interface (VSI) instance names, associated pseudowire information, virtual circuit IDs, and so on.
VTP	Provides details on VLAN Trunk Protocol domain names, modes, version numbers, and so on.

Logical Inventory Navigation Pane Icons

Table 3-5 describes the icons used in the logical inventory navigation pane.

Table 3-5 Logical Inventory Navigation Pane Icons

Icon	Logical Inventory Item	
	Access Lists	Link Layer Discovery Protocol (LLDP)
	ATM Traffic Profiles	Modular OS
	Bidirectional Forwarding Detection (BFD)	Operating System
	Cisco Discovery Protocol (CDP)	Operations, Administration, and Maintenance (OAM)
	Clock	Resilient Ethernet Protocol (REP)
	Ethernet LMI	Session Border Controller
	Frame Relay Traffic Profiles	Spanning Tree Protocol
	IP SLA	Tunnel Traffic Descriptors
	ARP Entity	MPBGPs
	Bridges	OSPF Processes
	Ethernet Link Aggregation	Pseudowires
	GRE Tunnels	Routing Entities
	IMA Groups	Traffic Engineering Tunnels
	Local Switching	VC Switching Entities
	LSEs	VRFs
	MLPPP	VSIs
	Bridge	

Table 3-5 Logical Inventory Navigation Pane Icons (continued)

Icon	Logical Inventory Item
	Connectivity Fault Management (CFM)
	CFM Maintenance Association
	CFM Maintenance Domain
	Cross-VRF
	Encapsulation
	Inverse Multiplexing over ATM (IMA) group
	Label switching
	Logical inventory
	Multiple Spanning Tree protocol (MST) instance
	Virtual Switch Interface (VSI)
	VLAN Trunk Protocol (VTP)

Logical Inventory Content Pane Tabs

Table 3-6 describes the tabs that can appear in the logical inventory content pane, depending on your selection in the navigation pane.

Table 3-6 Logical Inventory Content Pane Tabs

Tab	Description
Data Link Aggregation Containers	Lists the data link aggregations configured on the selected entity, such as Ethernet link aggregations.
Forwarding Component Containers	Lists the context profiles for which logical inventory information can be displayed, such as routing entities and bridges.
Physical Layer Aggregation Containers	Lists aggregations configured at the physical layer for the selected entity, such as IMA groups.
Processes	Lists the processes running on the selected entity, such as Clock or CDP.
Traffic Descriptors	Lists the profiles for which logical inventory information can be displayed, such as Frame Relay traffic profiles and Address Resolution Protocol (ARP) entities.
Tunnel Containers	Lists the types of tunnels that are configured on the selected entity, such as pseudowire or GRE tunnels.

Viewing Device Operating System Information

Cisco ANA discovers and automatically displays operating system information for Cisco IOS and Cisco IOS XR devices in logical inventory.

To view operating system information for Cisco IOS or Cisco IOS XR devices:

Step 1 In Cisco ANA NetworkVision, double-click the required device.

Step 2 For a Cisco IOS device, in the inventory window, choose **Logical Inventory > Operating System**.

Table 3-7 describes the information that is displayed for the Cisco IOS operating system:

Table 3-7 Operating System Information in Logical Inventory

Field	Description
Boot Software	Cisco IOS system image information.
Is K9Sec	Whether or not the K9 security feature is enabled on the operating system: True or False
ROM Version	Cisco IOS bootstrap software version, such as 12.2(33r)SRC3.
OS Version	Cisco IOS software version, such as 12.2(33)SRE, Release Software (fc1).

Step 3 For a Cisco IOS XR device, in logical inventory, choose **Logical Inventory > Modular OS**.

Figure 3-6 shows an example of the information that is displayed for Cisco IOS XR devices.

Figure 3-6 Modular OS Information in Logical Inventory

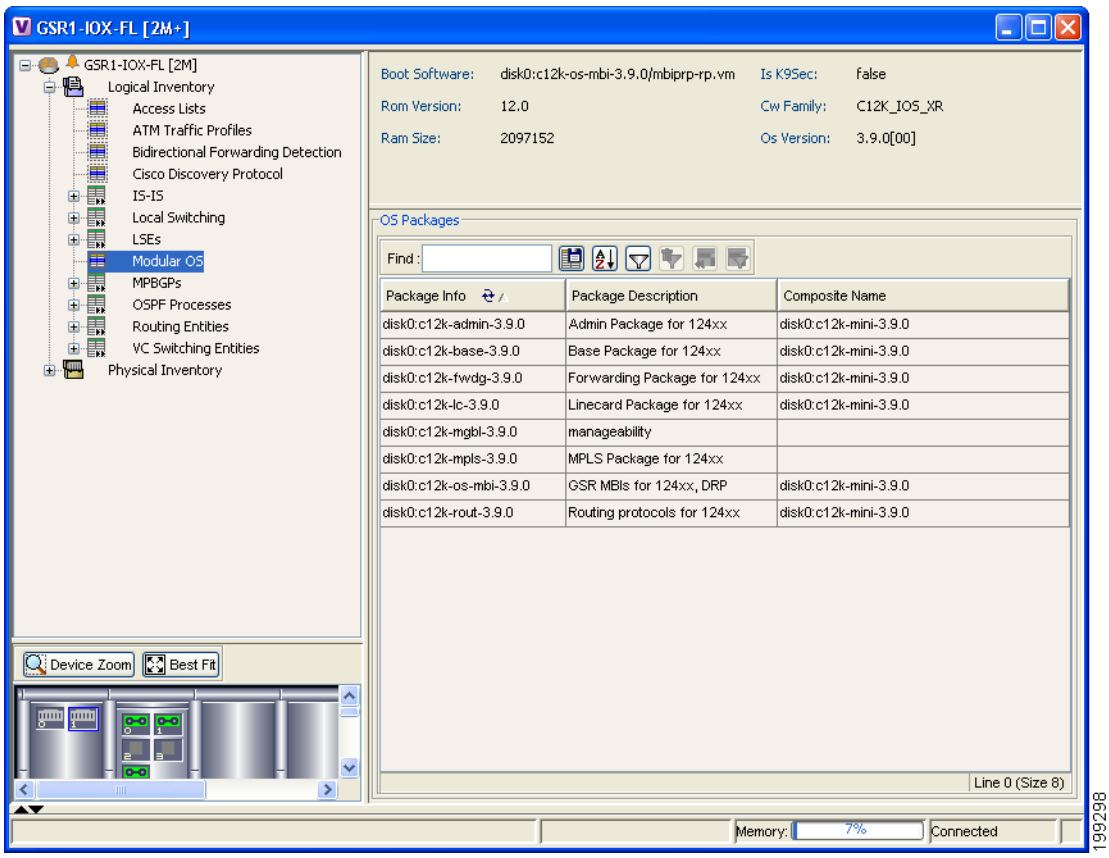


Table 3-8 describes the information that is displayed for Cisco IOS XR system.

Table 3-8 Modular OS Information in Logical Inventory

Field	Description
Boot Software	Cisco IOS XR system image information.
Is K9Sec	Whether or not the K9 security feature is enabled on the operating system: True or False
ROM Version	Cisco IOS XR bootstrap software version, such as 1.51.
Cw Family	Cisco software family, based on the device platform, such as CRS_IOS_XR or C12K_IOS_XR.
RAM Size	Size, in kilobytes, of the device processor RAM.
OS Version	Cisco IOS XR software version, such as 3.8.0[00].
OS Packages Table	
Package Info	Information on the individual package and its version, such as disk0:hfr-admin-3.8.0.

Table 3-8 Modular OS Information in Logical Inventory (continued)

Field	Description
Package Description	Description of the package, such as FPD (Field Programmable Device) Package.
Composite Name	Composite package name of the package, such as disk0:comp-hfr-mini-3.8.0.

Step 4 To view details about an individual package, double-click the package in the OS Packages table. The OS Package Properties window is displayed as shown in Figure 3-7.

Figure 3-7 OS Package Properties Window

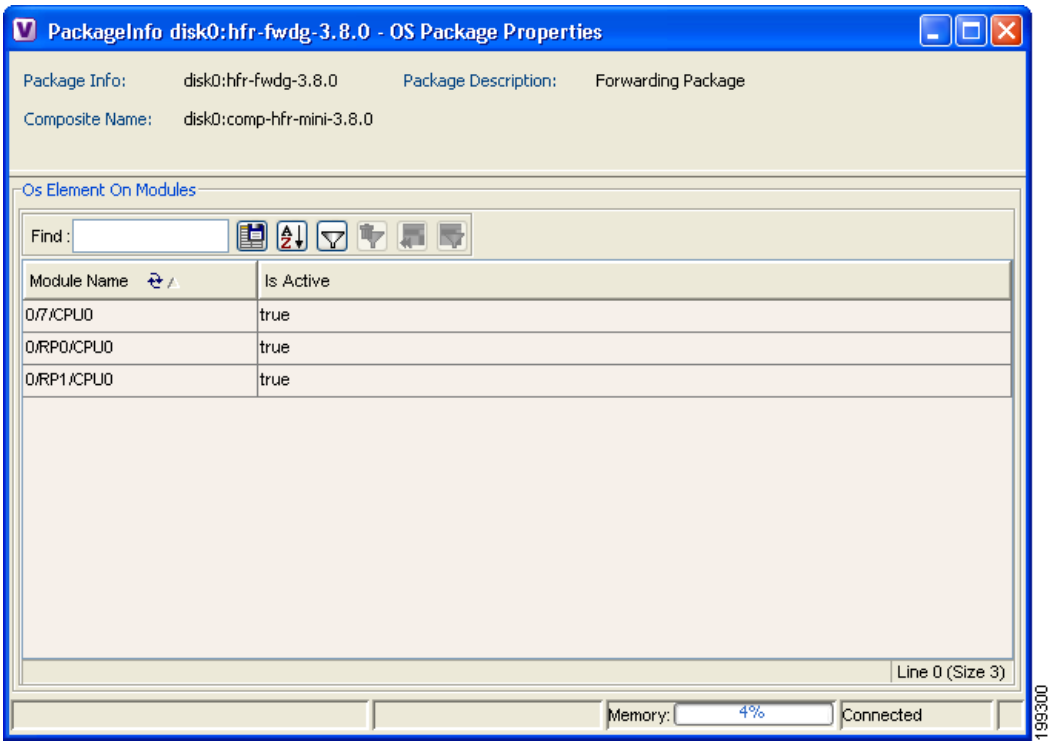


Table 3-9 describes the information displayed in the OS Package Properties window.

Table 3-9 OS Package Properties Window

Field	Description
Package Info	Information on the individual package and its version, such as disk0:hfr-admin-3.8.0.
Package Description	Description of the package, such as FPD (Field Programmable Device) Package.
Composite Name	Composite package name of the package, such as disk0:comp-hfr-mini-3.8.0.
OS Element on Modules	
Module Name	Name of the module on which the package is installed.
Is Active	Whether or not the package is active: Yes or No.