Configuring and Managing Token Ring Switches using Cisco's Network Management Products

Cisco offers several network management applications that you can use to manage your Catalyst Token Ring switches. The following network management products are described in this chapter:

- CiscoView

- CWSI

- Resource Manager

CiscoView

CiscoView is a GUI-based device management software application that provides dynamic status, statistics, and comprehensive configuration information for Cisco's internetworking products (switches, routers, concentrators, and adapters). CiscoView graphically displays a physical view of Cisco devices. Additionally, this network management tool provides configuring and monitoring functions and offers basic troubleshooting. Using CiscoView, you can more easily understand the tremendous volume of management data available for internetworking devices because CiscoView organizes it into graphical device representations presented in a clear, consistent format.

CiscoView provides the following advantages over using direct SNMP gets and sets:

- Graphically displays Cisco products from a centralized network management location, giving network managers a complete view of Cisco products without physically checking each device at remote sites.

- Oriented for exception reporting, enabling users to access essential inquiry information quickly.

- Shows a continuously updated physical picture of routers, hubs, switches, or adapters.

- Can be invoked several times in the same session to simultaneously support multiple switches, routers, hubs, or adapters.

- Scrollable viewing for use with large devices such as the Catalyst 5500 and Cisco 7500.

CiscoView can run on UNIX workstations as a fully functional, independent management application. It is also available in Windows 95 and NT format on a PC. In addition, CiscoView can be integrated with the following SNMP-based network management systems to provide a seamless, powerful network view:

- Sun Microsystems SunNet Manager

- Hewlett-Packard OpenView

- IBM NetView for AIX

CWSI

CWSI is a GUI-based device management software application that provides a suite of integrated tools to provide topology management, traffic management, VLAN management, management of ATM networks, and user tracking.

Topology Management Services

The topology displays provided by CWSI include both physical and logical layer topology views of Cisco switches and routers. CWSI uses the information contained in CDP advertisements to draw a map of the discovered devices, including Catalyst Token Ring switches. From these maps, you can launch other CWSI functions.

As an integral component of the topology management, CWSI offers logical viewing and configuration services for many of the Catalyst Layer 2 functions, such as spanning tree design and analysis. Network operators can easily select any one of, or a multiple of, these functions with the new topology display service module. This service module customizes the view to a specific feature and then allows the operator to undertake guided configuration functions.

These display and configuration functions are accomplished by simply selecting the Catalyst features to be managed. CWSI highlights the appropriate configuration details on top of the physical map and offers configuration selections in which modifications can be made. Critical information, such as the root bridge within a calculated spanning tree, are all provided as part of these services.

Traffic Management Services

The traffic management services of CWSI allow you to monitor your enterprise networks from a central site, to ensure high network reliability and availability.

The traffic management services work as a distributed system by using a central management console running the software in conjunction with data-gathering agents located at various points on a network. It can simultaneously collect wide-ranging statistical data, display selectively captured and fully decoded network traffic, set user-defined alarm conditions, and get real-time updates from all segments of a widely dispersed internetwork. The traffic management services are based on two standards that let them operate in a multi-topology, multivendor environment:

- SNMP defines the protocol for all intercommunications between the traffic management services and SwitchProbe devices.

- RMON MIB, which defines the type of information that the agent gathers that is available for you to display for each network segment.

The traffic management services provide functions for the following:

- Monitoring network traffic and measuring the flow of data

- Capturing network traffic and recording it for later examination

- Interpreting raw network data and translating it into a graphic form that you can view and analyze

- Setting limit conditions on network traffic and generating alarms if those limits are exceeded

Network traffic information is collected from RMON agents in devices running Cisco IOS software, SwitchProbe standalone network monitoring probes, or any RMON standards-compliant agent. Performance and fault management are also simplified by multilayer traffic analysis, proactive alarms, remote packet capture, and protocol decode features.

VLAN Management Services

The VLAN management services of CWSI allows you to configure, manage, and monitor interconnected Cisco switches and routers. Integral components of the VLAN management services include graphical mapping utilities for viewing and configuring logically defined workgroups, "drag-and-drop" port-level configuration options for assigning users to VLANs, automated link assignment settings for managing VLANs campus-wide, integration with common SNMP management platforms for consolidating system resources and detailed reporting functions for maintaining audit trails.

The benefits of VLAN management services include:

- Accurate campus view of Cisco switches and routers simplifies VLAN configuration and monitoring functions.

- On-screen reports of VLAN device, link, and port status are quickly obtained using pop-up windows and icon highlighting. Audit trails can then be generated from these reports.

- Drag-and-drop graphical configuration options provided by CiscoView minimize the skill level required to set up and assign ports to VLANs.

- A simplified VLAN naming window and associated directories offer flexibility and easy-to-use search functions for creating and changing VLAN names.

- User-selectable options for configuring VLANs across interswitch backbones include selecting multiple paths, choosing specific paths based on preferences, and manually adding and deleting paths.

- Logical views of configured VLANs include switch, link, and port membership windows, enabling users to audit and verify membership status.

User-selectable color options concurrently display multiple configured VLANs, making it easier to visualize and identify VLAN configurations.

ATM Management Services

The ATM management services of CWSI provides:

- Comprehensive discovery of ATM devices that support ILMI

- Virtual circuit setup and trace analysis of both PVCs and SVCs

- The launching of Cisco's graphical device management application from any of the Cisco icons within the topology map

- A real-time path trace analysis tool for checking end-to-end connectivity

Additional enhancements to the ATM management functionality in CWSI include performance analysis of the LANE components, configurations functions for PNNI routing, and traffic monitoring capabilities with ATM RMON. As part of the LANE management features, network managers can quickly check the status of the LECS database with a graphical representation on the location of this database within the ATM fabric, and they can query this database for ELAN-to-MAC and ELAN-to-network service access point (NSAP) address mappings. This information provides an address list of the end stations within each ELAN. Further, network managers can select the LES database and discover the MAC-to-NSAP address mappings to resolve network addresses. For redundancy, network managers can configure a backup LECS in conjunction with Cisco's SSRP for increased reliability. The ATM management functions provide utilities for synchronizing the database for naming consistency and integrity.

As part of the PNN configuration options, network managers can set administrative weightings and topology metrics to better optimize the communication across the ATM fabric. Further, network managers can view the PNNI-routed topology by selecting this display option within the topology map manager.

User Tracking Services

CWSI also provides utilities for tracking mobile users. The user tracking services of CWSI uses an automated VLAN authentication approach that verifies the user's station address prior to permitting access, and a newly developed tracking tool that maintains user location and identity as part of the embedded database functions. This management functions works seamlessly with Dynamic Host Configuration Protocol (DHCP), which automates TCP/IP addressing, and with the underlying topology services within CWSI that can pinpoint the user location within the topology map.

User tracking services provides:

- Discovery and reporting of end stations by MAC address and IP address
- Spreadsheet-style reporting of addressing information
- Configuration tool for assigning users to VLAN groups
- Pull-down preference settings for scheduling database updates
- Listing of all switch port-attached workstations
- Customized sorting tables for detailed reporting
- Scheduling managers for address tracking updating

Resource Manager

Cisco Resource Manager is a Web-based management solution for enterprise networks, offered on both Solaris and NT. It leverages Internet technologies to provide a flexible framework for simplifying several important tasks critical to network management. Cisco Resource Manager can run alongside CiscoWorks and CWSI, complementing their configurations and diagnostics capabilities with enhanced inventory and software distribution utilities for both routers and switches.

Resource Manager consists of four key management applications: Inventory Manager, Availability Manager, Syslog Analyzer, and Software Image Manager. Together these applications automate the task of finding software updates, speed device software deployment, provide multidevice views of network change, report on Year 2000 compliance, track device availability, and report, categorize, and analyze syslog messages, providing you probable cause and suggested actions.

Currently, the Inventory Manager and Software Image Manager are supported on the Catalyst 5000 series Token Ring switching module.

Inventory Manager

Inventory Manager centrally collects information on all types of network devices (routers, switches, hubs, and SNMP MIB II devices), allowing you to quickly find version and configuration information you need. Inventory Manager allows does the following:

- Quickly collects and displays up-to-date router and switch inventory details
- Notifies users of hardware and software configuration changes to network devices
- Allows users to view high-level device information or drill down to view a device's configuration details

- Allows users to group (create views of) devices by static or dynamic characteristics

- Provides device information to other Resource Manager modules

- Uses a CCO Internet connection to report on your network's compliance with Year 2000 certification information

Inventory Manager takes basic device seed information, entered directly or imported from CiscoWorks, CWW, CWSI, or HPOV, and adds detailed device characteristics to it. Imported data can be filtered to include only Cisco equipment. Once populated, Inventory Manager's database can be exported for uses in other applications.

Inventory Manager uses the concept of views to organize network devices into user-definable groups. A view can be static or dynamic. A static view contains specific devices known by name, whereas a dynamic view contains devices with a particular attribute such as model, location, or configuration characteristic. Dynamic views are powerful tools because they automatically adjust to reflect qualifying devices as they are added or removed from the network. Views created for Inventory Manager are shared with other Resource Manager applications.

Inventory Manager scans the network on a user-defined interval and gathers current hardware information (interface cards, Flash memory, firmware version) for devices it has been setup to manage. Network events such as a device reloading or restarting will automatically cause inventory info to be updated. One of the detailed reports that Inventory Manager provides is a proactive change-management report highlighting changes made to devices over time. Users can save a set number of these reports for historical tracking. Inventory information is displayed using a flexible reporting capability based on the views you have defined.

Software Image Manager

Software Image Manager automates many of the steps associated with scheduling, downloading, and monitoring software upgrades. The process of keeping switch and router images current starts with Software Image Manager scanning its database to check the software version, Flash memory size, and available RAM of each device you want to upgrade. It then notifies you if upgrades to Flash memory or RAM are required to accept the proposed image. Next, it allows you to bring the selected image down from CCO into Software Image Manager's library. Alternatively, software images can be loaded into the library from an existing device or from a local file system.

After you obtain the proper software image, you create a job defining which devices are to receive the new image(s), in what order, and what the script should do if an error is encountered. Software Image Manager can deploy software across the network at the scheduled time, synchronizing the download to multiple devices. To ensure that you know if all updates were successful, Software Image Manager generates detailed job reports which can be E-mailed upon completion, showing the status of each download performed.