

CiscoWorks **Campus Manager**

Campus Manager is a key component in the CiscoWorks family of management solutions designed to make Cisco networks the most manageable and available in the industry. Today's networks are critical business assets, and require sophisticated tools for administering, monitoring and configuring Layer 2 services. Designed for enterprise network operations staff, Campus Manager provides powerful tools with built-in network intelligence to reduce the complexity and automate manual tasks associated with maintaining complex physical and logical network infrastructures.

Campus Manager Overview

Campus networks are at the heart of business and mission-critical systems. The requirement to understand, monitor, and react to changing networking conditions drives the need for sophisticated, yet easy-to-use management tools. Campus Manager is part of the LAN Management Solution, part of the broad range of CiscoWorks network management solutions.

New in Version 3.3:

In addition to the rich set of management features already included, the new version of Campus Manager has been enhanced to provide even greater manageability for Cisco networks. New benefits include:

- Improved application performance
- Doubled capacity for tracking end users

Key Campus Manager features include:

- Intelligent discovery and display of Layer 2 networks on browser-accessible topology maps, independent of VTP server
- Configuration of virtual LAN (VLAN)/LAN Emulation (LANE) and asynchronous transfer mode (ATM) services and assignment of switch ports to those services
- Link and device status display based upon Simple Network Management Protocol (SNMP) polling
- Identification of Layer 2 configuration discrepancies
- Diagnostic tools for connectivity related problems between end stations, and Layer 2 and Layer 3 devices
- Automatic location and correlation of information on users by media access control (MAC), IP address, NT or NetWare Directory Services (NDS) login or UNIX host name, with their physical connections to the switched network
- Visibility and launch point of Cisco CallManager from topology services as well as tracking of phone handset to IP, Mac address, and switch port
- Layer 2 and Layer 3 path trace between source and destination handsets
- Export of topology maps to Visio
- Java plugins to improve graphical user interface (GUI) performance



- Ability to form Custom Groups in Topology View based on criteria like SysLocation, SysName and IP address/Subnet mask.
- Secure communication between the client browser and Campus applications using Secure Socket Layer (SSL) protocol.

Campus Manager enables administrators to more easily change, monitor, and control network relationships, making them more effective in delivering business-critical and advanced networking services to their users and customers.

Campus Manager is a suite of applications launched from a common “management desktop” used by all Web-based CiscoWorks applications. Campus Manager contains three applications that can be launched from the client’s browser:

- **Topology Services**—This is the principal interface to a variety of large scale topology maps, tabular summaries, reports, and configuration services of the Layer 2 network. A directory-like tree interface lists physical Layer 2 and logical, Virtual Trunking Protocol (VTP), and ATM domain views along with table summaries of the devices and interface associated with these views. This tree structure acts as the launching point for topology maps, discrepancy reporting functions, and configuration services. The integrated VLAN and LANE configuration capabilities, ATM soft permanent virtual circuit (PVC) configuration and diagnostic tools, along with physical and logical configuration discrepancy checking reports and highlighting tools are found within the Topology Services menus. It also supports discovery and display of Cisco Customer Response Applications, and reports on services of these devices.

Ability to form custom groups based on dynamic and static rules for the group membership. System defined groups and user defined grouping can be created by network administrators and users respectively and allows grouping by developing rules based on criteria such as IP address, subnets, SysLocation, SysName, SysContact, Image Version and hostname. A rules editor allows for creating, editing Topology groups and defines rules for membership.

Figure 1

Topology Services Tabular View

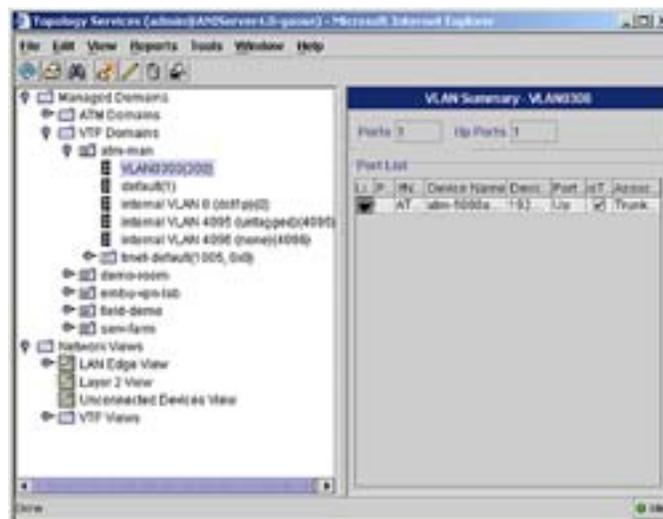




Figure 2
VTP Domain Topology Map

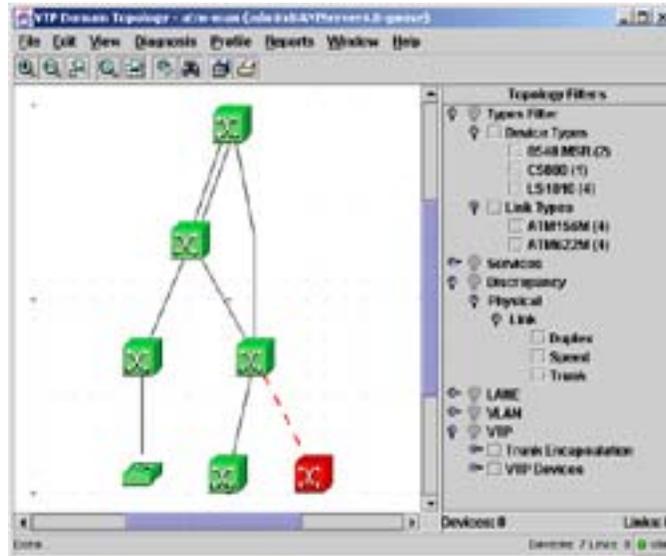


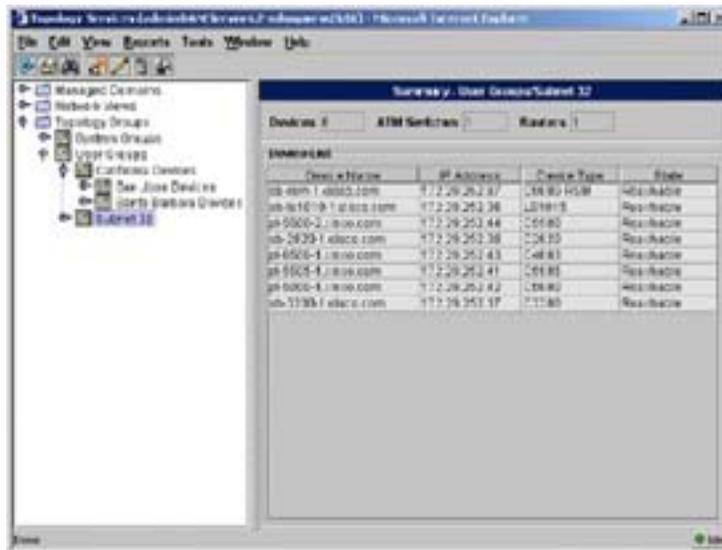
Figure 3
Forming Topology Groups

The screenshot shows the Network Services console. The left pane displays a tree view of managed domains and topology groups. The right pane shows a 'Summary - User Groups/Subnet 32' window with a 'Device List' table.

Device Name	IP Address	Device Type	Role
10-100-1-1000.com	172.26.252.37	CS690	Root
10-101-1-1000.com	172.26.252.28	LS1010	Wsp-leaf
10-100-2-1000.com	172.26.252.44	CS690	Wsp-leaf
10-200-1-1000.com	172.26.252.38	CS690	Wsp-leaf
10-100-1-1000.com	172.26.252.43	CS690	Wsp-leaf
10-100-1-1000.com	172.26.252.41	CS690	Wsp-leaf
10-100-1-1000.com	172.26.252.42	CS690	Wsp-leaf
10-200-1-1000.com	172.26.252.37	CS690	Wsp-leaf



Figure 4
Topology Group in Topology Maps



- User Tracking**—Designed to assist in locating end-station connections at the access switch, this application is a useful tool in troubleshooting or connectivity analysis. Through automated acquisition, a table of end-user stations and Layer 2 connection information is constructed. This table can be sorted and queried allowing administrators to easily find users. Users can be identified by name, IP handset, MAC and IP address, as well as the switch port and switch that they are connected, along with VLAN and VTP assignment of the port. Predefined reports, such as duplicate MAC per switch port, or duplicate IP addresses, enable managers to locate mobile users or violations in port policies.

Figure 5
User Tracking



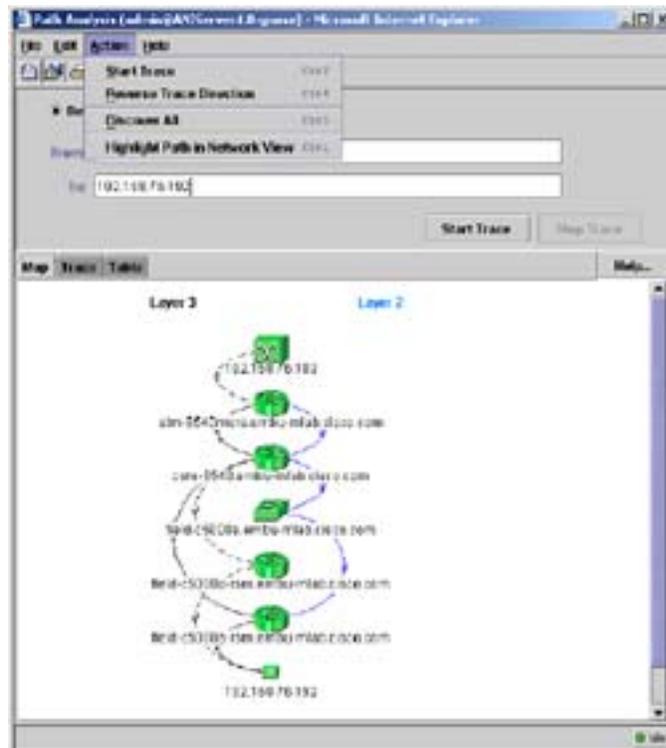


Figure 6
Subnet based acquisition



- **Path Analysis**—An application for switched network management, this is an extremely powerful tool for connectivity troubleshooting. Path Analysis utilizes User Tracking, topology services, and real-time spanning tree information to determine Layer 2 and Layer 3 connectivity between two end-points, or IP Handsets, in the network. The resulting trace is presented in graphical topology views that illustrate the Layer 2 and Layer 3 devices, path direction and link types, and in tabular formats that provide specific interface, IP address, VLAN, and link type information.

Figure 7
Path Analysis





VLAN/LANE Configuration and Port Assignment

Campus Manager provides an easy and graphical means for creating, modifying, or deleting VLANs, LANE elements, or assigning switch ports to VLANs. As VLANs are created or modified, port and user changes are instantly updated and transmitted to the switches, eliminating the need to update and configure each participating switch individually. As VLANs are selected, the table view shows the participating ports, port status, and switch information and the topology map can be launched to graphically highlight participating devices and links of the VLAN connections. Additional map tools allow managers to show spanning-tree states, VTP trunks, switch port links, and existing LANE service elements.

Figure 8

VLAN Port Assignment



Campus Manager 3.3 is a must for switched network management, and is an integral piece of the LAN Management Solution, by providing a broad, comprehensive set of tools for managing and administering the entire LAN environment.

Campus Manager 3.3 Features

Campus Manager provides a variety of functions within Topology Services, User Tracking, Path Analysis and VLAN/LANE port assignment that network managers can use to better understand, monitor, configure, diagnose, and be proactive to network infrastructure changes.

Topology Services

Topology Services provides access to a wide variety of physical and logical topology maps, summary lists of devices, ports, and their network relationships. Topology Services also acts as the launching point for topology-related configuration and diagnostic tools.



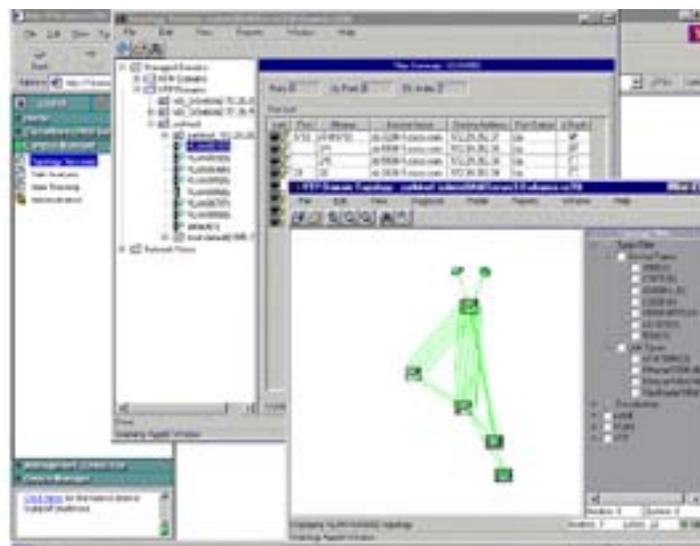
In Campus Manager 3.3, network topology maps can be displayed in a variety of ways from both a flat Layer 2 to abstracted views that better represent and scale to large campus networks. These abstractions are categorized into three different groups: managed domains, network views and topology groups. Managed domains are topological views of logical groups of devices organized around ATM switch fabrics and VTP domains. Network views are physical displays of the network and are organized to provide full and abstracted views, such as LAN edge views, Layer 2 views, unconnected device views, and VTP views. Topology Groups are custom views that are a subset of the entire network based on the group rule defined while creating the view. They can be two types of groups—system defined groups that are custom views created by admin user and user defined views which are created by CiscoWorks users. Membership to these groups are made via rules that can be evaluated either automatically or upon user request and these groups help in generating custom views that are a subset of the Layer 2 views.

Key features in the Campus Manager topology services include:

- Autodiscovery and display of Cisco switches, routers, and probes using the Cisco Discovery Protocol (CDP) and SNMP
- Display of physical and logical Layer 2 connections within the discovered LAN environment
- Highlighting tools to identify specific classes of devices or links such as switches, route switch modules (RSMs), Fast Ethernet, EtherChannel®, ATM links, Cisco Customer Response Applications, and other relevant Cisco device elements
- Expanded scalability to support more than 2000 Cisco devices
- Display of multilayer switches and components (switching entities and route-processing entities) with the ability to highlight logical relationships between devices, such as flow masks and shortcuts
- Device status indicators on the topology maps based on CDP, ILMI, ELMI, and SNMP availability
- Automated discrepancy reporting during discovery highlights connection problems, link mismatches, and logical misconfigurations
- Graphical interface for creating VLAN and LANE services for Ethernet, Token Ring, and transparent VLANs
- Graphical interface for locating—through search parameters—and assigning switch ports individually or in bulk to a VLAN
- ATM soft PVC configuration and diagnostics

Figure 9

Topology Views and Tools





VLAN/LANE Configuration and Port Assignment

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VLAN management services provide:

- Tabular summary views of VLANs shows participating ports, devices, links, and port status information
- Graphical setup of VLANs (including transparent VLANs) and VLAN membership to simplify administration
- Integration of LANE configuration services in VLAN configuration tools for more efficient operational and engineering practices
- A separate interface for administrators to quickly search, using a variety of criteria, and assign selected switch ports, individually or in bulk, to VLANs
- Logical display of VLAN configurations makes it easy to visualize switch connections
- Automated discrepancy reports highlight connection problems and link mismatches
- Automated VLAN membership registration reduces administration and configuration requirements

ATM Management

Campus Manager offers a graphical tool for managing complex ATM networks, simplifying configuration and performance monitoring. ATM networks are displayed on the topology map and the logical VLAN and ATM domain views provide graphical representations of ATM switches and LANE elements. “Drill down” capability allows access to configuration and performance monitoring tools. ATM management functions include:

- Autodiscovery of ATM switches, including switched virtual circuit (SVC) and PVC connections
- Connectivity checking of SVC and PVC connections
- End-to-end virtual circuit path tracing and analysis, which assists in connectivity diagnostics
- LANE troubleshooting and performance analysis
- Quality of service (QoS) templates for simplifying the configuration of typical traffic such as video or constant-bit-rate (CBR)
- Simple configuration of soft PVCs
- ATM remote monitoring (RMON) data collection and analysis

User Tracking

User Tracking automatically locates servers and end-user workstations, and Cisco voice over IP (VoIP) telephone handsets and their connections to Layer 2 Cisco switches. During this discovery process it also tabulates specific connection information about that end station, including:

- VLAN name, type, and VTP domain
- Switch port number, name, and state



- MAC and IP address of the end station and its subnet
- Tabular and sortable listing of all switch port attached end-user workstations, servers and IP handsets
- Last-seen time stamp reflecting last acquisition in which the end station was detected
- User login name passed automatically from the Windows NT Primary Domain Controller or Novell Directory Structure, or from the UNIX host

Campus Manager simplifies the dynamic nature of many business environments by providing a large number of sortable parameters that can be used to locate end-user stations. User Tracking discovers end stations connected to switch ports automatically and provides a means to identify end users, their assigned VLANs, and host station connections. User Tracking also supports voice/data convergence with interfaces to Cisco CallManager for correlating the IP and MAC addresses of discovered VoIP handsets with their assigned phone number and users.

User Tracking provides the following features:

- Enhanced scalability to support 60,000 end stations
- Predefined reports that identify duplicate MAC and IP addresses, ports with multiple MAC addresses and duplicate sysnames.
- IP and MAC addresses of discovered VoIP handsets with their assigned phone number and users
- Tabular and sortable listing of all switch port-attached end-user workstations and IP handsets
- Customized tables for user-defined, detailed reporting
- GUI for user tracking information table configuration to support dynamic/mobile users
- Scheduling managers for automating address change updates
- Easy-to-use search utility box locating users by MAC addresses, IP addresses, DNS host names, switch port labels, and optional voice handsets
- Provides ability to schedule User Tracking. Also exports User Tracking reports.
- Ability to define acquisition based on a subnet range

Figure 10

Scheduled export of User Tracking Reports





Path Analysis

Path Analysis is a powerful diagnostic tool for determining the Layer 2 and Layer 3 path between two selected endpoints using Campus Manager-discovered end-station data, VLAN/LANE configuration information, real-time Layer 3 path trace information, and spanning-tree calculations. Displays of path information are available in both topological map and tabular displays. Key Path Analysis features include:

- View the Layer 2 and Layer 3 path information in a map format with traces showing end stations, Layer 2 and 3 devices, route directions, and cut-through paths
- View specific details of the Layer 2 and Layer 3 path, including IP addresses and interfaces traveled, VLAN and VTP domain names, and port speeds and duplex settings
- Perform traces immediately or schedule them
- Perform traces using IP address, DNS name, or by telephone number for voice calls as start/stop points
- Provide Layer 2 and Layer 3 trace information between Cisco voice elements using interfaces to call detail records for specific voice calls
- Provides ability to schedule path traces. Also exports path traces data.

Built on the CiscoWorks Management Server

The CiscoWorks management server provides common resources, such as Web services, discovery, shared databases and database services, and the management desktop. Cisco Management Connection, a service on the CiscoWorks2000 server, delivers a set of tools for integrating applications into the management desktop using Internet-based standards and technologies. These tools allow users to link Web-based management applications to the CiscoWorks family of products and application developers to easily link Web-based applications through a certified registration mechanism. Cisco Management Connection has been used by Cisco and more than 30 network management vendors, including Hewlett-Packard, Computer Associates, Sun Microsystems, and Tivoli Systems to create certified Cisco Management Connections for their applications. This rapid adoption has created an environment in which users can easily build management intranets that link together their favorite Web-based management applications.

Specifications

Server, Client, and Web Browser System Requirements

The server, client and web browser system requirements can be found in the Product Overview documents for the Routed WAN and LAN Management solutions and on Cisco's main on-line documentation site, under each CiscoWorks solution. Please refer to these and other Product Installation documentation for more detailed information on setting up and configuring these solutions.

Supported Cisco Devices

Most Cisco routers, Catalyst[®] and LightStream switches, as well as Cisco AVVID devices.

http://www.cisco.com/en/US/products/sw/cscowork/ps563/products_device_support_tables_list.html

Supported Cisco IOS Versions

- Cisco IOS® version 10.3 and above
- Catalyst Supervisor code 2.1 and above

Availability

Campus Manager 3.3 is an integral part of multiple CiscoWorks solutions and is not sold as an individual product. For additional information on Campus Manager, see:

<http://www.cisco.com/en/US/products/sw/cscowork/ps563/index.html>

To place an order, contact your local Cisco sales representative.



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