Cisco Active Network Abstraction NetworkVision User Guide Version 3.6

CONTENTS

About This Guide

This User Guide describes Cisco ANA NetworkVision and its use in network based environments. It is intended for use by network administrators and anyone else responsible for the management, fulfillment, planning and assurance of the integrity of network resources.

It includes the following chapters:

- Chapter 1, "Cisco ANA Client Overview" describes the Cisco ANA Client application suite. In addition, it provides a brief explanation of the terms used in this guide.

- Chapter 2, "Getting Started" describes the Cisco ANA NetworkVision working environment and how to access the Cisco ANA NetworkVision tools and commands. In addition, it describes how to customize Cisco ANA NetworkVision's startup and display options.

- Chapter 3, "Working with Cisco ANA NetworkVision Tables" describes how to work with Cisco ANA NetworkVision's tables and how to perform general Cisco ANA NetworkVision functions, for example, printing, filtering and saving a map image.

- Chapter 4, "Working with Cisco ANA NetworkVision Maps" describes how to use Cisco ANA NetworkVision to perform various operations with the network maps including adding and aggregating devices.

- Chapter 5, "Viewing Device Properties" describes how to view the properties of a device and provides a description of these properties. In addition, it provides a brief description on Virtual Network Element (VNE) properties.

- Chapter 6, "Viewing Network Device Inventory" describes how to view the physical and logical inventory of devices and the relationship between them. In addition, it describes opening the port utilization graph, the DLCI/VC/Cross Connect tables and managing port alarms.

- Chapter 7, "Working with Links" describes how to view information about the physical links between ports. In addition, it describes adding links between devices.

- Chapter 8, "Working with Tickets" describes how Cisco ANA NetworkVision correlates alarms and how to view the tickets and tickets properties, including correlated alarms, active alarms and alarm history. In addition, it describes ticket management and the different ways in which a ticket is displayed in the ticket pane depending on the status/severity of the alarm.

- Chapter 9, "Working with Cisco ANA PathTracer" describes how to view a network path between two network objects using Cisco ANA PathTracer, in a circuit-switched network, like Frame Relay or ATM, or in packet-switched networks like Ethernet and IP. In addition, it describes the Cisco ANA PathTracer working environment.

- Chapter 10, "Working with Business Tags" describes how to manage and view business tag information.

- Appendix A, "Icon Reference" provides a quick reference guide to the Cisco ANA NetworkVision icons.

> **Note** Changes to the registry should only be carried out with the support of Cisco Professional Services.

Related Documentation

For more detailed information, refer to the following publications:

- *Cisco Active Network Abstraction Managing MPLS User Guide*
- *Cisco Active Network Abstraction EventVision User Guide*
- *Cisco Active Network Abstraction Administrator Guide*
- *Cisco Active Network Abstraction Command Builder User Guide*
- *Cisco Active Network Abstraction Installation Guide*
- *Cisco Active Network Abstraction Customization User Guide*

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Cisco ANA Client Overview

This chapter provides an overview of the Cisco ANA Client application suite, and in addition, it provides a brief explanation of the basic concepts, terms and acronyms used in this guide.

- Cisco ANA NetworkVision, page 1-1, provides a description of Cisco ANA NetworkVision, including the Cisco ANA Soft Properties Manager and the Cisco ANA Command Builder.
- Events, Tickets and Alarm Definitions, page 1-3, defines events, tickets and alarms.
- Basic Terminology, page 1-4, defines the terminology used throughout this guide.

Cisco ANA provides a suite of GUI tools that offer an intuitive interface for managing the network and services and performing the required system administration activities. The Cisco ANA Client application suite consists of the following:

- Cisco ANA NetworkVision, as described in Cisco ANA NetworkVision, page 1-1.
- Cisco ANA EventVision. For more information, refer to the *Cisco Active Network Abstraction EventVision User Guide*.
- Cisco ANA Manage. For more information, refer to the *Cisco Active Network Abstraction Administrator Guide*.

Note Changes to the registry should only be carried out with the support of Cisco Professional Services.

Cisco ANA NetworkVision

Cisco ANA NetworkVision is the main GUI for Cisco ANA. It is a surveillance tool providing total visibility for multi-vendor, multi-tier, multi-technology networks. It also supports fault and configuration functionality. The highly optimized, customizable GUIs enable constant, system-wide surveillance of the network and service states, down to the node level.

Cisco ANA NetworkVision supports the creation of multiple network maps in order to represent specific network views. Views can cover specific network segments, customer networks, or any other mix of network elements desired. Once the maps have been created, they are available for all connecting clients (with support for fine grained access privileges).

Cisco ANA NetworkVision enables you to:

- View network inventory and multilayer connectivity
- Troubleshoot, monitor and manage Network Elements (NEs)

- Model and view network maps maintaining up to date topological information on device connections, traffic and routes

The NetworkVision maps based on Cisco ANA's representation of VNEs (Virtual Network Elements) provides a graphic display of active faults and alarms and serves as an easy access point for activation of services. Cisco ANA provides rich functionality for displaying and managing the network maps by providing:

- Multiple concurrent maps per user.

- Easily customizable hierarchy of nested sub-maps, NE aggregations and business tags with easy navigation up and down the hierarchy.

- Dual views of the network in a hierarchical tree, as well as in topological maps, including all network connections.

- NEs and links using color cues and graphic symbols to indicate status and alarms.

- Every NE (either from the tree or map) allows mouse point-and-click drill-down providing detailed internal physical and logical inventory information.

NetworkVision is also the launch point for related tools such as the Command Builder, Soft Properties Manager and the Cisco ANA PathTracer.

For specific details on using Cisco ANA NetworkVision when working with MPLS VPN service network maps, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Cisco ANA PathTracer

Cisco ANA PathTracer enables end-to-end route tracing to be performed with informative performance information displayed simultaneously for the multiple networking layers. Upon receiving a path's start and endpoint, Cisco ANA PathTracer visually traces the route through the network. For more information about Cisco ANA PathTracer, see Chapter 9, "Working with Cisco ANA PathTracer".

SoftProperties Manager

The Cisco ANA Soft Properties Manager enables you to manage soft properties and Threshold Crossing Alarms (TCA).

The Soft Properties Manager allows you to extend the set of supported properties for each Network Element (NE), by adding soft properties to the Virtual Network Elements (VNEs). These properties extend the Cisco ANA IMO and are available through the client GUI as well as through the BQL API.

Soft properties are retrieved from the NE using SNMP, Telnet/SSH or TL1.

In addition, alarm thresholding enables the user to constantly monitor selected properties and generate an alarm every time they cross a user-defined threshold or violate a condition.

The Soft Properties Manager tool is typically used by integrators and any other users who want to manage the soft properties and TCA alarms that are executed within the Cisco Active Network Abstraction (ANA) platform.

For more information on the Cisco ANA Soft Properties Manager, refer to the *Cisco Active Network Abstraction Customization User Guide*.

Cisco ANA Command Builder

The Cisco ANA Command Builder enables you to execute a programmable sequence of SNMP or Telnet command lines. These commands can include data properties taken from the Cisco ANA information model (built-in), as well as user-defined input parameters entered during runtime.

The Command Builder is launched from a Managed Element (Cisco ANA modeled VNE) such as a port, typically from the NetworkVision's Inventory window. The Managed Element will then be used to develop and test the command. Once the command has been completed it can be published and attached to a wider scope of Managed Elements.

For more information on the Cisco ANA Command Builder, refer to the *Cisco Active Network Abstraction Command Builder User Guide*.

Events, Tickets and Alarm Definitions

Cisco ANA NetworkVision displays Ticket information created by Cisco ANA's discovery and correlation of system and network events and alarms.

In the Cisco ANA context, the relationship between events, alarms and tickets is as follows:

- An event is an indication of a distinct "activity" that occurred at a specific point in time. Events are derived from incoming traps or notifications and from detected status changes. Examples of events include:

- Port status change

- Route entry drop

- Device reset

- Device becoming reachable

- User acknowledgement of an alarm

  Events are written to the ANA database once and never change.

- An alarm represents a fault scenario that occurs in the network or management system. Alarms represent the complete fault lifecycle, from the time that the alarm is opened (when the fault is first detected) until it is closed and acknowledged. Examples of alarms include:

  - Link down

  - Device unreachable

  - Card out

  - Root cause correlation is determined between alarms (namely, between event sequences). It represents a causal relationship between an alarm and the consequent alarms that originate from it.

  For example, a Card-out alarm can be the root cause of several link down alarms, which in turn can be the root cause of multiple Route-lost and Device unreachable alarms, and so on (a consequent alarm can serve as the root cause of other consequent alarms).

- A ticket represents the complete alarm correlation tree of a specific fault scenario. It can be also identified by the topmost ("root of all roots") alarm. Cisco ANA NetworkVision's Ticket Properties dialog box displays only tickets, but allows drilling down to view the consequent alarm hierarchy.

From an operator's point of view, the managed entity is always a complete ticket. Operations such as Acknowledge, Force-Clear or Remove are always applied to the whole ticket. The ticket also assumes an overall, propagated severity (severity equal to the highest severity of the constituent alarms).

Basic Terminology

This section describes the terminology used throughout this guide.

Acronyms

The following acronyms are used throughout this guide:

Table 1-1   Acronyms

Acronym	Full Name	Description
General		
ANA	Active Network Abstraction	Reference for the entire Cisco ANA solution.
VNE	Virtual Network Element	Reference to a network and device agent
Client		
ANA	Active Network Abstraction	User CLI
EV	Cisco ANA EventVision	
NV	Cisco ANA NetworkVision	
VNE		
DC	Device Component	
NE	Network Element	
AVM	Autonomous Virtual Machine	

Basic Concepts and Terms

This section provides a description of the concepts and terms used throughout this guide.

Table 1-2   Basic Concepts and Terms

Aggregation/ Aggregated Node	Managed Element
Alarm	Network Object
Business Element	Physical Element
Business Tag	Physical Link
Business Link	Provider
Device/Network Element (NE)	Severity Propagation
Device/Network Element Components	Subscriber
Event	Ticket
Link	Virtual Cloud / Unmanaged Network

Table 1-2   Basic Concepts and Terms (continued)

Logical Element	VPN
Logical Link	

Table 1-3   Definitions

Term	Description
Event	An event is an indication of a discrete "activity" that occurred at a specific point of time. Events are determined from incoming traps/notifications and from detected device changes.
Alarm	A series of events having the same source and type.
Ticket	A ticket represents a faulty scenario that occurs in the network or management system. Tickets represent the complete fault lifecycle, from the time that the ticket is opened (when the fault is first detected) until it is closed and acknowledged. It is a correlation of multiple alarms (namely, event sequences). It represents a causal relationship between an alarm and the consequent alarms that originated from it. It is identified by the root cause alarm. Only tickets are displayed in Cisco ANA NetworkVision's ticket pane in the Cisco ANA NetworkVision window. Tickets are also displayed in the Inventory Properties window. Drill down to view the consequent alarm hierarchy when opening the ticket's properties.
Severity Propagation	The network objects' calculated status is propagated from the source/children (namely, the network element component) to the final destination (namely, the network element and tree) via defined relationships.
Aggregation/ Aggregated Node	Zero or more map elements joined together as an aggregation.
Physical Element	A user named physical component/device existing in the network.
Logical Element	A user named logical component, for example, a routing table.
Business Element	Cisco ANA supports the mapping of service-related information to the network resources. This mapping is achieved using a business element that is a wrapper to a network element or service. The VPN is a business element, which represents a set of interconnected Sites forming a single virtual private network over a public network. Cisco ANA organizes the business elements in a way that creates a containment hierarchy that reflects the VPN structure.
Managed Element	Anything managed by the system, usually a component managed by the VNE, for example, a device, cloud, ICMP VNE.
Link	A physical or logical link between: • Two devices in the network • A device and an aggregation • Two aggregations
Physical Link	A link between physical Network Objects, for example, a connection between two physical ports.

Table 1-3   Definitions (continued)

Term	Description
Logical Link	An association between two logical elements (based on a chain of physical elements), for example, a tunnel.
Business Link	An association between: • Logical (protocol oriented configuration) to physical • Logical to logical • Business link to anything For example, in a VPN an association between the physical IP interface and VRF (which is the associated routing table).
Device/Network Element (NE)	A user named physical component/device existing in the network.
Device/Network Element Components	A component of a network element, for example, a port, routing table and so on.
Network Object	Network Objects include network element components, network elements and links.
Virtual Cloud / Unmanaged Network	Virtual clouds are used for representing unmanaged network segments and are displayed as a cloud. Cisco ANA establishes if network problems emanate from the unmanaged network, namely, the cloud.
VPN	The VPN is a business element, which represents a set of interconnected Sites forming a single virtual private network over a public network.
Business Tag	A "business" tag is a record that points to a network object. Each business tag has a "key" field, which is a unique identifier for the entity and its name (refer to Business Element). There are three types of tags, namely, subscriber, provider, and label. Business tags are stored in the Cisco ANA Gateway database.
Provider	The party providing the service.
Subscriber	The party receiving the service.

C H A P T E R 2

Getting Started

This chapter describes the Cisco ANA NetworkVision working environment and how to access the Cisco ANA NetworkVision tools and commands.

The Cisco ANA NetworkVision window provides access to all Cisco ANA NetworkVision's functionality.

- Starting Cisco ANA NetworkVision, page 2-1 describes how to login to Cisco ANA NetworkVision.
- Cisco ANA Security, page 2-3 describes the enhanced security provided when working with and managing the Cisco ANA system.
- Cisco ANA NetworkVision Window, page 2-5 describes the Cisco ANA NetworkVision window, including the tree pane, workspace and properties pane, ticket pane, toolbar and menus.
- Changing a User Password, page 2-31 describes how the user can change their login password.
- Selecting Cisco ANA NetworkVision Map and Alarm Options, page 2-31 describes how to customize Cisco ANA NetworkVision's startup and display options.
- Logging Out, page 2-32 describes how to log out of Cisco ANA NetworkVision.

Starting Cisco ANA NetworkVision

This section provides instructions for launching the Cisco ANA NetworkVision application. Cisco ANA NetworkVision is password protected to ensure security. Before you start working with Cisco ANA NetworkVision make sure you know your username, password and the Cisco ANA Gateway IP address or hostname that you require.

> **Note** If a user does not login to the Cisco ANA Manage, NetworkVision or EventVision applications during a specified period of time (the default is one month) the user's account will be automatically locked. The default period can be changed per user in Cisco ANA Manage. The period of time is measured from the time the user last logged out of any of the Cisco ANA Client applications.

The security level required in order to perform the specific Cisco ANA NetworkVision function is indicated in this User Guide by means of icons.

For more information about the icons used, see Cisco ANA Security, page 2-3.

To start Cisco ANA NetworkVision:

Step 1   From the Start menu, select the **Programs** folder, then **Cisco ANA/Cisco ANA NetworkVision**.

or

Click on the Cisco ANA NetworkVision quick launch icon in the taskbar. The Cisco ANA NetworkVision Login dialog box is displayed.

The last four Cisco ANA Gateways to which the user logged in successfully are displayed in the **Host** dropdown list. The list is displayed in chronological order with the most recent Cisco ANA Gateway displayed at the top of the list.

Step 2   Enter your **User Name**, and **Password**.

Step 3   Enter the required Cisco ANA Gateway's information in the **Host** field, as an IP address or hostname,

or

Select a Cisco ANA Gateway from the **Host** dropdown list.

> **Note**   The Cisco ANA Gateway IP address or hostname that was used when you last logged in is automatically displayed at the top of the **Host** dropdown list.

> **Note**   Make sure that you use the leading IP address (the IP on which the Cisco ANA Gateway was configured) when logging in to the system.

Step 4   Click **OK**. The Cisco ANA NetworkVision window is displayed.

> **Note**   When logging in there is an update on minor fixes.

> **Note**   The Cisco ANA NetworkVision window appears empty when it is opened for the first time. You can create a new map and/or open a map that has been previously saved, see Chapter 4, "Working with Cisco ANA NetworkVision Maps", in order to view a network.

After logging in to Cisco ANA NetworkVision and launching the application, you may customize Cisco ANA NetworkVision's **Options,** namely, Start / Display /Audio settings, for example, you can:

- Load the workspace with information when starting NetworkVision
- Display network elements in the NetworkVision Map and tree panes
- Configure audio responses when different alarms are triggered

For more information on how to customize Cisco ANA NetworkVision's startup and display options, see Selecting Cisco ANA NetworkVision Map and Alarm Options, page 2-31.

Cisco ANA Security

Cisco ANA provides enhanced security when working with and managing the Cisco ANA system. Users are assigned permission levels for an operational scope, which enable them to perform only the functions assigned to the scope and defined security level. A user can be assigned more than one security level.

Permission

The user's ability to perform certain tasks. There are two types of permissions, namely, default and NE related.

- **Default—**The default permission only applies to the activities that are related to GUI functionality, not the activities related to network elements. For example, a user with the default permission Viewer can view maps and the Device List. For more information, refer to *Cisco Active Network Abstraction Administrator's Guide*.

- **Network Element—**The NE related permission enables the administrator to group a collection of managed network elements together (in Cisco ANA Manage) in order to enable the user to view and/or manage the NEs based on the user's role or permission. After the user is allocated a scope (list of network elements) and a role, the user can then perform various activities on the network elements, for example, manage alarms in Cisco ANA NetworkVision. For more information, refer to *Cisco Active Network Abstraction Administrator's Guide*.

Roles

Cisco ANA implements a security engine that combines a role-based security mechanism that is applied on scopes of network elements granted per user. The system supports user accounts creation, multiple network element scope definition and a set of five pre-defined roles for security and access control to allow different system functions:

Table 2-1   Security and Access Control Roles

	Viewer—Read only access to the network and to non-privileged system functions.
	Operator—Configure business tags and perform most day-to-day operations.
	Operator Plus—Able to fully control alarm life cycle and create maps.
	Configurator—Activate services, and configure the network.
	Administrator—Manage the system configuration and security.

This guide uses the icons displayed above (listed in order from lowest to highest security level) to indicate the security level required in order to perform specific Cisco ANA NetworkVision functions.

> **Note** A user with a higher security level can perform all the Cisco ANA NetworkVision functions assigned to a user with a lower security level.

Each user is assigned a permission level for an operational scope, which enables the user to perform certain tasks. Every user has a private username and password. A user can login from any workstation with the user's own set of permissions and operational scope.

When a user does not have the required permission level to perform a function the appropriate menu option or button is disabled.

The administrator is responsible for defining the types of activities that the user can view and perform using Cisco ANA Manage.

For more information about user security and defining operational scopes, refer to the *Cisco Active Network Abstraction Administrator's Guide*.

Roles can be granted per scope or at an application level (default permission), namely, all the activities that are related to GUI functionality, not the activities related to devices. The default permission includes:

- Application login.

- Manage alarms in Cisco ANA NetworkVision.

- Manage maps—Creating, deleting, and opening.

- Map manipulation—Arrange map, including, aggregations, adding NEs, NEs placement in map, map background and so on.

- Business tag management.

Scopes

A scope is a named collection of managed network elements that have been grouped together in order to allow a user to view and/or manage the network elements provided a given role. Grouping can be based on geographical location, network element type (such as DSLAM, router, SW, and so on), network element category (such as access, core, and so on) or any other division according to the network administrator's requirements.

Using NetworkVision, a user that has been assigned a scope can view and/or manage the NEs within this scope according to the role assigned to the user as per the scope. The user cannot view any information regarding NEs that are outside the user's scope, including basic properties, inventory, and alarms.

Cisco ANA NetworkVision Window

The Cisco ANA NetworkVision window with an open map is displayed below.

Figure 2-1   Cisco ANA NetworkVision Window
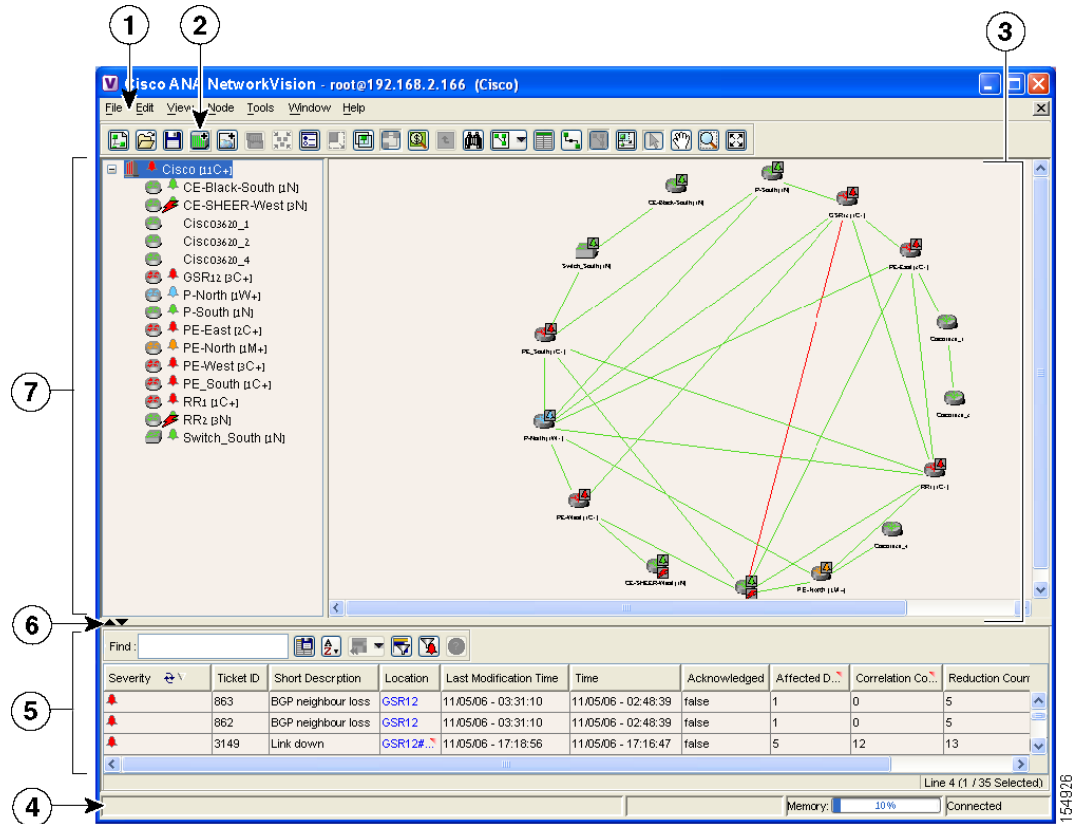
1	Menu bar
2	Toolbar
3	Workspace
4	Status bar
5	Ticket pane
6	Hide/display ticket pane
7	Tree pane

The Cisco ANA NetworkVision window is divided into three main areas or panes, as follows:

- Tree Pane
- Workspace, including the map pane, device view and links view.
- Ticket Pane

Note   The ticket pane can be displayed or hidden by clicking the arrows below the tree pane.

The status bar which is the horizontal area at the bottom of the main Cisco ANA NetworkVision window and other Cisco ANA NetworkVision windows provides information about the current state of what you are viewing in the window relating to the application. There are two states, namely, Connected and Reconnecting. It also displays what is happening to the command that has been sent while the application is waiting for an answer.

In addition, the memory utilization bar in the status bar displays the amount of memory used by the client. By default if memory utilization exceeds 60% it is colored yellow and if it exceeds 80% it is colored red. The default percentage and color values can be configured in the registry.

Dragging the borders of the Cisco ANA NetworkVision window adjusts the size of each pane. The tree pane, and workspace are correlated; this means that selecting an option in the one pane affects the information displayed in the other pane.

Some of the functions that the Cisco ANA NetworkVision window enables you to perform are:

- View the network.
- View device properties.
- View physical and logical inventory information.
- View a complete list of the physical links and their status.
- View link properties.
- View and manage tickets.

Tree Pane

The tree pane displays a tree-and-branch representation of the network elements and aggregations defined for the loaded map.

The highest level of the tree pane displays the map name, for example, the name of a geographic region, country or a state. When the map name is changed, the Cisco ANA NetworkVision window is updated. The new map name is displayed at the top of the tree pane and in the title bar of the window between brackets.

The lowest level of the tree pane displays a single NE, for example, a router and the device name or the name of the business tag. The tool tip displays the NE name, NE type and IP address. For information about the status of Network Objects, see Status of Network Objects, page 2-15.

Workspace

The workspace enables you to view and modify low-level information. It includes the following areas:

- **Map Pane**—Displays managed network elements on a geographical map. For more information see Map Pane, page 2-7.
- **Device View**—Displays the details of the network devices contained in the currently selected hierarchy or sub-network (map), for example, the IP Address and Vendor. For more information see Device View, page 2-9.
- **Links View**—Displays a complete list of the links shown in the map pane and their status. For more information see Links View, page 2-11.

When a user switches between the map pane, device view and links view the following is preserved:

- The network elements and/or links selected

- The sorting preferences

- The filtering preferences, as defined using:

  – The Map Options dialog box, see Filtering Links According To Type, page 4-17.

  – The Filter dialog box, see Defining a Filter, page 3-2.

  – The links view collection method, see Filtering Links Using the Collection Method, page 7-10.

Map Pane

Cisco ANA NetworkVision displays managed network elements in the map pane. In addition, the map pane displays the links or aggregated links and relationships between the network devices, aggregated nodes (topology), and networks on a geographical map.

Each NE is displayed using a NE icon, the color of which reflects severity, as described in the Map Pane, page 2-7. In addition, a management state or alarm icon is displayed together with the IP address. For more information see Appendix A, "Icon Reference". The tool tip displays the NE name, NE type and IP address.

The **links** or aggregated links that are presented in the map pane:

- Display arrowheads if they are unidirectional

- Do not have arrowheads if they are bi-directional

Note   A maximum number of 4000 links can be displayed in the map (configurable in the registry). If this number is exceeded a warning message is displayed and all the lines (links) are removed from the map (they are still displayed in the links view). In addition, the map is surrounded by a red border. Filtering the links may reduce the number of links so that the client can return to a normal state.

The links display tool tips that provide you with information regarding the number of links and partially describe the list of links. Physical links are highlighted in bold.

Note   If there is a link filter applied to the map then the links tool tip displays only the relevant links.

The map pane enables network objects to be viewed down to the device level. An example of the map pane is displayed in the Cisco ANA NetworkVision Window, page 2-5.

The devices can be moved manually on the geographical map by dragging the required device. In addition, clicking **Layout** on the toolbar or using the **Zoom** tools in the menu bar can change the way that the devices are displayed on the map.

Note   Click **Map pane** on the toolbar to display the map pane in the Cisco ANA NetworkVision window.

Some of the functions that can be performed using the right-click shortcut menu in the map pane are:

- View device inventory. For more information see Chapter 6, "Viewing Network Device Inventory".

- Aggregate devices. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

- Create and attach business tags. For more information see Chapter 10, "Working with Business Tags".

- Create and view tickets. For more information see Chapter 8, "Working with Tickets".

- Change the view and content of network maps. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

- Communicate with network devices. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

- Configure the topology. For more information see Chapter 7, "Working with Links".

- View device information, namely, device properties. For more information see Chapter 5, "Viewing Device Properties".

Note   Most of these functions can also be performed from the tree pane's right-click shortcut menu.

When working with this functionality for MPLS VPN networks, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

The following icons are used to display the network elements in the Cisco ANA NetworkVision window's tree pane and map panes:

Table 2-2   Device Icons

Icon	Device
	Unmanaged Network
	Network, sub-network or logical aggregation
	Router
	Generic SNMP
	Ethernet Switch
	DSLAM
	ATM switch
	BRAS
	Ping VNE
	Viewable by a user with a higher permission level
	Ghost device

Note   When Cisco ANA NetworkVision detects a network device for which there is not enough information available, the device is displayed as a ghost device on the map. In this case, the user is unable to view the ghost device's properties or communicate with the ghost device. When the ghost device's information is updated, its icon is replaced with the relevant device icon and all the related device information and communication become available.

The following colors are used to display the **severity** (or propagated severity) of a network device when displayed in the map pane, tree pane and ticket pane:

- **Red—**Critical.
- **Orange—**Major.
- **Yellow—**Minor.
- **Sky Blue—**Warning.
- **Green—**Cleared/Normal/OK.
- **Dark Blue—**Information.

Note   The Information severity does not affect the severity (color) of the network object.

- **White—**Indeterminate.

The same coloring conventions apply to the link severity displayed in the map pane and links view.

Note   The color of a selected link is customizable. The default color is blue.

When an aggregated node is selected in the tree pane, the map pane displays the devices contained within the aggregated node and the relationships between them.

For more information about how the status of a network device is displayed in the map pane, see Status of Network Objects, page 2-15.

Device View

The device view displays the details of the network devices contained in the currently selected hierarchy (map), for example, the IP Address and Vendor.

Note
- Click **Device View** on the toolbar to display the device view in the Cisco ANA NetworkVision window.
- Locked devices only display **Managed Element** information and the locked device icon.
- Use the scroll bar to view all the columns in the table.

The following columns are displayed in the device view:

- **Managed Element—**The device name of the element managed by Cisco, as defined in Cisco ANA Manage. It also displays a device icon, the color of which reflects severity. In addition, the management state or an alarm icon is displayed.

- **IP Address**—The IP address used for managing the device as a hyperlink that opens the properties of the relevant device.

- **System Name**—The system name of the device, as defined in the device's MIB, for example, Router. If it is Telnet then it is the prompt.

- **Communication State**—The communication status with the device or VNE, for example, Device Unreachable. For more information see Management State, page 2-17.

- **Investigation State**—The investigation status of the VNE, for example, normal, initializing, maintenance or unsupported.

- **Element Category**—The device category, for example, Router or ATM-Switch.

- **Element Type**—The device type (manufacturer name), for example, Cisco 7200.

- **Vendor**—The vendor name.

- **Up Since**—The date and time when the device was last reset.

- **Sending Alarms**—The status of alarms on the device, namely, enabled (true) or disabled (false) in the Cisco system. This can be enabled on only part of the device.

Warning   **There is an option to add the System Description, Location and Contact columns to the device view, however, this will increase memory consumption. Changing these settings must be done with the support of Cisco Professional Services.**

Note   Clicking on a red triangle displayed in a cell expands the cell to display all the information. You can also use a tool tip to view all the information.

The following buttons are displayed in the device view toolbar:

Table 2-3   Device View Toolbar

	Export to CSV—Enables you to export the information displayed in the device view. Either the selected row(s) is exported or when nothing is selected the entire table is exported.
	Sort Table Values—Enables you to sort the information displayed in the device view, for example, according to *element category*.
	Filter—Enables you to define a filter for the tickets displayed data displayed in the table according to a selected column. **Note** When a filter is applied the Set Selection Filter button is activated.
	Previous Selection Filter—Enables you to undo the last applied filter selection.
	Rewind All—Enables you to undo previous filter selections, and displays all the original information in the device view.

See Chapter 3, "Working with Cisco ANA NetworkVision Tables", for more information about filtering and finding details about a device displayed in Cisco ANA NetworkVision's tables, and for the keyboard shortcuts used for accessing table functionality.

Some of the functions that can be performed using the right-click shortcut menu in the device view are:

- View device information, namely, device properties. For more information see Chapter 5, "Viewing Device Properties".
- View device inventory. For more information see Chapter 6, "Viewing Network Device Inventory".
- Configure the topology. For more information see Chapter 7, "Working with Links".
- Configure and view Business Tag information. For more information see Chapter 10, "Working with Business Tags".

Note Clicking on a header in the device view sorts the information displayed, for example, according to an Element Category.

Links View

The links view is displayed in the Cisco ANA NetworkVision window when clicking [icon] on the toolbar.

When the user views a map, it may, for example, have many links or aggregated links. This may make it difficult for the user to view the links that are required. The links view enables the user to clearly view the required links, and in addition the user can easily search for a specific link. The links view provides the user with an easy to access complete list of the various types of links displayed on the map (the links view is context sensitive). The user can also view the status of the link.

Note You can view and filter the links according to type using the Map Options dialog box. For more information see Filtering Links According To Type, page 4-17.

Note Business links are part of the links view. For information about business links, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Any links that are added or removed from the map are automatically added or removed from the links view provided they have not been filtered out.

The links view is selection sensitive, namely, the links displayed in the links view depend on the context selected in the tree pane or map pane. For example, if an aggregated node or aggregated link is selected then the links of the selected context are displayed in the links view.

The links view is displayed below.

Figure 2-2   Links View

Note   An external link has a gray cell background in the table, and the Inventory window can be opened by clicking the hyperlink. For more information about external links, see Working in Links View, page 7-8.

The following columns are displayed in the Links View window:

- **Context**—The name of the map, aggregated node or sub-aggregated node containing the link.
- **Severity**—Displays a severity bell icon, which is colored according to the severity of the alarm on the link. This indicates the impact of the alarm on the network. For more information about severity, see Map Pane, page 2-7.
- **A End-Point**—The device or site that is the source of the link as a hyperlink to the inventory of the device or site.
- **Bi Directional**—The direction of the link, namely, **true** (bi-directional) or **false** (unidirectional). If the link is unidirectional (**false**) then the traffic is from A->Z.
- **Z End-Point**—The device or site that is the destination of the link as a hyperlink to the inventory of the device or site.
- **Link Type**—The type of link, for example, Physical Layer, VPN or MPLS.

Note   Clicking on a header in the links view sorts the information displayed, for example, according to Severity.

The following additional buttons are displayed at the top of the links view (navigation sensitive) and enable you to filter the links using the collection method:

	All Links—Displays the complete list of links for the selected context (map, aggregation, or sub-aggregation), namely, the list is not filtered and all the links are displayed (including external links).
	External Links—Displays the links where only one side of the link starts in this context (map, aggregation or sub-aggregation) and the other side ends somewhere else, namely, is not in the map or is outside the currently selected context.
	Flat Links (Surface)—Displays the links currently visible on the map for the selected context (map, aggregation or sub-aggregation), excluding, any thumbnails.
	Deep Links—Displays the links for the current aggregations and the sub-aggregations where both of the endpoints are somewhere within the currently selected context.

For more information about filtering and sorting links in links view, see Working in Links View, page 7-8.

Ticket Pane

When Cisco ANA detects faulty behavior in the network, the VNEs and their internal Device Components initiate an internal, end-to-end message flow, resulting in full understanding and containment of the fault across all relevant network elements and network layers.

The ticket pane is displayed beneath the tree pane and workspace in the Cisco ANA NetworkVision window. The ticket pane can be displayed or hidden by clicking the arrows displayed below the tree pane. For the definition of a ticket, alarm and event, see Events, Tickets and Alarm Definitions, page 1-3.

For more information about tickets, refer to the *Cisco Active Network Abstraction EventVision User Guide*.

A network event is a discrete occurrence or happening in the network at a specific point in time. Events are determined from incoming traps, syslogs and detected device changes. A system event is an occurrence or happening, usually significant to the performance of a function, operation or task in the Cisco ANA system. Examples of events include port status change; device reset or reloads of a Cisco ANA VNE. Cisco ANA EventVision enables you to view the event history. For more information, refer to the *Cisco Active Network Abstraction EventVision User Guide*.

Tickets represent an entire lifecycle within the system and include a chain of related events and alarms, from the time that the alarm is opened (when the change in behavior is first detected) until it is acknowledged, resolved and closed. Examples of alarms are link down, device unreachable or module out. Some event types are capable of creating tickets. When an event is generated it is correlated to an existing event which is correlated to a ticket. If there is no existing ticket then a new ticket is created.

The ticket pane enables you to view and manage tickets as well as pinpoint the source of the ticket. All the tickets that are reported by Cisco ANA are stored in Cisco ANA Gateway's database.

Cisco ANA identifies the relationship between a root cause alarm and its consequent alarms. It automatically correlates the consequent alarms as "children" of the root alarm. The ticket pane displays the ticket (namely, the root cause alarm) and the Ticket Properties dialog box enables you to view all correlated alarms.

Note The root cause alarm severity is the topmost severity of its contained alarms.

The ticket pane enables you to perform the following functions:

- View all the tickets or only the filtered tickets of a selected device. For more information about filtering tickets, see Filtering Tickets by Device, page 8-4.

- View and filter all the tickets according to specified criteria
  see Filtering Tickets by Criteria, page 8-4.

- View and acknowledge tickets.

- View the properties of a ticket, including the history, correlated alarms, and affected parties.

- Clear a ticket.

- Remove a ticket.

- Clear and remove a ticket.

- Locate the source of a ticket in the map.

- Sort the tickets displayed.

The following columns are displayed in the ticket pane:

- **Severity**—Displays a severity bell icon, which is colored according to the severity of the alarm. This indicates the impact of the alarm on the network, namely, one of the following:

  - **Red**—Critical.

  - **Orange**—Major.

  - **Yellow**—Minor.

  - **Sky Blue**—Warning.

  - **Green**—Cleared/Normal/OK.

  - **Dark Blue**—Information.

    Note The Information severity does not affect the severity (color) of the network object.

  - **White**—Indeterminate.

  For more information about severity, see Map Pane, page 2-7.

- **Ticket ID**—The sequential ID number of the ticket.

- **Short Description**—The supported ticket name.

  Note Rule-based alarms can be configured per customer site or upon request.

- **Location**—The entity that triggered the ticket, as a hyperlink that opens the relevant location.

- **Last Modification Time**—The date and time when the ticket was last modified. The ticket is modified when a user acknowledges the ticket or when an event is correlated.

- **Time**—The date and time when the initial ticket occurred.

- **Acknowledged**—The status of the ticket that is being handled, namely, acknowledged (true) or unacknowledged (false).

- **Affected Devices**—The number of devices affected by the ticket (the source(s) of the alarm and their subsequent alarms).

- **Correlation Count**—Displays the number of correlated alarms included in the ticket. For example, if in the Correlation tab of the Ticket Properties window, there are 3 alarms correlated to the root cause alarm, then the counter displays the number 3. If there are 2 alarms correlated to the root cause alarm, and each alarm in turn has 2 alarms correlated to it, then the counter displays the number 4.

- **Reduction Count**—Displays the number of alarms included in the ticket. For example, nine alarms can be viewed in the History tab of the Ticket Properties window, but only a single ticket is displayed in the ticket pane.

- **Duplication Count**—Displays the number of occurrences of the original root cause alarm included in the ticket. For example, if the ticket was created by a link down root cause alarm, and then the link goes up and down again quickly so that it is included in the same ticket, then the duplication counter displays the number 2, as the root cause alarm occurred twice.

The ticket details in the ticket pane change constantly as they are updated with new information. For example, Port Down is updated to Port Up.

The tickets in the ticket pane are by default sorted according to Ticket ID. For information about tickets, see Chapter 8, "Working with Tickets".

The Location field displays the number of selected rows and the total number of rows in the table, for example, 2/16 Selected. In addition, it displays the location of the selected row(s) in the table, for example, Line 3.

The Find field enables you to search for information in the ticket pane table according to the selected column. For more information about the buttons displayed in Cisco ANA NetworkVision's tables and table functionality, see Working with Tables, page 3-1.

For more information about how the status of a network device is displayed in the ticket pane, see Status of Network Objects, page 2-15.

Status of Network Objects

The status of a network object is displayed in Cisco ANA NetworkVision in the following ways:

- Severity
- Management State
- Tickets

Severity

Severity indicates the "operational health" of the network device. At any give time an icon has only one severity value and this value is displayed using the severity colors. For more information about the colors used to display the severity (or propagated severity) of network devices and links, see Map Pane, page 2-7.

Propagation

Severity is propagated upwards in the network hierarchy, displaying the topmost severity of its children and so ensuring that every single problem in the network is propagated and visible.

The same severity propagation rules that are used for network elements, apply to links. A link is a child object of an aggregation if and only if it is fully contained in the aggregation; namely, the network elements on both sides of the link are part of the aggregation, as displayed in the examples below.

Figure 2-3   Link Severity Example 1
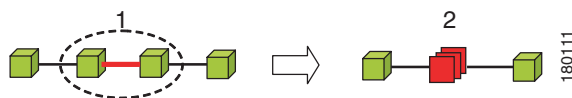
In the example above there is a critical link (#1) between two NEs in an aggregation. This will affect the severity of the aggregation (#2), namely, the aggregation will be critical because it contains a link with a critical severity. Link severity affects the context.

Figure 2-4   Link Severity Example 2

In the example above there is one critical link (#1) that forms part of an aggregated link. This will affect the severity of the aggregated link (#2), because it contains a link with a critical severity.

New Ticket Propagation

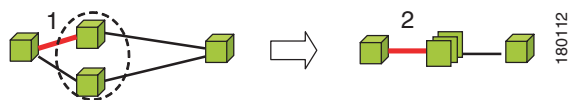A new ticket indicates a new local fault or accumulates and propagates the number of new faults in its children. New tickets are propagated upwards, displaying the number of new tickets and the topmost severity.

When new tickets are accumulated, a label is displayed in the tree pane and map pane, based on the following formula:

<n> <s> [+]

Where:	
n =	Displays the number of tickets with the highest severity in the new ticket count.
s =	Displays the highest severity level in the new tickets: • C = critical • M = major • m = minor • W = warning • N = normal (cleared alarm)
+ =	Indicates that additional, less severe tickets (optional) exist

The color of the bell displays the topmost severity level(s).

Examples:

- An object with three critical new alarms, two major alarms and one warning alarm is labeled 3C+.
- An object with five minor new alarms is labeled 5m.

Management State

The management state indicates the state/mode of the software component (a VNE) managing a network device and the communication with it. This enables you to determine the accuracy of the network information and the availability of the Cisco ANA VNEs in order to carry out network operations.

Management states are always local indications and are not propagated. A partial exception to this rule is the propagation of unreachable network elements.

The management state indication only applies to network elements and network element components. A network object can only have one state, for example, unsupported or initializing.

A network device icon consists of two components, a device icon and an overlay icon that reflects the status, namely, the severity, management state or new alarm.

The device icon displays a symbol of the network device and the color of the symbol displays the severity (or propagated severity) of the network device. For more information about device icons, see Device Icons, page A-1. For more information about severity colors, see Map Pane, page 2-7.

A small overlay icon is displayed on top of the device icon to indicate the management state in the tree pane and map pane. For example, a Router that Cisco ANA failed to access (unreachable) is displayed as illustrated below:

Figure 2-5   Device with Overlay Icons
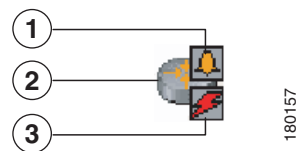
1	Alarm icon
2	Device icon
3	VNE Management State icon

Cisco ANA NetworkVision supports the following management states:

Table 2-4   Management States

Priority Value	Description	Tree Pane	Map Pane
Unsupported	The VNE does not support the network object hardware or software version or a device module.		
Initializing	The VNE or VNE component is in startup mode or is temporarily non-operational.		
VNE Unreachable	Cisco ANA Gateway received no response from the VNE.		

Table 2-4   Management States (continued)

Priority Value	Description	Tree Pane	Map Pane
Device Unreachable	Cisco ANA failed to access the device.		
Partially Supported	The group of devices is supported in general, but the specific device is only partially supported.		
Maintenance	The VNE state was manually changed to maintenance or when adaptive polling is implemented (CPU usage is high), so the VNE is no longer polled and the VNE automatically moves to maintenance mode (for more information, refer to the *Cisco Active Network Abstraction Administrator Guide*. The NE is working (status Up), but if there are any alarms or tickets that are generated on the device they will not be sent to the application.		
Unknown	The device (ghost) type is unknown.		
Operational	Fully functional.	NE icon	NE icon

More than one management state can occur at the same time. In this case, a single overlay icon is displayed reflecting the device status based on the following priorities: Unsupported > Initializing > VNE Unreachable > Device Unreachable > Partially Supported > Operational.

Tickets

A bell icon is displayed in the tree pane, map pane and ticket pane to indicate tickets. Every alarm is assigned a severity level, representing the impact of the fault on the network device. The bell icon displays the severity level of the topmost alarm. An example is displayed below.

Value	Tree Pane	Map Pane
Ticket		

Cisco ANA NetworkVision Toolbar

The Cisco ANA NetworkVision toolbar is context-sensitive and the options vary depending on your selection in the application.

Note   The functionality (available on the toolbar and menus) that is accessible to the user depends on the permissions defined for the user.

The Cisco ANA NetworkVision window contains the following tools:

Table 2-5   Cisco ANA NetworkVision Toolbar

Button	Function
	Creates a new map in the database.
	Opens a file/map saved in the database using the Open dialog box.
	Saves the current map, for example, the background and the location of devices, to the database.
	Adds a device to the map or to the sub-network selected in the tree pane and displayed in the map pane.
	Adds a VPN (that has not yet been loaded) to the currently displayed map. For more information, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.
	Opens the Inventory window enabling you to view the physical and logical inventory of a device.
	Aggregates the devices selected in the map pane of the Cisco ANA NetworkVision window and enables you to define a name for the aggregated device.
	Opens the Map Options dialog box, enabling the network administrator to display or hide different types of links on the map and in the links view.
	Defines the size of a selected device(s) or aggregated nodes in the map pane, according to predefined sizes or according a percentage of the current size.
	Choose and display an overlay of a specific VPN on top of the devices displayed in the network map of the map pane using the Choose Overlay dialog box. When a VPN in the network is selected all the devices and links that are part of the VPN are colored and those that are not part of the VPN are grayed out. The ones that remain highlighted are the provider edge routers and the physical links that carry the LSP that is being used by the VPN. For more information, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.
	After a selection is made by clicking Choose Overlay, displays or hides a previously defined overlay of a specific VPN on top of the physical devices displayed in the network map of the map pane. For more information, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.
	Opens the Find Business Tag dialog box, enabling the network administrator to find and/or delete a business tag according to a name, key or type.
	Moves up a branch in the tree pane and map pane in order to view different information.
	Finds a device or aggregated node in the network/map according to the name.

Table 2-5   Cisco ANA NetworkVision Toolbar (continued)

Button	Function
	Defines the way in which the map lays out the NEs in the map pane of the Cisco ANA NetworkVision window, namely, Circular, Symmetric, tree or Hierarchical.
	Displays the device view in the Cisco ANA NetworkVision window (the button toggles when selected or deselected).
	Displays the links view in the Cisco ANA NetworkVision window (the button toggles when selected or deselected).
	Displays the map pane in the Cisco ANA NetworkVision window (the button toggles when selected or deselected).
	Opens a window displaying an overview of the network.
	Activates the normal selection mode (the button toggles when selected or deselected).
	Activates the pan mode, which enables you to move around in the map pane by clicking and dragging (the button toggles when selected or deselected).
	Activates the zoom selection mode, which enables you to select an area in the map pane to be enlarged by clicking and dragging to view the selected area (the button toggles when selected or deselected).
	Fits the entire sub-network/map in the map pane.

Menu Bar

This section provides a description of each option available in the Cisco ANA NetworkVision menus. The following menus are available:

- File Menu
- Edit Menu
- View Menu
- Node Menu
- Tools Menu
- Window Menu
- Help Menu

Note   Based on the security level and access permissions assigned to a user, some of the menu options may not be available.

Note   The menus are context-sensitive and the options vary depending on your selection in the application.

File Menu

The File menu displays the following options (for more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps"):

New Map

Creates a new map in the database.

Open

Opens a file/map saved in the database using the Open dialog box.

Close Map

Closes the map currently displayed in the Cisco ANA NetworkVision window.

Load Path Tracer

Loads a Cisco ANA PathTracer map from a previously saved file in the Cisco ANA PathTracer Multi-Path window.

Add Device

Opens the device view and enables you to add a device to the map or to the sub-network selected in the tree pane and displayed in the map pane. This option is enabled when a map is open and you have the relevant security level, namely, OperatorPlus.

Add VPN

Adds a VPN (that has not yet been loaded) to the currently displayed map. For more information, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

> **Note** When you create a VPN or load a VPN Service View map, you may add and configure tunnels using a shortcut menu. For more information, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Save Map

Saves the appearance of the map, for example, the background and the location of devices, to the database. This option is enabled when a map is open and you have the relevant security level, namely, OperatorPlus.

Save As Image

Saves the active map as an image and automatically displays the Save as Image dialog box. Use this dialog box to save an image using a different file format or name.

Print Preview

Displays each map, as it will look when printed.

Print

Prints the active map as displayed in the Print Preview dialog box.

Exit

Exits the Cisco ANA NetworkVision application and saves the workspace.

Edit Menu

The Edit menu displays the following options:

Find in Map

Searches for a device in the network/map that contains the specified text in the name or the IP fields.

Find Business Tag

Searches for business tag information in the database.

Resize

Displays the Resize dialog box, enabling you to define the percentage used to resize device icon(s) or aggregated nodes in the map pane.

> **Note** The Resize option is only available when a device icon(s) or aggregated nodes are selected.

View Menu

The View menu displays the following options:

Layout

Defines the way in which the map is displayed in the map pane of the Cisco ANA NetworkVision window's workspace, namely, Circular, Symmetric, Tree or Hierarchical.

Overview

Opens a window displaying an overview of the network map.

Zoom In

Zooms in on the network map.

Zoom Out

Zooms out of the network map.

Fit In Window

Displays the entire network map in the map pane.

Normal Select

Activates the normal selection mode. The selected option is grayed out.

Pan

Activates the pan mode, which enables you to move around in the map pane by clicking and dragging. The selected option is grayed out.

Zoom Selection

Activates the zoom selection mode, which enables you to select an area in the map pane to be enlarged by clicking and dragging to view the selected area. The selected option is grayed out.

Node Menu

The Node menu displays the following options:

Note Most of the functionality available in this menu is only available when a device icon or an aggregated node is selected in the tree or map pane.

Inventory

Displays a dialog box enabling you to view the physical and logical inventory. For physical inventory you can view all the components of the device, for example, modules and ports. In addition, you can view the status of each component. For logical inventory you can view all the profiles and VC or routing tables of the device. For more information see Chapter 6, "Viewing Network Device Inventory".

Aggregate

Groups the selected devices into an aggregation in the map pane of the Cisco ANA NetworkVision window's workspace and enables you to define a name for the aggregated node. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

Disaggregate

Ungroup the selected aggregated node in the tree pane and map pane of the Cisco ANA NetworkVision window. All the nodes in the selected aggregation move up one level and the selected aggregation is removed. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

Note Only available when an aggregated node is selected in the tree or map pane.

Mark as A Side

Starts the process of creating a new static link. This option is enabled when a device, port or unmanaged network is selected.

Mark as Z Side

Launches the Add Static Link dialog box, enabling you to create a static link between to the two selected nodes. This option is enabled after a device, port or unmanaged network is selected and after the Mark as A Side option is selected.

> **Note**   When the user selects two ports, the Add Static Link dialog box is not displayed.

Properties

Displays a dialog box enabling you to view the properties of the selected device, for example, the severity, IP address and communication state. For more information see Chapter 5, "Viewing Device Properties".

Tools Menu

The Tools menu displays the following options:

Change User Password

Enables you to change the password used when logging in to the Cisco ANA Client application suite. The change will take effect the next time that the user logs in to the application.

> **Note**   The administrator can also change your password in Cisco ANA Manage.

Options

Enables you to customize several of Cisco ANA NetworkVision's options, for example, load workspace on startup. For more information
see Selecting Cisco ANA NetworkVision Map and Alarm Options, page 2-31.

Window Menu

The Window menu displays the names of all the maps open in the Cisco ANA NetworkVision window's workspace enabling you to move between the maps.

Help Menu

The Help menu provides the user with information about Cisco ANA NetworkVision and provides access to the Help.

Cisco ANA NetworkVision Help

Opens the Cisco ANA NetworkVision online Help.

Cisco.com

This option is currently unavailable in this version.

About Cisco ANA NetworkVision

Displays application information about Cisco ANA NetworkVision, for example, the version number.

Shortcut Menus

Right-clicking in a specific area or on a link, device or alarm in the Cisco ANA NetworkVision window opens the following shortcut menus:

- Device Shortcut Menu
- Map Shortcut Menu
- Aggregated Node Shortcut Menu
- Link Shortcut Menu
- Links View Shortcut Menu
- Ticket Shortcut Menu

A shortcut menu is displayed when you right-click in many of Cisco ANA NetworkVision's dialog boxes or tables. For example, you can open a map from the Map List dialog box using the shortcut menu. The options displayed vary depending on the dialog box or tables currently displayed and the selection. For more information about any of the shortcut menu options displayed, refer to the options discussed in this section.

> **Note**
> - Based on the security level and access permissions assigned to a user, some of the menu options may not be available.
> - The menus are context-sensitive and the options vary depending on your selection in the application, for example, the shortcut menus for NEs and aggregated nodes are different.

Device Shortcut Menu

The Device shortcut menu is displayed when you right-click a device in the tree pane, and workspace.

> **Note** The Device shortcut menu is context-sensitive and the options vary depending on your selection in the application. Some options may not be available when multiple devices are selected.

Inventory

Displays a window enabling you to view the physical and logical inventory. For physical inventory, you can view all the components of the device, for example, modules, ports, and its IP address or configured VLANs. In addition, you can view the status of each component. For logical inventory, you can view all the profiles and VC tables of the device. For more information see Chapter 6, "Viewing Network Device Inventory".

Aggregate

Aggregates the devices selected in the map pane of the Cisco ANA NetworkVision window and enables you to define a name for the aggregated device. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

Disaggregate

Ungroup the selected aggregated node(s) in the tree pane and map pane of the Cisco ANA NetworkVision window. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

> **Note** Only available when an aggregated node is selected in the tree or map pane.

Attach Business Tag

Attaches a business tag to the selected network element. For more information see Chapter 10, "Working with Business Tags".

Detach/Edit

You can detach or edit a business tag from the selected Network Object. For more information see Chapter 10, "Working with Business Tags".

> **Note** The Detach and Edit options are only displayed when a business tag is attached to a Network Object.

Filter Tickets

Filters the tickets shown in the ticket pane so that it only displays the tickets of a selected device/network element.

Resize

Displays the Resize dialog box that enables you to define the percentage used to resize the device icon(s) or aggregated nodes in the map pane.

Remove from Map

Removes the selected device and all its children from the map (tree pane and workspace). The device that has been removed is still maintained in the network.

Save as new map

Creates a new map and places the selected aggregation as the root, while leaving the original map intact.

Tools

The Tools option contains the following sub-menu options:

- **CPU Usage—**Displays memory and CPU usage information for a device/network element.
- **Ping—**Pings the device from the client station.
- **Telnet—**Communicates with the device using the Telnet window from the client station.

Topology

The Topology option enables you to:

- Add a new static link between two devices.

- Add new static topology between a device and an unmanaged network.

It contains the following sub-menu options in order to define the A Side and Z Side of the link:

- Mark as A Side

- Mark as Z Side

When working with VPNs in VPN Service View, the Topology sub-menu allows you define and configure tunnels. For more information, refer to the *Cisco Active Network Abstraction Managing MPLS User Guide.*

Properties

Displays the properties of the selected device, for example, IP address and system name. In addition, you can open the VNE Properties dialog box and manage VNE properties. For more information see Chapter 6, "Viewing Network Device Inventory".

VNE Tools

Changes the status of the VNE by starting or stopping the VNE. For more information see Chapter 5, "Viewing Device Properties".

Management

It contains the following sub-menu options:

- **Command Builder**—Defines commands and scripts using the Cisco ANA Command Builder tool (Configurator security level required). For further information, refer to the *Cisco Active Network Abstraction Command Builder User Guide*.

- **Soft Properties Management**—Extend VNEs by adding SNMP MIB and/or Telnet/SHH/TL1 properties to the device's collected information model using the Cisco Extended Properties Manager wizard (Administrator security level required). For further information, refer to the *Cisco Active Network Abstraction Customization User Guide*.

Map Shortcut Menu

The Map shortcut menu is displayed when you right-click anywhere on a map in the map pane.

Go to Parent

Goes to the parent in the tree pane and map pane in order to view different information.

Go to Root

Goes to the root in the tree pane and map pane in order to view different information.

Aggregate

Creates an aggregation of the selected nodes in the tree pane and map pane of the Cisco ANA NetworkVision window and enables you to define a name for the aggregation. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

Filter Tickets

Filters the tickets shown in the ticket pane so that it only displays the tickets of a selected device/network element.

Aggregated Node Shortcut Menu

The Aggregated Node shortcut menu is displayed when you right-click on an aggregated node in the map pane.

Aggregate

Aggregates the devices selected in the map pane of the Cisco ANA NetworkVision window and enables you to define a name for the aggregated device. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

Disaggregate

Ungroup the selected aggregated node in the tree pane and map pane of the Cisco ANA NetworkVision window. For more information see Chapter 4, "Working with Cisco ANA NetworkVision Maps".

> **Note** Only available when an aggregated node is selected in the tree or map pane.

Filter Tickets

Filters the tickets shown in the ticket pane so that it only displays the tickets of the selected aggregated node.

Rename

Renames the selected aggregated node.

Resize

Defines the size of selected devices or aggregated nodes in the map pane according to predefined sizes or according to a percentage of the current size.

Remove from Map

Removes the selected aggregated node and all its children from the map (tree pane and map pane).

Save as New map

Creates a new map and places the selected aggregation as the root, while leaving the original map intact.

Show Thumbnail

Displays a thumbnail of the selected aggregated node in the map pane, including all the aggregated devices.

Show as Aggregation

Displays the aggregated node in the map pane.

Note   The Show as Aggregation option is displayed in the shortcut menu when a thumbnail is displayed in the map pane.

Link Shortcut Menu

The Link shortcut menu is displayed when you right-click a link in the map pane. For more information see Chapter 7, "Working with Links".

Filter Tickets

Filters the tickets shown in the ticket pane so that it only displays the tickets of a selected Network Object.

Properties

Displays the properties of the selected link.

Links View Shortcut Menu

The Links View shortcut menu is displayed when you right-click a link in the links view table displayed in the Cisco ANA NetworkVision window's workspace. For more information see Chapter 7, "Working with Links".

Attach Business Tag

Attaches a business tag to the selected link. For more information see Chapter 10, "Working with Business Tags".

Detach/Edit

You can detach or edit a business tag from the selected link. For more information see Chapter 10, "Working with Business Tags".

Note   The Detach and Edit options are only displayed when a business tag is attached to a link.

Find Source

Finds the link source, if it exists, by highlighting the link in the map pane.

Properties

Displays the properties of the selected link.

Ticket Shortcut Menu

The Ticket menu is displayed when you right-click the ticket in the ticket pane. The Ticket menu enables the network administrator to view ticket properties and to highlight a device that is the source of a ticket. The Ticket menu also enables you to acknowledge, clear and remove a ticket. For more information see Chapter 8, "Working with Tickets".

Acknowledge

Acknowledges that the ticket is being handled and the ticket is displayed as true in the ticket pane. Acknowledging an alarm removes the alarm icon from the device icon.

Note Multiple tickets can be acknowledged at the same time.

Clear

Approves the reported faulty ticket and clears the faulty networking entity from Cisco ANA. The ticket is displayed as Clear in the ticket pane.

Note When a Card Out or Link Down alarm occurs the relevant information is displayed in the inventory and maintained in the VNE.

Remove

Removes the ticket and all its active sub-tickets from the ticket pane (this option is only available after the ticket has been cleared). The deleted tickets can be viewed using Cisco ANA EventVision.

Note
- Multiple tickets can be removed at the same time.
- When a ticket is removed the information is no longer displayed in the inventory and is removed from the VNE.

Clear and Remove

Approves the reported faulty ticket and clears the faulty networking entity from Cisco ANA. In addition, the ticket, and all its active sub-tickets are removed from the ticket pane.

Find Source

Finds the ticket source, if it exists, by highlighting the device or link in the map pane.

Properties

Displays the Ticket Properties dialog box enabling you to view ticket information, including impact analysis details of the affected parties and correlated alarms.

Changing a User Password

Cisco ANA NetworkVision enables the user to change his/her login password.

Note The administrator can also change the user password in Cisco ANA Manage.

Note Cisco ANA NetworkVision has the following pre-configured password defaults; the administrator can however modify these defaults using the Cisco ANA Registry:

- The minimum length of the user password is 6 characters.
- The maximum length of the user password is 10 characters.
- The minimum number of digits that must be included in the user password is 1.

To change a user password:

Step 1 Select **Change User Password** from the Tools menu. The Change User Password dialog box is displayed.

The following fields are displayed in the Change User Password dialog box:

- **Old password**—Enter the old user password.
- **New password**—Enter the new user password.
- **Confirm password**—Enter the new user password again to confirm the new password.

Step 2 Click **OK**. The change will take effect the next time that you log in to the application.

Note Clicking **Show Password Rules** in the Change User Password dialog box, displays the password rules.

Selecting Cisco ANA NetworkVision Map and Alarm Options

Cisco ANA NetworkVision enables you to customize the startup and display options.

To customize Cisco ANA NetworkVision:

Step 1 Select **Options** from the Tools menu. The Options dialog box is displayed.

The following checkbox is displayed in the Workspace Info area:

- **Load Workspace On Startup**—Your workspace is automatically loaded when logging in.

The Display tab enables you to define the display options for the application, for example, whether business tags are displayed. The Display tab is shown below.

The following checkboxes are displayed in the Severity area:

- **Show Severity Text**—Displays severity labels in the tree pane and map pane, as per the formula described in New Ticket Propagation, page 2-16.

- **Show Acknowledged**—Displays a critical alarm severity even after the alarm is acknowledged.

- **Show Propagated**—Displays only the alarms on the specific entity, namely, it does not display propagated alarms.

The following radio buttons are displayed in the Display Name area:

- **Do not use Business Tag**—Select this option to display the original network element name only.

- **Add Business Tag to name**—Select this option to display the original network element name and the name of the business tag.

- **Replace name with Business Tag**—Select this option to replace the network element name with the name of the business tag. When a subscriber is attached to a port the name of the subscriber is also added.

The Audio tab enables you to define whether sounds are used when an alarm is triggered and what these sounds will be.

You can select whether or not sound alarms are enabled, by selecting the Enable Audio Response for Alarm checkbox is displayed at the top of the Audio tab.

Selecting the Enable Audio Response for Alarm option enables the chosen sound files to be played when an alarm is triggered. You can select different sound files for critical, major, and minor alarms.

The following fields are displayed in the Alarm area:

- **Critical**—Enables you to define and test the .wav file that is used to alert the user when a critical alarm is triggered.

- **Major**—Enables you to define and test the .wav file that is used to alert the user when a major alarm is triggered.

- **Minor**—Enables you to define and test the .wav file that is used to alert the user when a minor alarm is triggered.

The following checkbox is displayed in the Alarm area:

- **Loop Sound on Critical Alarm**—Defines whether the critical alarm sound is played once only or is continuous, namely, loops.

Step 2   Define the options that you require.

Step 3   Click **OK/Apply** to save your changes. The changes will take affect when the application is restarted.

Logging Out

When you have finished working with Cisco ANA NetworkVision you can log out of the application. Any open maps and the workspace are automatically saved when you log out.

To log out of Cisco ANA NetworkVision:

Step 1   From the File menu, select **Exit** or click in the right-hand top corner of the Cisco ANA NetworkVision window. A confirmation message is displayed.

Step 2   Click **Yes**. The Cisco ANA NetworkVision window is closed.

Note   If the map appearance has changed a message is displayed asking you whether to save the current appearance of the map(s).

C H A P T E R **3**

Working with Cisco ANA NetworkVision Tables

This chapter describes how to work with Cisco ANA NetworkVision's tables and how to perform general Cisco ANA NetworkVision functions, for example, printing, filtering and saving a map image.

- Working with Tables, page 3-1, describes how to work with the Cisco ANA NetworkVision tables, including finding text, defining filters and exporting the table.

- Setting Selection Filters, page 3-3, describes how to define a selection filter in a table.

- Sorting a Table, page 3-4, describes how to sort a table by defining specific criterion.

- Exporting the Table to a File, page 3-5, describes how to export all the currently displayed data from the Cisco ANA NetworkVision table.

Working with Tables

Various tables are used throughout the application to display different types of information. Some of the functionality provided in the Cisco ANA NetworkVision tables is described below:

- Find text in a table. For more information see Finding Text in a Table, page 3-2.

- Define and remove a filter in a table. For more information see Defining a Filter, page 3-2 and Clearing a Filter, page 3-3.

- Set a selection filter and/or view a previous selection filter. For more information see Setting Selection Filters, page 3-3.

- Export table information. For more information see Exporting the Table to a File, page 3-5.

- Sort the table according to a column. For more information see Sorting a Table, page 3-4.

For more information about the toolbar displayed in the workspace, see Device View, page 2-9.

Cisco ANA NetworkVision enables the user to sort a table in one or more of the following ways:

- According to a column by clicking on the required column heading. The ⟳ icon is displayed next to the selected column heading indicating continuous sorting.

- In ascending or descending order by clicking on the column heading.

- By clicking the Sort Table Values button on the toolbar of the table and specifying the criterion by which the table will be sorted. For more information about sorting a table using the Sort Table Values button, see Sorting a Table, page 3-4.

A triangle is displayed next to the column heading to indicate the column according to which the table is sorted.

The user can open the Filter dialog box by clicking the Filter button and sorting criteria by table field, operator, and text.

Clicking on a red triangle automatically expands the cell to view all the data.

Finding Text in a Table

Cisco ANA NetworkVision enables you to search for information about a specific network object in a table by entering the search criteria, for example, by entering a partial IP address.

The table below lists the keyboard shortcuts that can be used when working with tables:

Keyboard Shortcut	Description
Ctrl + A	Select all the rows in the table.
Ctrl + Space	Deselect all the rows in the table.
Enter	On a selected row opens the default action.
Arrow Navigation Keys	Navigates up and down in the rows.
Ctrl + Up/Down	Keeps the selected row and moves up/down.
Ctrl + Up/Down + Space	Keeps the selected row and moves up/down. The space selects the required row.
Shift + Up/Down	Keeps the selected row and selects all the rows that are up/down.
Shift + F10	Opens the shortcut menu.
F3	Finds next.
Shift F3	Finds previous.

To find text in a table:

Step 1   In the Find field on the toolbar, enter the search criteria for the entity that you want to find.

Step 2   Press **Enter**. The row matching the search criteria is highlighted in the table.

> **Note**   Click **F3** to continue searching the table.

> **Note**   Use **Ctrl + F** to jump to find.

Defining a Filter

Cisco ANA NetworkVision enables you to define a filter for the data displayed in a Cisco ANA NetworkVision table by selecting filter criteria.

This tool occurs throughout the application with the same functionality. The ticket pane has its own unique filter. For more information see Filtering Tickets by Criteria, page 8-4.

To define a filter:

Step 1   On the toolbar, click **Filter**. The Filter dialog box is displayed.

The following dropdown lists are displayed in the Filter dialog box:

- **Field**—A dropdown list of all the columns displayed in the table.

- **Operator**—A dropdown list of the values included in the filter operation. The Not checkbox indicates that the selected value should not be included in the filter. For example, if you select Contains this means that the value should not be contained in the filter.

The following field is also displayed:

- **Search for**—Enter the required filter value or select the required value from the Field and Operator dropdown lists.

Step 2   Select an option from the Field and Operator dropdown lists.

Step 3   Enter the required filter values or select the required value from the dropdown list in the Search for field.

Step 4   Click **OK**. The table data is displayed using the defined filter.

Note   The Filter button toggles to indicate that a filter has been applied.

The filter can be cleared in order to redisplay all the data in the table.

Clearing a Filter

Cisco ANA NetworkVision enables you to clear a filter that was defined for the data displayed in a Cisco ANA NetworkVision table.

To clear a filter:

Step 1   On the toolbar, click **Filter**. The Filter dialog box is displayed.

Step 2   Click **Clear**. The table is redisplayed with all the data in the Cisco ANA NetworkVision window's workspace.

Setting Selection Filters

The user can choose a line or specific set of lines, and display them in the table (all un-selected lines are hidden). The user may make continuous multiple line selections, setting the table content after each selection, using the Set Selection Filter button.

The user can undo the last selections (one step back), one at a time, using the Previous Selection Filter button, or undo (rewind) all selections, using the Rewind All dropdown menu option.

This powerful Cisco ANA filtering mechanism enables the user sort though several hundred lines and pinpoint the appropriate line(s) that contain the required information.

For example, to filter and display seven lines in a 129 line Database Segment table, you:

- Select the appropriate lines in the table using standard Windows mouse and/or keystroke operations

- Apply the filter to the selected line(s) using the Set Selection Filter button.

To choose multiple lines and apply the set a selection filter:

Step 1 Select the line(s) in the table using the mouse and standard Microsoft® Windows selection keys. The Set Selection Filter button is activated.

Step 2 Click the **Set Selection Filter** button. Only the selected line(s) remain in the table.

The user can undo the last line selections (one step back), one at a time, using the Previous Selection Filter button.

To undo the previous filter selection:

Step 1 Select one or several lines and filter them out using the Set Selection Filter button.

Step 2 To undo the last filtering out selection, select the **Previous Selection Filter** button. The table will display all lines that appeared before your last filter selection.

The user can undo (rewind) all multiple line selections, using the Rewind All dropdown menu option.

To undo all previous selected filter out options:

Step 1 Select, filter out and sort lines as required in the table using the Set Selection Filter button.

Step 2 Click the **Previous Selection Filter** button. The Rewind All dropdown menu option is displayed.

Step 3 Select **Rewind All**. All the lines in the table are displayed.

✎
Note To clear all manually selected and defined filter options, use the **Clear** command button in the Filter dialog box (see Clearing a Filter, page 3-3 for more information about clearing filters).

Sorting a Table

The tables displayed in Cisco ANA Manage can be sorted by defining specific criterion on a one-time only basis or continuously.

To sort a table:

Step 1 On the toolbar, click **Sort Table Values**. The Sort dialog box is displayed.

The following dropdown lists are displayed in the Sort By area:

- **Sort By**—A dropdown list of all the columns displayed in the currently displayed table. The table is sorted firstly according to the selection made here. Select ascending or descending order.

- **Then By**—Dropdown lists of all the columns displayed in the table. The table is sorted secondly and then lastly according to the selections made here. Select ascending or descending order.

The following radio buttons are displayed in the Sort Operation area:

- **Once Only**—Sorts the information displayed in the table according to the specified criterion once only. When this option is selected a triangle ▲ is displayed in the table heading for the selected column.

- **Continuously/Repeatedly**—Sorts the information displayed in the table according to the specified criterion continuously. When this option is selected the ↻ icon is displayed next to the selected column heading.

Step 2   Select an option from the Sort By dropdown list and Ascending or Descending order.

Step 3   Select an option from the Then By dropdown lists and Ascending or Descending order (optional).

Step 4   Select **Once Only** or **Continuously/Repeatedly**.

Step 5   Click **OK**. The table information is sorted according to the filter defined.

> ✎
> **Note**   The Sort By default option depends on the table you are sorting. For example, when you click Sort Table Values in the links view table, the default value is Context. The default sorting is configured in the registry by type.

Exporting the Table to a File

Cisco ANA NetworkVision enables you to export all the currently displayed data from the Cisco ANA NetworkVision table. Either the selected row(s) is exported or when nothing is selected the entire table is exported. The data can then be imported and viewed at a later stage.

> ✎
> **Note**   Press **Ctrl + Space** to ensure nothing is selected in the table.

To export the table to a file:

Step 1   On the toolbar, click **Export to CSV**. The Export Table to File dialog box is displayed.

Step 2   Browse to the directory where you want to save the table.

Step 3   In the **File** name field, enter a name for the table.

Step 4   Click **Save**. The table or row(s) is saved in the selected directory.

C H A P T E R 4

Working with Cisco ANA NetworkVision Maps

This chapter describes how to work with the topological maps displayed in the workspace of the Cisco ANA NetworkVision window. The topological map is the main tool used by Cisco ANA NetworkVision to display the links and relationships between the network elements and/or aggregated nodes.

- **Opening Selected Maps, page 4-2**, describes how to open maps that were last visited by you, quickly and easily when the application is launched.

- **Creating a New Map, page 4-3**, describes how to create a new map.

- **Opening a Map, page 4-4**, describes how to open an existing map.

- **Adding a Device, page 4-5**, describes how to add a device in a map.

- **Removing a Device from the Map, page 4-6**, describes how to remove a device from the map.

- **Defining the Map Layout, page 4-6**, describes how to define the layout of the network in a map.

- **Saving a Map, page 4-7**, describes how to save the layout of the map.

- **Saving as a New Map, page 4-8**, describes how to save a copy of the entire map or parts thereof while leaving the original map intact.

- **Saving a Map as an Image, page 4-8**, describes how to save a map as an image.

- **Closing a Map, page 4-10**, describes how to close a map.

- **Deleting a Map, page 4-10**, describes how to delete a map.

- **Renaming a Map, page 4-10**, describes how to rename an existing map.

- **Resizing a Device, page 4-11**, describes how to define the size of selected device(s) or aggregated nodes in the map pane.

- **Viewing the Network, page 4-12**, describes how to display the entire network map or any part of the map, in the Overview window. In addition, it describes how to display an aggregated node in a thumbnail.

- **Viewing a Network Device, page 4-13**, describes how to view any network device on the map. The device is selected in the appropriate map in the workspace and/or tree pane and the active tickets are shown in the ticket pane.

- **Selecting Map Views, page 4-14**, describes the various selection tools that can be used to view and analyze maps in the map pane.

- **Finding a Ticket Source, page 4-15**, describes how to find the source of a ticket displayed in the ticket pane.

- **Finding a Link Source, page 4-15**, describes how to find the source of a link displayed in the links view.

- Finding a Network Device, page 4-15, describes how to find and display a network device on the map.

- Aggregating Devices, page 4-16, describes how to aggregate devices. In addition, it describes how to disaggregate the aggregated node selected in the map pane.

- Renaming an Aggregated Node, page 4-17, describes how to rename an existing aggregated node.

- Filtering Links According To Type, page 4-17, describes how to filter (display or hide) the different types of links displayed in the map pane.

- Opening the CPU Usage Graph, page 4-20, describes how to display memory and CPU usage information for a device.

- Communicating with Devices, page 4-20, describes how to ping and telnet a device.

- Previewing a Map, page 4-21, describes how to preview a map before it is printed.

- Defining the Print Setup, page 4-22, describes how to define the print setup.

- Printing a Map, page 4-23, describes how to print the map that is currently displayed.

Opening Selected Maps

When Cisco ANA NetworkVision is launched, the Cisco ANA NetworkVision window appears. Maps that were last visited by you can be opened quickly when the application is launched, if you closed the application without closing the maps.

Note First time users and users that closed their maps before closing the application will not be able to open maps using this functionality.

To open a selected map:

Step 1 Launch Cisco ANA NetworkVision. The Cisco ANA NetworkVision window is launched with the Open Selected Maps dialog box. For more information about launching Cisco ANA NetworkVision, see Starting Cisco ANA NetworkVision, page 2-1.

The Open Selected Maps dialog box displays a list of the maps last visited by you and that were not closed by you when exiting the application. By default all the maps that were last visited by you are selected.

The following buttons are displayed in the Open Selected Maps dialog box:

- **All**—Selects and opens all the last visited maps.

- **Selected**—Opens the maps that have been selected (checked) in the Open Selected Maps dialog box.

- **None**—Deselects all the last visited maps and displays an empty Cisco ANA NetworkVision window. You can now create a new map (see Creating a New Map, page 4-3) or open a map that was previously saved in the database.

Step 2 Click **All**,

or

Click **None**,

or

Clear the checkbox(es) for the maps that you do not want to display in the Cisco ANA NetworkVision window and click **Selected**.

The maps are displayed in the Cisco ANA NetworkVision window according to the defined selection.

Note   By default you can only view and work on a maximum of five maps at any given time in the NetworkVision map pane (to change this default setting please contact Cisco Professional Services). To create a new map or select a new map, close the required amount of maps.

Creating a New Map

When Cisco ANA NetworkVision is launched for the first time, or if None is selected in the Open Selected Maps dialog box (as described in the previous section) the Cisco ANA NetworkVision window appears empty.

A new map must be created, or a map that was previously saved can be opened, in order to display the network. Cisco ANA NetworkVision supports the creation of multiple network maps in order to represent specific network views. Views can cover specific network segments, customer networks, or any other mix of network elements desired. When a user creates a map it is available to other users (assuming they have sufficient access/security privileges).

The network maps provide a graphic display of active faults and alarms and serve as an easy access point for the activation of services.

Note   You can create a new map, select a filter and then add the devices to the map. This filter will then be applied to the new map and only the required link types will be visible in the map pane and recorded the links view. For more information see Filtering Links According To Type, page 4-17.

Note   You cannot define the same name for two or more maps.

To create a new map:

Step 1   On the toolbar, click **New Map**,

or

Select **New Map** from the File menu. The Create Map dialog box is displayed.

Note   Cisco ANA NetworkVision has the following pre-configured map name defaults; the administrator can however modify these defaults using the Cisco ANA Registry:
The minimum map name length of is 1 character.
The maximum map name length is 65 characters.
The map name cannot contain any symbols, excluding the **$** symbol.

The **Advanced** button enables you to filter the links displayed in the map pane. For more information see Filtering Links According To Type, page 4-17.

Step 2 Enter a name for the new map and click **OK**. An empty new map is displayed in the tree pane and map pane, as displayed below. For more information on adding devices, see Adding a Device, page 4-5.

Opening a Map

Cisco ANA NetworkVision enables you to open a map that was previously saved. When you open the map, the network information is automatically refreshed. For example, if a device was up the last time that the map was saved and closed, and then the device is moved to maintenance, the next time you open the map the management status of the device will be updated accordingly and the device will display a maintenance status.

Note The maps that you last visited can be opened quickly when the application is launched provided that you closed the application without closing the maps. For more information see Opening Selected Maps, page 4-2.

To open a map:

Step 1 On the toolbar, click **Open Map**,

or

Select **Open** from the File menu. The Map List dialog box is displayed.

The Map List dialog box displays the map name as defined by the network administrator.

The Find field enables you to search for information in the table according to the selected column. For more information see Finding Text in a Table, page 3-2.

The Map List dialog box contains the following tools:

Tool	Description
	Export to CSV—Exports the information displayed in the table. For more information see Exporting the Table to a File, page 3-5.
	Note The tools described above occur throughout the application and provide the same functionality.
	Delete Map—Deletes the selected map from the Map List dialog box, the Cisco ANA NetworkVision window and from the database. If a map that is being opened is deleted, this map will close. For more information see Deleting a Map, page 4-10.
	Rename Map—Renames the selected map in the Map List dialog box and Cisco ANA NetworkVision window. For more information see Renaming a Map, page 4-10.
	Sort Table Values—Enables you to sort the information displayed in the table.
	Filter—Defines a filter for the information displayed in the table. For more information see Defining a Filter, page 3-2.
	Note When a filter is applied the Set Selection Filter button is activated.

Tool	Description
	Set Selection Filter—Applies filters to the selected line or lines displayed in the Map List. **Note** When you select one or multiple lines, the Previous Selection Filter (and Rewind All) buttons are activated.
	Previous Selection Filter—Enables you to undo the last applied filter selection.
	Rewind All—Enables you to undo previous filter selections, and display all the original information in the table.
	Help—Opens the online help.

Step 2   Select the map that you require from the Map List and click **Open**,

or

Right-click on the required map, and select **Open** from the displayed shortcut menu,

or

Double-click on the required map. The map is displayed in the Cisco ANA NetworkVision window with the network.

One or more maps can be opened in the Cisco ANA NetworkVision window displaying the various available networks. Use the Windows menu to move between the open maps. For more information on the Cisco ANA NetworkVision window, see Chapter 2, "Getting Started".

Note   By default you can only view and work on a maximum of five maps at any given time in the NetworkVision map pane (to change this default setting please contact Cisco Professional Services). To create a new map or select a new map, close the required amount of maps.

Adding a Device

Cisco ANA NetworkVision enables you to add devices to the network. The device is added to the map or aggregation selected in the tree pane and workspace. In addition, devices that are added to the network are automatically saved.

Note   Based on the security level and access permissions assigned to a user, this option may not be available.

To add a device:

Step 1   On the toolbar, click **Add Device**,

or

Select **Add Device** from the File menu. The Device List dialog box is displayed, with all the devices that are managed by the system.

> ✎ **Note** Locked devices only display device information and the **Locked Device** icon.

For more information about:

- The columns that are displayed in the Device List dialog box, see Device View, page 2-9.
- The buttons displayed in the Device List dialog box, see Device View, page 2-9.

Step 2 From the Device List, select the device that you want to add.

> ✎ **Note** You can select and add multiple devices using **<Ctrl>** or **<Ctrl +A>** or by clicking and dragging the mouse.

Step 3 Click **Add Device**. The device is displayed in the tree pane and the selected map or sub-network in the Cisco ANA NetworkVision window's workspace. In addition, any tickets are displayed in the ticket pane.

> ✎ **Note** When a device is added to the network it is no longer displayed in the Device List dialog box dialog box.

Step 4 Click **Close** to close the Device List dialog box. The Cisco ANA NetworkVision window is displayed.

Removing a Device from the Map

Cisco ANA NetworkVision enables you to remove a device or aggregated node from the map.

A device that has been removed from the map is not deleted from the network.

To remove a device or aggregated node from the map:

Step 1 Select the device or aggregated node that you want to delete in the tree pane or map pane.

Step 2 Right-click to display the shortcut menu and select **Remove from Map**. The selected device or aggregated node is removed from the map.

Defining the Map Layout

Cisco ANA NetworkVision enables you to select the way in which the network object topology is displayed. The map pane displays the selected layout, namely, Circular, Symmetric, Hierarchical or Tree.

To define the map layout:

Step 1 On the toolbar, click on the dropdown list next to the Layout button and select one of the following options:

- **Circular**
- **Symmetric**
- **Tree**
- **Hierarchical**

or

Select **Layout** from the View menu and from the dropdown list, select one of the options displayed, as described above.

The map is displayed according to the selected option.

Note Clicking Layout on the toolbar displays the map according to the option last selected. Circular is the default layout option.

Saving a Map

Cisco ANA NetworkVision enables you to save map layouts and change existing ones.

The following changes are saved automatically:

- Addition or removal of a device
- Addition or removal of a link
- Aggregation or disaggregation of elements

The following changes to the workspace are only saved when the Save option is selected:

- The location of the devices on the map
- The layout
- Thumbnails
- The size of the devices

The maps can then be opened later as required.

To save changes to a map:

Step 1 On the toolbar, click **Save Map Appearance**,

or

Select **Save Map** from the File menu. Your changes are saved.

Saving as a New Map

The user can save a copy of the entire map or parts thereof (specific devices and aggregations) while leaving the original map intact.

To save as a new map:

Step 1   Make sure that the map that you want to save is displayed in the Cisco ANA NetworkVision window or that the required network elements and/or aggregated nodes are selected in the tree pane and map pane.

Step 2   Right-click in the tree pane or map pane to display the Device shortcut menu. Select **Save as New Map**. The Create Map dialog box is displayed with a default name for the new map.

Step 3   Enter a new name for the map,

or

You can accept the name provided by default.

Step 4   Click **OK**. The new map is created.

Note   For more information about how to open the new map, see Opening a Map, page 4-4.

Saving a Map as an Image

Cisco ANA NetworkVision enables you save the currently displayed map as an image.

To save a map as an image:

Step 1   Select **Save As Image** from the File menu. The Save as Image dialog box is displayed.

Figure 4-1   Save as Image Dialog Box
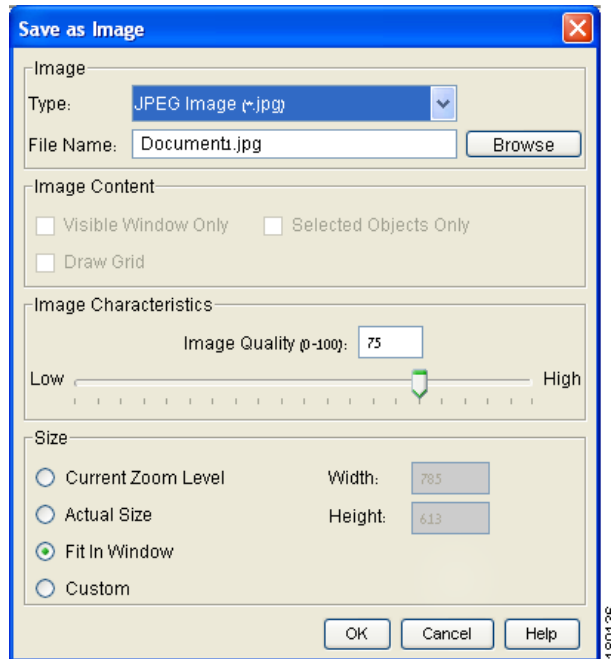
The following fields are displayed in the **Image** area:

- **Type—**Enables you to select the type of image required.

Note   The file types .svg and .png are not available in this version.

- **File Name—**Enables you to define a name for the image.

The following checkboxes are displayed in the Image Content area:

- **Visible Window Only—**Saves only the currently displayed window as an image.
- **Draw Grid—**This option is not available in this version.
- **Selected Objects Only—**Saves only the selected network objects as an image.

The Image Characteristics area enables you to define the quality of the image by entering a figure or by clicking and dragging the slider.

The following radio buttons are displayed in the Size area:

- **Current Zoom Level—**Saves the image at the currently selected zoom level. Selecting this radio button enables the Visible Window Only checkbox.
- **Actual Size—**Saves the image at the actual size.
- **Fit in Window—**Saves the image to fit in the window.
- **Custom—**Saves the image at an enlarged or reduced size. Selecting this radio button enables the Width and Height options.

Step 2   Define the image settings that are required.

Step 3   Click **OK**. The map is saved, as an image is the defined directory.

Closing a Map

Cisco ANA NetworkVision enables you to close a map displayed in the map pane whenever required. At the same time other maps can be left open in order to work with them.

To close a map:

Step 1   Select **Close** from the File menu,

or

Click ⊠ in the upper right-hand corner of the map in the workspace.

If changes have been made to the map, an information message is displayed.

Step 2   Click **Yes**. The map is saved and closed. An empty Cisco ANA NetworkVision window is displayed, or the map that was last opened is displayed.

Deleting a Map

Cisco ANA NetworkVision enables you to delete a map from all the views in the Cisco ANA NetworkVision window.

To delete a map:

Step 1   On the toolbar, click **Open Map**,

or

Select **Open** from the File menu. The Map List dialog box is displayed.

Step 2   From the Map List, select the map that you want to delete.

Step 3   On the toolbar, click **Delete Map**. An confirmation message is displayed.

Step 4   Click **Yes**. The selected map is deleted from the Map List dialog box, the Cisco ANA NetworkVision window and the database.

Step 5   Click **Close** to close the Map List dialog box. The Cisco ANA NetworkVision window is displayed.

Note   When a map that is open is deleted, a message is displayed to all users of the client that the map is being closed and deleted from the database.

Renaming a Map

Cisco ANA NetworkVision enables you to rename a map that is displayed in the Cisco ANA NetworkVision window. The name change affects all users of the map and the new name is displayed in the Cisco ANA NetworkVision window of all users.

To rename a map:

Step 1   On the toolbar, click **Open Map**,

or

Select **Open** from the File menu. The Map List dialog box is displayed.

Step 2   From the Map List, select the map that you want to rename.

Step 3   On the toolbar, click **Rename Map**. The Rename Map dialog box is displayed.

Step 4   Enter the new map name.

Step 5   Click **OK**. The selected map is renamed in the Map List dialog box, in the Cisco ANA NetworkVision window and in the database.

Step 6   Click **Close** to close the Map List dialog box. The Cisco ANA NetworkVision window is displayed.

Resizing a Device

Cisco ANA NetworkVision enables you to define the size of selected devices or aggregated nodes in the map pane, according to predefined sizes or according to a percentage of the current size.

Note   You can manually resize a node by selecting it and dragging the corner (handle).

To resize a device or aggregated node:

Step 1   Select the devices and/or aggregated node that you want to resize in the map pane.

Note   The Resize option is only enabled when devices and/or aggregated nodes are selected. If there are any links selected this option is disabled.

Step 2   On the toolbar, click **Resize Selected Nodes**,

or

Select **Resize** from the Edit menu.

or

Right-click on the selected devices and/or aggregated node in the map pane to display the Device shortcut menu. Select **Resize**.

The Resize Nodes Controller dialog box is displayed.

The following fields are displayed in the Resize Nodes Controller dialog box:

- **Resize Node**—Displays a dropdown list of percentages according to which the map selection is resized based on the current size.

- **Set Node Sizes**—Displays a dropdown list of fixed sizes according to which the map selection is resized.

Step 3   Select an option from the Resize Node or Set Node Sizes dropdown list.

Step 4 Click **OK**. The selected devices and/or aggregated node are resized.

Viewing the Network

Cisco ANA NetworkVision enables you to display the entire network map or any part of the map in the Cisco ANA NetworkVision window.

You can use the Zoom tools or the Overview window to display the part of the map that you require. The Overview window enables you to view all the changes and alarms taking place in the network. In addition, you can display an aggregated node in a thumbnail.

To open an overview of the network:

Step 1 On the toolbar, click **Overview**,

or

Select **Overview** from the View menu. The Overview window is displayed.

Figure 4-2   *Overview Window*
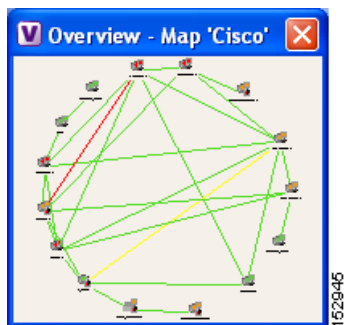
Step 2 In the Overview window, select the area that you require by clicking and dragging the mouse to view the required area and thereby enlarging it in the map pane. A blue rectangle is displayed around the selected area. You can move the selected area by placing the mouse above the rectangle. The mouse icon will be changed to a hand, and you can then click and drag the mouse to move the rectangle over the required area.

Step 3 Click and drag the rectangle again to select or resize a different network area.

Step 4 Click ✕ to close the Overview window.

In addition, you can display a thumbnail of the selected aggregated node in the map pane, including all the aggregated devices. Thumbnails can also be nested.

To display a thumbnail of the node:

Step 1 Right-click on an aggregated node in the map pane to display the Aggregated Node shortcut menu.

Step 2   Select **Show Thumbnail**. The thumbnail is displayed in the map pane.

Figure 4-3   *Thumbnail*
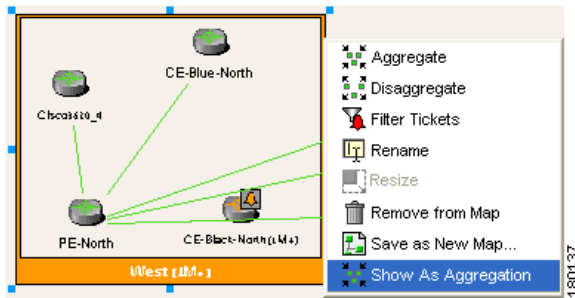
> **Note**   To redisplay the aggregated node in the map pane right-click on the thumbnail and select **Show As Aggregation**.

> **Note**   To resize the thumbnail select it, and click and drag any of the thumbnail handles.

Viewing a Network Device

Cisco ANA NetworkVision enables you to view any network device in the currently displayed map.

The network device is selected in the map pane and the tree pane. The ticket pane displays all the active and cleared tickets, however, the user can filter the tickets so that only the tickets of the selected network device are displayed in the ticket pane.

For more information about filtering tickets by device, see Filtering Tickets by Device, page 8-4.

To view a network device:

Step 1   Click on the device in the tree pane or select the device on the map.

> **Note**   • You can use the Zoom tools when viewing the network, see Cisco ANA NetworkVision Toolbar, page 2-18.
>
> • Click **Overview** on the toolbar to display the network in the Overview window.

Selecting Map Views

Cisco ANA NetworkVision provides you with various selection tools that can be used to view and analyze maps in the map pane.

You can view graphical representations of NEs and various links appearing in the map pane of the Cisco ANA NetworkVision window's workspace using the toolbar buttons.

The **Device View** and **Show Links View** buttons open dynamic tables listing network element/device information and respective map context links in table-format (not graphical links). The respective tables are displayed in the Cisco ANA NetworkVision window's workspace. For more information on viewing and working with device view tables and filtering the links view, see Chapter 3, "Working with Cisco ANA NetworkVision Tables".

Cisco ANA NetworkVision provides you with various selection tools that can be used to view and analyze maps in the map pane and the links view table displayed in the workspace as described below.

Button	Function
	Defines the way in which the map is displayed in the map pane of the Cisco ANA NetworkVision window, namely, Circular, Symmetric, Tree or Hierarchical.
	Displays the device view in the Cisco ANA NetworkVision window's workspace (the button toggles when selected or deselected).
	Displays the links view in the Cisco ANA NetworkVision window (the button toggles when selected or deselected).
	Displays the map pane in the Cisco ANA NetworkVision window (the button toggles when selected or deselected).
	Activates the normal selection mode (the button toggles when selected or deselected).
	Activates the pan mode, which enables you to move around in the map pane by clicking and dragging (the button toggles when selected or deselected).
	Activates the zoom selection mode, which enables you to select an area in the map pane to be enlarged by clicking and dragging to view the selected area (the button toggles when selected or deselected).
	Fits the entire sub-network or map in the map pane.

To select a tool:

Step 1   From the View menu choose the required selection tool,

or

On the toolbar, click the required selection tool.

Finding a Ticket Source

Cisco ANA NetworkVision enables you to find the source of a ticket displayed in the ticket pane by highlighting the device in the tree pane and/or map pane.

To find the ticket source:

Step 1   Right-click on the required ticket in the ticket pane to display the Ticket shortcut menu.

Step 2   Select **Find Source** from the Ticket menu. The source of the ticket is highlighted in the tree pane and/or map pane.

> **Note**   A blue selection box highlights the device that is the source of the ticket.

Step 3   Click anywhere in the tree pane or the map pane to remove the highlight from the selected device or link.

Finding a Link Source

Cisco ANA NetworkVision enables you to find a link displayed in the links view by highlighting the link in the map pane.

To find the link:

Step 1   Right-click on the required link in the links view to display the Links View menu.

Step 2   Select **Find Source** from the Links View menu.

The source of the link is highlighted in the map pane.

or

If there are two or more lines that represent the same links, for example, a VRF link, the Select Link Context dialog box is displayed. Select the required link context from the dropdown list and click **OK**. The source of the link is highlighted in the map pane.

> **Note**   A blue link highlights the source of the link in the map pane.

Step 3   Click anywhere in the tree pane or the map pane to remove the highlight from the selected link.

Finding a Network Device

Cisco ANA NetworkVision enables you to find a device in the map by entering the device name or the device IP address or any part thereof.

To find a device in the map:

Step 1   On the toolbar, click **Find in Map**,

or

Select **Find in Map** from the Edit menu. The Find in Map dialog box is displayed.

The Search all map levels checkbox enables you to search for a device or IP address at all levels of the map. This option is selected by default. Clearing this option searches for the device, but excludes device aggregations from the search.

Step 2   Enter the device name or the IP address.

> ✎
>
> **Note**   You can enter a partial name (case sensitive) or IP address. For example, XY will find the devices with the names containing the letters XY.

Step 3   Click **OK** to enable the search in all the maps and sub-networks. A device matching the search criteria is displayed on the map.

Step 4   Press **F3** to view the next device matching the search criteria.

Aggregating Devices

Cisco ANA NetworkVision enables you to aggregate devices in the map pane.

To aggregate devices:

Step 1   Select the required devices in the map pane,

or

Select the required devices in the tree pane or map pane using **<Ctrl>** or the selection tool.

Step 2   On the toolbar, click **Aggregate**,

or

Select **Aggregate** from the Node menu,

or

Right-click on the selected devices in the tree pane or map pane to display the Device menu. Select **Aggregate**.

The Aggregation dialog box is displayed prompting you to enter a name for the aggregated node.

Step 3   Enter a unique name for the aggregated node and click **OK**. The aggregated node is displayed in the tree pane and map pane. Aggregated nodes are displayed as a single entity with the Aggregation icon.

The aggregated node icon changes color according to the alarm severity. For more information about device colors, see Status of Network Objects, page 2-15.

The aggregated node selected in the map pane and tree pane of the Cisco ANA NetworkVision window can be disaggregated.

To disaggregate a node:

Step 1   Select the required branch in the tree pane,

or

Select the required aggregated node in the map pane.

> **Note**   The Aggregation icon indicates an aggregated node.

Step 2   Select **Disaggregate** from the Node menu,

or

Right-click on the aggregated node in the tree pane or map pane to display the Aggregated Node shortcut menu. Select **Disaggregate**.

An information message is displayed.

Step 3   Click **Yes**. The node is disaggregated.

For more information about resizing an aggregated node, see Resizing a Device, page 4-11.

Renaming an Aggregated Node

Cisco ANA NetworkVision enables you to rename an aggregated node that is displayed in the Cisco ANA NetworkVision window.

The name change affects all users of the map and the new name is displayed in the Cisco ANA NetworkVision window of all users.

To rename an aggregated node:

Step 1   Select the aggregated node that you want to rename in the tree pane or map pane.

Step 2   Right-click on the aggregated node to display the Aggregated Node menu and select **Rename**. The Rename Node dialog box is displayed.

Step 3   Enter a new name for the aggregated node and click **OK**. The selected aggregated node is renamed in the tree pane and map pane and in the database.

Filtering Links According To Type

The links filter enables the user to filter the links displayed in the map pane and in the links view.

The user quickly selects the types of links to be filtered by selecting from a predefined set of link types in the list or by manually configuring a customized set of link types. The user can either:

- Create a new map, select a filter and then add the devices to the map. This filter will then be applied to the new map and only the required link types will be visible in the map pane and the links view (**method 1**)
  or

- Create a map and add the devices with all the links enabled and visible in the map pane and links view. The user can then filter (display or hide) the different types of links required (**method 2**).

Note   By default all the link types are displayed in the map pane and links view until the links filter is applied.

Note   The filter only applies to the map pane and the links view; it has no affect elsewhere in Cisco ANA NetworkVision. Since the filtered links are removed from the map, it also has an affect on the severity of the network elements.

To filter links according to type (method 1):

Step 1   On the toolbar, click **New Map**,

or

Select **New Map** from the File menu.

The Create Map dialog box is displayed. For more information see Creating a New Map, page 4-3.

Step 2   Click **Advanced**. The Map Options dialog box is displayed.

Figure 4-4   Map Options Dialog Box
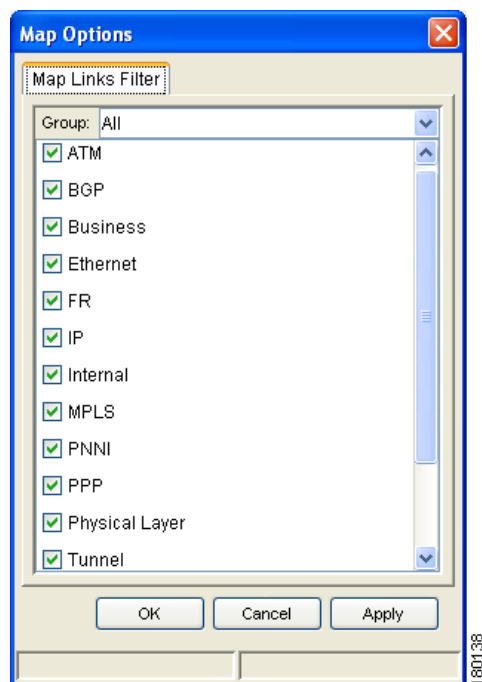
> **Note** By default all the link types are selected in the Map Options dialog box, namely, all the links are displayed in the map pane and links view.

The Map Options dialog box displays a list of all the types of links that can be filtered by the user in the map pane.

The **Group** dropdown list contains the following options:

- **Custom**—Only the links defined for the customized filter are displayed in the map pane.
- **All**—All the links are displayed in the map pane.
- **Data Link**—The data link layer class of links is displayed in the map pane, namely, ATM and FR.
- **None**—None of the links are displayed in the map pane.
- **Physical**—Only the physical links are displayed in the map pane.
- **VPN**—Only the VPN links are displayed in the map pane.

ATM, VPN, MPLS, and Ethernet are just some of the options displayed in the Map Options dialog box that can be used to filter the links displayed in the map pane and in the links view.

> **Note** The Group dropdown list options can be customized by selecting an option and adding or removing the required link types. The next time the Map Options dialog box is opened the Custom option is displayed with the required link types.

Step 3 Select or clear the checkbox(es) for the links that you want or do not want to display in the map pane and links view.

Step 4 Click **OK/Apply** to apply the defined link filter settings.

Step 5 Enter a name for the new map and click **OK**. An empty new map is displayed in the tree pane and map pane.

Step 6 Add the required devices to the network. For more information see Adding a Device, page 4-5.

The links are displayed in the map pane and links view according to the defined filter criterion.

A user can also create a map and add the devices with all the links enabled and visible in the map pane and links view. The user can then filter (display or hide) the different types of links required.

To filter links according to type (method 2):

Step 1 On the toolbar, click **Map Options**. The Map Options dialog box is displayed.

Step 2 Clear the checkbox(es) for the links that you do not want to display in the map pane and links view.

Step 3 Click **OK/Apply** to apply the defined link filter settings. The links are displayed in the map pane and links view according to the defined filter criterion

---

.

Opening the CPU Usage Graph

Cisco ANA NetworkVision enables you to display memory and CPU usage information for a device/network element, including its history.

To open the CPU usage graph:

Step 1 Right-click on a device/network element in the tree pane or map pane to display the Device shortcut menu.

Step 2 Select **Tools | CPU Usage**. The CPU Usage dialog box is displayed.

The following areas are displayed in the CPU Usage dialog box:

- **CPU Usage**—The CPU usage rate as a percentage.
- **CPU Usage History**—The CPU usage rate history is graphically displayed.
- **Memory Usage**—The memory usage rate as a percentage.
- **Memory Usage History**—The memory usage rate history is graphically displayed.

The following tool is displayed in the dialog box:

💾	Exports all the information currently displayed in the dialog box. This information can then be viewed at a later stage. For more information see Exporting the Table to a File, page 3-5.

Step 3 Click **Close** to close the CPU Usage dialog box.

Communicating with Devices

Cisco ANA NetworkVision enables you to communicate with devices in the following ways:

- Pinging the Device
- Telneting the Device

Pinging the Device

Cisco ANA NetworkVision enables you to ping the device in order to check whether the device is responding.

✎
Note The ping is performed from the client to the device, and not from the ANA Unit hosting the VNE to the device.

To ping the device:

Step 1 Select the required device in the tree pane or map pane in the workspace.

Step 2 Right-click on the required device to display the Device shortcut menu.

Step 3   Select **Tools** | **Ping**. The Ping window is displayed and the device is pinged.

Telneting the Device

Cisco ANA NetworkVision enables you to communicate with the device using the Telnet window.

✎

Note   The telnet is performed from the client to the device, and not from the ANA Unit hosting the VNE to the device.

To telnet the device:

Step 1   Select the required device in the tree pane or map pane in the workspace.

Step 2   Right-click on the required device to display the Device shortcut menu.

Step 3   Select **Tools** | **Telnet**. The Telnet window is displayed.

Step 4   Complete the necessary communication with the device.

Previewing a Map

Using Cisco ANA NetworkVision you can preview a map before it is printed.

To preview a map:

Step 1   Display the map that you want to print in the map pane.

Step 2   Select **Print Preview** from the File menu. The Print Preview dialog box is displayed with the active map.

The following buttons are displayed in the Print Preview dialog box:

- **Print**—Prints the displayed network/map to the selected printer.
- **Print Setup**—Opens the Print Setup dialog box enabling you to define how the network/map is printed. For more information see Defining the Print Setup, page 4-22.
- **Zoom In**—Zooms in on the network/map.
- **Zoom Out**—Zooms out of the network/map.
- **Zoom %**—Zoom in to get a close-up view of your network/map or zoom out to see more of the network/map at a reduced size. Click the arrow next to the **Zoom** box and the zoom setting that you want.
- **Fit In Window**—Displays the entire network/map in the Print Preview dialog box.
- **Close**—Closes the Print Preview dialog box.

Step 3   Click **Print**. The required map is printed to the selected printer.

Defining the Print Setup

Cisco ANA NetworkVision enables you to define the print setup of a map before it is printed.

To define the print setup:

Step 1   Open the Print Preview dialog box, see .

Step 2   Click **Print Setup**. The Print Setup dialog box is displayed.

Figure 4-5   Print Setup Dialog Box
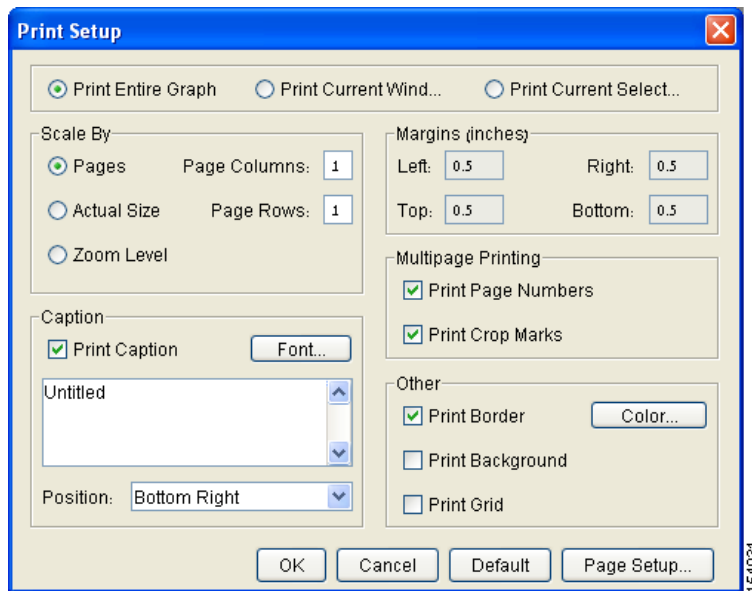
The following radio buttons are displayed at the top of the Print Setup dialog box:

- **Print Entire Graph**—Prints the currently displayed map, including aggregated nodes.
- **Print Current Window**—Prints the currently displayed map, excluding aggregated nodes.
- **Print Current Selection**—Prints the area selected in the currently displayed map.

The following radio buttons are displayed in the Scale By area, enabling you to define the number of pages and size at which the map is printed:

- **Pages**—Prints the currently displayed map according to the numbers specified in the Page Columns and Page Rows fields.
- **Actual Size**—Prints the currently displayed map at the actual size.
- **Zoom Level**—Prints the currently displayed map according to the selected zoom level.

The following checkbox is displayed in the Caption area:

- **Print Caption**—Select this option to add a caption to the printed map and enter the required text in the field below.

The following field is displayed in the **Caption** area:

- **Position**—Defines the position of the caption in the printed map.

The **Margins** area enables you to define the print margins of the map.

The following checkboxes are displayed in the Multipage Printing area:

- **Print Page Numbers—**Prints the map with page numbers.
- **Print Crop Marks—**Prints the map with crop marks.

The following checkboxes are displayed in the Other area:

- **Print Border—**Prints a border around the printed map.
- **Print Background—**Prints the background of the currently displayed map.
- **Print Grid—**Prints a grid for the printed map.

The following buttons are displayed in the Print Setup dialog box:

- **Default—**Restores the default print settings.
- **Page Setup—**Defines the page setup settings for printing.

Step 3   Define the print setup as required.

Step 4   Click **OK**. Now that you have defined the print setup you can print the map. For more information see Printing a Map, page 4-23.

Printing a Map

Cisco ANA NetworkVision enables you to print the map that is currently displayed.

To print a map:

Step 1   Select **Print** from the File menu.

or

Click **Print** in the Print Preview dialog box. For more information about the Print Preview dialog box, see Previewing a Map, page 4-21.

C H A P T E R **5**

Viewing Device Properties

This chapter describes how to view the properties of a device in any mapped network and also provides a description of these device properties.

Viewing Device Properties

Cisco ANA NetworkVision enables you to view the properties of a selected device using the Properties dialog box. For example, you can view the Vendor and Location of a device.

To view device properties:

Step 1 Right-click on a device in the tree pane or map pane or device view in the workspace to display the Device shortcut menu. Select **Properties**.

The Properties dialog box is displayed.

Figure 5-1   *Properties Dialog Box*
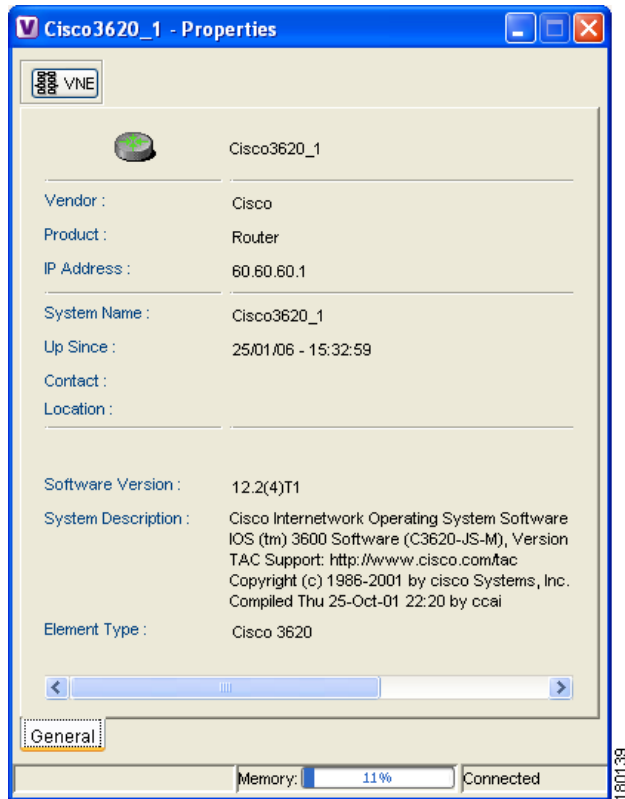
The device icon and name are displayed at the top of the Properties dialog box. In addition, the severity of the selected network device is displayed using the severity colors palette. The following fields are displayed in the Properties dialog box:

- **Vendor—**The vendor name, as defined in the device's MIB.

- **Product—**The product name of the device, as defined in the device's MIB, for example, Router.

- **IP Address—**The IP address used for managing the device.

- **System Name—**The name of the device, as defined in the device's MIB.

- **Up Since—**The date and time when the device was last reset.

- **Contact—**The name of the contact person for the device, as defined in the device's MIB.

- **Location—**The physical location of the device, as defined in the device's MIB.

- **Software Version—**The details of the software version.

- **System Description—**A description of the system taken from the device.

- **Element Type—**The device type (manufacturer name), for example, Cisco 7200.

The VNE button displayed in the Properties dialog box opens the VNE Properties dialog box enabling you to edit the VNE's properties, including starting and stopping the VNE, maintenance and configuring polling rates. For more information, refer to the *Cisco Active Network Abstraction Administrator Guide*.

Step 2   To close the device Properties dialog box, click ☒ .

Viewing VNE Properties

Click the VNE button to view more information about the VNE. For more information about VNE Management, such as adding new VNEs to a network and modifying the status of a VNE, refer to the *Cisco Active Network Abstraction Administrator Guide*.

C H A P T E R **6**

Viewing Network Device Inventory

This chapter describes how to view the physical and logical inventory of a selected device in any mapped network and provides a description of both. In addition, it briefly describes the DLCI, VC and Cross Connect tables.

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

> **Note**   The window displayed for all the devices is similar in appearance however the information that can be viewed for each device may vary.

The Inventory window also enables the user to view all the tickets that are collected on the selected NE in the ticket pane. For more information see Ticket Pane, page 6-5.

- Opening the Inventory Window, page 6-1, describes how to open the Inventory window. In addition, it describes the Inventory window, including the tree pane, device view panel, toolbar, ticket pane and workspace.

- Viewing Physical Inventory, page 6-5, describes how to view the physical inventory of a selected device and port functionality. In addition, it describes opening the port utilization graph, and managing port alarms.

- Viewing Logical Inventory, page 6-7, describes how to view the logical inventory of a selected device.

- Opening the DLCI/VC/Cross Connect Table, page 6-8, describes how to open the DLCIs/VCs/Cross Connect information table on a selected port.

Opening the Inventory Window

The Inventory window enables you to perform the following functions:

- View physical and logical inventory information.
- View tickets for the device.
- Open the port utilization graph.
- Open the DLCI, VC and Cross Connect tables.
- Open the Cisco PathTracer.
- Add or remove links.

- Manage the alarms being sent on a port.
- Open the Command Builder to create customized commands.
- Open the Soft Properties Manager to extend the amount of information displayed. For more information see *Cisco Active Network Abstraction Customization User Guide*.

For more specific information on MPLS-TE (Traffic Engineering) tunnels and Cisco ANA Network's Traffic Engineering Tunnel viewing capabilities, see *Cisco Active Network Abstraction Managing MPLS User Guide*.

To open the Inventory window:

Step 1 Double-click on a device in the tree pane or map pane,

or

Select a device in the tree pane or map pane or device view and on the toolbar click ![icon],

or

Right-click on a device in the tree pane or map pane to display the Device shortcut menu and select **Inventory**.

The Inventory window for the selected device is displayed.

Figure 6-1   Inventory Window
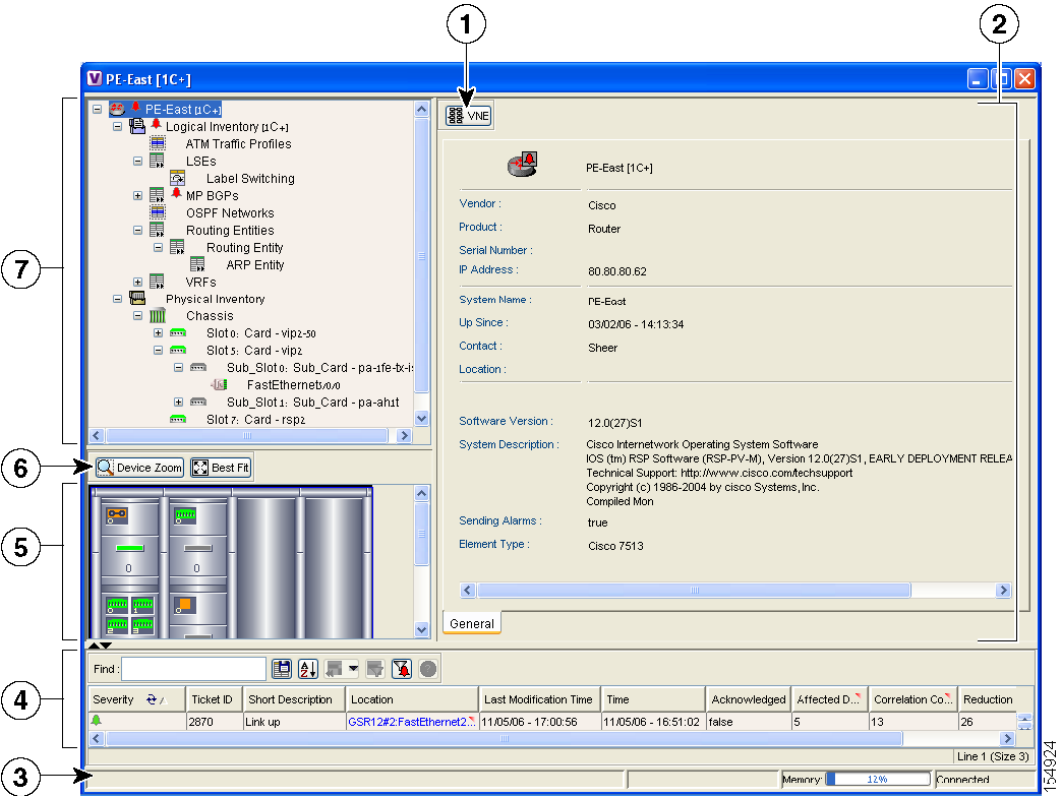
| 1 | Viewing VNE properties |
| 2 | Properties pane including tabs and tables |

3	Status bar
4	Ticket pane
5	Device view panel
6	Device view panel toolbar
7	Tree 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 Logical Inventory, page 6-7.

Note   Click in the right-hand top corner to close the Inventory window.

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

- Tree Pane.

- Device View Panel.

- Device View Panel Toolbar.

- Ticket Pane.

- Information Tabs and Tables in the Properties Pane.

All the 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 changes according to the network element or network element component selected in the tree pane.

For more information about the right-click shortcut menus that are displayed in the Inventory window see Shortcut Menus, page 2-25.

Tree Pane

The tree pane displays a tree-and-branch representation of the selected device and all its modules. The tree pane is divided into two main branches, namely, Logical Inventory and Physical Inventory.

The window heading and the highest level of the tree pane displays the name of the VNE given to the device as defined in Cisco ANA Manage. The highest level of the tree pane also displays the device icon and status. For more information about icons see Appendix A, "Icon Reference".

The color of the device icon in the tree pane reflects its severity. In addition, the color of the network element component in the device view panel is the same as the color of the network element component in the tree pane. For more information about severity and status see Status of Network Objects, page 2-15.

The branches of the tree pane display the different network element components, for example, a chassis, card and so on. When a network element component is selected in the tree pane, the information displayed in the Information tabs and tables in the properties pane is updated. The branches in the tree pane can be expanded and collapsed in order to display and hide information as needed.

The table below displays the different network element component icons used to display physical inventory in the tree pane of the Inventory window:

Table 6-1   Physical Inventory Icons

Icon	Device
IIIII	Chassis
IIIIII	Shelf
	Slot/Sub-slot
	Port/Logical Port
	Unmanaged Port

For more information about the device icons displayed see Appendix A, "Icon Reference". A business tag can be attached to the selected network element component by right-clicking. For more information about business tags see Chapter 10, "Working with Business Tags".

For more information about the right-click menus that are displayed in the tree pane of the Inventory window see Shortcut Menus, page 2-25.

Device View Panel

The device view panel displays a graphical representation of the front view of the selected device. The colors displayed in the device view panel reflect the colors of the network element components in the tree pane. For example, if a port is down and is colored red in the tree pane, the same port is colored red in the device view panel.

Clicking on a network element component in the device view panel displays the properties of the selected component in the Information tabs and tables in the properties pane and selects the same network element component in the tree pane.

Device View Panel Toolbar

The Inventory window contains the following tools that are connected to the device view panel:

	Displays an enhanced view of the network element components within the device in the 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 tree pane. For more information about the ticket pane, see Ticket Pane, page 2-13.

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

Information Tabs and Tables in the Properties Pane

The Information tabs and tables in the properties pane enable you to view physical and logical inventory information, depending on your selection in the tree pane or device view panel, for example, chassis or port information. The inventory information displayed in the Inventory window varies according to the device or network element component selected in the tree pane.

The properties pane displays context-sensitive tabs and toolbars; the tools displayed depend on your selection in the tree 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, the user can display the properties of a row in a table by double-clicking on the row in the table or by right-clicking it and selecting Properties from the shortcut menu.

For more information about the toolbar displayed in the table of the properties pane see Chapter 3, "Working with Cisco ANA NetworkVision Tables".

Viewing Physical Inventory

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 the user to view physical inventory information for the following modules:

- Device—For a detailed description of device properties see Viewing Device Properties, page 5-1.
- Chassis
- Shelves
- Slots
- Sub-Slot
- Ports, including logical ports

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

The system also includes built in properties (system properties) for each network element. This includes information such as MAC address, MTU and Media Type.

> **Note** The window displayed for all the devices is similar in appearance, however the network element components contained in each device can vary, for example, chassis, shelf, sub-port and so on.

The information displayed in the Inventory window changes according to the device type, device and network element component selected in the tree pane.

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

- **Show DLCI Table | Show VC Table | Show Cross Connect Table**—Displays the DLCI/VC/Cross Connect Table of the selected port. For more information see Opening the DLCI/VC/Cross Connect Table, page 6-8.

- **Open Port Utilization Graph**—Displays the selected port traffic statistics, namely, Rx/Tx Rate and Rx/Tx Rate History. For more information see Opening the Port Utilization Graph, page 6-6.

- **Disable Sending Alarms**—Enables the user to manage the alarms on a port. For more information see Managing Port Alarms, page 6-6.

For information about configuring topology from a port see Adding a Link, page 7-6.

Opening the Port Utilization Graph

Cisco ANA NetworkVision enables you to display the online information of a port, namely, Rx/Tx Rate and Rx/Tx Rate History.

To open the port utilization graph:

Step 1   Open the Inventory window and select the required port.

Step 2   Click **Open Port Utilization Graph** in the properties pane. The Port Statistics dialog box is displayed.

The following areas are displayed in the Port Statistics dialog box:

- **Rx Rate**—The reception rate as a percentage.

- **Rx Rate History**—The reception rate history is graphically displayed.

- **Tx Rate**—The transmission rate as a percentage.

- **Tx Rate History**—The transmission rate history is graphically displayed.

Step 3   Click ✕ to close the Port Statistics dialog box.

Managing Port Alarms

The user 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 will be generated for the port and they will not be displayed in the ticket pane.

To disable a port alarm:

Step 1   Open the Inventory window to select the required port.

Step 2   Right-click the required port to display the shortcut menu, and select **Disable Sending Alarms**,

or

On the toolbar of the properties pane, click **Disable Sending Alarms**.

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

The user can enable the alarms on a port at any time.

To enable a port alarm:

Step 1   Open the Inventory window to select the required port.

Step 2   In the properties pane click **Enable Sending Alarms**.

The Sending Alarms field in the Location Information area of the properties pane displays the value true. This indicates that the alarm for the required port has been enabled.

In addition, the toolbar in the properties pane now displays the Disable Sending Alarms tool.

Viewing Logical Inventory

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, which affect traffic handling in the device.

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

Logical Inventory Window

Logical inventory information is displayed in the Inventory window, which can be divided into tabs, for example, Traffic Descriptors and Forwarding Component Containers tabs, as shown in the example.

Figure 6-2   Logical Inventory Information Displayed in the Inventory Window
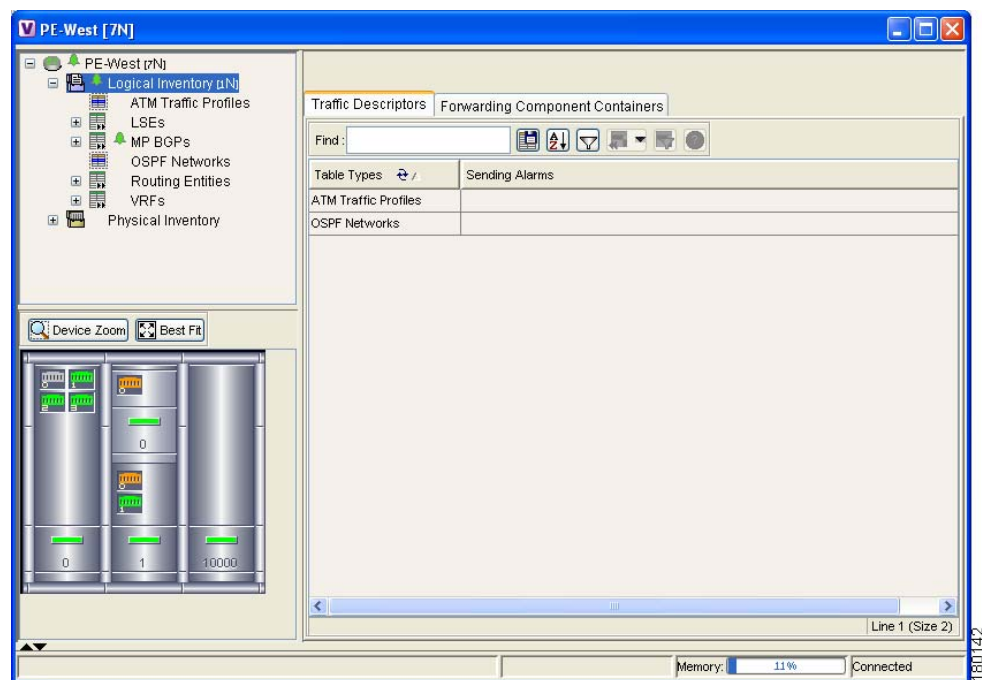
Note For more information about opening the Inventory window see Opening the Inventory Window, page 6-1.

The Traffic Descriptors tab enables you to view the profiles for which logical inventory information can be displayed, for example, Frame Relay Traffic Profiles and ARP Entities.

The logical device information is also updated in the model of the network element in order to accurately reflect the traffic handling which is being performed by the device at any time.

The Forwarding Component Containers tab enables you to view a list context profiles for which logical inventory information can be displayed, for example, VRFs and Routing Entities.

Note Cisco ANA NetworkVision now provides enhanced support for the Generic SNMP VNE. The user can now view Bridge and ARP table information.

Opening the DLCI/VC/Cross Connect Table

The DLCI/VC/Cross Connect Table enables you to view a table of DLCIs/VCs/Cross Connect information on a selected port. For example, the Cross Connect table enables you to view in and out port cross connect information, including cross connect information for unmanaged networks, Frame Relay and ATM devices.

To open the DLCI/VC/Cross Connect table:

Step 1 Right-click on a device in the tree pane or Context pane to display the Device shortcut menu.

Step 2 Select **Inventory**. The Inventory window for the selected device is displayed.

Step 3 Open the Physical Inventory branch and drill down to the required port.

Step 4 Click **Show DLCI Table/Show VC Table/Show Cross Connect Table** on the toolbar of the Context pane. The relevant dialog box is displayed.

Working with Links

This chapter describes how to view information about the physical links between ports and sub-ports. In addition, it describes adding and removing links between devices.

- Opening Link Properties, page 7-2, describes how to open the Link Properties dialog box.
- Monitoring Link Properties, page 7-3, describes the Link Properties dialog box and how to view information about the physical links between ports.
- Viewing Impact Analysis, page 7-4, describes how the user can select a network link and calculate the potentially affected parties in the event of the selected link going down.
- Adding a Link, page 7-6, describes how to add links between devices.
- Working in Links View, page 7-8, describes the links view, including how to filter the links.

The Cisco ANA solution enables the continuous automatic discovery of connectivity between all network elements. Using the automatic discovery mode, all the links in the network are discovered automatically. Auto-discovery is an ongoing process that maintains the real topology information of the network. Cisco ANA NetworkVision discovers any new links that are added and continues to verify that the discovered links still exist.

Link properties are displayed for the following types of links:

- Between two devices.
- Between a device and an aggregation of devices or aggregation of aggregations, which connects this device to another device inside the aggregation(s).
- Between two aggregations, which contains devices that cross the aggregations.

The links or aggregated links presented in the map pane:

- Display arrowheads if they are unidirectional
- Have no arrowheads if they are bi-directional

In addition, the links displayed in the map pane have tool tips that provide the user with information regarding the number of links and partially describe the list of links. Physical links are highlighted bold. The links displayed in the map pane can be filtered. For more information see Filtering Links According To Type, page 4-17.

Opening Link Properties

The properties of the physical links between two ports are viewed using the Link Properties dialog box. ATM, Frame Relay, Ethernet and Serial are some of the examples of the technologies that Cisco ANA currently supports links.

Note The color of a selected link is customizable. The default color is blue. For more information on link colors see Chapter 2, "Getting Started".

To open link properties:

Step 1 Select a link between two devices in the map pane.

Step 2 Right-click on the selected link to display the Link shortcut menu.

Step 3 From the Link shortcut menu, select **Properties**,

or

Double-click on the link. The Link Properties dialog box is displayed.

Figure 7-1   Link Properties Dialog Box
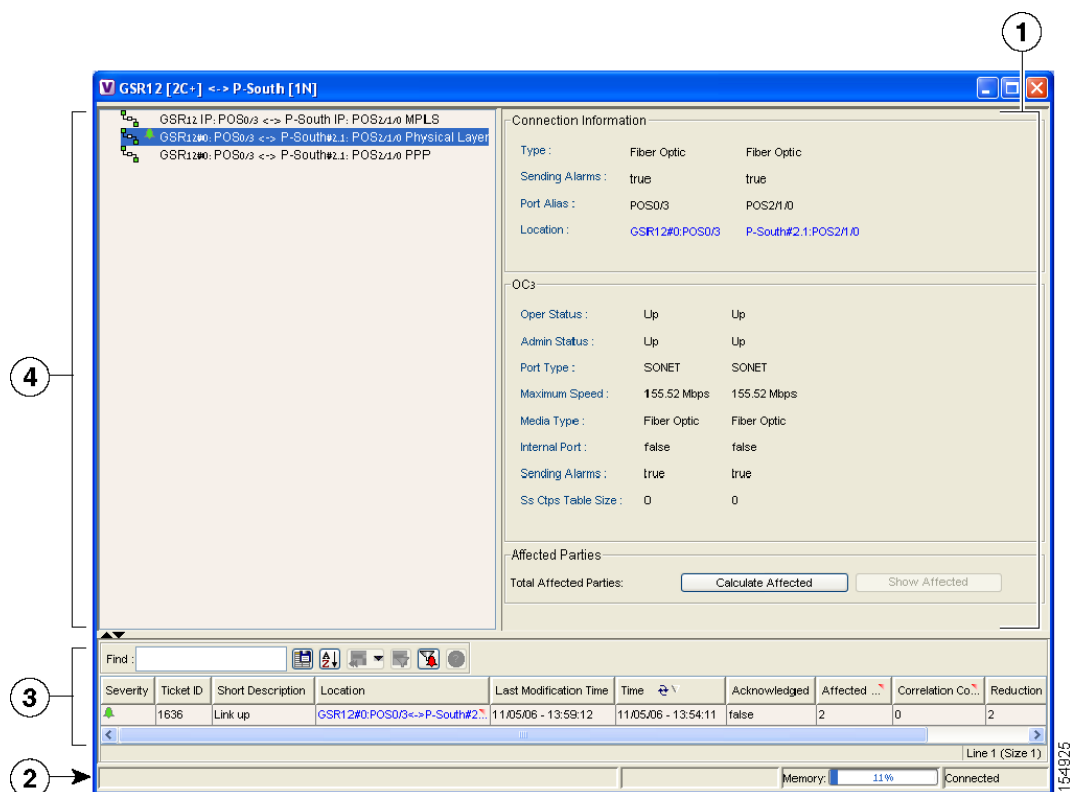
1	Properties pane
2	Status bar
3	Ticket pane
4	Link List pane

✎

Note   If there are a few links between the devices or aggregations, the Link Properties dialog box displays the information of all the links.

Step 4   Click **Close** to close the Link Properties dialog box. The Cisco ANA NetworkVision window is displayed.

Monitoring Link Properties

The Link Properties dialog box is divided into the following areas:

- Link List Pane
- Properties Pane
- Ticket Pane

All the areas displayed in the Link Properties dialog box are correlated; this means that selecting an option in one area affects the information displayed in the other areas.

The information displayed in the Link Properties dialog box changes according to the ports or sub-ports selected in the Link List pane.

Link List Pane

The Link List pane displays a list of the links that are represented by a single link on the map. Each link has a single entry in the Link List pane.

When a branch is selected in the Link List pane, the information displayed in the properties pane is updated. The color of the icon in the Link List pane reflects its severity. For more information about severity see Status of Network Objects, page 2-15.

The heading and the Link List pane display the left and right link identifiers between the two nodes, the device alias and CTP.

Properties Pane

The properties pane enables you to view the following, depending on your selection in the Link List pane:

- Properties of a selected link, including port properties information
- Hyperlink to ports inventory access
- Status

The properties pane displays the connection information type, port alias and port location (a hyperlink) information, all which uniquely identify the port. Port location information is also displayed as a hyperlink to the Inventory window.

The properties pane displays the parameters for the different sides of the link, aligned under the relevant link identifier. Any discrepancies between the link's ports are colored red.

The properties pane enables you to view the statistics of the traffic on the link. The following fields are displayed in the Connection Information area:

- **Type**—The type of connector, for example, fiber optic.
- **Sending Alarms**—The status of alarms on the port of the device, enabled (true) or disabled (false).
- **Port Alias**—The name used in the device CLI or EMS for the selected port.
- **Location**—The location of the entity, slot number and port on the slot, as a hyperlink that opens the properties of the relevant location.

The following fields may be displayed in the properties pane:

- **Oper Status**—The operation status, Up or Down.
- **Admin Status**—The port configuration, Up or Down.
- **Port Type**—The specific port type, for example, OC3 or Ethernet.
- **Maximum Speed**—The maximum port speed in Mbps.
- **Media Type**—The type of cable used, for example, fiber optic.
- **MAC Address**—The MAC address.
- **Distribution Protocol Type**—The distribution protocol type, for example, LDP.

The following buttons are displayed in the Affected Parties area for physical links:

- **Calculate Affected**—Calculates and retrieves the total number of potentially affected entities.

> **Note** This button is displayed when selecting a physical layer Link.

- **Show Affected**—Displays the properties of the affected parties after clicking **Calculate Affected**.

> **Note** This button is enabled when the **Calculate Affected** button is clicked.

Viewing Impact Analysis

Cisco ANA NetworkVision enables the user to select a network link and calculate the potentially affected parties (proactive impact analysis) in the event of the selected link going down, the fault has not actually occurred).

> **Note** This section only applies to physical links.

To calculate impact analysis:

Step 1   Select a context in the tree pane, and click **Links View** on the toolbar. The links view is displayed in the workspace.

Step 2   On the toolbar, click **Map Options**. The Map Options dialog box is displayed. For information about the Map Options dialog box see Filtering Links According To Type, page 4-17.

Step 3   Select **Physical** from the Group dropdown list, and click **OK**. Only the physical links for the selected context are displayed in the links view.

Step 4   Select the required physical link in the links view.

Step 5   Right-click on the selected link to display the shortcut menu, and select **Properties**. The Topological Link Properties window is displayed.

Figure 7-2   Topological Link Properties Window
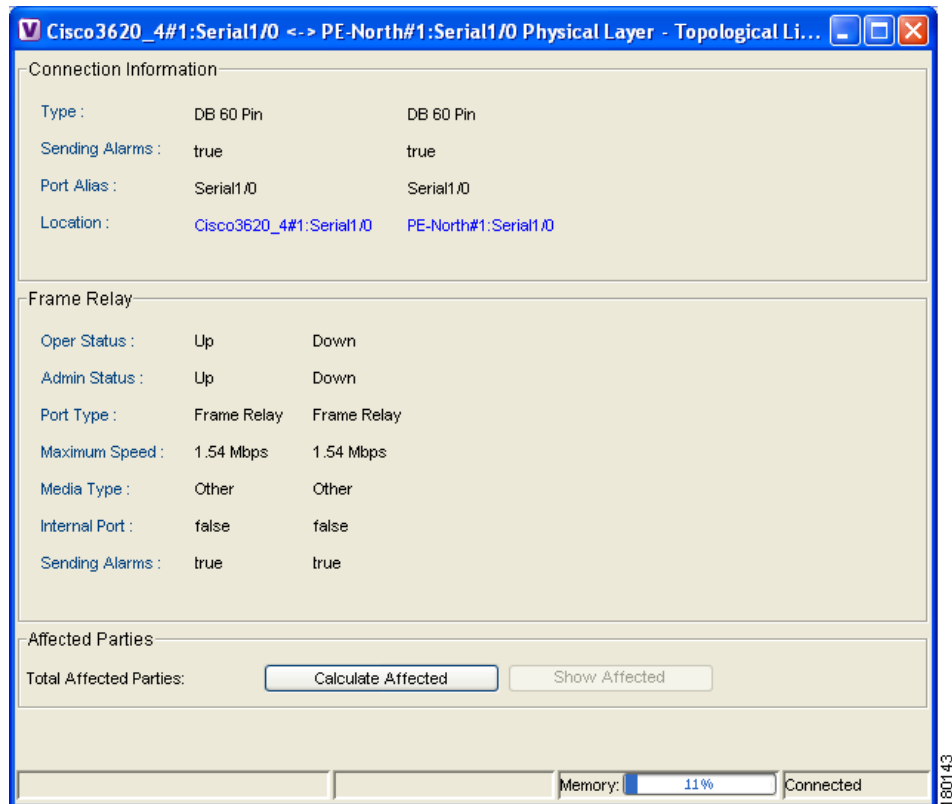
Step 6   Click **Calculate Affected**. The total number of potentially affected parties is displayed in the Affected Parties area.

Step 7   Click **Show Affected**. The Affected Parties dialog box is displayed.

Figure 7-3   *Affected Parties Dialog Box*
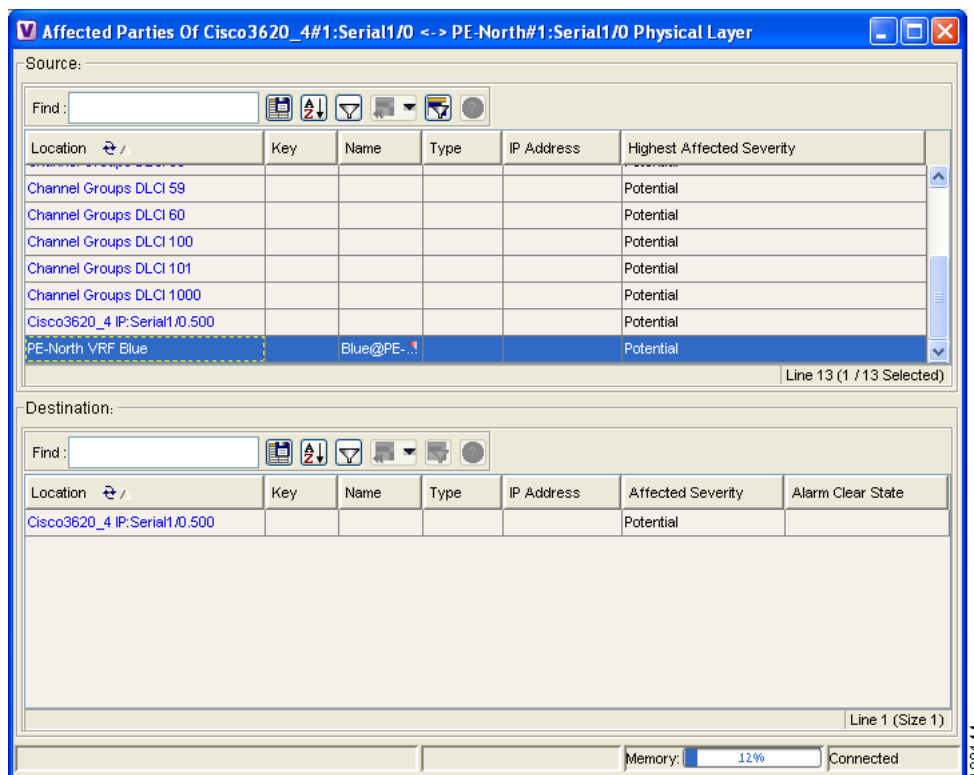
Step 8   Click in the upper right corner to close the Affected Parties dialog box.

Step 9   Click in the upper right corner to close the Topological Link Properties dialog box. The Cisco ANA NetworkVision window is displayed.

Adding a Link

Cisco ANA NetworkVision enables you to manage the links between devices (topology), to add a new static link between two devices.

A dynamic link is a link that is detected by Cisco ANA and connected automatically. A static link is a link that you can manually enter.

Cisco ANA NetworkVision enables you to add a static link by selecting a device or port and defining it as the A side. A second device or port is then defined as the Z side.

Cisco ANA validates the new link after the two ports are selected. Validation checks the consistency of the port types (for example, RJ45 on both sides), and Layer 2 technology type (for example, ATM OC-3 on both sides).

When adding a new link the state of the link reflects its current state. For example, if the operation status of a port is down, the link is colored red.

You can add links from either the Cisco ANA NetworkVision window's Tree and map pane (method 1), or from the Inventory window tree pane (method 2).

In addition, a new link can be added using Cisco ANA Manage. For more information refer to the *Cisco Active Network Abstraction Administrator Guide*.

To add a link (method 1):

Step 1 Right-click on the required A Side device in the tree pane or map pane of the Cisco ANA NetworkVision window's workspace to display the right-click shortcut menu, and select **Topology | Mark as A Side**.

Step 2 Right-click on the required Z Side device in the tree pane or properties pane to display the right-click shortcut menu and select **Topology | Mark as Z Side**. The Create Static Link dialog box is displayed enabling you to select the port to be connected.

Figure 7-4   Create Static Link Dialog Box
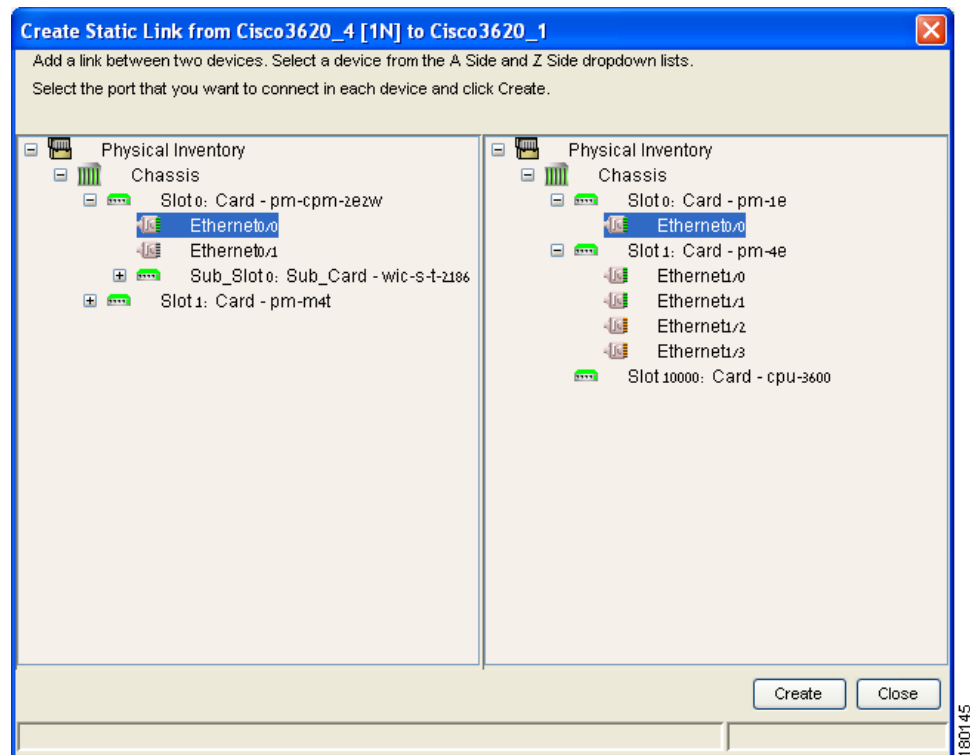
Step 3 Drill down and select the required port on the A Side device and Z Side device.

Step 4 Click **Create** to validate the connection and create the new link. A success message is displayed.

Note A warning message is displayed if:
One of the validation checks fails
The operation status of one port is Up and the other port is Down
The ports selected are not of the same type
The Layer 2 technology type is not the same
If one of the ports is part of another link
Click **No** to cancel the connection.

Step 5 Click **Close** to display the Cisco ANA NetworkVision window again.

To add a link (method 2):

Step 1   Open the Inventory window for the required A Side device.

> **Note**   For more information about opening the Inventory window see Opening the Inventory Window, page 6-1.

Step 2   Drill down to the required port in the Inventory window tree pane.

Step 3   Right-click on the required A Side port to display the right-click shortcut menu and select **Topology | Mark as A Side**.

Step 4   Repeat steps 1-2 for the Z Side device.

Step 5   Right-click on the required Z Side port to display the right-click shortcut menu and select **Topology | Mark as Z Side**. A confirmation message is displayed.

Step 6   Click **Yes.** The ports are connected, and a new link is created between the selected ports.

> **Note**   A warning message is displayed if:
> One of the validation checks fails
> The operation status of one port is Up and the other port is Down
> The ports selected are not of the same type
> The Layer 2 technology type is not the same
> If one of the ports is part of another link
> Click **No** to cancel the connection.

For information about removing a static link, refer to the *Cisco Active Network Abstraction Administrator Guide*.

Working in Links View

The links view provides you with an easy to access complete table list of the various types of physical links displayed on the map (the links shown in the map pane are a summary of the many links starting from one side and ending at the other side of the link) and their status.

> **Note**   Business links are not currently supported in the links view. For more information about business links refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Click **Show Links View** to display the links view in the Cisco ANA NetworkVision window. The links view is displayed.

> **Note**   An external link to the network has a gray cell background in the table, and you can open the Inventory window by clicking on the hyperlink. For more information about external links, see Working in Links View, page 7-8.

Any links that are added or removed from the map are automatically added or removed from the links view provided they have not been filtered out.

The links view displays the selected filtered links and the new location in the tree pane:

- When the user navigates in the tree pane or,
- When the user selects devices and/or aggregated nodes in the map pane.

The following columns are displayed in the links view:

- **Context**—The name of the map, aggregated node or sub-aggregated node containing the link (there may be multiple contexts).
- **Severity**—Displays a severity bell icon, which is colored according to the severity of the alarm on the link. This indicates the impact of the alarm on the network. For more information about severity, see Status of Network Objects, page 2-15.
- **A End-Point**—The device or site that is the source of the link as a hyperlink to the inventory of the device or site.
- **Bi Directional**—The direction of the link, true (bi-directional) or false (unidirectional).
- **Z End-Point**—The device or site that is the destination of the link as a hyperlink to the inventory of the device or site.
- **Link Type**—The type of link, for example, Physical Layer, VPN or MPLS.

Note
- Clicking on a red triangle displayed in a cell expands the cell to display all the information.
- Clicking on a header in the links view sorts the information displayed, for example, according to Severity.

The links displayed in the links view are by default sorted according to Link Type and Deep collection method. In addition, the links view can be sorted:

- According to a column by clicking on the required column heading. The ⇄ icon is displayed next to the selected column heading.
- In ascending or descending order by clicking on the column heading or the Sort Table Values button on the toolbar. A triangle is displayed next to the selected column heading. For more information see Finding Text in a Table, page 3-2.

The Location field displays the number of selected rows and the total number of rows in the table, for example, 2/16 Selected. In addition, it displays the location of the selected row(s) in the table, for example, Line 3.

The Find field enables you to search for information in the links view table according to the selected column.

For more information about the standard buttons displayed in Cisco ANA NetworkVision's tables and table functionality see Opening a Map, page 4-4.

The following additional buttons are displayed at the top of the links view and enable you to filter the links using the collection method:

Table 7-1   Links View Tools

[icon]	**All Links—**Displays the complete list of links for the selected context (map, aggregation, or sub-aggregation).
[icon]	**External Links—**Displays the links where only one side of the link starts in this context (map, aggregation or sub-aggregation) and the other side ends somewhere else not in the map or outside of the currently selected context.
[icon]	**Flat Links (Surface)—**Displays the links currently visible on the map for the selected context (map, aggregation or sub-aggregation), excluding any thumbnails.
[icon]	**Deep Links—**Displays the links for the current aggregations and the sub-aggregations where both of the endpoints are somewhere within the currently selected context.

For more information about filtering links using the collection method see Filtering Links Using the Collection Method, page 7-10.

Some of the functions that can be performed in the links view are:

- View all the links or only the filtered links of a selected context using the collection methods, All, External, Flat and Deep. For more information see Filtering Links Using the Collection Method, page 7-10.

- View and filter the links according to type using the Map Options dialog box. For more information see Filtering Links According To Type, page 4-17.

- Locate the source of a link in the map. For more information see Finding a Link Source, page 4-15.

- Sort the links displayed.

- View link properties.

Filtering Links Using the Collection Method

The links view table is a very powerful tool allowing you to "view" NEs links that you cannot see visually or graphically in the map pane in the Cisco ANA NetworkVision window's workspace. The links view table is dynamic and automatically refreshes itself, allowing you to view up to date network links in real-time.

The collection method enables you to filter the links displayed in the links view based on the selected context (map, aggregation or sub-aggregation). By selecting the collection method from the toolbar in the links view table, the user can quickly filter the links.

Note
- By default the Deep collection method is applied in the links view.

- The filter only applies to the links view; it has no effect elsewhere in Cisco ANA NetworkVision.

For more information about the buttons displayed in the links view, see Working in Links View, page 7-8.

For more information about filtering links according to type, see Filtering Links According To Type, page 4-17.

To filter links according to the collection method:

Step 1   In the Cisco ANA NetworkVision window's toolbar, click **Links View** to display the links view in the Cisco ANA NetworkVision window's workspace.

Step 2   Select the required context in the Cisco ANA NetworkVision window's tree pane or links view in the Cisco ANA NetworkVision window's workspace.

Step 3   In the links view toolbar select one of the following collection method options:

- All Links
- External Links
- Flat Links
- Deep Links

The links are displayed in the links view according to the defined collection method.

Cisco ANA NetworkVision also enables you to find the source of a link displayed in the links view by highlighting the link in the map pane.

To find the links source:

Step 1   Right-click on the required link in the links view to display the Links View menu.

Step 2   Select **Find Source** from the Links View shortcut menu. The source of the link is highlighted in the map pane,

or

If there are two or more links that are the same, for example, a VRF link, the Select Link Context dialog box is displayed. Select the required link context from the dropdown list, click **OK**. The source of the link is highlighted in the map pane.

> **Note**   A blue link highlights the source of the link in the map pane.

> **Note**   Click the NE in the tree pane or the link in the map pane to remove the highlight from the selected link.

Working with Tickets

This chapter describes how Cisco ANA NetworkVision correlates alarms and how to view the tickets and ticket properties, including correlated alarms, active alarms and alarm history. In addition, it describes ticket management, for example, acknowledging a ticket.

Cisco ANA NetworkVision enables you to view and acknowledge tickets using the ticket pane. For more information, see Ticket Pane, page 2-13.

About Alarms

Cisco ANA provides the ability to correlate related alarms and events and accurately detect the root cause. The following scenarios are supported by Cisco ANA and illustrate alarm correlation:

- Correlating an event to the actual network element that created the event, that is a device, interface, and so on.

- Correlating a clearing alarm with its fault alarm, for example, a link up with a link down.

- Correlating a set of events into a single network failure, for example, multiple events of port down with a related module-out event.

- Correlating side-effect events with a single root-cause alarm across the network, for example, OSPF neighbor-down syslog message with a link-down alarm.

- Correlating loss of reachability to a device with a network failure.

For more information about the definition of a ticket, alarm, and event, see Events, Tickets and Alarm Definitions, page 1-3.

For more information about alarms, refer to the *Cisco Active Network Abstraction Fault Management User Guide*.

For more specific information on tickets, including fault and IP correlation, MPLS-TE (Traffic Engineering), refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Alarm Life-Cycle

Cisco ANA NetworkVision correlates all the subalarms to the original parent alarm (root-cause alarm), and changes its status accordingly.

Cisco ANA provides for an aging period before closing alarms. The alarm may remain open for correlation even if it has already been cleared or acknowledged. In other words, for a specified aging period, new correlated alarms are accepted into a parent alarm even after the parent alarm has been cleared or acknowledged.

An alarm is considered closed after the parent alarm has been cleared and the aging period has passed even if the parent alarm still contains open correlated alarms.

# Accumulating Affected Parties

When a fault occurs, Cisco ANA automatically calculates the affected parties (automatic impact analysis), for example, when a link goes down and embeds this information in the ticket along with all the correlated faults. You can view a list of all the inter-site connections that are affected and the sites that have lost connectivity. For more information about proactive impact analysis, see Viewing Impact Analysis, page 7-4.

The Affected Parties tab displays the services (affected pairs) that are potentially affected (automatic impact analysis) by the ticket. For more information about the Affected Parties tab, see Affected Parties Tab, page 8-8.

In the example below the following types of alarms exist in the correlation tree:

- Ticket root-cause alarm (card out).
- An alarm which is correlated to the root cause and has other alarms correlated to it (link A down).
- An alarm with no other alarms correlated to it (link B down and BGP neighbor loss).

An event sequence is correlated to each of these alarms.

Figure 8-1   Event Sequence Example

```
Card out
   |
   ----- Link A down
     |   |
     |   ------BGP neighbor loss
     |
     ----- Link B down
```
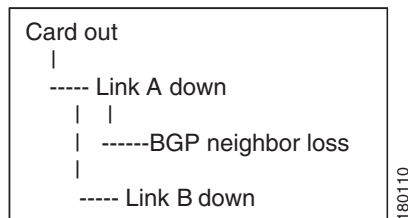
For each type of alarm Cisco ANA NetworkVision provides a report of the affected parties. This report includes the accumulation of:

- The affected parties reported on all the events in the alarm event sequence (this also applies to flapping alarms).
- The affected parties reported on the alarms that are correlated to it.

Each report includes the accumulation of the affected report of all the events in its own correlation tree.

For example, in the diagram:

- "BGP neighbor loss" includes the accumulation of the affected report of its own event sequence.
- "Link A down" includes the accumulation of the report of its own event sequence. In addition, it includes the report of the BGP neighbor loss.

Accumulating the Affected Parties in an Alarm

When there are two events that form part of the same event sequence in a specific alarm the reoccurring affected pairs are only displayed once in the Affected Parties tab. Where there are different affected severities reported for the same pair, the pair is marked with the severity that was reported by the latest event, according to the time stamp.

Accumulating the Affected Parties in the Correlation Tree

Where there are two or more alarms:

- That are part of the same correlation tree,
- That report on the same affected pair of edge points and,
- That have different affected severities.

Then the reoccurring affected pairs are only displayed once in the Affected Parties tab. Where there are different affected severities reported for the same pair, the pair is marked with the highest severity.

In this example X and Y are the OIDs of edge points in the network and there is a service running between them. Both of the alarms "Link B down" and "BGP neighbor loss" report on the pair "X<->Y" as affected:

- "Link B down" reports on "X<->Y" as "Potentially" affected.
- "BGP neighbor loss" reports on "X<->Y" as "Real" affected.

The affected severity priorities are:

- Real – Priority 1
- Recovered – Priority 2
- Potentially – Priority 3

"Card out" reports on "X<->Y" as "Real" affected only once.

Updating Affected Severity Over Time

Cisco ANA has the ability to update the affected severity of the same alarm (report) over time due to the fact that in some cases the affect of the fault on the network cannot be determined until the network has converged.

For example, a link-down alarm creates a series of affected severity updates over time. These updates are added to the previous updates in the system database. In this case the system provides the following reports:

- The first report of a link down reports on "X<->Y" as Potentially affected.
- Over time the VNE identifies that this service is Real affected or Recovered and generates an updated report.
- The Affected Parties tab of the Ticket Properties dialog box displays the latest severity which is Real affected.
- The Affected Parties Destination Properties dialog box displays both reported severities.

This functionality is currently only supported for link down.

Filtering Tickets by Device

Cisco ANA NetworkVision enables you to filter the tickets that are shown in the ticket pane so that only the tickets of a selected device or network element are displayed.

To filter tickets for a specific network element:

Step 1   Right-click on the required device or network element in the tree pane or map pane of the Cisco ANA NetworkVision window to display the Device shortcut menu.

Step 2   Select **Filter Tickets**. The ticket pane displays the tickets of the selected device or network element only.

> **Note**   The Filter button in the ticket pane toggles to indicate that a filter has been applied.

The filter can be removed to display all the tickets in the system. For more information about removing a filter, see Filtering Tickets by Criteria, page 8-4.

Filtering Tickets by Criteria

Cisco ANA NetworkVision enables you to define a filter for the tickets displayed in the ticket pane according to various criteria; for example, tickets can be filtered according to the number of affected parties or acknowledged tickets.

To define the ticket filter:

Step 1   On the toolbar of the ticket pane, click **Ticket Filter**. The Ticket Filter dialog box is displayed.

Figure 8-2   Ticket Filter Dialog Box

The Severity area in the Ticket Filter dialog box enables the user to filter the tickets displayed in the ticket pane by selecting one or more options. For more information about severities, see Status of Network Objects, page 2-15.

The checkboxes displayed in the Other area reflect the columns displayed in the ticket pane and enable the user to filter the tickets according to any of these criteria. For more information about the columns displayed in the ticket pane, see Ticket Pane, page 2-13.

The Source checkbox (selected by default) enables the user to filter the tickets that are shown in the ticket pane so that only the tickets of a selected device or network element are displayed by selecting a source.

Step 2   Select the required filter values.

Step 3   Click **OK**. The filtered tickets are displayed in the ticket pane according to the defined criteria.

> **Note**   The Ticket Filter button in the ticket pane toggles to indicate that a filter has been applied.

To remove the ticket filter:

Step 1   On the toolbar of the ticket pane, click **Ticket Filter**. The Ticket Filter dialog box is displayed.

Step 2   Click **Clear**. The selected options in the Ticket Filter dialog box are cleared.

Step 3   Click **OK**. All the tickets are displayed in the ticket pane.

Opening Ticket Properties

The properties of a selected ticket can be viewed by displaying the Ticket Properties dialog box. For example, you can view alarm severity, correlated alarms, active alarms, alarm history or the source of the alarm.

To open ticket properties:

Step 1   Double-click on the required ticket in the ticket pane.

or

Right-click on a ticket in the ticket pane to display the Ticket shortcut menu, select **Properties**.

The Ticket Properties dialog box is displayed.

Figure 8-3   *Ticket Properties Dialog Box*
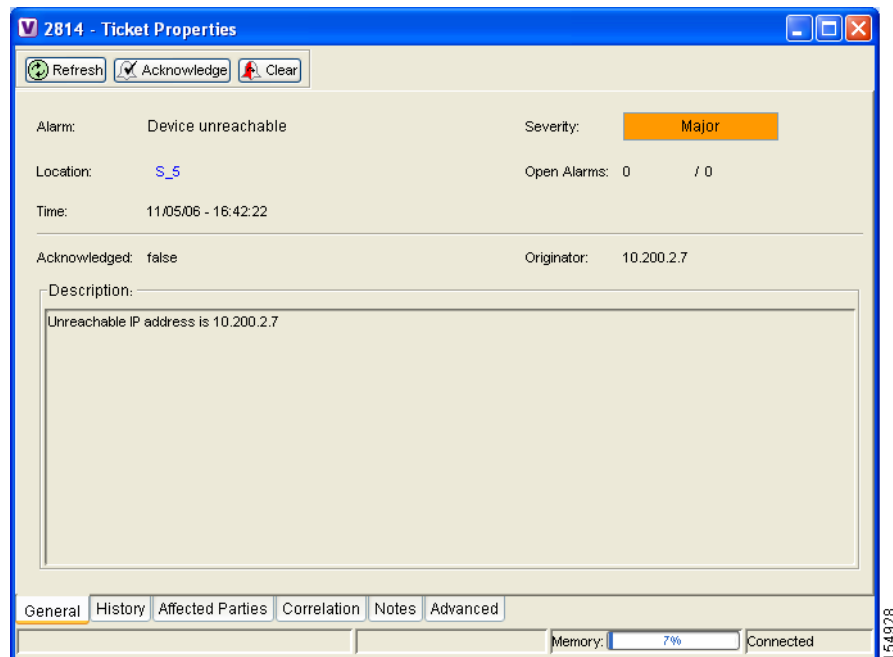
The information displayed in the Ticket Properties dialog box corresponds with the information displayed in the ticket pane. The ID number displayed in the header corresponds to the ID number of the ticket selected in the ticket pane.

The Ticket Properties dialog box is divided into the following areas:

- Tabbed Pane
- Toolbar

Tabbed Pane

The Ticket Properties dialog box is divided into the following tabs:

- **General—**General information about the selected ticket, see General Tab, page 8-7.

- **History**—The history of the ticket, see History Tab, page 8-7.

- **Affected Parties**—The services (affected pairs) that are potentially affected (potential impact analysis) by the ticket, see Affected Parties Tab, page 8-8.

- **Correlation—**All the alarms that are correlated to the selected ticket, see Correlation Tab, page 8-10.

- **Notes—**Enables you to add notes to the selected ticket, see Notes Tab, page 8-11.

- **Advanced—**All the affected devices, correlation, duplication and reduction counts for the selected ticket. In addition, it provides any other additional information available about the ticket, see Advanced Tab, page 8-11.

General Tab

The following fields are displayed in the General tab providing information about the compiled alarm:

- **Alarm—**The supported root-cause alarm name, for example, link down.

- **Location—**The entity that triggered the root-cause alarm, as a hyperlink that opens the relevant location.

- **Severity—**Displays the severity that was propagated from all the correlated alarms. For more information, see Map Pane, page 2-7.

- **Time—**The date and time when the initial root-cause alarm was generated. The time is taken from Cisco ANA.

- **Open Alarms—**The number of correlated alarms for the ticket that are open. For example, 3 / 4. Four relates to the total number of correlated alarms for the ticket. Three indicates the number of alarms that have not been cleared, and therefore there is one alarm that is cleared.

- **Acknowledged—**The status of the ticket that is being handled, namely, acknowledged (true) and unacknowledged (false).

- **Description—**The detailed description from the ticket.

History Tab

The History tab enables you to display the history of the ticket, including all the events. The History tab is displayed.

Figure 8-4   History Tab
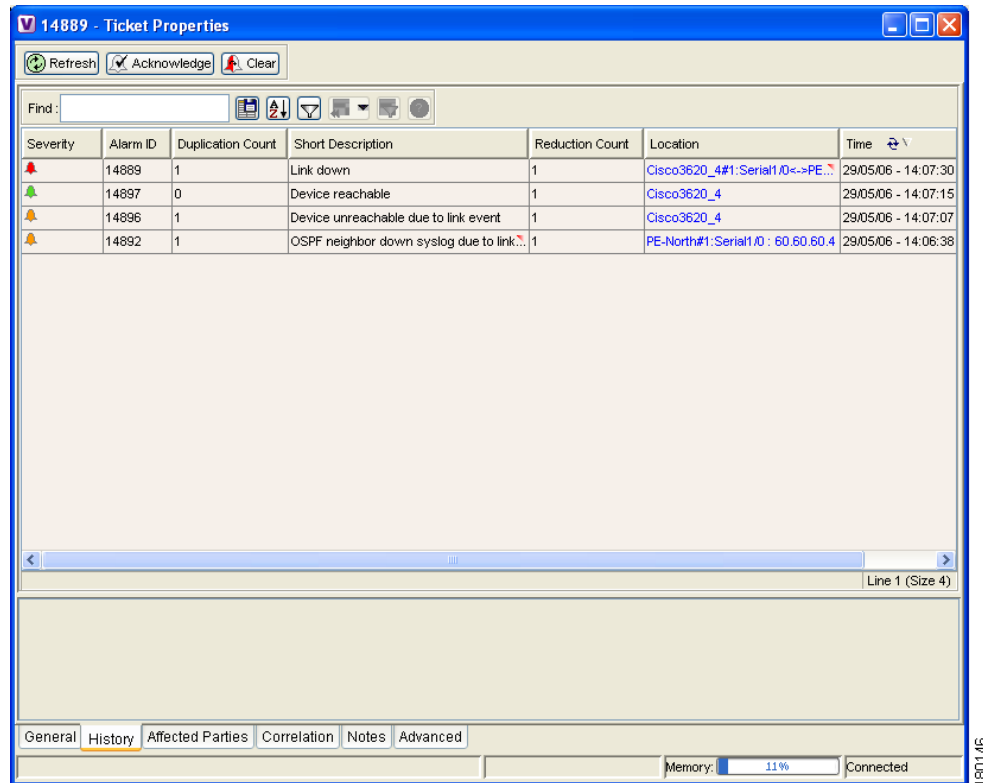
The following columns are displayed in the History tab providing information about the compiled alarm:

- **Severity—**Displays a severity bell icon, which is colored according to the severity of the alarm.
- **Alarm ID—**The ID number of the event that changed the ticket.
- **Duplication Count—**The number of occurrences of the root alarm in a successors sequence. For example, link down, link up, link down would equal a duplication counter of 2.
- **Short Description—**A description of the event.
- **Reduction Count—**The number of alarms displayed under the ticket. For example, nine alarms may be viewed in the History tab accessed from the NetworkVision ticket pane, whereas, only a single ticket is displayed in the ticket pane.
- **Location—**The entity that triggered the alarm, as a hyperlink that opens the relevant location.
- **Time—**The date and time when the ticket changed.

Affected Parties Tab

When a fault occurs Cisco ANA automatically calculates the affected parties (automatic impact analysis), for example, when a link goes down, and embeds this information in the ticket along with all the correlated faults. You can view a list of all the endpoints that are affected. For more information about proactive impact analysis, see Viewing Impact Analysis, page 7-4.

The Affected Parties tab displays the service resources (affected pairs) that are affected (automatic impact analysis) by the ticket. For more information about accumulating affected parties, see Accumulating Affected Parties, page 8-2.

The Affected Parties tab is displayed.

Figure 8-5   Affected Parties Tab
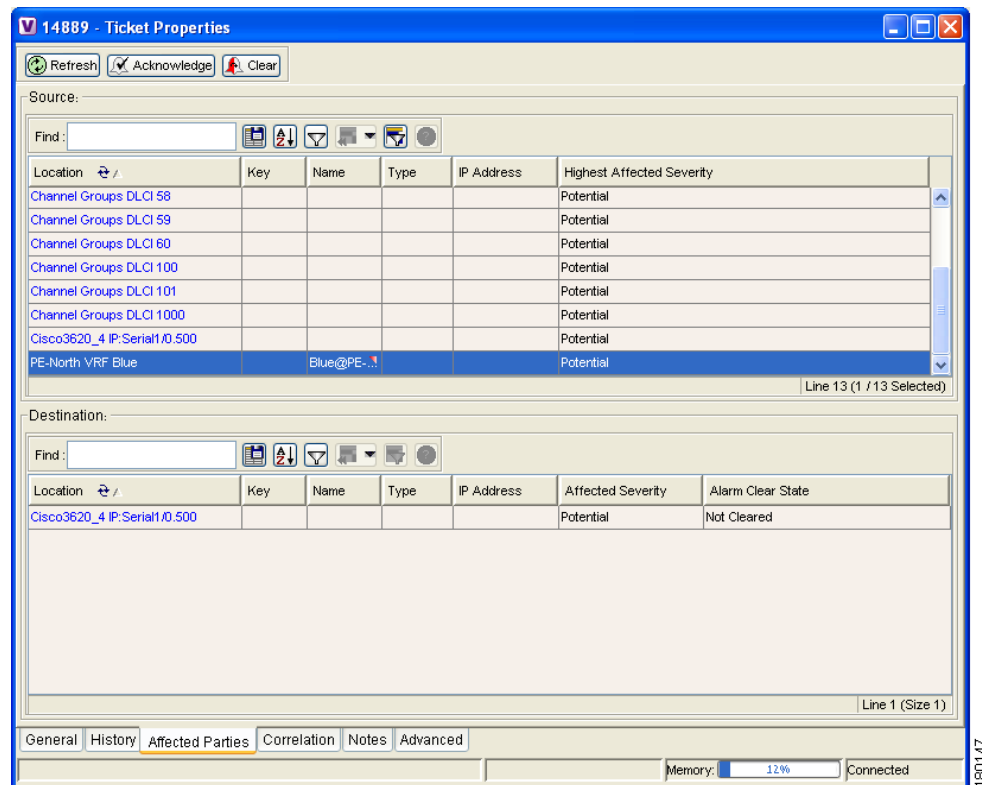
The Affected Parties tab is divided into two areas, namely, Source and Destination. The Source area displays the set of affected elements (A side and Z side). The following columns are displayed in the Affected Parties tab providing information about the affected parties:

- **Location**—A hyperlink that opens the Inventory window, highlighting the port with the affected parties.

- **Key**—The unique value taken from the affected element's business tag key (if it exists).

- **Name**—The subinterface (site) name or business tag name of the affected element (if it exists). For more information refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

- **Type**—The business tag type.

- **IP Address**—If the affected element is an IP interface the IP address of the subinterface (site) is displayed. For more information refer to the *Cisco Active Network Abstraction Managing MPLS User Guide*.

- **Highest Affected Severity**—The severest affected severity for the affected pair (Destination). The same source can be part of multiple pairs, and therefore each pair can have different affected severities. The highest affected severity reflects the highest one among these. The affected pair can have one of the following severities:

    - **Potential**—The service may be affected but its real state is not known.

    - **Real**—The service is affected.

    - **Recovered**—The service was recovered after the network fault. This state only applies to affected pairs that were previously marked as Potentially Affected or Real Affected.

    - **N/A**—From Links view this indicates not relevant.

When an affected side (a row) is selected in the Source area the selected element's related affected pairs are displayed in the Destination area.

The following additional columns are displayed in the Destination area table in the Ticket Properties window:

- **Affected Severity**—The severity of the affected pair as calculated by the client according to the rules defined in Accumulating Affected Parties, page 8-2.

- **Alarm Clear State**—An indication for each pair of the clear state of the alarm. The following states exist:

    - **Not Cleared**—There are one or more alarms that have not been cleared for this pair.

    - **Cleared**—All the related alarms for this pair have been cleared.

In addition, you can view a detailed report for every affected pair that includes a list of the events that contributed to this affected pair. For more information about viewing a detailed report, see Viewing a Detailed Report for the Affected Pair, page 8-12.

Correlation Tab

The Correlation tab displays all the alarms that are correlated to the selected ticket.

Figure 8-6   Correlation Tab
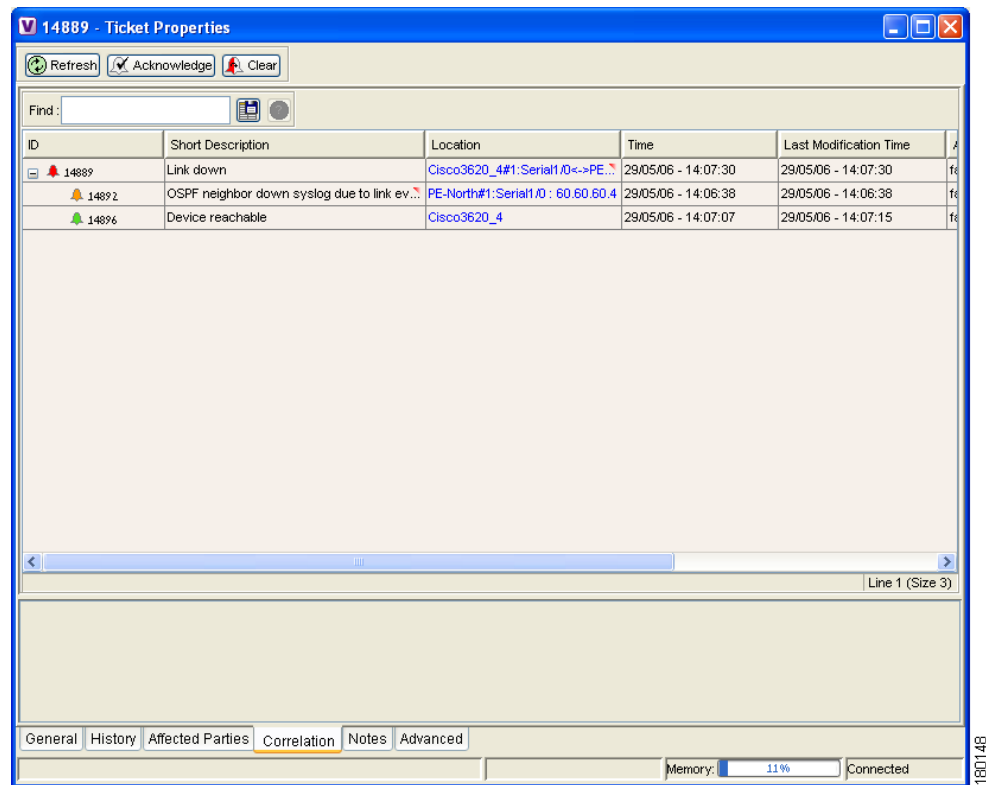
Each branch provides a short description of the alarm, a severity icon, ID, location, and time of the alarm. For more information about the columns displayed in the Correlation tab, see Ticket Pane, page 2-13.

The following columns are displayed in the Correlation tab providing information about the alarm as follows:

- **ID**—The ID number of the alarm. The branches can be expanded and collapsed in order to hide information as needed.

- **Short Description**—A description of the change in the ticket. The full description is displayed in the lower tab area.

- **Location**—A hyperlink that opens the Inventory window, selecting the node with the affected parties.

- **Time**—The date and time the alarm was issued.

- **Last Modification Time**—The date and time when the alarm changed.

- **Reduction Count**—The number of alarms displayed under the ticket. For example, nine alarms may be viewed in the **History** tab accessed from the NetworkVision ticket pane, whereas, only a single ticket is displayed in the ticket pane.

- **Duplication Count**—The number of occurrences of the root alarm in a successors sequence. For example, link down, link up, link down would equal a duplication counter of 2.

The Find field on the toolbar enables you to search for information in the Correlated Alarms table.

Notes Tab

The Notes tab enables you to add and save notes for the selected ticket. The Notes tab is displayed below.

To add text, enter text in the Notes field and click **Save Notes**. The new text is added to any previously existing text.

> **Note**
> - Save Notes is only enabled when text is entered in the Notes field.
> - The text cannot be edited or removed once you have saved the notes.

Advanced Tab
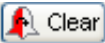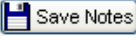
The Advanced tab enables you to view all the affected devices, correlation, duplication and reduction counts for the selected ticket. In addition, it provides any other additional information available about the ticket. The Advanced tab is displayed below.

The following fields are displayed in the Advanced tab providing information about the compiled alarm:

- **Successor**—A hyperlink to the successor event (if it exists), for example, port up.

- **Correlator**—A hyperlink to the correlator alarm (if it exists).

- **Predecessor**—A hyperlink to the predecessor event (if it exists), for example, port down.

- **Affected Devices**—The number of devices affected by the ticket (the source(s) of the alarm and their subsequent alarms).

- **Duplication Count**—Displays the number of occurrences of the original root-cause alarm included in the ticket. For example, if the ticket was created by a link-down root-cause alarm, and then the link goes up and down again quickly so that it is included in the same ticket, then the duplication counter displays the number 2, as the root-cause alarm occurred twice.

- **Correlation Count**—Displays the number of correlated alarms included in the ticket. For example, if in the Correlation tab of the Ticket Properties, there are 3 alarms correlated to the root-cause alarm, then the counter displays the number 3. If there are 2 alarms correlated to the root-cause alarm, and each alarm in turn has 2 alarms correlated to it, then the counter displays the number 4.

- **Reduction Count**—Displays the number of alarms included in the ticket. For example, nine alarms can be viewed in the History tab of the Ticket Properties window, but only a single ticket is displayed in the ticket pane.

Toolbar

The Ticket Properties dialog box contains the following tools:

Refresh	Refreshes the information displayed in the Ticket Properties dialog box.
Acknowledge	**Acknowledge**—Acknowledges that the ticket is being handled and the status of the ticket is displayed as true in the ticket pane and in the Ticket Properties dialog box. For more information, see Acknowledged Ticket, page 8-16.
	If a ticket was acknowledged, and some events were correlated to it afterwards, then the ticket is considered to have been NOT acknowledged.
	Note This button is only enabled if the ticket is not acknowledged.
Clear	**Clear**—Requests the relevant Cisco ANA to remove the faulty network element from the Cisco ANA networking inventory. In addition, it sets the ticket to Cleared severity or status (the icon is displayed in green) and automatically changes the acknowledged status of the ticket to true. For more information, see Cleared Ticket, page 8-16.
	Note This button is only enabled if the severity of the alarm is higher than Cleared or Normal.
Save Notes	**Save Notes**—Saves the notes for the selected ticket.
	Note This button is only enabled when text is entered in the Notes field of the Notes tab.

Viewing a Detailed Report for the Affected Pair

Cisco ANA NetworkVision enables you to view a detailed report for every affected pair. The detailed report includes a list of the events that contributed to the affected pair.

To open a detailed report:

Step 1   Open the Ticket Properties dialog box for the required ticket, see Opening Ticket Properties, page 8-6.

Step 2   Select the Affected Parties tab. The Affected Parties tab is displayed in the Ticket Properties dialog box.

Step 3   Select an affected side (a row) in the Source area table of the Ticket Properties dialog box. The selected element's related affected pairs are displayed in the Destination area.

Step 4   Select one of the element's affected pairs in the Destination area table of the Ticket Properties dialog box.

Step 5   Right-click to display the shortcut menu, and select **Detailed Report**, or double-click on the affected pair. The Affected Parties Destination Properties dialog box is displayed.

The following fields are displayed at the top of the Affected Parties Destination Properties dialog box:

- **Affected Pair**—The details of A side and Z side of the affected pair.

- **Alarm Clear State**—An indication for each pair of the clear state of the alarm. The following states exist:

– **Not Cleared**—There are one or more alarms that have not been cleared for this pair.

– **Cleared**—All the related alarms for this pair have been cleared.

- **Affected Severity**—The severity of the affected pair as calculated by the client according to the rules defined in Accumulating Affected Parties, page 8-2.

- **Name**—The name of the destination from which you opened the detailed report.

Each row in the Instances table represents an event that was reported for the affected pair. The following columns are displayed in the Instances table of the Affected Parties Destination Properties dialog box:

- **Alarm OID**—The ID of the alarm to which the event is correlated as a hyperlink to the relevant alarm's properties.

- **Alarm Description**—A description of the alarm to which the event is correlated.

- **Alarm Clear State**—The alarm's calculated severity.

- **Event OID**—The ID of the event as a hyperlink to the relevant event's properties.

- **Event Description**—A description of the event.

- **Event Time Stamp**—The event's time stamp. The date and time of the event.

- **Affected Severity**—The actual affected severity of the pair that was reported by the selected event. For more information, see Affected Parties Tab, page 8-8.

Step 6   Click ⊠ to close the Affected Parties Destination Properties dialog box. The Ticket Properties dialog box is displayed.

Acknowledging a Ticket

When an alarm occurs, a warning or ticket is displayed in the ticket pane. Cisco ANA NetworkVision enables you to handle the status of a ticket by acknowledging it. This acknowledges the fault.

The change is reported to the Cisco ANA Gateway and all open Cisco ANA NetworkVision applications. Several tickets can be acknowledged at the same time. For more information, see Ticket Status in the Ticket Pane, page 8-15.

Note   Rule-based alarms can be configured per customer site or upon request.

An acknowledged ticket will change back to not acknowledged when a new event is correlated to it. You cannot undo this operation. To acknowledge a ticket:

Step 1   Right-click on a ticket in the ticket pane. The Ticket shortcut menu is displayed.

Step 2   From the Ticket shortcut menu, select **Acknowledge**.

or

Click **Acknowledge** in the Ticket Properties dialog box.

The ticket is handled as described above.

Clearing a Ticket

When an alarm occurs a warning or ticket is displayed in the ticket pane. Cisco ANA NetworkVision enables you to handle the reported ticket by verifying the report of what is faulty and clearing the faulty network element. The change is reported to the Cisco ANA Gateway and all open Cisco ANA NetworkVision applications. This operation cannot be reversed.

Clearing an open ticket performs the following operations:

- Sends a request to the Cisco ANA system to remove the faulty network element from the Cisco ANA networking inventory.

- Sets the alarm to Cleared or Normal severity or status by issuing a corresponding Clear alarm.

- Automatically sets the alarm severity or status to acknowledged (true).

Note   When a Card Out or link-down alarm occurs the relevant information is displayed in the inventory and maintained in the VNE.

To clear a ticket:

Step 1   Right-click on a ticket in the ticket pane. The Ticket shortcut menu is displayed.

Step 2   From the Ticket shortcut menu, select **Clear**.

or

Click **Clear** in the Ticket Properties dialog box.

The ticket is handled as described above.

For more information, see Ticket Status in the Ticket Pane, page 8-15.

Removing a Ticket

When an alarm occurs a warning or ticket is displayed in the ticket pane. Cisco ANA NetworkVision enables you to completely remove the ticket and all its active alarms and business tags. The change is reported to the Cisco ANA Gateway and all open Cisco ANA NetworkVision applications. In addition, several tickets can be removed at the same time. When a ticket has been cleared or when an 'Up Alarm' occurs then the ticket can be removed. This operation cannot be reversed. A ticket that has been removed can only be viewed using Cisco ANA EventVision.

Removing an alarm performs the following operations:

- Sends a request to the Cisco ANA system to remove the faulty network element from the Cisco ANA networking inventory.

- Archives the ticket, and active alarms.

- Removes the ticket from the Cisco ANA NetworkVision ticket pane.

- Notifies all the open Cisco ANA NetworkVision applications of the removal.

Note   Only tickets with a Cleared/Normal or Information severity can be removed.

To remove a ticket:

Step 1   Right-click on a ticket in the ticket pane. The Ticket shortcut menu is displayed.

Step 2   From the Ticket shortcut menu, select **Remove**.

The ticket is handled as described above.

For more information, see Ticket Status in the Ticket Pane, page 8-15.

In addition, an uncleared ticket (which has a severity higher than Cleared or Normal) can be cleared and removed by right-clicking in the ticket pane and selecting **Clear and Remove**. For more information about the Ticket shortcut menu, see Ticket Shortcut Menu, page 2-30.

Ticket Status in the Ticket Pane

The appearance of a ticket displayed in the ticket pane depends on the status or severity of the (ticket) alarm and what affect manipulating the ticket has on the way in which the ticket is displayed in the ticket pane.

Tickets detailed in the ticket pane change when a:

- Ticket is generated.
- Ticket is cleared.
- Ticket is acknowledged.
- 'Up Ticket' is generated.
- Ticket is cleared and removed.
- Ticket is removed.
- Some other properties are updated, for example, severity, description, counters and so on.

Generated Ticket

An example of the appearance of the ticket pane when a ticket is generated is displayed.

Table 8-1   Generated Ticket

Severity	Ticket ID	Short Description	Acknowledged
🔔 Major	27	Port down	False (Not Acknowledged)

Cleared Ticket

An example of the appearance of the ticket pane when a ticket is cleared is displayed.

Table 8-2   Cleared Ticket

Severity		Ticket ID	Short Description	Acknowledged
Normal	🔔	27	Cleared due to Force Clear	True (Acknowledged)

A ticket that has been cleared can then be removed from the ticket pane. For more information, see Removing a Ticket, page 8-14.

When a ticket is cleared, its definition changes to acknowledged automatically in the ticket pane and its definition in the Acknowledged column is True.

Acknowledged Ticket

An example of the appearance of the ticket pane when a ticket is acknowledged is displayed below. When a ticket is acknowledged it can then be cleared and the severity changes to Normal.

Table 8-3   Acknowledged Ticket

Severity		Ticket ID	Short Description	Acknowledged
Major	🔔	27	Port up	True

> **Note**   When a ticket with an Information severity is acknowledged, the ticket is automatically removed from the Cisco ANA Gateway and from the ticket pane.

Generated Up Ticket

The cause of the alarm is fixed; therefore an 'Up Ticket' is automatically generated with a Normal severity. An example of the appearance of the ticket pane when an 'Up Ticket' is generated is displayed.

Table 8-4   Generated Up Ticket

Severity		Ticket ID	Short Description	Acknowledged
🔔	Normal	27	Port up	True

Clearing and Removing Tickets

Approves the reported faulty ticket and clears the faulty networking entity from Cisco ANA.

C H A P T E R 9

Working with Cisco ANA PathTracer

This chapter describes how to view a network path between two network objects using Cisco ANA PathTracer:

- In a circuit-switched network, like Frame Relay or ATM, or

- In packet-switched networks, like Ethernet and IP.

In addition, it describes the Cisco ANA PathTracer working environment and the functionality available when using Cisco ANA PathTracer.

- Overview, page 9-1, describes the Cisco ANA PathTracer single and multi-path route tracing functionality and the information that can be viewed in the two main Cisco ANA PathTracer windows.

- Opening Cisco ANA PathTracer, page 9-2, describes how to open Cisco ANA PathTracer.

- Cisco ANA PathTracer Multi-Path Window, page 9-4, describes the Cisco ANA PathTracer multi-path window working environment and the information that can be viewed.

- Cisco ANA PathTracer Single-Path Window, page 9-7, describes the Cisco ANA PathTracer single-path window working environment and the information that can be viewed.

- Viewing Path Information, page 9-12, describes how to view information about the path between two network objects, including ingress and egress port information.

- Saving and Opening Cisco ANA PathTracer Map Files, page 9-13, describes how to export the maps (paths) displayed in the Cisco ANA PathTracer multi-path window to an .xml file.

- Saving Cisco ANA PathTracer Counter Values, page 9-13, describes how to export the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a .csv file.

- Rerunning a Path and Making a Comparison, page 9-14, describes how to rerun a path using a previously saved map file with the same source and destination and then compare the paths.

Overview

Cisco ANA PathTracer enables end-to-end route tracing to be performed with informative performance information displayed simultaneously for the multiple networking layers. Upon receiving a path's start and endpoint, Cisco ANA PathTracer visually traces the route through the network. For example, in an ATM network environment, Cisco ANA PathTracer identifies all information regarding the connection of a subscriber to a provider, including all ATM PVCs, ATM switching table, ATM class of services, IP related information and so on.

Cisco ANA understands and is able to derive the various paths on the network due to the up-to-date knowledge of the network. Cisco ANA PathTracer finds and retrieves the path of a specified service, after the user has selected a source and destination. The retrieved information contains, for example, all the network elements in path.

Cisco ANA PathTracer enables the user to view multiple paths between the source and the destination in the Cisco ANA PathTracer multi-path window, or to view a selected single-path in the Cisco ANA PathTracer single-path window.

Opening Cisco ANA PathTracer

Cisco ANA PathTracer can be opened from an ATM VC, DLCI, or from an IP interface entry point. The virtual route is found according to the Cross Connect table of each ATM switch or Frame Relay device. The IP routing and path finding process is enabled according to the Routing VRF tables of each router.

In order to view a specific path you must specify an initial point like VPI/VCI, DLCI, Ethernet port or IP interface and a destination IP address (optional). If the user specified VC information or DLCI information, which ends in a router, Cisco ANA PathTracer finds the next hop according to the "destination IP address". If the user did not specify the destination IP address the system uses the default gateway in the router. In addition, the related business tags that have been referred to the physical or logical entities are also displayed.

Note   The path can also be opened if there is a business tag attached to an endpoint that can be used as the starting point for opening the Cisco ANA PathTracer.

The Cisco ANA PathTracer tool provides the user with two windows in which to view the path:

- Cisco ANA PathTracer Multi-Path Window—Displays all the paths available between the selected source and destination.

- Cisco ANA PathTracer Single-Path Window—Displays a single path available between the selected source and destination, as well as, the subscribers and properties.

The user can also enter the required destination IP address after opening the Cisco ANA PathTracer from the right-click shortcut menu at one of the following locations:

Element	Location
Affected Parties	• Inventory window
	• Ticket Properties window (Affected Parties tab)
VC Cross Connect Table	• Inventory window (Cross Connect dialog box)
Site	• Service View map
IP Interface	• Inventory window
	• Affected entry
Layer 2 MPLS Tunnel	• Inventory window
VC Table	• Inventory window (VC Table dialog box)
Business tag	• The path can be found using a business tag, which is attached to the VPI/VCI, or IP interface by entering its key, and it can then be opened from the Find Business Tag window.

Element	Location
Ethernet port	• Inventory window
MPLS-TE Tunnel	• Inventory window

To open Cisco ANA PathTracer:

Step 1   Double-click on a device/element in the tree pane or map pane of the Cisco ANA NetworkVision window's workspace,

or

Right-click on a device/element in the tree pane or map pane of the Cisco ANA NetworkVision window's workspace to display the Device shortcut menu. Select **Inventory**.

The Inventory window is displayed.

Step 2   In the Physical Inventory branch of the tree pane, drill down and select the required port.

Step 3   Right-click on the required port to display the shortcut menu and select **PathTracer | From Here to IP Destination**.

or

Open the Logical Inventory's Routing Entity properties pane, right-click on the required element in the IP Interface tab, and select **PathTracer | Start Here** and **PathTracer | End Here** from the shortcut menu.

✎
Note   The "End Here" option indicates that when a certain point is selected as "End Here" the system extracts the relevant IP address from this point and uses it as the destination.

The Path Information dialog box is displayed.

Step 4   Enter the required destination IP address.

Step 5   Click **OK**. The Cisco ANA PathTracer multi-path window is displayed

For more information about this window, see Cisco ANA PathTracer Multi-Path Window, page 9-4.

Step 6   In the Cisco ANA PathTracer multi-path window, select a path in the Paths pane.

✎
Note   If multiple paths are selected in the Paths pane they will be opened. If nothing is selected in the Paths pane, then all the available paths will be opened automatically, and each one will be displayed in a separate Cisco ANA PathTracer single-path window.

Step 7   On the toolbar, click Cisco ANA **PathTracer**. The Cisco ANA PathTracer single-path window is displayed showing the end-to-end path.

For more information about this window, see Cisco ANA PathTracer Single-Path Window, page 9-7.

For more information about opening the Cisco ANA PathTracer from other Cisco ANA NetworkVision windows, and selecting multi-path options, refer to the section on *Viewing Multi-Path Routes in VPN Networks* in the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Cisco ANA PathTracer Multi-Path Window

The Cisco ANA PathTracer multi-path window displays all the discovered paths for the selected context, including devices, and physical links.

The Cisco ANA PathTracer multi-path window enables you to perform the following functions:

- View a previous path or view the next path.
- Open the Cisco ANA PathTracer single-path window in order to view a single selected path.
- Save the multi-path map to a file.
- Run the Cisco ANA PathTracer again.

An example of the Cisco ANA PathTracer multi-path window is displayed below.

Figure 9-1   Cisco ANA PathTracer Multi-Path Window
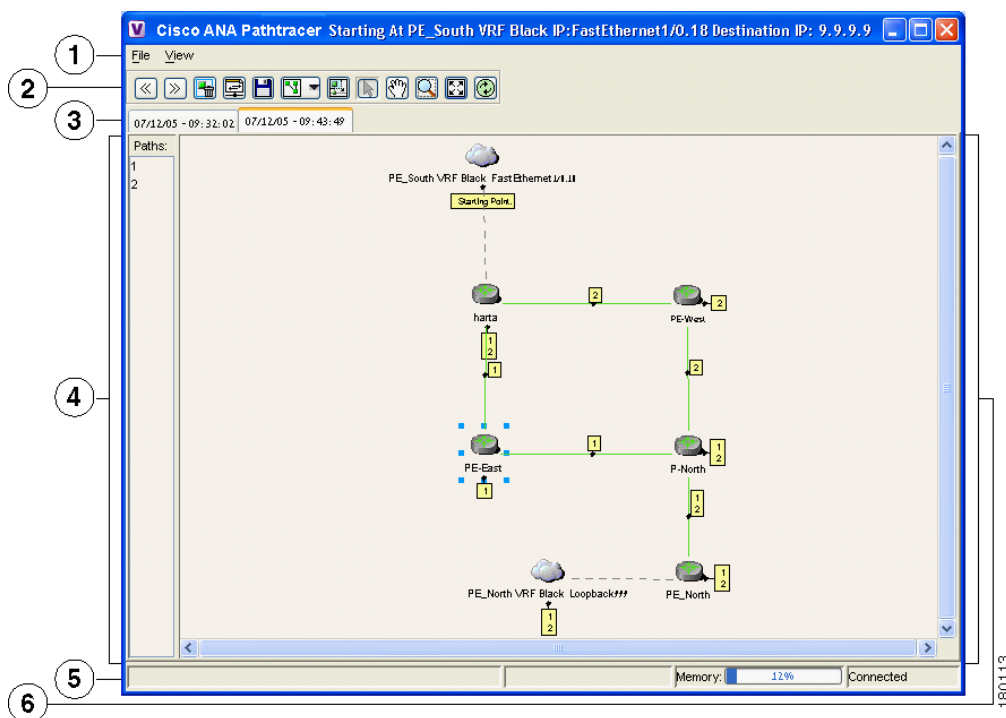
1	Menu bar
2	Toolbar
3	Map path traced at...tabs
4	Paths pane
5	Status bar
6	Map pane

The Cisco ANA PathTracer multi-path window is divided into the following areas:

- Cisco ANA PathTracer Multi-Path Window Toolbar
- Cisco ANA PathTracer Multi-Path Window Menus

- Tabs
- Paths Pane
- Map Pane

Cisco ANA PathTracer Multi-Path Window Toolbar

The Cisco ANA PathTracer multi-path window contains the following tools:

Button	Function
	Selects the previous path viewed in the topological map pane.
	Selects the next path viewed in the topological map pane.
	Clears the path selection made in the topological map pane.
	Opens the Cisco ANA PathTracer single-path window based on the path selected in the Cisco ANA PathTracer multi-path window. A map is displayed for the selected path, including NE details, links and property information. For more information, see Cisco ANA PathTracer Single-Path Window, page 9-7.
	Saves the multi-path map displayed in the topological map pane. For more information, see Saving and Opening Cisco ANA PathTracer Map Files, page 9-13.
	Defines the way in which the map is displayed in the topological map pane, namely, Circular, Symmetric, Tree, or Hierarchical.
	Opens a window displaying an overview of the network displayed in the topological map pane.
	Runs Cisco ANA PathTracer again creating a new map that is displayed in topological map pane tab. A new tab with an up-to-date (refreshed) path map is created for each run (the source and destination must be the same), with each tab representing a run, and its header indicating the snapshot time.

For information about the selection tools displayed on the toolbar, see Cisco ANA NetworkVision Toolbar, page 2-18.

Cisco ANA PathTracer Multi-Path Window Menus

This section provides a description of each option available in the Cisco ANA PathTracer multi-path window menus. The following menus are available:

- File Menu
- View Menu
- Shortcut Menu

File Menu

The Cisco ANA PathTracer multi-path window File menu is displayed with the following options.

Run Again

Runs the PathTracer again, using the same source and destination parameters.

Save

Save the map displayed in the Cisco ANA PathTracer multi-path window. For more information, see Saving and Opening Cisco ANA PathTracer Map Files, page 9-13.

Close

Closes the open Cisco ANA PathTracer multi-path window.

Shortcut Menu

The shortcut menu displayed in the Cisco ANA PathTracer multi-path window is context sensitive depending on the view and the NE selected. The Device shortcut menu is displayed when right-clicking on a NE.

For more information about the Device shortcut menu and for a detailed description of all the menu options available here, see Device Shortcut Menu, page 2-25.

Tabs

The path is initially displayed in the map pane in a tab that displays the starting point date and time of when Cisco ANA commenced the path tracing process (snapshot time).

If you want to load a saved path from a file or run the displayed path again, a new tab with an up-to-date (refreshed) path map is created for each run or file (the source and destination must be the same). This is displayed in a separate tab, with each tab representing a run or file, and its header indicating the snapshot time.

Paths Pane

The Paths pane displays all the paths available for the selected source and destination (for each pair of source and destination a new path is created). The paths are displayed using numbers. Selecting a path in the Paths pane enables you to view each individual path in the map pane of the Cisco ANA PathTracer single-path window and the selected path is highlighted in the map pane.

Map Pane

The map pane enables you to view a route map of the intermediate network elements. The map displays devices, links and paths (topological paths).

Icons are used in the map pane to display the network objects and these icons provide a visual representation of the network object's status. For more information about the icons used, see Appendix A, "Icon Reference".

Every link and node are labeled with the relevant paths numbers. The starting point is labeled with a special Starting Point label. All other edge points are displayed as clouds.

Cisco ANA PathTracer Single-Path Window

The Cisco ANA PathTracer single-path window displays the devices and links of the discovered path, as well as path layer properties information in tables and subscribers.

Note This section refers to single-path view only.

The Cisco ANA PathTracer single-path window enables you to:

- View a map of the intermediate network elements.
- View the following information for each network element:
  - The relevant parameters for each interface on all layers along the path.
  - For each layer an indication of a mismatch between the parameters of the interfaces on both sides of a link.
  - View traffic statistics along the path.
- Monitor the status and traffic of all the links along the path.
- View In and Out port properties.

In addition, right-clicking on an item in Cisco ANA PathTracer enables you to perform certain functions. For example, you can view device information, including device properties, and attach business tags.

An example of the Cisco ANA PathTracer single-path window is displayed.

Figure 9-2   Cisco ANA PathTracer Single-Path Window
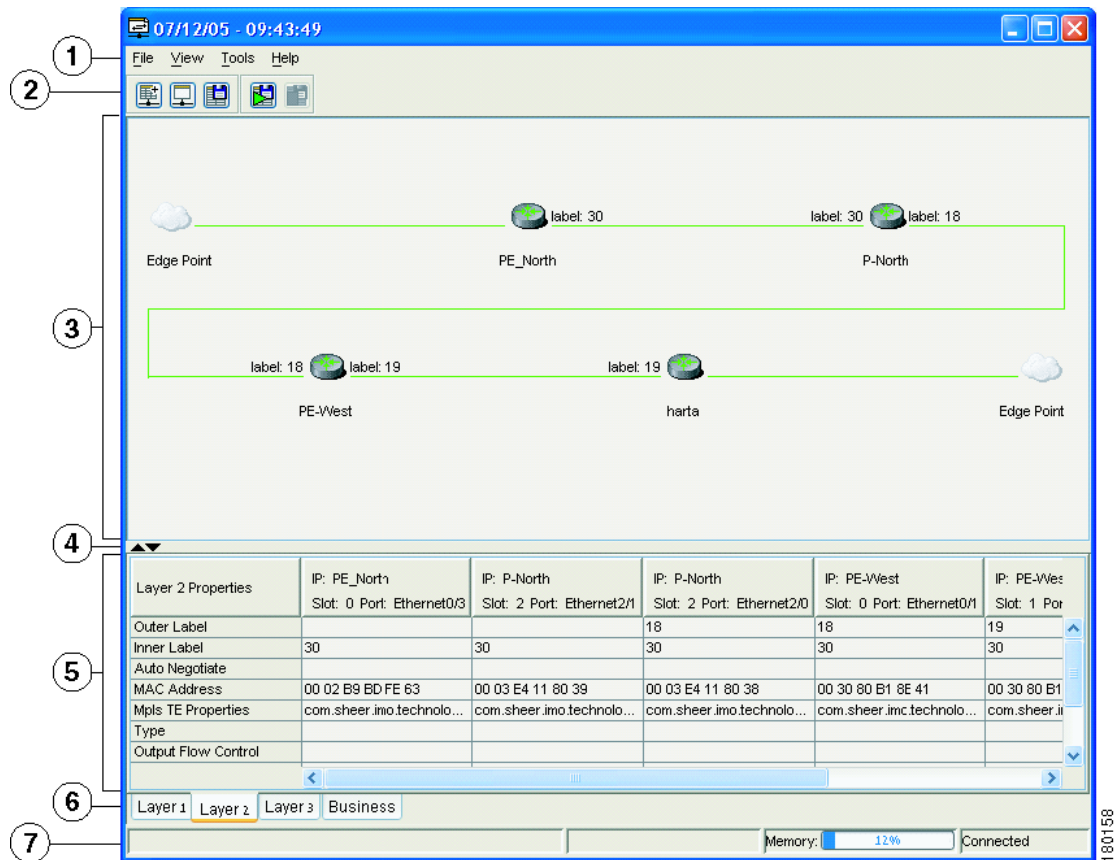
1	Menu bar
2	Toolbar
3	Map pane
4	Hide/Display Properties table
5	Properties table
6	Layer tabs
7	Status bar

The Cisco ANA PathTracer single-path window is divided into the following areas:

- Cisco ANA PathTracer Single-Path Window Toolbar
- Cisco ANA PathTracer Single-Path Window Menus
- Topological Map
- Properties Table and Layer Tabs

Cisco ANA PathTracer Single-Path Window Toolbar

The Cisco ANA PathTracer single-path window contains the following tools:

Table 9-1   ***Cisco ANA PathTracer Single-Path Window Tools***

Button	Function
	Displays all the information in the tabs.
	Hides all the information in the tabs.
	Exports the currently displayed data to a CSV file.
	Starts exporting the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a CSV file.
	Stops exporting the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a CSV file.

Cisco ANA PathTracer Single-Path Window Menus

This section provides a description of each option available in the Cisco ANA PathTracer single-path window menus:

- File Menu
- View Menu
- Tools Menu
- Help Menu
- Shortcut Menu

File Menu

The Cisco ANA PathTracer single-path window File menu is displayed with the following option:

Close

Closes the open Cisco ANA PathTracer single-path window.

View Menu

The Cisco ANA PathTracer single-path window View menu is displayed with the following options:

Show All

Displays all the information in the Properties Table tabs.

Hide All

Hides all the information in the Properties Table tabs.

Tools Menu

The Cisco ANA PathTracer single-path window Tools menu is displayed with the following options:

Note This section refers to single-path view only.

Export to File

Exports the currently displayed data to a file.

Start Saving to File

Starts exporting the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a CSV file.

Stop Saving to File

Stops exporting the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a CSV file.

Help Menu

The Cisco ANA PathTracer single-path window Help menu is displayed with the following options:

Help Contents

Opens the Cisco ANA NetworkVision online help.

Help About

Displays application information, for example, the version number.

Shortcut Menu

The shortcut menu displayed in the Cisco ANA PathTracer single-path window is context sensitive depending on the view and the NE selected. The Device shortcut menu is displayed when right-clicking on a NE, as displayed.

For more information about the Device shortcut menu and for a detailed description of all the menu options available here, see Device Shortcut Menu, page 2-25.

Show 'In' Port

Highlights information regarding the In Port (the in port of the device in the path)of the selected network element in the Properties table of the Cisco ANA PathTracer single-path window.

Note This option is only available in the Device shortcut menu in the Cisco ANA PathTracer single-path window.

Show 'Out' Port

Highlights information regarding the Out Port (the out port of the device in the path) of the selected network element in the Properties table of the Cisco ANA PathTracer single-path window.

Note This option is only available in the Device shortcut menu in the Cisco ANA PathTracer single-path windows.

Topological Map

The topological map displays the devices and links that are part of the path. Icons are used in Cisco ANA PathTracer to display the network objects and these icons provide a visual representation of the network object's status. For more information about the icons used, see Appendix A, "Icon Reference".

For more information about the colors used to indicate severities, see Map Pane, page 2-7.

The same coloring conventions that are used in the map pane of the Cisco ANA NetworkVision window are used to display links in the Cisco ANA PathTracer single-path window. Selecting a device or link on the map automatically highlights the related parameters in the table.

Note The color of a selected link is customizable. The default color is blue.

There are three ways in which the status of a network object is indicated on the topological map:

1. By severity
2. By management state
3. By new alarms

For more information, see Status of Network Objects, page 2-15.

Properties Table and Layer Tabs

The Properties Table and tabs displays the supported parameters of the specified NE. The Cisco ANA PathTracer single-path window is divided into tabs as shown in the example in the Cisco ANA PathTracer Single-Path Window, page 9-7.

The information parameters are displayed in a table, with the ingress and egress ports on the top and the parameters on the left.

Any inconsistencies between the two connected ports are colored to emphasize a discrepancy, for example, different admin statuses.

The Cisco ANA PathTracer information parameters are arranged in groups as follows:

- **Networking Layers**—This group displays information regarding each network element including ingress and egress port information. The information is either plain data that was extracted from the device or calculated data such as rates or statistics. This information is displayed in the Layer 1, Layer 2 and Layer 3 tabs.

- **Business**—This area displays the name and the key of the business tags that have been attached to the network entities displayed, namely, the port or the entire device (physical entity), VC, VP, DLCI, context (logical entity) or MPLS. This information is displayed in the Business Tag area.

The Cisco ANA PathTracer window is divided into the following tabs and all appear empty when the window opens:

- **Layer 1**—Displays the Layer 1 information in the selected path and enables you to view the link parameters. The name of each device is displayed, as well as, the sub-slot, slot and port details.

- **Layer 2**—Displays the Layer 2 information in the selected path. In addition, it enables you to view the link and connection parameters. For each of the devices, the name and MAC address is displayed, the VPI/VCI in an ATM link, or DLCI in a Frame Relay link. By default, the Cisco ANA PathTracer single-path window is displayed with the Layer 2 tab active.

- **Layer 3**—Displays the Layer 3 information selected path and enables you to view the link parameters. The name of each device is displayed.

- **Business Parameter**—Displays the name and the key of the business tags that have been attached to the network entities displayed, namely, the port or the entire device (physical entity), VC, VP, DLCI, IP interface or context (logical entity).

For specific information about VPN Cisco ANA PathTracer information refer to the section on *Viewing VPN Cisco ANA PathTracer Information* in the *Cisco Active Network Abstraction Managing MPLS User Guide*.

Viewing Path Information

The Cisco ANA PathTracer tabs display information regarding each network element including ingress and egress port information. The information is either plain data that was extracted from the device or calculated data such as rates or statistics. This information is displayed in the Layer 1, Layer 2 and Layer 3 tabs of the Cisco ANA PathTracer single-path window.

To view path information:

Step 1   Select the required tab, and click **Show All**. The path information is displayed in the active tab of the Cisco ANA PathTracer single-path window.

> **Note**   Selecting a device or link on the map automatically highlights the related parameters in the table.

> **Note**   Drag the scroll bar at the bottom of the Cisco ANA PathTracer window to view the various areas of the selected path and the parameters.

Saving and Opening Cisco ANA PathTracer Map Files

Cisco ANA NetworkVision enables you to export the maps (paths) displayed in the Cisco ANA PathTracer multi-path window to an .xml file. The data can then be viewed at a later stage in order to assess whether anything has changed.

To save Cisco ANA PathTracer Map Files:

Step 1   Open the Cisco ANA PathTracer multi-path window.

Step 2   On the toolbar, click **Save**,

or

Select **Save** from the File menu.

The Save dialog box is displayed.

Step 3   Browse to the directory where you want to save the file.

Step 4   In the File name field enter a name for the map file.

Step 5   Click **Save**. The map file is saved in the selected directory.

Cisco ANA NetworkVision enables you to open saved xml format path-tracing maps.

Note   • When the user loads a multi-path file, Cisco ANA queries the file (not the network), and loads all the persisted information.

• When the user loads a multi-path file that does not contain the same "start here" and "end here" destination information, the map is automatically opened in another instance of Cisco's PathTracer.

To open Cisco ANA PathTracer Map Files:

Step 1   Select **Load PathTracer** from the File menu in the Cisco ANA NetworkVision window. The Open dialog box is displayed.

Step 2   Browse to the directory of the saved file and select the file.

Step 3   Click **Open**. The Cisco ANA PathTracer multi-path window is displayed with the previously saved map file.

Saving Cisco ANA PathTracer Counter Values

Cisco ANA NetworkVision enables you to export the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a CSV file. The data can then be viewed at a later stage.

Note   This section refers to single-path view only.

To save Cisco ANA PathTracer counter values:

Step 1   Open the Cisco ANA PathTracer window, see Opening Cisco ANA PathTracer, page 9-2.

Step 2   On the toolbar, click **Start Saving to File**,

or

Select **Start Saving to File** from the Tools menu. The Export Table to File dialog box is displayed.

Step 3   Browse to the directory where you want to save the Cisco ANA PathTracer counter values.

Step 4   In the File name field enter a name for the Cisco ANA PathTracer counter values.

Step 5   Click **Save**. The Cisco ANA PathTracer counter values are saved in the selected directory.

The user can then stop exporting the counter values of the path displayed in the Cisco ANA PathTracer single-path window to a CSV file.

To stop saving Cisco ANA PathTracer counter values:

Step 1   On the toolbar, click **Stop Saving to File**,

or

Select **Stop Saving to File** from the Tools menu.

Cisco ANA NetworkVision stops exporting the counter values to the CSV file.

Rerunning a Path and Making a Comparison

Cisco ANA NetworkVision enables you to save and load a path (see Saving and Opening Cisco ANA PathTracer Map Files, page 9-13). This file can then be used at a later stage rerun the path automatically using the same source and destination. You can then compare the paths for example, if you suspect that the path has changed and assess where the problem is occurring.

To rerun the path:

Step 1   Load the required map file, see Saving and Opening Cisco ANA PathTracer Map Files, page 9-13. The Cisco ANA PathTracer multi-path window is displayed with the previously saved map file.

Step 2   On the toolbar click **Run Again**,

or

Select **Run Again** from the File menu.

The path reruns automatically using the same source and destination as the loaded map file and a new tab is displayed in the Cisco ANA PathTracer multi-path window with the updated map (path). The tab also displays the updated details of the date and time when the path was rerun.

The user can easily compare the two paths by simply switching between the tabs in the Cisco ANA PathTracer multi-path window and comparing the old map (path) with the new updated one.

Note
- When the user loads a Cisco ANA PathTracer map file that does not contain the same source and destination information as the map that is currently displayed in the window, the map is automatically opened in another instance of the Cisco ANA PathTracer multi-path window.

- If the user loads a Cisco ANA PathTracer map file that contains the same source and destination information as a window which has already been opened, the file will be loaded in a new tab within this window.

Working with Business Tags

This chapter describes how to manage and view business tag information.

- Working with Business Tags, page 10-2, describes how to create a business tag, for example, a subscriber to a port. In addition, it describes how to detach a business tag.

- Searching for Business Tags, page 10-3, describes how to find a business tag using the business tag's name and key.

- Viewing Business Tag Properties, page 10-4, describes how to view business tag properties.

Cisco ANA NetworkVision enables the operator to attach business tags to network objects. A business tag is a record, which is stored in the Cisco ANA Gateway database that points to a network object. Each business tag has a "key" field, which is a unique identifier for the business tag. The key is common both to the Cisco Supervisor and the Northbound OSS applications that are integrated with Cisco.

The tag can be created explicitly, by specifying the network object and the business tag's details. When the system performs an impact analysis report on the affected network objects, if there are business tags attached to these objects, the report includes the details.

Cisco ANA Gateway enables business tags to be attached to any managed network object that is represented in the Cisco ANA information model. This enables you to:

- Add user familiar labels to network objects, for example, devices and so on.

- Define service endpoints, for example, subscriber and provider connections.

- Click on a hyperlink and go directly to the required location, for example:
  - To a specific port.
  - To a specific subscriber using the subscriber's phone number.

Cisco ANA supports the following types of business tags:

- Subscriber

- Provider Connection

- Label

Business tags enable you to perform the following functions:

- Create a business tag for a network object see Working with Business Tags, page 10-2.

- Search for a business tag and/or generate a list of all the business tags see Searching for Business Tags, page 10-3.

- Edit the details of a business tag.

- Remove a business tag. For more information see Working with Business Tags, page 10-2.

Working with Business Tags

Cisco ANA NetworkVision enables you to create a business tag, for example, a new subscriber to a port. In addition, you can detach existing subscribers from ports.

To attach a business tag:

Step 1   Right-click on a network object in the Cisco ANA NetworkVision window or in any of the dialog boxes to display a right-click shortcut menu.

Step 2   From the right-click shortcut menu, select **Attach Business Tag**. The Attach Business Tag dialog box is displayed.

The following fields are displayed in the Attach Business Tag dialog box:

- **Unique Key**—A unique identifier for the business tag.
- **Name**—The name of the business tag.
- **Type**—The related business tag type options, namely, Subscriber, Provider Connection or Label.
- **Notes**—A free text message.

Step 3   Enter a **Key** and **Name** for the business tag.

Step 4   From the Type dropdown list, select the type of business tag (namely, Subscriber, Provider Connection or Label).

> **Note**   When Label is selected as type the name of the network object changes to display the business name.

Step 5   Enter a free text message in the Notes area (optional).

Step 6   Click **Save**. The business tag is attached to the network object. The business tag is displayed in the Business Tag tab of the Inventory window for the selected network object and the name of the business tag is displayed in the tree pane, map pane, Cisco ANA PathTracer and so on.

> **Note**   The Edit and Detach options are displayed in the right-click shortcut menu when a business tag is attached to a network element.

You can search and edit business tag information attached to a network object using tools available from the appropriate Business Tag dialog box. A business tag that has been attached to a network object can also be detached.

To detach a business tag:

Step 1   Open the business tag that you want to delete by selecting the Business Tag tab of the required network object in the Inventory window. On the toolbar, click **Detach Business Tag**.

or

Right-click on the network object with the business tag in the tree pane or map pane in the Cisco ANA NetworkVision window's workspace to display the General shortcut menu and select **Detach Business Tag**.

or

Search for the business tag. For information see Searching for Business Tags, page 10-3. Select the business tag in the table and click **Detach Business Tag**.

> **Note**   A single or multiple business tags can be detached.

The business tag is detached from the network object and the Business Tag tab is no longer displayed.

Searching for Business Tags

Cisco ANA NetworkVision enables you to find a business tag, namely, a subscriber, provider connection or label using the full or partial business tag name and the business tag key. If you use the full or partial business tag name for the search, the search results provide a list of business tags meeting the search criteria. If you use the business tag key, the search results provide information about the particular business tag.

> **Note**   Click on the hyperlink provided in the search results table to go directly to the required location.

To search for a business tag:

Step 1   In the Cisco ANA NetworkVision toolbar, click **Find Business Tag**,

or

From the Edit menu, select **Find Business Tag**. The Find Business Tag dialog box is displayed.

The Find Business Tag dialog box contains the following tools:

Table 10-1   Find Business Tag Dialog Box Tools

Button	Function
	Finds the business tag according to a name, key or type entered in the Find Business Tag dialog box.
	Clears the search information entered in fields in the Find Business Tag dialog box.
	Opens the Edit Business Tag dialog box enabling you to edit the business tag.
	Detaches the business tag. For more information see Working with Business Tags, page 10-2.
	Opens the online Cisco ANA NetworkVision Help.

> **Note**   To activate all the business tag tools (toolbar buttons), click on any line in the table of the Find Business Tag dialog box.

Step 2   Enter the full or partial Key and/or Name for the business tag.

Step 3   From the Type dropdown list, select the type of business tag that you want to find.

Step 4   Click **Find**. The results of the search are displayed in a table at the bottom of the Find Business Tag dialog box.

The following columns are displayed in the table:

- **Key**—A unique identifier for the business tag.
- **Name**—The name of the business tag.
- **Type**—The business tag type, namely, Subscriber, Provider Connection or Label.
- **Entity**—The location of the network element with the attached business tag, as a hyperlink that opens the properties of the relevant location.

Step 5   Click on the hyperlink provided in the search results table to go directly to the required location.

Viewing Business Tag Properties

Cisco ANA NetworkVision enables you to view business tag properties.

To view business tag properties:

Step 1   Select a business tag in the table in the Find Business Tag dialog box.

Step 2   Right-click to display the shortcut menu and select **Properties**.

or

Click **Edit** on the toolbar of the Find Business Tag dialog box.

or

Double-click on the business tag in the table. The Business Tag Properties dialog box is displayed.

For more information about the fields displayed see Working with Business Tags, page 10-2.

You can also view the business tag's properties in the Business Tag tab of the Inventory window.

Icon Reference

This appendix provides a quick reference guide to Cisco ANA NetworkVision's icons.

- Device Icons, page A-1, displays the Cisco ANA NetworkVision device icons and provides a description.
- Management State Icons, page A-3, displays the Cisco ANA NetworkVision management state icons and provides a description.
- Alarm and Ticket Icons, page A-3, displays the Cisco ANA NetworkVision alarm icon and provides a description.

Device Icons

Table A-1 Device Icons

Tree Pane/ Map Pane	Description
	Unmanaged Network
	Network, sub-network or logical aggregation
	Router
	Generic SNMP
	Ethernet Switch
	DSLAM
	ATM switch
	BRAS
	Ping VNE

Table A-1   Device Icons (continued)

Tree Pane/ Map Pane	Description
	Viewable by a user with a higher permission level
	Ghost device

Note   When Cisco ANA NetworkVision detects a network device for which there is not enough information available, the device is displayed as a ghost device on the map. In this case, the user is unable to view the ghost device's properties or communicate with the device. When the ghost device's information is updated, its icon is replaced with the relevant device icon and all the related device information and communication become available.

The following icons are used in specific VPN MPLS Service View maps and are displayed in the tree and map panes:

Table A-2   VPN MPLS Device Icons

Tree pane	Map pane	Represents
		Root (map name) or aggregation
		VPN business element
		Virtual Router business element
		Site business element
		Site business element with an actively associated CE device and where the device is hidden
		Logical Circuit Aggregator (LCA) business element
		Logical Circuit Peer (LCP) business element
		LCP business element with an actively assigned tunnel edge for the CE device and where the device is hidden

Management State Icons

Table A-3   Management State Icons

Tree Pane/ Ticket Pane	Map Pane	Description
		Unsupported. The VNE does not support the network object hardware or software version or a device module.
		Initializing. The VNE or VNE component is in startup mode or temporarily non-operational.
		VNE Unreachable. Cisco ANA Gateway received no response from the VNE.
		Device Unreachable. Cisco ANA failed to access the device.
		Partially Supported. Partially supported device.
		Maintenance. The VNE state was manually changed to maintenance.

For more information about management states see Management State, page 2-17.

Alarm and Ticket Icons

The way in which a ticket is displayed in the ticket pane depends on the status/severity of the alarm. The alarm displays the severity level of the topmost alarm.

In the tree pane and ticket pane the icon is displayed. In the map pane the icon is displayed. The ticket pane icons change when:

- A ticket is generated.
- A ticket is cleared.
- A ticket is acknowledged.
- An up ticket is generated.
- A ticket is cleared and removed.

For more information about severities see Map Pane, page 2-7.

An example of the appearance of the ticket pane when a ticket is generated is displayed below.

Table A-4   Ticket Pane Displaying Generated Ticket

Severity	Ticket ID	Short Description	Acknowledged
Major	27	Port down	False (Not Acknowledged)

An example of the appearance of the ticket pane when a ticket is cleared is displayed below.

Table A-5   Ticket Pane Displaying Cleared Ticket

Severity	Ticket ID	Short Description	Acknowledged
Normal	27	Cleared due to Force Clear	True (Acknowledged)

A ticket that has been cleared can be removed from the ticket pane. For more information see Ticket Pane, page 2-13.

When a ticket is cleared its definition changes to acknowledged automatically in the ticket pane, namely, its definition in the Acknowledged column is true.

An example of the appearance of the ticket pane when a ticket is acknowledged is displayed below. When a ticket is acknowledged it can then be cleared and the severity changes to OK.

Table A-6   Ticket Pane Displaying Acknowledged Ticket

Severity	Ticket ID	Short Description	Acknowledged
Major	27	Port up	True

Note   When a ticket with an Information severity is acknowledged, the ticket is automatically removed from the Cisco ANA Gateway and from the ticket pane.

The cause of the alarm is fixed; therefore an 'Up Ticket' is automatically generated with an **OK** severity. An example of the appearance of the ticket pane when an 'Up Ticket' is generated is displayed below.

Table A-7   Ticket Pane Displaying 'Up Ticket'

Severity	Ticket ID	Short Description	Acknowledged
Normal	27	Port up	True

The ticket can be removed from the ticket pane when it has been cleared or when an 'Up Ticket' is generated. The ticket is then removed from the ticket pane and the database.

Approves the reported faulty ticket and clears the faulty networking entity from Cisco ANA. In addition, the ticket, all its active alarms and business entities are removed from Cisco ANA Gateway and from the ticket pane.

INDEX