CHAPTER 17

Administering the Cisco Application Networking Manager

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The following topics describe how to administer, maintain, and manage the ANM management system. Previous topics described how to manage your network devices on ANM, while this topic describes how to perform procedures on the system itself.

Note When naming ACE objects (such as a real server, virtual server, parameter map, class map, health probe, and so on), enter an alphanumeric string of 1 to 64 characters, which can include the following special characters: underscore (_), hyphen (-), dot (.), and asterisk (*). Spaces are not allowed.

If you are using ANM with an ACE module or ACE appliance and you configure a named object at the ACE CLI, keep in mind that ANM does not support all of the special characters that the ACE CLI allows you to use when configuring a named object. If you use special characters that ANM does not support, you may not be able to import or manage the ACE using ANM.

This chapter includes the following sections:

Overview of the Admin Function

Note Some of the Admin options might not be visible to some users; the roles assigned to your login determine which options are available.

Table 17-1 describes the options that are displayed when you click **Admin**.

Table 17-1 Admin Menu Options

Menu	Option	Description	Reference
Role-Based Access Control	Organizations	Manage organizations, configure remote authentication mechanisms	See Configuring User Authentication and Authorization, page 17-40
	Users	Manage users	See Managing User Accounts, page 17-48
	Active Users	Display active users	See Displaying or Terminating Current User Sessions, page 17-53
	Roles	Manage user roles	See Managing User Roles, page 17-54
	Domains	Manage domains	See Managing Domains, page 17-61

Table 17-1 Admin Menu Options (continued)

Menu	Option	Description	Reference
ANM Management	ANM	Checks the status of the ANM server.	See Checking the Status of the ANM Server, page 17-75
	License Management	Views ANM license state, add more licenses, and tracks license information on your ACE	See Using ANM License Manager to Manage ANM Server or Demo Licenses, page 17-79
	Statistics	Displays ACE statistics (for example, CPU, disk, and memory usage).	See Displaying ANM Server Statistics, page 17-81
	Statistics Collection	Enables ACE server statistics polling.	See Configuring ANM Statistics Collection, page 17-81
	Audit Log Settings	Allows you to specify number of audit logs saved and how many days logs are saved.	See Configuring Audit Log Settings, page 17-82
	ANM Change Audit Log	Allows you to display audit logs recording any user input.	See Displaying Change Audit Logs, page 17-85
	ANM Auto-Sync Settings	Allows you to specify ANM server auto sync settings	See Configuring Auto Sync Settings, page 17-85
	Advanced Settings	Allows you to configure the following Advanced Settings functions: • Enable or disable overwrite of the ACE logging device-id while setting up syslog for autosync using Config > Devices > Setup Syslog for Autosync. • Enable or disable write memory on a Config > Operations configuration.	See Configuring Advanced Settings, page 17-86
Lifeline Management		Use this tool to report a problem to the Cisco support line and generate a diagnostic package	See Lifeline Management, page 17-90

Controlling Access to Cisco ANM

Access to ANM is based on usernames and passwords, which can be authenticated to a local database on the ANM system or to a remote RADIUS, Active Directory/Lightweight Directory Access Protocol (AD/LDAPS), or TACACS+ server. For detailed procedures about remote authentication, see the "Configuring Authentication and Accounting Services" chapter of either the *Cisco ACE Module Security Configuration Guide* or *Cisco ACE 4700 Series Appliance Security Configuration Guide* on www.cisco.com.

Note ANM supports LDAPS through Active Directory (AD) only.

When a user logs into the system, the specific tasks they can perform and areas of the system that they can use are controlled by *organizations*, *roles*, and *domains*. An organization is a virtual group of users, their roles, and domains managed by a specific server that provides authentication to its users. Each organization has its own set of users. See the "Understanding Organizations" section on page 17-7 for information about organizations.

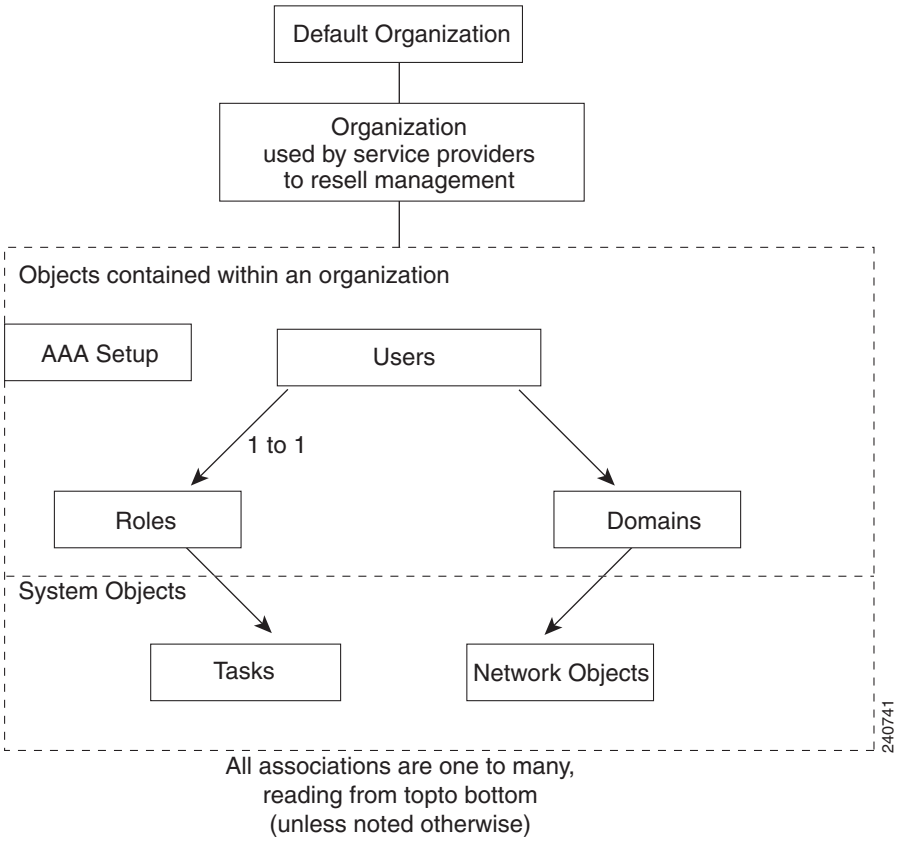
The role assigned to a user defines the tasks that a user can perform and the items in the hierarchy that they can see. Roles are either pre-defined or set up by the system administrator. See the "Understanding Roles" section on page 17-6 for more information.

A domain is a collection of managed objects. When a user is given access to a domain, it acts as a filter for a sub-set of objects on the network which are displayed as a virtual context. The types of objects in the system that are domain controlled are:

- Chassis (with VLANs)
- Virtual contexts
- Building Blocks
- Resource classes
- Real servers
- Virtual servers

Thus, role-based access control ensures that a user or organization can view only the devices or services or perform the actions that are included in the domains to which they have been given access.

Figure 17-1 Role-Based Access Control Containment Overview



The following is an example of RBAC containment.

Organization		
Webmasters		
Domains		
East Coast servers	Central servers	West Coast servers
Role		
Web server administrator		
Users		
User A	User B	User C

Note Each association is one-to-many. Because the organization itself is a collection, it is possible for a role to be used in many organizations.

All other user interfaces, such as configuration and monitoring, respect this role-based access control policy:

- Roles limit the screens (or functions on those screens) that a user can see.
- Domains limit the objects that are listed on any window that the roles allow.
- Users (other than the system administrator) can only create subdomains of the domains to which they are assigned.
- The system administrator user can see and modify all objects. All other users are subject to the role-based access controls illustrated in Figure 17-1.

Related Topics

- Types of Users, page 17-5
- Understanding Roles, page 17-6
- Understanding Operations Privileges, page 17-6
- Understanding Domains, page 17-7
- Understanding Organizations, page 17-7
- Managing User Accounts, page 17-48

Types of Users

Two types of users configure and monitor the ANM system:

- Default users—Individuals associated with the data center or IT department where ANM is installed. The default administrative account (user ID is admin) is a system user account that is preconfigured on ANM. The default administrative password (admin) is also preconfigured on ANM. You can change the password for the admin user account in the same manner as any other user password (see the "Managing User Accounts" section on page 17-48).

  System roles are defined by the system administrator when ANM is first set up. System roles are specified in terms of resource types and operations privileges. For each system role, the system administrator specifies which resource types a role can work with and what operations a role can perform on each resource type.

- Organization users—Users who work for the customer of a service provider or AAA server that segments your users and to whom you want to grant access to ANM. Organization users automatically have their access limited to the organization to which they belong.

Related Topics

- Configuring User Authentication and Authorization, page 17-40
- Managing User Accounts, page 17-48
- Authenticating ANM Users with an AAA Server, page 17-66

Understanding Roles

Roles in ANM are defined by the system administrator. Roles are specified in terms of resource types and operations privileges. For each role, the system administrator specifies which resource types a role can work with and what operations a role can perform on each resource type.

When users are created, they are assigned at least one system role and inherit the operations privileges specified for each of the resource types assigned to that role.

The options a user sees in the menu are filtered according to that user's role. See Table 17-2 on page 17-9.

Roles can be applied to both default and organization users. All users are strictly limited by the combination of their operations privileges and user access. For example, a user cannot create another user who has greater privileges or access.

Related Topics

- Configuring User Authentication and Authorization, page 17-40
- Managing User Accounts, page 17-48
- Managing User Roles, page 17-54

Understanding Operations Privileges

Operations privileges define what users can do in the designated resource types. For example, each command and function on ANM has an assigned privilege. If a user's privileges are not sufficient, the command or function will not be available to them. The following operations privileges can be granted:

- No Access—The user has no access to this command or function.

Note If a user is configured with no access to virtual contexts, it means absolutely no access to them. The most a user with this access can do is activate or suspend real servers.

- View—Allows the user to view statistics and specify parameter collection and threshold settings. Gives the user read-only or view access to system objects and information.
- Modify—Allows the user to change the persistent information associated with system objects, such as an organization record, or configuration.
- Debug—Gives the user read-only or view access to system objects and information.

- Create—Allows the user to control system objects, for example, creating them, enabling them, or powering up. Also allows the user to control system objects, for example, deleting them, disabling them, or powering down.

Note The Create privilege includes the functions associated with the Modify privilege; however, the reverse is not true (a user with Modify privileges cannot create items).

Privileges are hierarchical. If a user has Modify privileges, they have View privileges as well. If a user has Create or Debug privileges, they have View privileges as well.

Related Topics

- How ANM Handles Role-Based Access Control, page 17-8
- Managing User Roles, page 17-54
- Guidelines for Managing User Roles, page 17-54
- Understanding Predefined Roles, page 17-55
- Authenticating ANM Users with an AAA Server, page 17-66

Understanding Domains

Domains in ANM are defined by the system administrator. A domain is a collection of managed objects to which a user is given access. By setting up a domain, you are filtering for a subset of objects on the network. The user is then given access to this virtual context.

The table rows that a user sees in any table are filtered according to the domain to which that user has access.

Understanding Organizations

An organization allows you to configure AAA server lookup for your users or set up users who work for a service provider customer. Organizations in ANM are defined by the system administrator.

When you use an ACE device as a AAA server, you may want to segment them for customer, business, or security reasons. If you use more than one authentication server, then you can use organizations to configure them to authenticate your users.

For example, if your company has four servers, one each for local, RADIUS, TACACS+, and LDAPS authentication, then organizations could reflect that. The Default organization in ANM is set up to act as the local server.

ANM supports different device types that have unique ways of configuring authentication access, which helps with future device support. ANM can configure which users are authenticated by which authentication servers, but does not act as an AAA server itself because this would be in conflict of its role as a RBAC administrator and allows for the separation of authority that is needed to perform RBAC successfully.

Related Topics

- Authenticating ANM Users with an AAA Server, page 17-66

How ANM Handles Role-Based Access Control

This section describes how and why a system administrator might want to use the ANM RBAC features.

ANM supports two distinct, but related RBAC capabilities as follows:

- ANM RBAC—ANM acts as a system and network device overseer allowing it to globally implement its use of RBAC.
- Device RBAC—ANM devices enforce RBAC.

Understanding ANM RBAC

ANM is a central place where you can globally set the RBAC for users, roles, and domains (as well as for virtual contexts or device types using device RBAC).

As a system administrator, you may need to delegate authority to allow another administrator to perform specific tasks on specific devices, such as activating, suspending, and monitoring traffic flow to specific real servers, yet restrict them from accessing all other capabilities. ANM enables you to accomplish this delegation with more control. For a description of how the roles map to the functions, see Table 17-2 on page 17-9.

Understanding Device RBAC

ANM's device RBAC allows you to set up device permission levels of a more granular nature. You no longer have to provide "all-or-nothing" roles-based access of devices and device modules. Without ANM, some devices may be open to users who can perform every task on that device or module, regardless of their authorization due to permission level requirements on modules and or switches. ANM provides a central place to grant special access to users you specify. Device users, roles, and domain data are not part of, nor can they be used by ANM. Device RBAC is only for CLI access directly to the context.

For example, some users may need level 3 access when direct troubleshooting of ACE hardware is required. You can set up these users with or without ANM, but ANM centralizes the capability to do so. If you want to configure a network engineer with a special role, for example either ACE-Admin or Network-Admin, to provide the level 3 access. ANM accesses the ACE as a level 15 user and an admin supervisor and uses the RBAC to determine the level of access (to device types, segments, elements, subelements, and so on).

Some Cisco devices have the ability to configure RBAC directly on the device, for example the ACE. The CSS and CSM are examples of Cisco devices that do not have the capability to have its their own RBAC.

When you configure remote authentication (AAA, RADIUS, LDAPS, or TACACs+) for the ACE through ANM, users no longer have to log out to access their device using Telnet. When you manually log into a CSS, the CSS performs user authentication in a Telnet session. Telnet does not provide any domain enforcement, so it is less secure. For an overview of the steps that you perform to configure remote authentication using an AAA server, see the "Authenticating ANM Users with an AAA Server" section on page 17-66

If you are an admin using a CSS module outside of the ANM application, then you might have permission to do anything on this switch. If you are using ANM, you can set up better authorization for your administrators for specific devices. Better authorization controls are one of the advantages of using the ANM rather than using only the CLI on the ACE hardware. You can now configure separate access for one function for this user in this domain only. ANM allows this high level of granularity and with it, more control over who does what to your devices.

You can access device RBAC by choosing **Config > Devices** or **Config > Global >All Building Blocks**.

Note When configuring device RBAC though Config > Devices, a message displays reminding you that you are configuring RBAC outside of ANM for direct access. Be aware that this may contradict your ANM settings.

For more information on centralizing direct access to devices through RBAC on individual devices, see the "Configuring ACE Module and Appliance Role-Based Access Controls" section on page 4-51.

Case Example

In this example, a CSM device must have a level 15 access which by default makes the admin a supervisor on everything in the switch (and everything in the module). Another way of looking at this is providing read-only access to everything or configuration access to everything.

ACE hardware can be configured on a virtual context to perform that task on a subset domain for every individual module, on every context, but this type of configuration must be configured individually.

A system administrator might need to configure a network admin to manage two CSM modules, one out of six virtual contexts, and all East Coast web servers. With ANM, the admin could create one configuration set that includes a user account with a Network-Admin role and a domain that includes these objects. ANM then becomes the security window through which this user passes to get to their destination for that domain and for that virtual context.

If there were six users, nine domains, and three virtual contexts, there would be 54 entries required into a AAA Server and ACE module. In ANM there is one entry completed for each of the six users.

Table 17-2 Role Mapping in ANM

Role Tasks/Permissions	Resulting Menus Available
ACE-Admin Predefined Role	
Threshold/View	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups /Edit
	Monitor / Settings / SMTP Configuration
Device Events/Create	Monitor / Events / Events

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Virtual Contexts/Create	Config / Deploy
	Config / Deploy / Deploy Now
	Config / Deploy / Edit
	Config / Devices / Device RBAC / Domains
	Config / Devices / Device RBAC / Roles
	Config / Devices / Device RBAC / Users
	Config / Devices / Expert / Class Map
	Config / Devices / Expert / HTTP Header Modify Action Lists
	Config / Devices / Expert / Optimization Action Lists
	Config / Devices / Expert / Policy Maps
	Config / Devices / HA Tracking and Failure Detection / Hosts
	Config / Devices / HA Tracking and Failure Detection / HSRP Groups
	Config / Devices / HA Tracking and Failure Detection / Interfaces
	Config / Devices / High Availability (HA) / Setup
	Config / Devices / Load Balancing / Health Monitoring
	Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Map s
	Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Maps

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
ACE-Admin Predefined Role (continued)	
Virtual Contexts/Create (continued)	Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Maps
	Config / Devices / Load Balancing / Real Servers
	Config / Devices / Load Balancing / Secure KAL-AP
	Config / Devices / Load Balancing / Server Farms
	Config / Devices / Load Balancing / Stickiness
	Config / Devices / Load Balancing / Virtual Servers
	Config / Devices / Load Balancing / Virtual Servers / Add
	Config / Devices / Load Balancing / Virtual Servers / Edit
	Config / Devices / Network / BVI Interfaces
	Config / Devices / Network / GigabitEthernet Interfaces
	Config / Devices / Network / Global IP DHCP
	Config / Devices / Network / NAT Pools
	Config / Devices / Network / Port Channel Interfaces
	Config / Devices / Network / Static Routes
	Config / Devices / Network / VLAN Interfaces
	Config / Devices / Security / ACLs
	Config / Devices / Security / Object Groups
	Config / Devices / SSL / Auth Group Parameters
	Config / Devices / SSL / Certificate Revocation List
	Config / Devices / SSL / Certificates
	Config / Devices / SSL / Chain Group Parameters
	Config / Devices / SSL / CSR Parameters
	Config / Devices / SSL / Keys
	Config / Devices / SSL / Parameter Map
	Config / Devices / SSL / Proxy Service
	Config / Devices / System / Application Acceleration and Optimization
	Config / Devices / System / Backup / Restore
	Config / Devices / System / Checkpoints
	Config / Devices / System / Global Policies

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
ACE-Admin Predefined Role (continued)	
Virtual Contexts/Create (continued)	Config / Devices / System / Licenses
	Config / Devices / System / Primary Attributes
	Config / Devices / System / Resource Classes
	Config / Devices / System / Resource Classes / Add
	Config / Devices / System / Resource Classes / Edit
	Config / Devices / System / SNMP
	Config / Devices / System / Syslog
	Config / Devices / Virtual Context Management
	Config / Devices / Virtual Context Management / Add
	Config / Devices / Virtual Context Management / Edit
	Config / Devices / Virtual Context Management / Extract building block
	Config / Devices / Virtual Context Management / Restart Polling
	Config / Devices / Virtual Context Management / Sync
	Config / Global / Backups
	Config / Global / Building Blocks
	Config / Global / Building Blocks / Add
	Config / Global / Building Blocks / Tag
	Config / Global / Expert / Class Map
	Config / Global / Expert / HTTP Header Modify Action Lists
	Config / Global / Expert / Optimization Action Lists
	Config / Global / Expert / Policy Map
	Config / Global / Load Balancing / Health Monitoring
	Config / Global / Load Balancing / Parameter Maps / Connection Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / Generic Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / HTTP Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / Optimization Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / RTSP Parameter Maps

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
ACE-Admin Predefined Role (continued)	
Virtual Contexts/Create (continued)	Config / Global / Load Balancing / Parameter Maps / SIP Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / Skinny Parameter Maps
	Config / Global / Load Balancing / Real Servers
	Config / Global / Load Balancing / Secure KAL-AP
	Config / Global / Load Balancing / Server Farms
	Config / Global / Load Balancing / Stickiness
	Config / Global / Network / BVI Interfaces
	Config / Global / Network / Global IP DHCP
	Config / Global / Network / NAT Pools
	Config / Global / Network / Static Routes
	Config / Global / Network / Static VLAN
	Config / Global / Network / VLAN Interfaces
	Config / Global / Resource Classes
	Config / Global / Resource Classes / Add
	Config / Global / Resource Classes / Audit
	Config / Global / Resource Classes / Edit
	Config / Global / Role-Based Access Control / Domains
	Config / Global / Role-Based Access Control / Roles
	Config / Global / Role-Based Access Control / Users
	Config / Global / Security / ACLs
	Config / Global / Security / Object Groups
	Config / Global / SSL / Auth Group Parameters
	Config / Global / SSL / Certificate Revocation Lists (CRL)
	Config / Global / SSL / CSR Parameters
	Config / Global / SSL / Keys
	Config / Global / SSL / Parameter Map
	Config / Global / System / Global Policy
	Config / Global / System / Primary Attributes
	Config / Global / System / SNMP
	Config / Global / System / Syslog
	Config / Guided Setup / ACE Hardware Setup
	Config / Guided Setup / ACE Hardware Setup / GigabitEthernet Interfaces

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
ACE-Admin Predefined Role (continued)	
Virtual Contexts/Create (continued)	Config / Guided Setup / ACE Hardware Setup / HA Peering
	Config / Guided Setup / ACE Hardware Setup / Licenses
	Config / Guided Setup / ACE Hardware Setup / Port Channel Interfaces
	Config / Guided Setup / ACE Hardware Setup / SNMP v2c Community
	Config / Guided Setup / ACE Hardware Setup / VLAN Interfaces
	Config / Guided Setup / Application Setup
	Config / Guided Setup / Application Setup / ACLs
	Config / Guided Setup / Application Setup / BVI Interfaces
	Config / Guided Setup / Application Setup / NAT Pools
	Config / Guided Setup / Application Setup / SSL Proxy
	Config / Guided Setup / Application Setup / SSL Proxy / SSL Proxy Setup
	Config / Guided Setup / Application Setup / Virtual Server
	Config / Guided Setup / Application Setup / Virtual Server / Add
	Config / Guided Setup / Application Setup / Virtual Server / Edit
	Config / Guided Setup / Application Setup / VLAN Interfaces
	Config / Guided Setup / Virtual Context Setup
	Config / Guided Setup / Virtual Context Setup / Resource Classes
	Config / Guided Setup / Virtual Context Setup / Resource Classes / Add
	Config / Guided Setup / Virtual Context Setup / Resource Classes / Edit
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Add
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management / CLI Sync
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Edit

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
ACE-Admin Predefined Role (continued)	
Virtual Contexts/Create (continued)	Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Extract building block
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Restart Polling
	Config / Operations / Real Servers
	Config / Operations / Virtual Servers
	Config / Operations / Virtual Servers / Activate
	Config / Operations / Virtual Servers / Details
	Config / Operations / Virtual Servers / Suspend
	Monitor / Devices / Application Acceleration
	Monitor / Devices / Dashboard
	Monitor / Devices / Load Balancing
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Virtual Servers
	Monitor / Devices / Polling Settings
	Monitor / Devices / Resource Usage
	Monitor / Devices / Resource Usage
	Monitor / Devices / Resource Usage / Connections
	Monitor / Devices / Resource Usage / Features
	Monitor / Devices / System View
	Monitor / Devices / Traffic Summary
	Monitor / Devices / Virtual Context Management
	Monitor / Events / Events
	Monitor / Events /Virtual Context Management
	Monitor / Tools / Ping
	Change Password
	Create Checkpoint
	Copy License
	Export
	Generate CSR
	Import

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
ACE-Admin Predefined Role (continued)	
Virtual Contexts/Create (continued)	Install License
	Resequence
	Rollback
	Status
	Uninstall
	Update
ANM-Admin Predefined Role	
All Options	All menus (ANM System, ANM User Access, VM Mapping, and ANM Inventory)
Network-Admin Predefined Role	
Threshold/View	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups / Edit
Switch/Create	Config / Devices / Device Management / CLI Sync
	Config / Devices / Device Management / Edit
	Config / Devices / Device Management / Return to Devices
	Config / Devices / Interfaces / Access Ports
	Config / Devices / Interfaces / Routed Ports
	Config / Devices / Interfaces / Summary
	Config / Devices / Interfaces / Switched Virtual Interfaces
	Config / Devices / Interfaces / Trunk Ports
	Config / Devices / Interfaces / Secure KAL-AP
	Config / Devices / System / Primary Attributes
	Config / Devices / System / Static Routes
	Config / Devices / VLANs / Groups
	Config / Devices / VLANs / Layer 2
	Config / Devices / VLANs / Layer 2 / Add
	Config / Devices / VLANs / Layer 2 / Edit
	Config / Devices / VLANs / Layer 3
	Config / Devices / VLANs / Layer 3 / Add
	Config / Devices / VLANs / Layer 3 / Edit
	Config / Devices / VLANs / Summary

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Admin Predefined Role (continued)	
Switch/Create (continued)	Config / Guided Setup / Import Devices / CLI Sync
	Config / Guided Setup / Import Devices / Edit Config / Guided Setup / Import Devices / Modules / Return to Devices
	Config / Guided Setup / Import Devices / Update Password
	Monitor / Events / Modules
Routing/Create	Config / Devices / Network / GigabitEthernet Interfaces
	Config / Devices / Network / Global IP DHCP
	Config / Devices / Network / Port Channel Interfaces
	Config / Devices / Network / Static Routes
	Config / Guided Setup / ACE Hardware Setup / GigabitEthernet Interfaces
	Config / Guided Setup / ACE Hardware Setup / Port Channel Interfaces
	Details
	Poll Now
Interface/Create	Config / Devices / Network / BVI Interfaces
	Config / Devices / Network / NAT Pools
	Config / Devices / Network / VLAN Interfaces
	Config / Guided Setup / ACE Hardware Setup / VLAN Interfaces
	Config / Guided Setup / Application Setup / BVI Interfaces
	Config / Guided Setup / Application Setup / NAT Pools
	Config / Guided Setup / Application Setup / VLAN Interfaces
	Monitor / Devices / Dashboard
	Monitor / Devices / Traffic Summary
	Monitor / Tools / Ping
	Details
	Poll Now
NAT/Create	No specific menus

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Admin Predefined Role (continued)	
Connection/Create	Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Maps Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Maps Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Maps
Network-Monitor Predefined Role	
Inventory (which includes Threshold, UDG, Device Events, Switch, and all Virtual Context tasks)/View	Config / Deploy Config / Deploy / Edit Config / Device Audit Config / Devices / Device Management Config / Devices / Device Management / Edit Config / Devices / Device Management / Modules Config / Devices / Device Management / Modules / Return to Devices Config / Devices / Device RBAC / Domains Config / Devices / Device RBAC / Roles Config / Devices / Device RBAC / Users Config / Devices / Expert / Class Map Config / Devices / Expert / Action List Config / Devices / Expert / Building Block Audit Config / Devices / Expert / Class Maps Config / Devices / Expert / HTTP Header Modify Action Lists Config / Devices / Expert / Optimization Action Lists Config / Devices / Expert / Policy Maps

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Monitor Predefined Role (continued)	
Inventory/View (continued)	Config / Devices / Groups
	Config / Devices / Groups / Edit
	Config / Devices / HA Tracking and Failure Detection / Hosts
	Config / Devices / HA Tracking and Failure Detection / HSRP Groups
	Config / Devices / HA Tracking and Failure Detection / Interfaces
	Config / Devices / High Availability (HA) / Setup
	Config / Devices / Interfaces / Access Ports
	Config / Devices / Interfaces / Routed Ports
	Config / Devices / Interfaces / Summary
	Config / Devices / Interfaces / Switched Virtual Interfaces
	Config / Devices / Interfaces / Trunk Ports
	Config / Devices / Load Balancing / Health Monitoring
	Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Map
	Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Map
	Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Map
	Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Map
	Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Map
	Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Map
	Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Map
	Config / Devices / Load Balancing / Real Servers
	Config / Devices / Load Balancing / Secure KAL-AP
	Config / Devices / Load Balancing / Server Farms
	Config / Devices / Load Balancing / Stickiness
	Config / Devices / Load Balancing / Virtual Servers
	Config / Devices / Load Balancing / Virtual Servers / Edit
	Config / Devices / Network / BVI Interfaces
	Config / Devices / Network / GigabitEthernet Interfaces

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Monitor Predefined Role (continued)	
Inventory/View (continued)	Config / Devices / Network / Global IP DHCP
	Config / Devices / Network / Port Channel Interfaces
	Config / Devices / Network / Static Routes
	Config / Devices / Network / Static VLAN
	Config / Devices / Network / VLAN Interfaces
	Config / Devices / Security / ACLs
	Config / Devices / Security / Object Groups
	Config / Devices / SSL / Auth Group Parameters
	Config / Devices / SSL / Certificate Revocation List (CRL)
	Config / Devices / SSL / Certificates
	Config / Devices / SSL / Chain Group Parameters
	Config / Devices / SSL / CSR Parameters
	Config / Devices / SSL / Keys
	Config / Devices / SSL / Parameter Map
	Config / Devices / SSL / Proxy Service
	Config / Devices / SSL / Setup Sequence
	Config / Devices / System / Application Acceleration and Optimization
	Config / Devices / System / Global Policies
	Config / Devices / System / Licenses
	Config / Devices / System / Primary Attributes
	Config / Devices / System / Resource Classes
	Config / Devices / System / Resource Classes / Edit
	Config / Devices / System / SNMP
	Config / Devices / System / Static Routes
	Config / Devices / System / Syslog
	Config / Devices / Virtual Context Management
	Config / Devices / Virtual Context Management / Edit
	Config / Devices / VLANs / Groups
	Config / Devices / VLANs / Layer 2
	Config / Devices / VLANs / Layer 2 / Edit
	Config / Devices / VLANs / Layer 3
	Config / Devices / VLANs / Layer 3 / Edit
	Config / Devices / VLANs / Summary

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Monitor Predefined Role (continued)	
Inventory/View (continued)	Config / Global / Building Blocks
	Config / Global / Expert / Class Map
	Config / Global / Expert / HTTP Header Modify Action Lists
	Config / Global / Expert / Optimization Action Lists
	Config / Global / Expert / Policy Map
	Config / Global / Expert / Policy Map
	Config / Global / Load Balancing / Health Monitoring
	Config / Global / Load Balancing / Parameter Maps / Connection Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / DNS Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / Generic Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / HTTP Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / Optimization Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / RTSP Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / SIP Parameter Maps
	Config / Global / Load Balancing / Parameter Maps / Skinny Parameter Maps
	Config / Global / Load Balancing / Real Servers
	Config / Global / Load Balancing / Secure KAL-AP
	Config / Global / Load Balancing / Server Farms
	Config / Global / Load Balancing / Stickiness
	Config / Global / Network / BVI Interfaces
	Config / Global / Network / Global IP DHCP
	Config / Global / Network / Static Routes
	Config / Global / Network / Static VLAN
	Config / Global / Network / VLAN Interfaces
	Config / Global / Resource Classes
	Config / Global / Resource Classes / Audit
	Config / Global / Resource Classes / Edit
	Config / Global / Role-Based Access Control / Domains

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Monitor Predefined Role (continued)	
Inventory/View (continued)	Config / Global / Role-Based Access Control / Roles
	Config / Global / Role-Based Access Control / Users
	Config / Global / Security / ACLs
	Config / Global / Security / Object Groups
	Config / Global / SSL / Auth Group Parameters
	Config / Global / SSL / Certificate Revocation List (CRL)
	Config / Global / SSL / CSR Parameters
	Config / Global / SSL / Keys
	Config / Global / SSL / Parameter Map
	Config / Global / System / Global Policy
	Config / Global / System / Primary Attributes
	Config / Global / System / SNMP
	Config / Global / System / Syslog
	Config / Guided Setup / ACE Hardware Setup / GigabitEthernet Interfaces
	Config / Guided Setup / ACE Hardware Setup / HA Peering
	Config / Guided Setup / ACE Hardware Setup / Licenses
	Config / Guided Setup / ACE Hardware Setup / Port Channel Interfaces
	Config / Guided Setup / ACE Hardware Setup / SNMP v2c Community
	Config / Guided Setup / ACE Hardware Setup / VLAN Interfaces
	Config / Guided Setup / Application Setup / ACLs
	Config / Guided Setup / Application Setup / BVI Interfaces
	Config / Guided Setup / Application Setup / NAT Pools
	Config / Guided Setup / Application Setup / SSL Proxy
	Config / Guided Setup / Application Setup / Virtual Server
	Config / Guided Setup / Application Setup / Virtual Server / Edit
	Config / Guided Setup / Application Setup / VLAN Interfaces
	Config / Guided Setup / Import Devices / Edit
	Config / Guided Setup / Import Devices / Modules
	Config / Guided Setup / Import Devices / Modules / Return to Devices

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Monitor Predefined Role (continued)	
Inventory/View (continued)	Config / Guided Setup / Virtual Context Setup / Resource Classes
	Config / Guided Setup / Virtual Context Setup / Resource Classes / Edit
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management
	Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Edit
	Config / Operations / DNS Rules
	Config / Operations / GSS VIP Answers
	Config / Operations / Real Servers
	Config / Operations / Virtual Servers
	Config / Operations / Virtual Servers / Details
	Config / Tools / Credential Pool Management
	Config / Tools / IP Discovery
	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups / Edit
	Monitor / Devices / Application Acceleration
	Monitor / Devices / Dashboard
	Monitor / Devices / Device Management
	Monitor / Devices / Load Balancing
	Monitor / Devices / Load Balancing / Probes
	Monitor / Devices / Load Balancing / Real Servers
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Virtual Servers
	Monitor / Devices / Polling Settings
	Monitor / Devices / Resource Usage
	Monitor / Devices / Resource Usage / Connections
	Monitor / Devices / Resource Usage / Features
	Monitor / Devices / System View
	Monitor / Devices / Traffic Summary
	Monitor / Devices / Virtual Context Management

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Network-Monitor Predefined Role (continued)	
Inventory/View (continued)	Monitor / Events / Events
	Monitor / Events / Modules
	Monitor / Events / Virtual Context Management
	Monitor / Tools / Ping
	Details
	Export
	Poll Now
	Status
Org-Admin Predefined Role	
ANM User Access/Create	Admin / Role-Based Access Control / Domains
	Admin / Role-Based Access Control / Domains / Add
	Admin / Role-Based Access Control / Domains / Edit
	Admin / Role-Based Access Control / Roles
	Admin / Role-Based Access Control / Roles / Add
	Admin / Role-Based Access Control / Roles / Edit
	Admin / Role-Based Access Control / Roles / Users
	Admin / Role-Based Access Control / Users
	Admin / Role-Based Access Control / Users / Add
	Admin / Role-Based Access Control / Users / Edit
VM Mapping/Create	Config / Devices / System / VM Mappings
ANM Inventory/Create	Config / Deploy
	Config / Deploy / Deploy Now
	Config / Deploy / Edit
	Config / Device Audit
	Config / Devices / Device Management
	Config / Devices / Device Management / Add
	Config / Devices / Device Management / CLI Sync
	Config / Devices / Device Management / Edit
	Config / Devices / Device Management / Modules
	Config / Devices / Device Management / Modules / CLI Sync
	Config / Devices / Device Management / Modules / Return to Devices
	Config / Devices / Device Management / Restart Polling
	Config / Devices / Device Management /Update Password
	Config / Devices / Device RBAC / Domains

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Config / Devices / Device RBAC / Roles Config / Devices / Device RBAC / Users Config / Devices / Expert / Class Maps Config / Devices / Expert / HTTP Header Modify Action Lists Config / Devices / Expert / Optimization Action Lists Config / Devices / Expert / Policy Maps Config / Devices / Groups Config / Devices / Groups / Add Config / Devices / Groups / Edit Config / Devices / HA Tracking and Failure Detection / Hosts Config / Devices / HA Tracking and Failure Detection / HSRP Groups Config / Devices / HA Tracking and Failure Detection / Interfaces Config / Devices / High Availability (HA) / Setup Config / Devices / Interfaces / Access Ports Config / Devices / Interfaces / Routed Ports Config / Devices / Interfaces / Summary Config / Devices / Interfaces / Switched Virtual Interfaces Config / Devices / Interfaces / Trunk Ports Config / Devices / Load Balancing / Health Monitoring Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Maps Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Maps Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Map

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Map Config / Devices / Load Balancing / Real Servers Config / Devices / Load Balancing / Secure KAL-AP Config / Devices / Load Balancing / Server Farms Config / Devices / Load Balancing / Stickiness Config / Devices / Load Balancing / Virtual Servers Config / Devices / Load Balancing / Virtual Servers / Add Config / Devices / Load Balancing / Virtual Servers / Edit Config / Devices / Network / BVI Interfaces Config / Devices / Network / GigabitEthernet Interfaces Config / Devices / Network / Global IP DHCP Config / Devices / Network / NAT Pools Config / Devices / Network / Port Channel Interfaces Config / Devices / Network / Static NAT Overwrite Config / Devices / Network / Static Routes Config / Devices / Network / VLAN Interfaces Config / Devices / Security / ACLs Config / Devices / Security / Object Groups Config / Devices / SSL / Auth Group Parameters Config / Devices / SSL / Certificate Revocation List (CRL) Config / Devices / SSL / Certificates Config / Devices / SSL / Chain Group Parameters Config / Devices / SSL / CSR Parameters Config / Devices / SSL / Keys Config / Devices / SSL / Parameter Map Config / Devices / SSL / Proxy Service Config / Devices / System / Application Acceleration and Optimization Config / Devices / System / Backup / Restore Config / Devices / System / Checkpoints Config / Devices / System / Global Policies Config / Devices / System / Licenses Config / Devices / System / Primary Attributes

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Config / Devices / System / Resource Classes
	Config / Devices / System / Resource Classes / Add
	Config / Devices / System / Resource Classes / Edit
	Config / Devices / System / SNMP
	Config / Devices / System / Static Routes
	Config / Devices / System / Syslog
	Config / Devices / Virtual Context Management
	Config / Devices / Virtual Context Management / Add
	Config / Devices / Virtual Context Management / CLI Sync
	Config / Devices / Virtual Context Management / Edit
	Config / Devices / Virtual Context Management / Extract building block
	Config / Devices / Virtual Context Management / Restart Polling
	Config / Devices / Virtual Context Management / Sync
	Config / Devices / VLANs / Groups
	Config / Devices / VLANs / Layer 2
	Config / Devices / VLANs / Layer 2 / Add
	Config / Devices / VLANs / Layer 2 / Edit
	Config / Devices / VLANs / Layer 3
	Config / Devices / VLANs / Layer 3 / Add
	Config / Devices / VLANs / Layer 3 / Edit
	Config / Devices / VLANs / Summary
	Config / Global / Backups
	Config / Global / Building Blocks
	Config / Global / Building Blocks / Add
	Config / Global / Building Blocks / Tag
	Config / Global / Expert / Class Map
	Config / Global / Expert / HTTP Header Modify Action Lists
	Config / Global / Expert / Optimization Action Lists
	Config / Global / Expert / Policy Map
	Config / Global / Load Balancing / Health Monitoring

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Config / Global / Load Balancing / Parameter Maps / Connection Parameter Maps Config / Global / Load Balancing / Parameter Maps / DNS Parameter Maps Config / Global / Load Balancing / Parameter Maps / Generic Parameter Maps Config / Global / Load Balancing / Parameter Maps / HTTP Parameter Maps Config / Global / Load Balancing / Parameter Maps / Optimization Parameter Maps Config / Global / Load Balancing / Parameter Maps / RTSP Parameter Maps Config / Global / Load Balancing / Parameter Maps / SIP Parameter Maps Config / Global / Load Balancing / Parameter Maps / Skinny Parameter Maps Config / Global / Load Balancing / Real Servers Config / Global / Load Balancing / Secure KAL-AP Config / Global / Load Balancing / Server Farms Config / Global / Load Balancing / Stickiness Config / Global / Network / BVI Interfaces Config / Global / Network / Global IP DHCP Config / Global / Network / NAT Pools Config / Global / Network / Static NAT Overwrite Config / Global / Network / Static Routes Config / Global / Network / VLAN Interfaces Config / Global / Resource Classes Config / Global / Resource Classes / Add Config / Global / Resource Classes / Audit Config / Global / Resource Classes / Edit Config / Global / Role-Based Access Control / Domains Config / Global / Role-Based Access Control / Roles Config / Global / Role-Based Access Control / Users Config / Global / Security / ACLs Config / Global / Security / Object Groups

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Config / Global / SSL / Auth Group Parameters
	Config / Global / SSL / Certificate Revocation List (CRL)
	Config / Global / SSL / CSR Parameters
	Config / Global / SSL / Keys
	Config / Global / SSL / Parameter Map
	Config / Global / System / Global Policies
	Config / Global / System / Primary Attributes
	Config / Global / System / SNMP
	Config / Global / System / Syslog
	Config / Guided Setup / ACE Hardware Setup / GigabitEthernet Interfaces
	Config / Guided Setup / ACE Hardware Setup / HA Peering
	Config / Guided Setup / ACE Hardware Setup / Licenses
	Config / Guided Setup / ACE Hardware Setup / Port Channel Interfaces
	Config / Guided Setup / ACE Hardware Setup / SNMP v2c Community
	Config / Guided Setup / ACE Hardware Setup / VLAN Interfaces
	Config / Guided Setup / Application Setup
	Config / Guided Setup / Application Setup / ACLs
	Config / Guided Setup / Application Setup / BVI Interfaces
	Config / Guided Setup / Application Setup / NAT Pools
	Config / Guided Setup / Application Setup / SSL Proxy
	Config / Guided Setup / Application Setup / SSL Proxy / SSL Proxy Setup
	Config / Guided Setup / Application Setup / Virtual Server
	Config / Guided Setup / Application Setup / Virtual Server / Add
	Config / Guided Setup / Application Setup / Virtual Server / Edit
	Config / Guided Setup / Application Setup / VLAN Interfaces
	Config / Guided Setup / Import Devices
	Config / Guided Setup / Import Devices / Add
	Config / Guided Setup / Import Devices / CLI Sync

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Config / Guided Setup / Import Devices / Edit Config / Guided Setup / Import Devices / Modules Config / Guided Setup / Import Devices / Modules / CLI Sync Config / Guided Setup / Import Devices / Modules / Return to Devices Config / Guided Setup / Import Devices / Restart Polling Config / Guided Setup / Import Devices / Update Password Config / Guided Setup / Virtual Context Setup Config / Guided Setup / Virtual Context Setup / Resource Classes Config / Guided Setup / Virtual Context Setup / Resource Classes / Add Config / Guided Setup / Virtual Context Setup / Resource Classes / Edit Config / Guided Setup / Virtual Context Setup / Virtual Context Management Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Add Config / Guided Setup / Virtual Context Setup / Virtual Context Management / CLI Sync Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Edit Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Extract building block Config / Guided Setup / Virtual Context Setup / Virtual Context Management / Restart Polling Config / Operations / DNS Rules Config / Operations / GSS VIP Answers Config / Operations / Real Servers Config / Operations / Virtual Servers Config / Tools / Credential Pool Management Config / Tools / IP Discovery Monitor / Alarm Notifications / Alarms Monitor / Alarm Notifications / Threshold Groups Monitor / Alarm Notifications / Threshold Groups / Add Monitor / Alarm Notifications / Threshold Groups / Edit

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Org-Admin Predefined Role (continued)	
ANM Inventory/Create (continued)	Monitor / Devices / Application Acceleration Monitor / Devices / Dashboard Monitor / Devices / Device Management Monitor / Devices / Load Balancing / Probes Monitor / Devices / Load Balancing / Real Servers Monitor / Devices / Load Balancing / Statistics Monitor / Devices / Load Balancing / Virtual Servers Monitor / Devices / Polling Settings Monitor / Devices / Resource Usage Monitor / Devices / Resource Usage / Connections Monitor / Devices / Resource Usage / Features Monitor / Devices / System View Monitor / Devices / Traffic Summary Monitor / Devices / Virtual Context Management Monitor / Devices / Virtual Servers Monitor / Events / Events Monitor / Events / Modules Monitor / Events / Virtual Context Management Monitor / Tools / Ping Change Password Create Checkpoint Details Export Generate CSR Import Install License Poll Now Resequence Rollback Status Uninstall Update

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Security-Admin Predefined Role	
AAA/Create	No specific menu items
Access List/Create	Config / Devices / Security / ACLs Config / Devices / Security / Object Groups Config / Devices / Security / ACLs Config / Devices / Security / Object Groups Config / Guided Setup / Application Setup / ACLs Resequence
Interface/Modify	Config / Devices / Network / BVI Interfaces Config / Devices / Network / NAT Pools Config / Devices / Network / VLAN Interfaces Config / Guided Setup / ACE Hardware Setup / VLAN Interfaces Config / Guided Setup / Application Setup / BVI Interfaces Config / Guided Setup / Application Setup / NAT Pools Config / Guided Setup / Application Setup / VLAN Interfaces Monitor / Devices / Dashboard Monitor / Devices / Traffic Summary Monitor / Tools / Ping Details Poll Now
NAT/Create	No specific menu items
Inspect/Create	No specific menu items

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Security-Admin Predefined Role (continued)	
Connection/Create	Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Map Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Map Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Map Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Map Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Map Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Map
VIP/View	Config / Deploy Config / Deploy / Edit Config / Devices / Load Balancing / Health Monitoring Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Maps Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Maps Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Maps Config / Devices / Load Balancing / Real Servers Config / Devices / Load Balancing / Secure KAL-AP Config / Devices / Load Balancing / Server Farms

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Security-Admin Predefined Role (continued)	
VIP/View (Continued)	Config / Devices / Load Balancing / Stickiness Config / Devices / Load Balancing / Virtual Servers Config / Devices / Load Balancing / Virtual Servers / Edit Config / Guided Setup / Application Setup / Virtual Server Config / Guided Setup / Application Setup / Virtual Server / Edit Config / Operations / Real Servers Config / Operations / Virtual Servers Config / Operations / Virtual Servers / Details Monitor / Devices / Load Balancing Monitor / Devices / Load Balancing / Probes Monitor / Devices / Load Balancing / Real Servers Monitor / Devices / Load Balancing / Statistics Monitor / Devices / Load Balancing / Statistics Monitor / Devices / Load Balancing / Virtual Servers Details Poll Now
Server-Appln Maintenance Predefined Role	
Threshold/View	Monitor / Alarm Notifications / Alarms Monitor / Alarm Notifications / Threshold Groups Monitor / Alarm Notifications / Threshold Groups/ Edit
Server-Maintenance Predefined Role	
Threshold/View	Monitor / Alarm Notifications / Alarms Monitor / Alarm Notifications / Threshold Groups Monitor / Alarm Notifications / Threshold Groups /Edit
VIP/View	Config / Deploy Config / Deploy / Edit Config / Devices / Load Balancing / Health Monitoring Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Maps Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Maps

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Server-Maintenance Predefined Role (Continued)	
VIP/View (Continued)	Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Maps
	Config / Devices / Load Balancing / Real Servers
	Config / Devices / Load Balancing / Secure KAL-AP
	Config / Devices / Load Balancing / Server Farms
	Config / Devices / Load Balancing / Stickiness
	Config / Devices / Load Balancing / Virtual Servers
	Config / Devices / Load Balancing / Virtual Servers / Edit
	Config / Guided Setup / Application Setup / Virtual Server
	Config / Guided Setup / Application Setup / Virtual Server / Edit
	Config / Operations / Real Servers
	Config / Operations / Virtual Servers
	Monitor / Devices / Load Balancing
	Monitor / Devices / Load Balancing / Probes
	Monitor / Devices / Load Balancing / Real Servers
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Virtual Servers
	Details
	Poll Now
SLB-Admin Predefined Role	
Threshold/View	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups /Edit
DNS Answer Inservice/Create	Config / Operations / GSS VIP Answers
DNS Rule Inservice/Create	Config / Operations / DNS Rules

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
SLB-Admin Predefined Role (continued)	
Building Block/Create	Config / Global / Building Blocks
	Config / Global / Building Blocks / Add
	Config / Global / Building Blocks / Tag
	Config / Global / Expert / Class Map
	Config / Global / Expert / HTTP Header Modify Action Lists
	Config / Global / Expert / Optimization Action Lists
	Config / Global / Expert / Policy Map
	Config / Global / Load Balancing / Health Monitoring
	Config / Global / Load Balancing / Parameter Maps / Connection Parameter Map
	Config / Global / Load Balancing / Parameter Maps / DNS Parameter Map
	Config / Global / Load Balancing / Parameter Maps / Generic Parameter Map
	Config / Global / Load Balancing / Parameter Maps / HTTP Parameter Map
	Config / Global / Load Balancing / Parameter Maps / Optimization Parameter Map
	Config / Global / Load Balancing / Parameter Maps / RTSP Parameter Map
	Config / Global / Load Balancing / Parameter Maps / SIP Parameter Map
	Config / Global / Load Balancing / Parameter Maps / Skinny Parameter Map
	Config / Global / Load Balancing / Real Servers
	Config / Global / Load Balancing / Secure KAL-AP
	Config / Global / Load Balancing / Server Farms
	Config / Global / Load Balancing / Stickiness
	Config / Global / Network / BVI Interfaces
	Config / Global / Network / Global IP DHCP
	Config / Global / Network / NAT Pools
	Config / Global / Network / Static NAT Overwrite
	Config / Global / Network / Static Routes
	Config / Global / Network / VLAN Interfaces

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
SLB-Admin Predefined Role (continued)	
Building Block/Create	Config / Global / Role-Based Access Control / Domains
(Continue)	Config / Global / Role-Based Access Control / Roles
	Config / Global / Role-Based Access Control / Users
	Config / Global / Security / ACLs
	Config / Global / Security / Object Groups
	Config / Global / SSL / Auth Group Parameters
	Config / Global / SSL / Certificate Revocation Lists (CRL)
	Config / Global / SSL / Certificate Signing Request (CSR)
	Config / Global / SSL / Keys
	Config / Global / SSL / Parameter Map
	Config / Global / System / Global Policies
	Config / Global / System / Primary Attributes
	Config / Global / System / SNMP
	Config / Global / System / Syslog
Interface/Modify	Config / Guided Setup / Application Setup / NAT Pools
	Config / Guided Setup / Application Setup / VLAN Interfaces
	Monitor / Devices / Dashboard
	Monitor / Devices / Traffic Summary
	Monitor / Tools / Ping
	Details
	Poll Now
Expert/Create	Config / Deploy
	Config / Deploy Now
	Config / Deploy / Edit
	Config / Devices / Expert / Class Maps
	Config / Devices / Expert / HTTP Header Modify Action Lists
	Config / Devices / Expert / Optimization Action Lists
	Config / Devices / Expert / Policy Maps
	Config / Devices / Load Balancing / Health Monitoring
	Config / Devices / Load Balancing / Parameter Maps / Connection Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / DNS Parameter Maps

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
Expert/Create (continued)	Config / Devices / Load Balancing / Parameter Maps / Generic Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / HTTP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / Optimization Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / RTSP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / SIP Parameter Maps
	Config / Devices / Load Balancing / Parameter Maps / Skinny Parameter Maps
	Config / Devices / Load Balancing / Real Servers
	Config / Devices / Load Balancing / Secure KAL-AP
	Config / Devices / Load Balancing / Server Farms
	Config / Devices / Load Balancing / Stickiness
	Config / Devices / Load Balancing / Virtual Servers
	Config / Devices / Load Balancing / Virtual Servers / Add
	Config / Devices / Load Balancing / Virtual Servers / Edit
	Config / Guided Setup / Application Setup
	Config / Guided Setup / Application Setup / Virtual Server
	Config / Guided Setup / Application Setup / Virtual Server / Add
	Config / Guided Setup / Application Setup / Virtual Server / Edit
	Config / Operations / Real Servers
	Config / Operations / Virtual Servers
	Monitor / Devices / Load Balancing
	Monitor / Devices / Load Balancing / Probes
	Monitor / Devices / Load Balancing / Real Servers
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Statistics
	Monitor / Devices / Load Balancing / Virtual Servers
	Details
	Poll Now

Table 17-2 Role Mapping in ANM (continued)

Role Tasks/Permissions (continued)	Resulting Menus Available (continued)
SSL-Admin Predefined Role	
Threshold/Create	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups / Add
	Monitor / Alarm Notifications / Threshold Groups / Edit
SSL/Create	Config / Devices / SSL / Auth Group Parameters
	Config / Devices / SSL / Certificate Revocation Lists (CRL)
	Config / Devices / SSL / Certificates
	Config / Devices / SSL / Chain Group Parameters
	Config / Devices / SSL / CSR Parameters
	Config / Devices / SSL / Keys
	Config / Devices / SSL / Parameter Maps
	Config / Devices / SSL / Proxy Service
	Config / Devices / SSL / Setup Sequence
	Config / Guided Setup / Application Setup / SSL Proxy
	Config / Guided Setup / Application Setup / SSL Proxy / SSL Proxy Setup
	Export
	Generate CSR
	Import
SSL-Cert-Key-Admin Predefined Role	
Threshold/Create	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups / Add
	Monitor / Alarm Notifications / Threshold Groups / Edit
Certificate/Key/Create	Config / Devices / SSL / Certificates
	Config / Devices / SSL / Keys
	Config / Devices / SSL / Setup Sequence
	Monitor / Alarm Notifications / Alarms
	Monitor / Alarm Notifications / Threshold Groups
	Monitor / Alarm Notifications / Threshold Groups / Edit
	Configure Certificate Expiry Threshold Alarms
	Export Certificate
	Export Key
VM-Mapper Predefined Role	
VM Mapping/Create	Config / Devices / System / VM Mappings

Configuring User Authentication and Authorization

In ANM, you can configure authentication for your users by specifying the authentication method to use for specific user; the local method using ANM or a remote method using an AAA servers. You do this through *organizations*. An organization allows you to configure your local or AAA server lookup for your users, then associate specific users, roles, and domains with those organizations.

The following sections describe the organization authentication tasks that you can complete in ANM:

- Adding a New Organization, page 17-41
- Configuring AAA Server lookup for your users—See Adding a New Organization, page 17-41
- Changing server passwords—See Changing Authentication Server Passwords, page 17-45
- Modifying Organizations, page 17-45
- Duplicating an Organization, page 17-46
- Displaying Authentication Server Organizations, page 17-47
- Deleting Organizations, page 17-47

The Default organization (in which all users belong) authenticates users through the ANM internal mechanism, which is based on the RBAC security model. This mechanism authenticates users through the local authentication module and a local database of user IDs and passwords. If you choose to use a remote authentication method, you must specify the authentication server and port.

Many organizations, however, already have an authentication service. To use your own authentication service instead of the local module, you can choose one of the alternate modules:

- TACACS+
- RADIUS
- AD/LDAPS

Note For detailed procedures about remote authentication, see the "Configuring Authentication and Accounting Services" chapter of either the *Cisco ACE Module Security Configuration Guide* or *Cisco ACE 4700 Series Appliance Security Configuration Guide* on www.cisco.com.

After you configure an organization, all authentication transactions are performed by the authentication service associated with that organization. Users log in with the user ID and password associated with the current authentication module.

Related Topics

- Managing User Accounts, page 17-48
- Managing User Roles, page 17-54
- Managing Domains, page 17-61
- Authenticating ANM Users with an AAA Server, page 17-66

Adding a New Organization

You can add organizations, which define the mechanism for authenticating ANM users: local using ANM or remote using RADIUS, TACACS+, or AD/LDAPS. When you configure an organization for remote authentication, users within that organization have their passwords validated using the specified remote AAA server.

You can also configure an organization to use a TACACS+ server for remote authorization of ANM users. To use remote authorization, you must also configure the TACACS+ server with the role and domains associated with a user or user group (see the "Configuring a TACACS+ Server for ANM User Authorization" section on page 17-72).

When you use the services of a a remote AAA server, you can configure the organization to fall back to using local authentication and authorization when the remote AAA server becomes unavailable.

Procedure

Step 1 Choose **Admin > Role-Based Access Control > All Organizations**.

Step 2 Click **Add**.

Step 3 Enter the name of the new organization and notes if required, and click **Save**.

Step 4 Enter the attributes described in Table 17-3.

Certain attributes will display when specific options are selected.

Table 17-3 Organization Attributes

Attribute	Description
Notes	Description of the organization or notes to administrator.
Organization Name	Company, department, or division of the organization that administers the ANM server. This can be different from the organization name above. Default name entered appears.
Account Number	Account number for the organization.
Contact Name	Name of the individual who is the contact in the organization.
Email	Address for the organization's contact person.
Telephone #	Telephone number for the organization's contact person. The format is free text with no embedded spaces.
Alternative Telephone #	Alternative telephone number for the organization's contact person.
Street Address	Street for the organization.
City	City where the organization is located.
Zip Code	Zip code for the organization's address.
Country	Country where the organization is located.
Authentication	Mechanism that the system uses to authenticate users. The default authentication mechanism is ANM's internal mechanism (local), which is based on ANM's security model. For remote authentication, you must specify the authentication server and port number. Options: • Local—Specifies the use of the local database. • RADIUS • TACACS+ • AD/LDAPS (ANM requires that a Domain Controller Server certificate be installed on the Active Directory Server. For a document containing the detailed instructions, see the "Configuring an LDAP Server" section in the "Configuring Authentication and Accounting Services" chapter of either the *Cisco ACE Module Security Configuration Guide or Cisco ACE 4700 Series Appliance Security Configuration Guide* on www.cisco.com.)

Note: The attributes listed below appear only when the Authentication attribute is set to AD/LDAPS, RADIUS, or TACACS+. For detailed instructions about configuring these attributes, see the "Configuring Authentication and Accounting Services" chapter of either the *Cisco ACE Module Security Configuration Guide or Cisco ACE 4700 Series Appliance Security Configuration Guide* on www.cisco.com.

Table 17-3 Organization Attributes (continued)

Attribute	Description
Authentication Server	Hostname or IP address of a RADIUS, TACACS+, or LDAPS server for remote user authentication. **Note** Setting the server with this command is mandatory if you set the Authentication attribute to anything other than the default (local). If you select a remote authentication method, you might need to specify a separate user ID for the authentication server. For AD/LDAPS, you must provide the FQDN of the server (which must be in the users authenticating domain). **Note** ANM supports LDAPS only through Active Directory (AD).
Authentication Port	(Optional) Destination port for communicating authentication requests to the authentication server as follows: • RADIUS—By default, the RADIUS authentication port is 1812 (as defined in RFC 2138 and RFC 2139). If your RADIUS server uses a port other than 1812, configure ANM for the appropriate port. Valid values are from 1 to 65535. • TACACS+—By default, the TACACS+ authentication port is 49 (as defined in RFC 1492). If your TACACS+ server uses a port other than 49, configure ANM for the appropriate port. Valid values are from 1 to 65535. • LDAPS—By default, the LDAP server port is 636. If your LDAP server uses a port other than 636, configure ANM for the appropriate port. Valid values are from 1 to 65535.
Secondary Authentication Server	(Optional) Hostname or IP address for the secondary RADIUS, TACACS+, or LDAPS server used for authentication in case the primary server is unavailable.
Secondary Authentication Port	(Optional) Destination port on the secondary RADIUS, TACACS+, or LDAPS server for communicating authentication requests if the primary server is unavailable.
Authentication Secret	String used to encrypt the traffic between Cisco ANM and the AAA server. This string must be identical on both servers.
Remote Authorization	(Optional) Field that appears only when the Authentication attribute is set to TACACS+. Determines whether ANM or the TACACS+ server performs user authorization. Uncheck the check box to have ANM perform user authorization locally (this is the default setting). Check the check box to enable remote authorization by the TACACS+ server. If you enable remote authorization, you must configure the TACACS+ server with the role and domain information associated with each user (see the "Configuring a TACACS+ Server for ANM User Authorization" section on page 17-72). **Note** All role and domain definitions are stored locally on ANM (see the "Managing User Roles" section on page 17-54 and the "Managing Domains" section on page 17-61).

Table 17-3 Organization Attributes (continued)

Attribute	Description
ANM Unique IDs	Field that appears only when the Remote Authorization check box is checked for a TACACS+ server. Enter the value that matches the ANM identifier that you configure on the TACACS+ server (see the "Configuring a TACACS+ Server for ANM User Authorization" section on page 17-72). The default value is ANM. Depending on how you configure the TACACS+ server for user authorization, you may need to specify multiple, comma-separated ANM IDs in the ANM Unique IDs field as follows: `anm_1,anm2,anm3` For example, when configuring ANM user authorization on the TACACS+ server, you can use a maximum of 160 characters to specify an ANM unique ID and associated user role and user domain information. To work around this limitation, on the TACACS+ server you can specify additional domain information for the role by entering multiple ANM identifiers. When multiple ANM organizations share the same TACACS+ server, specify a different ANM identifier for each organization. When multiple ANMs share the same TACACS+ server, specify a different ANM identifier for each ANM.
Fallback to Local	Enables ANM to use local authentication (and local user authorization for TACACS+ applications) if the remote primary and secondary AAA servers are not available, such as when there is a timeout issue, connectivity issue, wrong IP address, and so forth. **Note** To use the fallback option, you must configure a local user on ANM that ANM can use when fallback is invoked. When you enable Fallback to Local for RADIUS and AD/LDAP, ANM falls back to local user authentication only when the AAA server is unreachable. If the AAA server is reachable but remote authentication fails, ANM does not fall back to local and the login is rejected. When you enable Fallback to Local for TACACS+, ANM falls back to local user authentication and authorization only when the AAA server is unreachable. If the remote server is reachable but remote authentication fails, ANM does not fall back to local and the login is rejected. If Remote Authorization is not enabled, after remote authentication is complete, ANM performs user authorization by checking the local user for role and domain information. If Remote Authorization is enabled and no valid role or domain information is found on the TACACS+ server, including the ANM IP attributes not being set on the TACACS+ server, ANM does not fall back to the local user and rejects the login (see the "Configuring a TACACS+ Server for ANM User Authorization" section on page 17-72).

Step 5 Click **Save**.

Related Topics

- Managing User Accounts, page 17-48

- Changing the Admin Password, page 17-45

Changing Authentication Server Passwords

Note Your user role determines whether you can use this option.

You can change the authentication server password.

Procedure

Step 1 Choose **Admin > Role-Based Access Control > Organization**.

Step 2 Choose the organization that you want to modify and click **Edit**.

Step 3 Change the password attribute in the attributes table (see Table 17-4).

Step 4 Click **Save**.

The Edit User Details window appears.

Step 5 Make any changes and click **Save**.

Step 6 When all the details are correct, click **Cancel**.

The User Management table is displayed.

Related Topics

- Managing User Accounts, page 17-48
- Changing the Admin Password, page 17-45

Changing the Admin Password

Each ANM has an admin user account built into the device. The root user ID is admin, and the password is set when the system is installed. For information about changing the Admin password, see Changing Your Account Password, page 1-4.

Note For details about resetting the Admin password, see the *Installation Guide for Cisco Application Networking Manager 3.0*.

Modifying Organizations

Note Your user role determines whether you can use this option.

You can modify an existing organization.

Assumptions

This topic assumes the following:

- ANM is installed and running.
- The organization exists in the ANM database.
- You have reviewed the guidelines for managing customer organizations (see the "Adding a New Organization" section on page 17-41).

Procedure

Step 1 Choose **Admin > Role-Based Access Control > Organizations**.

Step 2 Choose the organization that you want to modify and click **Edit**.

The Edit Organization window appears.

Step 3 In the attributes table of the Edit Organization window, modify any of the attributes in the attributes table (see Table 17-3).

Step 4 Click **Save**.

Related Topics

Configuring User Authentication and Authorization, page 17-40

Duplicating an Organization

Note Your user role determines whether you can use this option.

You can create a new organization from an existing one.

Assumptions

This topics assumes the following:

- ANM is installed and running.
- The organization exists in the ANM database.
- You have reviewed the guidelines for managing customer organizations (see the "Adding a New Organization" section on page 17-41).

Procedure

Step 1 Choose **Admin > Role-Based Access Control > Organizations**.

The Organizations window appears.

Step 2 In the Organizations window, choose the organization that you want to copy.

Step 3 Click **Duplicate**.

A script popup window appears.

Step 4 At the prompt in the popup window, enter a name for the new organization.

Step 5 Click **OK**.

The popup window closes and the new organization copy is added to the Organization window.

Step 6 (Optional) Choose the new organization and click **Edit** to make changes to the organization settings.

The Edit Organization window appears.

Step 7 In the attributes table of the Edit Organization window, modify any of the attributes in the attributes table (see Table 17-3).

Step 8 Click **Save**.

Related Topics

Configuring User Authentication and Authorization, page 17-40

Displaying Authentication Server Organizations

Note Your user role determines whether you can use this option.

To display the authentication server organizations, choose **Admin > Role-Based Access Control > All Organizations**. The Organizations window appears with a list of customer organizations. From this window you can create a users, roles, and domains that are associated with this specific organization. You can also access organizations by selecting the organization from the object selector that displays in the top right portion of the content area.

Related Topics

- Understanding Organizations, page 17-7
- Configuring User Authentication and Authorization, page 17-40

Deleting Organizations

Note Your user role determines whether you can use this option.

You can delete an organization.

Assumptions

This topic assumes the following:

- ANM is installed and running.
- The organization exists in the ANM database.
- You have reviewed the guidelines for managing customer organizations (see Adding a New Organization, page 17-41).

Procedure

Step 1 Choose **Admin > Role-Based Access Control > Organizations**.

The Organizations window appears.

Step 2 In the Organizations window, choose the organization to delete.

Step 3 Click **Delete**.

All users, domains, and roles within that organization are removed.

Related Topics

Configuring User Authentication and Authorization, page 17-40

Managing User Accounts

You use the User Management feature to specify the people that are allowed to log onto the system.

Note You can create users in the organization in which you are a member. You will see users only in the organizations in which you are a member.

This section includes the following topics:

Guidelines for Managing User Accounts

This topic includes the following guidelines:

- A user cannot log in until they have one domain and one user role associated via an organization. This can be the Default domain but a role must be specified.
- Users cannot be moved from one organization to another. Organizations are designed to be separate and distinct.
- Only users with create permissions can reset other user's password. See the "Resetting Another User's Password" section on page 17-52.

Displaying a List of Users

To display the list of users, choose **Admin > Role-Based Access Control >** *Organization* **> Users**. The Users table appears, displaying the organization's users, their role, and their domain. From this window you can create a new user, duplicate, modify or delete any existing user to which you have access.

Related Topics

Managing User Accounts, page 17-48

Creating User Accounts

Note Your user role determines whether or not you can use this option.

You can create new user accounts for an organization.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Users**.

The Users table appears.

Step 2 Click **Add**.

The New Organization User window appears.

Step 3 In the New Organization User window, configure the user attributes as described in Table 17-4:

Note If your web browser supports the Remember Passwords option and you enable this option, the web browser may fill in the Name and Password fields when the New Organization User window loads. By default, these fields should be empty. You can change the name and password fields from whatever the web browser inserts into the two fields.

Table 17-4 User Attributes

Field	Description
Login Name	Name by which the user is to be identified in the system (up to 24 characters). Only letters, numbers, underscore (_), and backslash (\) can be used. The field is case sensitive.
Name	Full name of the user. The format is free text.
Password	Password for the user account.
Confirm	Password confirmation for the account.
Email	Email address for the user.
Telephone#	Telephone number for the user. The format is free text with no embedded spaces.
Role	Predefined role from the drop-down list.
Domains	Domains to which this user belongs. Use the **Add** and **Remove** buttons to choose the domains to which this user belongs.

Table 17-4 User Attributes (continued)

Field	Description
Allowed Login IP	IP address or a subnetwork from which the user is allowed to log in. You can define up to ten different addresses for a single user. Unless you specifically define IP addresses or subnetworks using this option, the user can log in from any IP address. When you enter an allowed single IP address or an allowed subnet, then the user is only allowed to log in from the specified addresses. To restrict access to a specific subnetwork, enter the IP address and the mask, for example, 10.1.200.60/255.255.255.0. **Note** IP addresses 1.1.1.1 and 0.0.0.0 cannot be entered in this field.
Description	Notes about the user.
First menu	Menu that displays when this user first logs in. Choose one from the drop-down list.
Last Login	Last time (local time) this user logged in.

Step 4 Click **Save** to save the user account information.

Related Topics

Managing User Accounts, page 17-48

Duplicating a User Account

Note Your user role determines whether you can use this option.

You can create a new user account using settings from an existing user.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Users**.

The Users table appears.

Step 2 Choose the user account you want to copy and click **Duplicate**.

A script popup window appears.

Step 3 At the prompt in the popup window, enter a name for the new user account and click **OK**.

The popup window closes and the Users table displays the new user account.

Step 4 (Optional) To make changes to the user account, from the Users table, choose the user account and click **Edit**.

The Edit Organization User window appears.

Step 5 In the Edit Organization User window, modify the user account settings as described in Table 17-5.

Step 6 Click **Save** to save the user account information.

The Users window appears.

Related Topics

Managing User Accounts, page 17-48

Modifying User Accounts

Note Your user role determines whether you can use this option.

You can modify existing user accounts.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Users**.

The Users table appears.

Step 2 Choose the user account you want to modify and click **Edit**.

The Edit Organization User window appears.

Step 3 In the Edit Organization User window, modify any of the attributes in the attributes table (see Table 17-5).

Table 17-5 Modify User Attributes

Field	Description
Login Name	Name you specified when you created the user you want to duplicate. This is the name by which the user is to be identified in the system (up to 24 characters). Only letters, numbers, and underscore can be used. The field is case sensitive.
Name	Full name of the user. The format is free text.
Email	Email address for this user.
Telephone#	Telephone number for this user. The format is free text with no embedded spaces.
Role	Predefined role from the list.
Domains	Domains to which this user belongs. Use the **Add** and **Remove** buttons to choose domains to which this user belongs.
Allowed Login IP	IP address or a subnetwork from which the user is allowed to log in. You can define up to ten different addresses for a single user. Unless you specifically define IP addresses or subnetworks using this option, the user can log in from any IP address. When you enter an allowed single IP address or an allowed subnet, then the user is only allowed to log in from the specified addresses. To restrict access to a specific subnetwork, enter the IP address and the mask, for example, 10.1.200.60/255.255.255.0. **Note** IP addresses 1.1.1.1 and 0.0.0.0 cannot be entered in this field.
Description	Notes about the user.

Table 17-5 Modify User Attributes

Field	Description
First Menu	Menu that is displayed when this user first logs in. Choose one from the drop-down list.
Last Login	Last time (local time) that this user logged in and the IP address that was used.

Step 4 Click **Save** to save the user account information.

Related Topics

Managing User Accounts, page 17-48

Resetting Another User's Password

Note You must have create permissions in order to reset another user's password.

Use this procedure to reset another users's password.

Step 1 Log in to Cisco License Manager making sure the login username has create permissions.

Step 2 Choose **Admin > Users**.

The Users window appears.

Step 3 In the Users window, choose the username for which the password needs to be reset and click the **Reset Password** button.

The Reset Password popup window appears with the selected username in the username field.

Step 4 Enter and confirm the new password.

Step 5 Click **OK** to save the password information.

The **Password has been reset** message displays if there are no errors.

Related Topics

- Managing User Accounts, page 17-48
- Displaying or Terminating Current User Sessions, page 17-53

Deleting User Accounts

Note Your user role determines whether you can use this option.

You can delete a user account.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Users**.

The Users table appears.

Step 2 Choose the user account to delete and click **Delete**.

Step 3 The confirmation popup window appears.

Step 4 In the confirmation popup window, do one of the following:

- Click **OK** to confirm the deletion request. The user account is removed from the ANM database.
- Click **Cancel** to ignore the deletion request.

Related Topics

Managing User Accounts, page 17-48

Displaying or Terminating Current User Sessions

Note Your user role determines whether you can use this option.

You can display a list of the users currently logged into the system and end their sessions, if required.

You can only display the users in your organization.

Procedure

Step 1 Choose **Admin > Role-Based Access Control > Active Users**.

The Active User Sessions window displays the following information for each active user who is logged in:

Table 17-6 Active User Session Information

Column	Description
Name	Name used to log into the Cisco ANM.
Type Of Login	Method used to log in, for example WEB.
User Type	Method used to authenticate and authorize the user: • Local using ANM • Remote using AAA server
Login From IP	IP address of host.
Time Of Login	Time user logged in.

Step 2 (Optional) To terminate an active session, click **Terminate**.

When a user session is terminated, the user is logged out of the interface from which the user session was initiated. If the user was making changes to a configuration, the configuration lock is released and any uncommitted configuration change is discarded.

If a user session is terminated while an operation is in progress, the current operation is not stopped, but any subsequent operation is denied.

For more details on terminating active users, see the "Displaying or Terminating Current User Sessions" section on page 17-53.

Related Topics

- Controlling Access to Cisco ANM, page 17-3
- Managing User Accounts, page 17-48

Managing User Roles

You use the Roles Management feature to add, modify, and delete user-defined roles and to modify predefined roles.A user's role determines the tasks the user can access. Each role is associated with permissions or rules that define what feature access this role contains. For example, if you design a role that provides access to virtual servers, the role automatically includes access to all real servers that could be included in the virtual server.

ANM provides several predefined user roles that you can modify but not delete. For more information about predefined user roles, including the list of the predefined user roles, see the "Understanding Predefined Roles" section on page 17-55.

This section includes the following topics:

Guidelines for Managing User Roles

This topic includes the following guidelines:

- System Administrators can view and modify all roles.
- Organization administrator users can only see and modify the users, roles, and domains in their organization.
- Other users can only view the user, roles, and domains assigned to them.

- User-defined roles can be created but follow strict rules about which tasks can be selected or deselected. See the user interface for specific dependencies or Table 17-2 on page 17-9 for role to task mapping information.
- You must have the ability to create real servers in your role and at least one virtual context in your domain before you can create real servers.
- You must have the ability to create virtual contexts in your role and an Admin context in your domain before you can create virtual contexts.
- If you upgrade to ANM 2.2 any custom roles that are migrated retain their associations but have different role definitions. We encourage you to use the ANM 2.2 predefined default roles.

Understanding Predefined Roles

You must have one of the predefined roles in the Admin context in order to use the changeto command, which allows users to visit other contexts. Non-admin/user contexts do not have access to the changeto command; they can only visit their home context. Context administrators, who have access to multiple contexts, must explicitly log in to other contexts to which they have access.

The predefined roles and their default privileges are defined in Table 17-7. For detailed information on RBAC, see either the *Cisco Application Control Engine Module Virtualization Configuration Guide* or the *Cisco 4700 Series Application Control Engine Appliance Virtualization Configuration Guide*.

Table 17-7 ANM Predefined Role Tasks

Predefined Role	Description	Role Tasks/Operation Privileges[1]
ACE-Admin	Access to create virtual contexts and monitor threshold information.	• View Threshold • Create Device Events • Create Virtual Context+
ANM-Admin	Access to create virtual contexts and monitor threshold information. Provides access to all features and functions.	• Create ANM System • Create ANM User Access • Create ANM Inventory+
Network-Admin	Admin for L3 (IP and Routes) and L4 VIPs	• View Threshold • Create Switch • Create Routing • Create Interface • Create NAT • Create Connection
Network-Monitor	Monitoring for all features	• View ANM Inventory+
Org-Admin	Access to create role-based access control and import and update device data.	• Create ANM User • Create ANM Inventory+

Table 17-7 ANM Predefined Role Tasks (continued)

Predefined Role	Description	Role Tasks/Operation Privileges[1]
Security-Admin	Security features	• Create AAA • Modify Interface • Create NAT • Create Inspect • Create Connection
Server-Appln-Maintenance	Server maintenance and L7 policy application	• View Threshold • View VIP • View Virtual Inservice • Create LoadBalancer+
Server-Maintenance	Server maintenance, monitoring, and debugging	• View Threshold • View VIP+ • Modify Real Server • Debug Probe • Create Real Inservice
SLB-Admin	Load-balancing features	• View Threshold • Create Building Block • Modify Interface • Create Expert+
SSL-Admin	SSL features	• Create SSL+
SSL-Cert-Key-Admin	SSL certificate and key management features	• Import, generate, or delete keys • Import or delete certificates • Generate a certificate signing request (CSR) • Monitor certificate expiration though the dashboard GUI and threshold modifications
VM-Mapper	Virtual machine (VM) mapping feature	• Create VM to real server map

1. Where the plus sign (+) is indicated, all permissions included in this folder are included at the same privilege level, unless otherwise noted. For example, Virtual Contexts tasks are comprised of tasks such as AAA, Building Blocks, and so on. These tasks are depicted as columns in the Roles table.

Displaying User Role Relationships

Note Your user role determines whether you can use this option.

You can display which users are associated to specific roles.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organizations* **> Roles**.

The Roles table appears.

Step 2 In the Roles table, choose a role and click **Users**.

The Users With Role window appears. From this window you can delete or duplicate a user. For information about how roles map to users, see Table 17-2, "Role Mapping in ANM".

Related Topics

- Duplicating a User Account, page 17-50
- Managing User Roles, page 17-54

Displaying User Roles

Note Your user role determines whether you can use this option.

You can display the existing user roles by choosing **Admin > Role-Based Access Control >** *Organizations* **> Roles**. The Roles table appears.

You can use the options in this window to:

- Create a new role (see Creating User Roles, page 17-58).
- View the users assigned to a role (see Displaying User Role Relationships, page 17-56).
- Modify any existing role to which you have access (see Modifying User Roles, page 17-60).
- Duplicate any existing role to which you have access (see Duplicating a User Role, page 17-59).
- Delete any existing role to which you have access (see Deleting User Roles, page 17-60).

Related Topics

- Understanding Operations Privileges, page 17-6
- Managing User Roles, page 17-54

Creating User Roles

Note Your user role determines whether you can use this option.

You can edit the predefined roles, or you can create new, user-defined roles. When you create a new role, you specify a name and description of the new role, then choose the privileges for each task. You can also assign this role to one or more users.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Roles**.

The Roles table appears.

Step 2 Click **Add**.

The New Role window appears.

Step 3 Enter the following attributes as shown in Table 17-8:

Table 17-8 Role Attributes

Attribute	Description
Name	Name of the role.
Description	Brief description of the role.
Role Tasks	Role task tree that defines the operation privileges associated with each task. The tasks are arranged in a hierarchy of parent and subordinate tasks. Click on the + sign of a parent task to display its subordinate tasks as shown in the following example for the ANM Inventory task. – ANM Inventory [parent task] Threshold [subordinate tasks] DNS Answer UDG Device Events Switch + Virtual Context [subordinate task that has its own set of subordinate tasks as indicated by the + sign] You assign one of the following operating privileges to each of the tasks: No Access, View, Modify, Debug, or Create. When you assign an operating privilege to a parent task, by default, the same privilege is assigned the subordinates. You can assign a different operating privilege to the subordinates if needed; however, you can only assign an operating privilege that is greater than or equal to the operating privilege assigned to the parent task. If you set the parent task to Modify or Debug, the Create privilege is the only privilege allowed for the subordinate tasks and by default, is assigned to the subordinate tasks. For more information about operating privileges, see the "Understanding Operations Privileges" section on page 17-6.
Resulting Menu Items	Synchronized list of features in the form of menus that this role is able to access after setting the role task operation privileges.

Step 4 Click **Save**.

The new role is added to the list of user roles.

Step 5 (Optional) To assign this new role to one or more users, go to **Admin >** *Organizations* **> Users**.

For detailed steps, see Modifying User Accounts, page 17-51.

Related Topics

- Understanding Operations Privileges, page 17-6
- Managing User Roles, page 17-54

Duplicating a User Role

Note Your user role determines whether you can use this option.

You can create a new user-defined role from an existing one.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Roles**.

The Roles table.

Step 2 In the Roles table, choose the role you want to copy and click **Duplicate**.

A script popup window appears.

Step 3 At the prompt in the script popup window, enter a name for the new role.

Step 4 Click **OK**.

Step 5 The script popup window closes and Roles tables displays the new role.

Step 6 (Optional) To make changes to the new role's attributes, in the Roles table, choose the role and click **Edit**.

The Edit Role window appears.

Step 7 Make the required changes and click **Save** to save the changes.

Related Topics

- Understanding Operations Privileges, page 17-6
- Managing User Roles, page 17-54

Modifying User Roles

Note Your user role determines whether you can use this option.

You can modify any user-defined roles.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Roles**.

The Roles table appears.

Step 2 Choose the role you want to modify and click **Edit**.

The Edit Role window appears.

Step 3 Make the required modifications.

Step 4 Click **Save**.

Related Topics

- Understanding Operations Privileges, page 17-6
- Managing User Roles, page 17-54

Deleting User Roles

Note Your user role determines whether you can use this option.

You can delete any user-defined roles.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Roles**.

The Users table appears.

Step 2 Choose the role to delete and click **Delete**.

Step 3 The confirmation popup window appears.

Step 4 In the confirmation popup window, click **OK** to confirm the deletion.

Users that have the deleted role no longer have that access.

Related Topics

Managing User Roles, page 17-54

Managing Domains

Network domains provide a means for organizing the devices and their components (physical and logical) in your network and permitting access according to the way your site is organized. You can allow access to a domain by assigning it to an organization. Examples are specific virtual contexts, or specific servers within a context.

The following sections describe how to manage domains:

Guidelines for Managing Domains

This topic includes the following guidelines:

- Domains are *logical* concepts. You do *not* delete a member of a domain when you delete the domain.
- Domains can include supported Cisco chassis, ACE modules, ACE appliances, and CSS or CSM devices, as well as their virtual contexts, building blocks, resource classes, and real and virtual servers.
- Choose the Allow All setting to include current and future device objects in a domain.
- Objects must already exist in ANM. To add objects, see Importing Network Devices into ANM, page 4-9.
- You must have the ability to create real servers in your role and at least one virtual context in your domain before you can create real servers.
- You must have the ability to create virtual contexts in your role and an Admin context in your domain before you can create virtual contexts.
- Domains continue to display device information even after you remove that device from ANM. This allows the domain information to be easily reassociated if you reimport the device. The device name must remain the same for this to work properly.

Caution Domain objects are hierarchical. If you include a parent object in a domain, the child object is also included even though they do not display in the Object selector tree when you add or edit domains.

For example:

- Inclusion of a Catalyst 6500 series switch includes all cards, virtual contexts, real servers and virtual servers.
- Inclusion of an ACE 4710 includes all virtual contexts, real servers, and virtual servers.
- Inclusion of a virtual context, CSM module or CSS device includes all associated objects.

Related Topics

- Creating a Domain, page 17-62

- Modifying a Domain, page 17-64
- Displaying Network Domains, page 17-62
- Duplicating a Domain, page 17-63
- Deleting a Domain, page 17-65

Displaying Network Domains

Note Your user role determines whether you can use this option.

You can display the network domains and a domain's attributes.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Domains**.

The Domains table appears.

Step 2 Expand the table until you can see all the network domains.

Step 3 Choose a domain from the Domains table to view and click **Edit**.

The Edit Domains window appears, displaying the domain's attributes.

Related Topics

- Managing Domains, page 17-61
- Guidelines for Managing Domains, page 17-61
- Creating a Domain, page 17-62
- Duplicating a Domain, page 17-63
- Modifying a Domain, page 17-64
- Deleting a Domain, page 17-65

Creating a Domain

Note Your user role determines whether you can use this option.

You can create a new domain.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Domains**.

The Domains table appears.

Step 2 Click **Add**.

Step 3 Define the domain attributes as described in Table 17-9:

Table 17-9 Domain Attributes

Field	Description
Name	Name of the domain.
Description	Description of the domain.
Allow All	Check box that enables all objects within this domain (current and future objects). If this check box is left unchecked, the Objects tree displays.
Objects	Collection of objects that comprise this domain. Choose an object name and use the arrows to move it from the available to selected column. For example, selecting a virtual context selects all real servers within that virtual context, or selecting a chassis selects the virtual contexts on that chassis. The interface does not explicitly display this in the table, but the objects are, in fact, selected. See the "Guidelines for Managing Domains" section on page 17-61 for domain rules about creating virtual contexts and real servers.

Step 4 Click **Save**.

The Domains Edit window updates and displays the total object number next to the object name.

Related Topics

- Managing Domains, page 17-61
- Guidelines for Managing Domains, page 17-61
- Displaying Network Domains, page 17-62
- Creating a Domain, page 17-62
- Duplicating a Domain, page 17-63
- Modifying a Domain, page 17-64
- Deleting a Domain, page 17-65

Duplicating a Domain

Note Your user role determines whether you can use this option.

You can create a new domain from an existing one.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Domains**.

The Domains table appears.

Step 2 Choose the domain to copy and click **Duplicate**.

Step 3 A script popup window appears.

Step 4 At the prompt in the script popup window, enter a name for the new domain and click **OK**.

The script popup window closes and the Domains table displays the new domain.

Step 5 Click **Save**.

Related Topics

- Managing Domains, page 17-61
- Guidelines for Managing Domains, page 17-61
- Displaying Network Domains, page 17-62
- Creating a Domain, page 17-62
- Modifying a Domain, page 17-64
- Deleting a Domain, page 17-65

Modifying a Domain

Note Your user role determines whether you can use this option.

You can modify the settings in a domain.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Domains**.

The Domains table appears.

Step 2 In the Domains table, choose the domain you want to change and click **Edit**.

The Edit Domains window appears.

Step 3 In the Edit Domains window, modify the domain settings.

For detailed domain attribute descriptions, see Table 17-9 on page 17-63.

Step 4 Click **Save**.

Related Topics

- Managing Domains, page 17-61
- Guidelines for Managing Domains, page 17-61
- Displaying Network Domains, page 17-62
- Creating a Domain, page 17-62
- Duplicating a Domain, page 17-63
- Deleting a Domain, page 17-65

Deleting a Domain

Note Your user role determines whether you can use this option.

You can delete a network domain from the systems. You do not delete objects associated with that domain when you delete the domain.

Procedure

Step 1 Choose **Admin > Role-Based Access Control >** *Organization* **> Domains**.

The Domains table appears.

Step 2 In the Domains table, choose the domain to delete and click **Delete**.

The confirmation popup window appears.

Step 3 In the confirmation popup window, click **OK**.

The domain is removed from the ANM database.

Related Topics

- Managing Domains, page 17-61
- Guidelines for Managing Domains, page 17-61
- Displaying Network Domains, page 17-62
- Creating a Domain, page 17-62
- Duplicating a Domain, page 17-63
- Modifying a Domain, page 17-64

Authenticating ANM Users with an AAA Server

RBAC is a common access control method. ANM allows the administrator to centrally control user authentication and authorization. Users can be authenticated using a local database that resides in ANM, or the user database can reside on a remote AAA server such as an AD/LDAPS, RADIUS, or TACACS+ server. In ANM, you can configure authentication for your users by specifying which AAA servers are used for specific users. You configure authentication through organizations. An organization allows you to configure your AAA server lookup for your users, and then associate specific users, roles, and domains with those organizations.

This topic describes how to configure ANM to use a TACACS+ server for user authentication. This section is intended as a guide to help ensure proper communication with the AAA server and ANM operating as the AAA client. If a user is successfully authenticated by the TACACS+ server, then the ANM will determine the authorization for the user (what objects he or she can manipulate, and which actions he or she can take on those objects).

For details on configuring the Cisco Secure ACS, OpenLDAP Software, or another AAA server, see the documentation that is provided with the software.

Table 17-10 provides a high-level overview of the steps required to authenticate ANM users with a TACACS+ server.

Note For background information about configuring a AAA server, see the "Configuring Authentication and Accounting Services" chapter of either the *Cisco ACE Module Security Configuration Guide or Cisco ACE 4700 Series Appliance Security Configuration Guide* on www.cisco.com.

Assumptions

This topics assumes the following:

- For purposes of this example, assume usage of a Cisco Secure ACS version 4.1 server.
- Your user role determines whether you can perform the procedures outlined in this section.
- Administrative login rights are required to access the Cisco Secure ACS HTML interface.

Related Topics

- Controlling Access to Cisco ANM, page 17-3
- How ANM Handles Role-Based Access Control, page 17-8

Table 17-10 Authenticating ANM Users with a TACACS+ Server

	Task	Procedure
Step 1	Create an organization and define the remote TACACS+ server used (ANM)	**Note** Your user role determines whether you can use this option. Remote authentication servers are defined in ANM as organizations. A single server can be used in multiple organizations. To configure authentication for your users by creating an organization and defining TACACS+ as the method of authentication, do the following: **a.** Choose **Admin > Role-Based Access Control > All Organizations**. The Organizations window appears. **b.** Click **Add**. **c.** Enter the name of the new organization and notes if required. **d.** Click **Save**. **e.** Choose the new organization and click **Edit**. **f.** Enter the attributes as described in Table 17-3. Certain attributes appear when you choose specific options. Include the following organization attributes to authenticate ANM users with a TACACS+ server: – Organization name – TACACS+ as authentication method – IP address of TACACS+ server – Authentication port number – Authentication secret **g.** Click **Save**. See the "Adding a New Organization" section on page 17-41 for details on this procedure.
Step 2	Creating a role for RBAC (ANM)	**Note** Your user role determines whether you can use this option. You can edit the predefined roles, or you can create user-defined roles. When you create a role, you specify a name and description of the new role, and then choose the privileges for each task. You can also assign this role to one or more users. Do the following: **a.** Choose **Admin > Role-Based Access Control >** *Organization* **> Roles**. The Roles table appears. **b.** Click **Add**. The New Role form appears. **c.** Enter the attributes as described in Table 17-8. **d.** Click **Save**. The new role is added to the list of user roles. See the "Creating User Roles" section on page 17-58 for details on this procedure.

Table 17-10 Authenticating ANM Users with a TACACS+ Server (continued)

	Task	Procedure
Step 3	Create a domain for an RBAC user (ANM)	**Note** Your user role determines whether you can use this option. A domain defines which objects that the RBAC user will have access to. The assigned role defines which actions that user will be able to perform on those objects. To configure a domain for an RBAC user, do the following: **a.** Choose **Admin > Role-Based Access Control >** *Organization* **> Domains**. The Domains table appears. **b.** In the Domains table, click **Add**. **c.** For the new domain, enter the attributes as described in Table 17-9. **Note** If you check the Allow All checkbox, this selection enables all objects within this domain (current and future objects). If you leave this check box unchecked, the Objects tree displays. To allow a user to have access to the entire context, highlight the Virtual Contexts folder in the Objects tree, locate the specific user context, and then click the arrow to send it to the Selected box. The context name format is `<chassis-name>:<slot-number>:<context-name>` **d.** Click **Save** when all the objects that you want to allow access to are listed in the Selected box. See the "Creating a Domain" section on page 17-62 for details on this procedure.
Step 4	Create an organization user (ANM)	**Note** Your user role determines whether you can use this option. Organization users are users who work for the customer of a service provider or AAA server that segments your users and to whom you want to grant access to ANM. Do the following: **a.** Choose **Admin > Role-Based Access Control >** *Organization* **> Users**. The Users window appears. **b.** In the Users window, click **Add**. **c.** Enter the attributes as described in Table 17-4. Include the following organization user attributes: – Login name – Predefined role – Domains to which this user belongs **d.** Click **Save**. The Users table appears. See the "Creating User Accounts" section on page 17-49 for details on this procedure.

Table 17-10 Authenticating ANM Users with a TACACS+ Server (continued)

	Task	Procedure
Step 5	Access the AAA server (Cisco Secure ACS server)	**Note** Administrative login rights are required to access the Cisco Secure ACS HTML interface. To access the Cisco Secure ACS HTML interface, do the following: **a.** Open a web browser for the URL of the Cisco Secure ACS HTML interface. **b.** In the Username box, type a valid Cisco Secure ACS administrator name. **c.** In the Password box, type the password for the administrator name that you specified. **d.** Click **Login**. The Cisco Secure ACS HTML interface appears. For details on configuring the Cisco Secure ACS HTML server, see the documentation that is provided with the software.
Step 6	Create a network device group (Cisco Secure ACS Server)	To create a group of TACACS+ clients and servers on the Cisco Secure ACS HTML server, do the following: **a.** Go to the Network Configuration section of the Cisco Secure ACS HTML interface. **b.** In the navigation bar, click the **Network Configuration** button. The Network Configuration page appears in the Cisco Secure ACS HTML interface. **c.** Under the Network Device Groups table, click the **Add Entry** button to create a new group of TACACS+ clients and servers. Type the name of the new group (for example ANM). **d.** Click **Submit**. For details on configuring the Cisco Secure ACS HTML server, see the documentation that is provided with the software.

Table 17-10 Authenticating ANM Users with a TACACS+ Server (continued)

	Task	Procedure
Step 7	Specify the AAA client setup for ANM (Cisco Secure ACS Server)	To define the AAA client setup for ANM on the Cisco Secure ACS HTML server, do the following: **a.** Click **Add Entry** below the AAA Clients table. The Add AAA Client window appears. **b.** In the Add AAA Client window, specify the following attributes: – AAA Client IP Address—Client IP address of ANM that will be used for communicating with the TACACS+ server – Shared Secret—Shared secret specified on ANM – Network Device Group—ANM – Authenticate Using—TACACS+ (Cisco IOS) **Note** The TACACS+ (Cisco IOS) drop-down item specifies the Cisco TACACS+ authentication function. This selection activates the TACACS+ option when using Cisco Systems access servers, routers, and firewalls that support the TACACS+ authentication protocol, including support for ANM as well. **c.** Click **Submit + Apply**. For details on configuring the Cisco Secure ACS HTML server, see the documentation that is provided with the software.
Step 8	Specify the AAA server setup (Cisco Secure ACS Server)	To define the AAA server setup for ANM on the Cisco Secure ACS HTML server, do the following: **a.** Click **Add Entry** below the AAA Servers table. The Add AAA Servers window appears. **b.** In the Add AAA Servers window, specify the following attributes: – AAA Server IP Address—IP address of the TACACS+ server – Key—Shared secret specified on ANM – Log Update/Watchdog Packets from This Remote AAA Server—Enabled – Network Device Group—ANM – AAA Server Type—TACACS+ – Traffic Type—Inbound/Outbound **c.** Click **Submit + Apply**. For details on configuring the Cisco Secure ACS HTML server, see the documentation that is provided with the software.

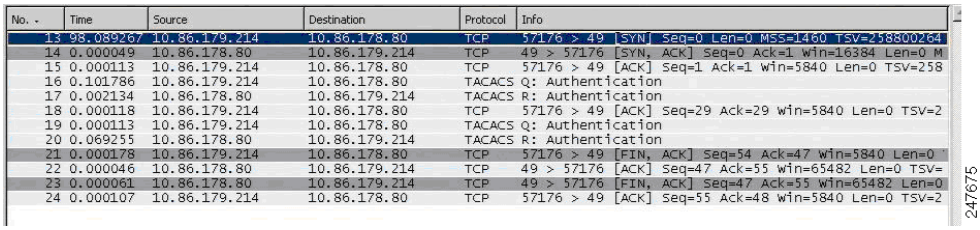
Table 17-10 Authenticating ANM Users with a TACACS+ Server (continued)

	Task	Procedure
Step 9	Create the ANM user on the TACACS+ server (Cisco Secure ACS Server)	To create the ANM user on the Cisco Secure ACS HTML server, do the following: **a.** Click the **User Setup** button. The User Setup window appears. **b.** In the User text box of the User Setup window, enter the user name of the organization user that you created in ANM (see Step 3, the Create an domain for a RBAC user task). **c.** Click the **Add/Edit** button. **d.** Specify the following user attributes: – Real Name—Real name of the ANM user. – Description—Brief description of the user for the administrator. – Password Authentication—ACS Internal Database. – Password—Password for this user account. Enter this password a second time in the Confirm Password text box. For details on configuring the Cisco Secure ACS HTML server, see the documentation that is provided with the software.

Table 17-10 Authenticating ANM Users with a TACACS+ Server (continued)

	Task	Procedure
Step 10	Log in to ANM using the newly created account	To test the new login credentials for user authentication, do the following: **a.** Log in to ANM by entering the new user account in the ANM login window. Enter the username using the following format: <*username*>@<*organization*>. **b.** Click **Login**. Authentication occurs between ANM and the TACACS+ server (Figure 17-2). All authentication transactions are performed by the TACACS+ authentication service associated with the associated organization. **c.** ANM appears with the virtual contexts that you included as part of the domain for the RBAC user in Step 3 (the Create an domain for a RBAC user task).

Figure 17-2 Example of Authentication Communication Between ANM and a TACACS+ Server



Configuring a TACACS+ Server for ANM User Authorization

You can configure a TACACS+ server to perform remote authorization of ANM users by configuring the authorization settings on the AAA server, which includes a unique ANM identifier, user role, and domain information. After you configure the TACACS+ server and ANM for remote authorization, when ANM authorizes a user, it sends an authorization request to the TACACS+ server, which returns with the names of the role and domains that are assigned to the user and defined on ANM.

Guidelines and Restrictions

This topic includes the following guidelines and restrictions:

- You can configure ANM remote authorization on a TACACS+ server only. This feature is not available for AD/LDAPS or RADIUS.
- Cisco has approved the use of Cisco Secure Access Control System (ACS) only for remote authorization (Cisco has not approved the use of other TACACS+ servers for this purpose). The Cisco Secure ACS can accept an authorization request and send the following attribute in the request:

  ANM_UniqueID=*RoleName*<space>*Domain1*<space>*Domain2* . . .

  ANM/IP should be used as the TACACS_Service/TACACS_Protocol pair for an authorization request and response.
- You configure the user authorization attributes on the TACACS+ server using the following format:

  ANM_UniqueID=*RoleName*<space>*Domain1*<space>*Domain2* . . .

The number of characters allowed for the ANM identifier, role, and domain information is limited to 160 characters, including spaces. You can use additional characters by adding a new ANM Unique ID entry for domain attributes as follows:

ANM_UniqueID_1=RoleName<space>*Domain1*<space>*Domain2*

ANM_UniqueID_2=Domain3<space>*Domain4*

ANM_UniqueID_3=Domain5

You must assign a different ANM identifier to each entry. Make sure that you configure the ANM organization with each ANM unique ID (see the "Adding a New Organization" section on page 17-41).

- You can define user authorization at the user level, user group level, or both. We recommend configuring authorization at the user group level, which allows you to assign a common set of authorization attributes to multiple users. When you configure the authorization attributes at both the user level and user group level, the user attributes take precedence over user group attributes. The procedure in this section includes all three configuration options.
- You can configure ANM to revert to local user authorization if the TACACS+ server becomes unavailable (see the "Adding a New Organization" section on page 17-41).

Prerequisites

ANM has a user organization that is configured for remote authorization (see the "Adding a New Organization" section on page 17-41).

Note This procedure describes only the ANM-specific attributes for creating user groups and users on Cisco Secure ACS. For information about configuring the other attributes, see the *User Guide for Cisco Secure Access Control Server* located on Cisco.com.

Procedure

Step 1 From the Cisco Secure ACS HTML GUI, configure the interface as follows:

a. From the side menu bar, click **Interface Configuration**.

The Interface Configuration window appears.

b. From the Advanced Options pane of the Interface Configuration window, check the **Per-user TACACS+/RADIUS Attributes** check box and click **Submit**.

c. From the New Services pane of the Interface Configuration window, check the **Service** and **Protocol** check boxes and add a new service as follows:

- In the Service text box, enter **ANM**.
- In the Protocol text box, enter **IP**.

d. Click **Submit**.

Step 2 Do one of the following:

- Configure a user group for the users that you create—Go to Step 3.
- Configure a user only—Skip to Step 4.

Step 3 To configure a user group, do the following:

a. From the side menu bar, click **Group Setup**.

The Group Setup window appears.

b. From the Group Setup window, create a user group and set the following ANM attributes:

- Check the **ANM IP service** check box.
- Check the **Custom attributes** check box and enter the ANM unique identifier followed by the role and domain names as a name/value pair (NV Pair) in the Custom Attributes pane using the following format:

  ANM_UniqueID=*RoleName*<space>*Domain1*<space>*Domain2* . . .

  For example:

  ```
  ANM=Role1 Domain1 Domain2 Domain6
  ```

  The *ANM_UniqueID* variable must match the ANM unique ID that you configured in the ANM organization on ANM (see the "Adding a New Organization" section on page 17-41). This line cannot exceed 160 characters. If you need to use more that 160 characters, add another ANM Unique ID entry to specify the domains associated with the role specified in the first entry (for details, see this topic's Guidelines and Restrictions).

c. Click **Submit**.

The user group is now ready for adding users (go to Step 4).

Step 4 Create a user as follows:

a. From the side menu bar, click **User Setup**.

The User Setup window appears.

b. To assign the user to the user group that you created in Step 3, from the User Setup window, choose the group from the following drop-down list: Group to which the user is assigned.

Skip this step if the user is not to be included in a user group.

c. Configure the ANM-specific attributes. Perform this step for either of the following reasons; otherwise, skip this step:

- The user is not to be included in a user group.
- The user is included in a user group but requires different authorization attributes (user attributes have precedence over user group attributes).

To configure the ANM-specific attributes, from the User Setup window, do the following:

- Check the **ANM IP service** check box.
- Check the **Custom attributes** check box, enter the ANM unique ID and role and domain names as NV Pair in the Custom Attributes pane using the following format:

  ANM_UniqueID=*RoleName*<space>*Domain1*<space>*Domain2* . . .

  For example:

  ```
  ANM=Role1 Domain1 Domain2 Domain6
  ```

  The *ANM_UniqueID* variable must match the ANM Unique ID that you configured in the ANM organization (see the "Adding a New Organization" section on page 17-41). This line cannot exceed 160 characters. If you need to use more that 160 characters, add another ANM Unique ID entry to specify the domains associated with the role (for details, see this topic's Guidelines and Restrictions):

d. Click **Submit**.

Related Topics

- Managing User Roles, page 17-54
- Managing Domains, page 17-61
- Adding a New Organization, page 17-41
- Authenticating ANM Users with an AAA Server, page 17-66

Managing ANM

When you choose **Admin >** ANM **Management**, you can display the following information:

- ANM—Allows you to check the status of your ACE. See Checking the Status of the ANM Server, page 17-75.
- License Management—Displays the ANM license information. See Using ANM License Manager to Manage ANM Server or Demo Licenses, page 17-79.
- Statistics—Displays the ANM server statistics. See Displaying ANM Server Statistics, page 17-81.
- Statistics Collection—Allows you to enable or disable ANM server statistic collection. See Configuring ANM Statistics Collection, page 17-81.
- Audit Log Settings—Allows you to determine how long audit log records are kept. See Configuring Audit Log Settings, page 17-82.
- Change Audit Log—Displays ANM server logs. See Displaying Change Audit Logs, page 17-85.
- Auto Sync Settings—Allows you to allow ANM to automatically sync with CLI when it detects out of band changes between itself and the ACE. See Configuring Auto Sync Settings, page 17-85.
- Advanced Settings—Allows you to set the following advanced settings for ANM:
  - Enable or disable overwrite of the ACE logging device-id while setting up syslog for autosync using Config > Devices > Setup Syslog for Autosync.
  - Enable or disable write memory on a Config > Operations configuration.
  - Enable features for displaying details about real servers or server farms.

  See Configuring Advanced Settings, page 17-86.
- Virtual Center Plugin Registration—Allows you register the ANM plugin to integrate ANM in a VMware virtual data center environment. See Appendix B, "Using the ANM Plug-In With Virtual Data Centers."

Checking the Status of the ANM Server

Note Your user role determines whether you can use this option.

You can check if ANM has a backup server and to view the server status.

The ANM server can be configured as either of the following:

- A non-HA ANM. The non-HA ANM consists of only one host and is referred to as a standalone ANM.
- An HA (high availability or fault-tolerant) ANM, which consists of two hosts: an active ANM and a standby ANM. An HA ANM has a virtual IP address that is always assigned to the active ANM. Users log into this virtual IP address—they never log into the real IP addresses of the hosts. In addition, an HA ANM has a secondary NIC and IP address on each host over which “heartbeat” messages are used to arbitrate which host is active and which is standby.

Procedure

Step 1 Choose **Admin >** ANM **Management >** ANM.

The ANM Server status window appears. This window contains the following information:

Table 17-11 ANM Server Status Information

Field	Description
HA Replication State	HA replication state as follows: • OK—This is an HA ANM and is running properly. • Standalone—This is a non-HA ANM; therefore, the HA attributes and operations are not meaningful. • Stopped—This is HA ANM and this state indicates that the active ANM is copying its entire database contents to the standby ANM. This normally happens when the standby ANM initially starts up or it has been stopped and restarted later. This process normally takes a few seconds to a few minutes depending on the size of the ANM configuration data and monitoring data. During this time, the active ANM cannot be stopped, restarted, or failover. • Failed—This is an HA ANM and database replication cannot proceed. Most likely this is because the standby ANM is unresponsive or is unreachable.
Version	Version of the ANM software.
Build Number and Build Timestamp	Build identification information.
Time Server Started	Date and time the ANM server started.
Virtual IP Address	Virtual IP address that associates with the active host. This IP address must be on the same subnet as the primary IP addresses of both Node 1 and Node 2.
Active Name	Name of Node 1, which can be displayed by issuing the **uname -n** command on the host.
Active IP	IP address used by Node 1 for normal (non-heartbeat related) communication. This IP address must be on the same subnet as the primary address for Node 2.
Active Heartbeat IP	IP address associated with the crossover network interface for Node 1. This IP address must be on the same subnet as the Heartbeat IP address for Node 2.
Standby Name	Name of Node 2, which can be returned by issuing the **uname -n** command on the host.
Standby IP	IP address used by Node 2 for normal (non-heartbeat related) communication. This IP address must be on the same subnet as the primary IP address for Node 1.
Standby Heartbeat IP	IP address associated with the crossover network interface for Node 2. This IP address must be on the same subnet as the Heartbeat IP address for Node 1.

Table 17-11 ANM Server Status Information (continued)

Field	Description
License Server State	License server state as follows: • OK—There is a valid license on the host. • Invalid—The host either contains an invalid license or there is no license present. • Unknown—It is not possible to communicate with the host's license manager, therefore, the license state is unknown. **Note** The Unknown and Invalid states will not display for the active (local) ANM. If the standby ANM has an Invalid license state, you should install a valid license. If the standby ANM has an Unknown license state, check that the standby ANM has been installed correctly. • DEMO—Used for the demonstration purposes. It lasts for 30, 60, or 90 days from the issue day of the license. It allows you to use all features.
Standby License Server State	Standby license server state as follows: • OK—There is a valid license on Node 2. • Invalid—Node 2 either contains an invalid license or there is no license present. • Unknown—It is not possible to communicate with the license manager on Node 2, therefore, the license state is unknown. **Note** The Unknown and Invalid states will not display for the active (local) ANM. If the standby ANM has an Invalid license state, you should install a valid license. If the standby ANM has an Unknown license state, check that the standby ANM has been installed correctly. • DEMO—Used for the demonstration purposes. It lasts for 30, 60, or 90 days from the issue day of the license. It allows you to use all features.

Related Topics

- Using ANM License Manager to Manage ANM Server or Demo Licenses, page 17-79
- Displaying ANM Server Statistics, page 17-81
- Configuring ANM Statistics Collection, page 17-81

Using ANM License Manager to Manage ANM Server or Demo Licenses

This section describes how to use the ANM License Manager feature to manage to the ANM license required to enable full functionality of the software.

Note Your user role determines whether you can use this option.

Table 17-12 describes the available ANM licenses and their purpose.

Table 17-12 ANM License Descriptions

License Name	Description
ANM-DEMO or DEMO	Used for demonstration purposes. It lasts for 90 days from the issue day of the license and allows you to use all features.
ANM-SERVER-40-K9	Used to allow access to the ANM server. Beginning with ANM 4.1, ANM does not perform a license version number check; it will accept any version ANM license.

ANM licenses are available at no charge. When you install the ANM software, you also need to install an ANM license from the command line before you can access ANM. See the *Installation Guide for Cisco Application Networking Manager 4.2* or the *Installation Guide for the Cisco Application Networking Manager 4.2 Virtual Appliance* for instructions.

Note ANM uses TCP port 10444 for the ANM License Manager. For other port numbers, see Appendix A, "ANM Ports Reference."

This topic contains the following tasks:

- Displaying and Adding ANM Licenses to License Management, page 17-79
- Removing an ANM License File, page 17-80

Displaying and Adding ANM Licenses to License Management

Note Your user role determines whether you can use this option.

This procedure shows how to add a license to the license manager. You need to add a license when you convert from a demo license to an ANM server license.

Procedure

Step 1 Choose **Admin** > ANM **Management** > **License Management**.

The Licenses table appears. Table 17-13 describes the contents of this table.

Table 17-13 License Files

Field	Description
File Name	The name of the ANM server or demo license file that you have installed on the ANM host.
Install Status	Status of the license file. Any licensing errors display here. If errors display, see Removing an ANM License File, page 17-80 for details on how to remove this file and import a working file.

Step 2 To add new license, from the Licenses table, click **Add**

The New License window appears.

Step 3 In the New License window, click **Browse** to locate the new license name.

Use the browser to choose the license file.

Step 4 Click **Upload** to install the license you added onto the ANM Server or **Cancel** to exit.

The license file appears in the License Files table.

From the License Files table you can see the Install Status of the license file and if there are any errors.

Related Topics

- ANM Licenses, page 1-5
- Using ANM License Manager to Manage ANM Server or Demo Licenses, page 17-79
- Removing an ANM License File, page 17-80
- Managing ACE Licenses, page 5-34

Removing an ANM License File

If your license file does not work in ANM due to file errors, you need to remove it from the ANM host and request another license file from Cisco. There is no ANM GUI remove license command. You must remove the license from the operating system by deleting the file.

Procedure

Step 1 Log in as the root user.

Step 2 To remove the license file, enter the following:

rm /opt/CSCOanm/etc/license/<ANM_LICENSE_FILE>

The license file is removed from the ANM host.

Step 3 Restart ANM to allow it to update the licenses table data.

To restart ANM, see instructions in the *Installation Guide for Cisco Application Networking Manager 4.2*.

To request another license from Cisco to replace the one that had errors, open a service request using the TAC Service Request Tool or call the Technical Assistance Center. Then add the license into ANM.

Related Topics

- Using ANM License Manager to Manage ANM Server or Demo Licenses, page 17-79
- Displaying and Adding ANM Licenses to License Management, page 17-79
- ANM Licenses, page 1-5

Displaying ANM Server Statistics

You can display ANM statistics (for example, CPU, disk, and memory usage on the ACE).

Procedure

Step 1 Choose **Admin** > ANM **Management** > **Statistics**.

The statistics viewer displays the fields in Table 17-14.

Table 17-14 ACE Server Statistics

Name	Description
Owner	Process where statistics are collected.
Statistic	Statistical information, includes the following: • CPU Usage—Overall ACE CPU busy percentage in the last 5-minute period. • Disk Usage—Amount of disk space being used by the ANM server or ACE device. • Memory Usage—Amount of memory being used by the ANM server or ACE hardware. • Process Uptime—Amount of time since this system was last initialized, or the amount of time since the network management portion of the system was last reinitialized.
Value	Value of the statistic.
Description	Information that the statistic gathered.

Related Topics

- Checking the Status of the ANM Server, page 17-75
- Configuring ANM Statistics Collection, page 17-81

Configuring ANM Statistics Collection

You can enable ACE server statistics polling.

Procedure

Step 1 Choose **Admin** > ANM **Management** > **Statistics Collection**.

The Primary Attributes configuration window appears.

Step 2 In the Polling Stats field, click **Enable** to start background polling or **Disable** to stop background polling.

Step 3 In the Background Polling Interval field, choose the polling interval appropriate for your networking environment.

Step 4 Click **Deploy Now** to save your entries.

Related Topics

- Displaying ANM Server Statistics, page 17-81
- Checking the Status of the ANM Server, page 17-75

Configuring Audit Log Settings

You can determine how long audit logs are kept in the database.

Audit Log Purge Settings allow you to specify the following:

- How many days the log records in the database will be kept (default is 31).
- The maximum of log records that will be stored in the ANM database (default 100,000).

Audit Log File Purge Settings allows you to specify the following:

- The number of days worth of log record files that will be stored in the ANM database (default 31 days).
- The number of daily rolling files that will be stored in the ANM database (default 10 files each day, allowable file size is 2 Megabytes and is not configurable).

Procedure

Step 1 Choose **Admin >** ANM **Management > Audit Log Settings**.

The Audit Log Settings configuration window appears. Audit Log Purge Settings fields let you determine whether audit log table entries will be deleted after a certain number of days (default is 31 days) or after the table entries reach a certain size (default is 100 entries).

Step 2 Enter the greatest number of days that you would like entries to be retained in the **Number of Days** field.

Step 3 Enter the maximum amount of log records to be stored in the ANM database in the audit log tables in the **Number of Entries (Thousand)** field (default 100,000).

Audit Log File Purge Settings fields let you determine whether to retain log files according by age (default is 31 days) or by amount saved in a given day (default is 10 entries).

Step 4 Enter the greatest number of days that you would like entries to be retained in **Number of Days** field.

Step 5 Enter the greatest number of log files that you would like retained in the **Number of Daily Rolling Log Files** field.

Step 6 Do one of the following:

- Click **Reset to Default** to erase changes and restore the default values.
- Click **Save Now** to save your entries.

Related Topics

- Configuring Audit Log Settings, page 17-82
- Performing Device Audit Trail Logging, page 17-83
- Displaying Change Audit Logs, page 17-85

Performing Device Audit Trail Logging

Certain configuration and deployment changes are logged in the ANM database and available for displaying according to your role, which is restricted by ACE module or ACE appliance virtual context as established by RBAC. Log files are located /var/lib/anm/events/*date*/audit, where *date* is in YYYYMMDD format (for example, 20091109 for November 9, 2009).

The following changes will be logged in ANM:

- Configuration deployments to devices
- Device or virtual context synchronization operations
- Device or virtual context import and deletions
- Creation/updates/deletion of the to-be-deployed later by the virtual server

Procedure

Step 1 Choose **Config >** *device(s) to view* **> Device Audit**.

ANM displays all operations described above on the specified devices. See Table 17-15 for a description of the displayed information, some of which is extracted from the syslog.

You can sort information in the table by clicking on a column heading, adjust the viewable time range using the drop-down list, and export the table for reporting and troubleshooting purposes.

Table 17-15 Config > Device Audit Fields

Field	Description
Time	ANM server timestamp when the action is complete.
Client IP	Source IP address initiating action.
User	Email address in the following format: *username@organization name* for example, admin@cisco.com.
Device	Device or ACE virtual context target of user action.
Action	The action name of the operation, including the following: • add staging object • allocate vlan • change credential • create • create vc • create vc-template • create-vip • delete • delete-vip • deploy staging object • disable polling • enable polling • export-certificate-key • generate-csr • import device • import-certificate-key • import module • remove device • remove vc • restart monitoring • syncup config • syslog-setup • unmanage module • update • update staging object • update-vip
Target	Name of the target configuration object (for example, Serverfarm sf1).

Table 17-15 Config > Device Audit Fields (continued)

Field	Description
Status	Indicates whether operation succeeded or not.
Detail	CLI commands sent to the device and/or error messages.[1]

1. If the detail column contains more than approximately 4KB of CLI commands, the data will appear truncated, and not display properly.

Related Topics

- Configuring Audit Log Settings, page 17-82
- Displaying Change Audit Logs, page 17-85

Displaying Change Audit Logs

You can display ANM change audit logs for example, user login attempts, create/update/delete objects such as RBAC, Global Resource Class, Credential, device group, and threshold setting. Any key or change related activities to the ANM server will be logged and viewed according to your role.

To display the change audit logs, choose **Admin >** ANM **Management > ANM Change Audit Log**. The audit log displays the fields in Table 17-16.

Table 17-16 Server Audit Log

Name	Description
Time	Server time stamp when user action is complete.
Client IP	IP address where action originated.
User	Email address in the following format: *username@organization name* for example, admin@cisco.com.
Message	Boilerplate text descriptive of action taken, usually self-explanatory (for example “User authentication succeeded.”

Related Topics

- Performing Device Audit Trail Logging, page 17-83
- Checking the Status of the ANM Server, page 17-75
- Configuring Audit Log Settings, page 17-82

Configuring Auto Sync Settings

You can configure ANM server auto sync settings.

Procedure

Step 1 Choose **Admin >** ANM **Management > ANM Auto Sync Settings**.

The Setup ANM Auto-Sync Settings window appears.

Step 2 In the ANM Auto-Sync field of the Setup ANM Auto-Sync Settings window, do one of the following:

- Click **Enable** to have the ANM server automatically sync with ACE CLI when it detects out of band changes.
- Click **Disable** to have the ANM server warn but not take independent action when it detects out of band changes between the server and ACE CLI.

Step 3 In the Polling Interval field, choose the polling interval you want the ANM server to employ.

Step 4 Click **OK** to save your entries.

Related Topic

Synchronizing Virtual Context Configurations, page 5-98

Configuring Advanced Settings

This section discusses the Advanced Settings window.

This section includes the following topic:

Configuring the Overwrite ACE Logging device-id for the Syslog Option

Yo can overwrite the ACE logging device-id.

By default, ANM Autosync relies on the ACE logging device-id to be of type “String.” A device-id setting adds explicit information that is appended to the syslog message and is used by ANM to identify the source of a syslog message. If you configure ANM to manage syslog settings for Autosync on a virtual context (Config > Devices > Setup Syslog for Autosync) and the logging device-id is defined as something other than type “String” for the context, the operation fails and ANM displays “Syslog device is already configured for other purpose.”

You can instruct ANM to overwrite the ACE logging device-id when you enable the synchronization of syslog messages setup of syslog for Autosync from the ACE. If any of the contexts that you are trying to set up a syslog the syslog for Autosync has a device-id setup for a type other than string, ANM will override the device-id with the ANM preferred string.

Procedure

Step 1 Choose **Admin > ANM Management > Advanced Settings**.

The Advanced Settings configuration window appears.

Step 2 In the Overwrite ACE Logging Device ID field of the Advanced Settings configuration window, do one of the following:

- Click **Enable** to overwrite the logging device-id during Setup Syslog for Autosync.

- Click **Disable** to prevent overwriting the existing logging device-id if it has been previously set up with a type other than string. If the selected context from Setup Syslog for Autosync already has a device-id that is set up with a type other than string, then the operation reports an error and ANM does not overwrite this setting. This is the default setting.

Step 3 Click **OK** to accept your entries on the Advanced Settings configuration window.

Related Topic

Enabling a Setup Syslog for Autosync for Use With an ACE, page 4-25

Configuring the Enable Write Mem on the Config > Operations Option

You can configure the Enable Write Mem on the Config > Operations feature.

By default, ANM initiates a **write memory** command action after you activate or suspend changes on the ACE, CSM, or CSS through the different ANM Operations Pages (Config > Operations). In certain situations, such as those that involve large configurations, a **write memory** action can take an extended period of time to complete. In this case, the ANM GUI may time out. If a **write memory** action is not performed before a device reload occurs, the changes will be lost. You can instruct ANM to enable or disable write memory on a Config > Operations configuration.

Note The **write memory** command is the same as the **copy running-config startup-config** command; both commands save changes to the configuration.

Note The CSS Expert mode must be disabled if you wish to disable the Write Mem on Config > Operations feature. The Expert mode allows you to turn the CSS confirmation capability on or off; turning Expert mode on disables the CSS from prompting for confirmation when configuration changes are made. If Expert mode is enabled on the CSS, this function will cause the CSS to perform an implicit write memory action after each operational change.

Procedure

Step 1 Choose **Admin > ANM Management > Advanced Settings**.

The Advanced Settings configuration window appears.

Step 2 In the Enable Write Mem on Config > Operations field of the Advanced Settings configuration window, do one of the following:

- Click **Enable** to instruct ANM to activate the write memory action on the Config > Operations window. This is the default.
- Click **Disable** to deactivate the write memory action on the Config > Operations window. This option will require you to periodically access the CLI for the ACE context, the CSM, or the CSS and enter the **write memory** command to commit the change to the startup-configuration file.

Step 3 Click **OK** to accept your entries on the Advanced Settings configuration window.

Enabling the ACE Real Server Details Pop-up Window Option

You can enable the ACE real server Details pop-up window option that displays real server details by issuing the **show rserver detail** command to the selected ACE in the real servers operation window (Config > Operations > Real Servers). This top level real server **show** command displays information that includes total statistics about every serverfarm real server associated with the selected rserver. The ACE real server Details pop-up window feature is disabled by default.

Caution When you enable the ACE real server Details pop-up window option, the information that displays in the Details pop-up window may exceed the RBAC restrictions assigned to the user.

The following example shows how enabling the ACE real server Details pop-up window option in ANM can display information that may exceed the RBAC restrictions assigned to a user. In the following CLI example, the ACE displays information for rbac-test:80 and rbac-test:443 in response to the **show rserver rbac-test detail** command:

```
switch/Admin# sh rserver rbac-test detail

rserver              : rbac-test, type: HOST
state                : OUTOFSERVICE
---------------------------------
                                                  ----------connections-----------
      real                  weight state          current    total
  ---+--------------------+------+------------+----------+--------------------
  serverfarm: sf-rbac-test
      0.0.0.0:80            8      OUTOFSERVICE 0          0
  serverfarm: sf1-rbac-test
      0.0.0.0:443           8      OUTOFSERVICE 0          0
switch/Admin(config-sfarm-host-rs)#
```

When you enable the Details option in ANM, the pop-up window displays the same information even if the user requesting the information is configured in ANM to have access to rbac-test:80 only.

Procedure

Step 1 Choose **Admin > ANM Management > Advanced Settings**.

The Advanced Settings configuration window appears.

Step 2 In the Enable Details pop-up window for Config > Operations > Real Servers field of the Advanced Settings configuration window, do one of the following:

- Click **Enable** to enable the ACE real server Details pop-up window option.
- Click **Disable** to disable the ACE real server Details pop-up window option. This is the default.

Step 3 Click **OK** to accept your entries on the Advanced Settings configuration window.

Related Topic

"Displaying Real Servers" section on page 7-12

Enabling the ACE Server Farm Details Pop-up Window Option for Virtual Servers

You can enable the ACE Server Farm Details pop-up window option that displays details about the server farms associated with a virtual server. When you enable this feature, the server farms listed in the virtual servers operation window (Config > Operations > Virtual Servers) become hyperlinks that open a pop-up details window. When you click a server farm associated with a virtual server, ANM issues the **show serverfarm detail** command to the ACE and displays the command output in the pop-up window.

This top level virtual server **show** command displays information that includes statistical information related to the real servers associated with the server farm. The ACE Server Farm Details pop-up window feature is disabled by default.

Caution When you enable the ACE Server Farm Details pop-up window option, the information that displays in the pop-up window may exceed the RBAC restrictions assigned to the user. For example, information related to real severs that a user is not permitted to access may display.

The following is an example of the **show serverfarm test-sf detail** command output:

```
serverfarm     : test-sf, type: REDIRECT
 total rservers : 1
 active rservers: 0
 description    : -
 state          : INACTIVE
 predictor      : ROUNDROBIN
 failaction     : -
 back-inservice    : 0
 partial-threshold : 0
 num times failover       : 0
 num times back inservice : 0
 total conn-dropcount : 0
 ---------------------------------
                                                 ----------connections-----------
      real                  weight state        current    total      failures
  ---+--------------------+------+------------+----------+----------+---------
  rserver: anm-vm-119
      0.0.0.0:0             8      OUTOFSERVICE 0          0          0
        description          : -
        max-conns            : -         , out-of-rotation count : -
        min-conns            : -
        conn-rate-limit      : -         , out-of-rotation count : -
        bandwidth-rate-limit : -         , out-of-rotation count : -
        retcode out-of-rotation count : -
```

Procedure

Step 1 Choose **Admin > ANM Management > Advanced Settings**.

The Advanced Settings configuration window appears.

Step 2 In the Enable Details pop-up window for Config > Operations > Virtual Servers field of the Advanced Settings configuration window, do one of the following:

- Click **Enable** to enable the ACE Server Farm Details pop-up window option.
- Click **Disable** to disable the ACE Server Farm Details pop-up window option. This is the default.

Step 3 Click **OK** to accept your entries on the Advanced Settings configuration window.

Related Topic

"Displaying Virtual Servers" section on page 6-72

Lifeline Management

You can use the troubleshooting and diagnostics tools provided by the Lifeline feature to report a critical problem to the Cisco support line and generate a diagnostic package. For more information about this feature, see the "Using Lifeline" section on page 18-7.