



CHAPTER 16

Using Configuration Building Blocks

Date: 12/23/11



Note

Beginning with ANM software Version 5.1, the building block feature by default is hidden. If you have used the building block feature in the past and want to continue using it after upgrading to ANM 5.1, you must enable it (see the [“Enabling the Building Block Feature”](#) section on page 16-5).



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.

Building blocks allow authorized users to create and design reusable configuration attributes which can then be applied to virtual contexts. The ANM also allows you to extract the configuration of an existing virtual context and tag it as a building block.

In many cases, the same configuration settings can be used in several virtual contexts (for example, it can offer the same service bundle to many customers). To avoid repeating virtual context configuration and testing each time you create a virtual context, you can create a building block of many configuration attributes that can be applied to virtual contexts as appropriate or as needed.

With building blocks, you can also create a variety of configurations that address customers' differing needs. The ability to customize configurations to customer needs also allows you to use network resources most efficiently.

Benefits of configuration building blocks include:

- You can establish baseline versions of working configurations.
- Users can make real-time changes to configurations and roll back to a previously working configuration, if needed.
- Building blocks can be extracted from proven, working configurations.
- Building blocks can be placed under version control, with tagged versions that cannot be modified.

Table 16-1 lists the configuration options that are available for each building block type and provides links to related topics. For descriptive information about the menu options, see “Configuring Virtual Contexts” section on page 6-8.

Table 16-1 Building Block Configuration Options

Menu Option	Building Block Type		Related Topic
	ACE 2.0	ACE 4710 Appliance	
System			
Primary Attributes	X	X	Configuring Building Block Primary Attributes, page 16-8
Syslog	X	X	Configuring Virtual Context Syslog Settings, page 6-19
SNMP	X	X	Configuring SNMP for Virtual Contexts, page 6-27
Global Policies	X	X	Applying a Policy Map Globally to All VLAN Interfaces, page 6-35
Licenses			
Application Acceleration and Optimization			
Resource Classes			
Checkpoints			
Backup/Restore ¹			
Load Balancing			
Virtual Servers			
Real Servers	X	X	Configuring Real Servers, page 8-5
Server Farms	X	X	Configuring Server Farms, page 8-30
Health Monitoring	X	X	Configuring Health Monitoring for Real Servers, page 8-51
Stickiness	X	X	Configuring Sticky Groups, page 9-7
HTTP Parameter Map	X	X	Configuring HTTP Parameter Maps, page 10-9
Connection Parameter Maps	X	X	Configuring Connection Parameter Maps, page 10-3
Optimization Parameter Maps		X	Configuring Optimization Parameter Maps, page 10-12
Generic Parameter Maps	X	X	Configuring Generic Parameter Maps, page 10-8
RTSP Parameter Maps	X	X	Configuring RTSP Parameter Maps, page 10-20
SIP Parameter Maps	X	X	Configuring SIP Parameter Maps, page 10-21
Skinny Parameter Maps	X	X	Configuring Skinny Parameter Maps, page 10-23
DNS Parameter Maps	X	X	
Secure KAL-AP	X	X	Configuring Secure KAL-AP, page 8-77
SSL			
Setup Sequence			
Certificates			
Keys	X	X	Using SSL Keys, page 11-10

Table 16-1 Building Block Configuration Options (continued)

Menu Option	Building Block Type		Related Topic
	ACE 2.0	ACE 4710 Appliance	
Parameter Maps	X	X	Configuring SSL Parameter Maps, page 11-18
Chain Group Parameters			
CSR Parameters	X	X	Configuring SSL CSR Parameters, page 11-24
Proxy Service			
Auth Group Parameters	X	X	Configuring SSL Authentication Groups, page 11-31
Certificate Revocation Lists (CSL)	X	X	Configuring CRLs for Client Authentication, page 11-33
Security			
ACLs	X	X	Creating ACLs, page 6-79
Object Groups	X	X	Configuring Object Groups, page 6-89
Network			
Port Channel			
Gigabit Ethernet Interfaces			
VLAN Interfaces	X	X	Configuring Virtual Context VLAN Interfaces, page 12-6
BVI Interfaces	X	X	Configuring Virtual Context BVI Interfaces, page 12-19
NAT Pools ²	X		Configuring VLAN Interface NAT Pools, page 12-26
Static Routes	X	X	Configuring Virtual Context Static Routes, page 12-28
Global IP DHCP	X	X	Configuring Global IP DHCP, page 12-29
Static NAT Overwrite	X		Configuring Static VLANs for Over 8000 Static NAT Configurations, page 12-31
High Availability			
Setup			
HA Tracking and Failure Detection			
Interfaces			
Hosts			
HSRP Groups			
Role-Based Access Control			
Users	X	X	Configuring Device RBAC Users, page 5-51
Roles	X	X	Configuring Device RBAC Roles, page 5-54
Domains	X	X	Configuring Device RBAC Domains, page 5-59
Expert			
Class Map	X	X	Configuring Virtual Context Class Maps, page 14-6
Policy Map	X	X	Configuring Virtual Context Policy Maps, page 14-32
HTTP Header Modify Action Lists	X	X	Configuring an HTTP Header Modify Action List, page 14-85

Table 16-1 Building Block Configuration Options (continued)

Menu Option	Building Block Type		Related Topic
	ACE 2.0	ACE 4710 Appliance	
Optimization Action Lists		X	Configuring an HTTP Optimization Action List, page 15-3
Building Block Audit			

1. Backup/Restore is only supported for software version A2(3.0) and higher for the ACE module.
2. NAT pools as a selection under Network is only supported for software version A2(3.0) and higher for the ACE module.

This chapter includes the following sections:

- [Information About Building Block Versions and Tagging, page 16-4](#)
- [Enabling the Building Block Feature, page 16-5](#)
- [Creating Building Blocks, page 16-5](#)
- [Extracting Building Blocks from Virtual Contexts, page 16-6](#)
- [Configuring Building Blocks, page 16-7](#)
- [Tagging Building Blocks, page 16-9](#)
- [Applying Building Blocks, page 16-9](#)
- [Displaying Building Block Use, page 16-11](#)

Information About Building Block Versions and Tagging

The ANM maintains version history for the building blocks that you create, design, and tag. You can tag a working building block version at any point during design or configuration, and reuse any tagged version of a building block.

A building block is not available for deployment until it has been *tagged*. When you tag a building block, the ANM publishes it with a version tag, such as 1.0 or 1.1.

You cannot edit tagged versions of a building block. After a building block is tagged, it is “frozen” and can no longer be modified in any way. When you open a tagged building block for editing, the ANM does not modify the tagged version, but instead creates a new working copy of the building block for you to work in. Any changes you make to the working copy are not available for deployment until you tag the building block under a new version tag.

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Using Configuration Building Blocks, page 16-1](#)
- [Creating Building Blocks, page 16-5](#)
- [Extracting Building Blocks from Virtual Contexts, page 16-6](#)
- [Applying Building Blocks, page 16-9](#)
- [Tagging Building Blocks, page 16-9](#)
- [Displaying Building Block Use, page 16-11](#)

Enabling the Building Block Feature

Beginning with ANM software Version 5.1, the building block feature by default is hidden because it has been replaced with the application template feature introduced in the same release. The application template feature provides a more efficient and easier way of configuring ACE devices (see [Chapter 4, “Using Application Template Definitions”](#)). If you have used the building block feature in the past and want to continue using it after upgrading to ANM 5.1, you must enable it.

This procedure shows how to enable the building block feature on ANM server and ANM Virtual Appliance.

Procedure

- Step 1** Enable the building block feature as follows:
- ANM Server—Open the `/opt/CSCOanm/etc/cs-config.properties` file in a text editor and add the following line:
`web.buildingblocks.enable=true`
 - ANM Virtual Appliance—Enter the following command:
`anm-property set web.buildingblocks.enable true`
- Step 2** Restart ANM as follows:
- ANM Server—Enter the following command:
`/opt/CSCOanm/bin/anm-tool restart`
 - ANM Virtual Appliance—Enter the following command:
`anm-tool restart`
- Step 3** From the ANM client devices, close all open ANM browser instances, clear the browser cache, and log in again.

Failure to clear the browser cache after enabling the building block feature can result in the Extract Building Block function buttons not displaying.

Creating Building Blocks

Use this procedure to create a building block without using an existing configuration.

To create a building block from an existing virtual context, see [Extracting Building Blocks from Virtual Contexts, page 16-6](#).

Procedure

- Step 1** Choose **Config > Building Blocks**.
The All Building Blocks table appears.
- Step 2** In the All Building Blocks table, click **Add**.
The New Building Block window appears.
- Step 3** In the Name field of the New Building Block window, enter a unique name for this building block.

- Step 4** In the Type field, choose the type of building block to create:
- **ACE v1.0**—Use with virtual contexts on ACE modules using the specified software version.
 - **ACE v2.0**—Use with virtual contexts on ACE modules using the specified software version.
 - **ACE v2.3**—Use with virtual contexts on ACE modules using the specified software version.
 - **ACE v4.1**—Use with virtual contexts on ACE modules using the specified software version.
 - **ACE v4.2**—Use with virtual contexts on ACE modules using the specified software version.
 - **ACE4710 V 1.0**—Use with virtual contexts on ACE appliances using the specified software version.
 - **ACE4710 V 2.0**—Use with virtual contexts on ACE appliances using the specified software version.
 - **ACE4710 V 4.1**—Use with virtual contexts on ACE appliances using the specified software version.
 - **ACE4710 V 4.2**—Use with virtual contexts on ACE appliances using the specified software version.

See [Table 16-1](#) for a list of the available configuration options for each building block type.

Step 5 In the Description field, enter a brief description for this building block.

Step 6 Do one of the following:

- Click **Save** to save your entries and to continue with building block configuration. The Primary Attributes configuration window appears.
- Click **Cancel** to exit this procedure without saving your entries and to return to the All Building Blocks table.
- Click **Tag** to save your entries and tag the building block. After you tag a building block, the window refreshes and provides fields for applying the building block. For more information, see [Applying Building Blocks, page 16-9](#).

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Using Configuration Building Blocks, page 16-1](#)
- [Extracting Building Blocks from Virtual Contexts, page 16-6](#)
- [Information About Building Block Versions and Tagging, page 16-4](#)
- [Applying Building Blocks, page 16-9](#)
- [Tagging Building Blocks, page 16-9](#)
- [Displaying Building Block Use, page 16-11](#)

Extracting Building Blocks from Virtual Contexts

An alternative to creating a new configuration building block and configuring each attribute individually is to extract a configuration building block from an existing virtual context. By extracting a building block from a virtual context, you can reduce the time you spend configuring and testing the configuration.

Use this procedure to create a working building block from a virtual context configuration.

Procedure

- Step 1** Choose **Config > Devices**.
The device tree appears.
- Step 2** In the device tree, choose the ACE with the virtual context whose configuration you want to use as a building block.
The Virtual Contexts table appears.
- Step 3** In the Virtual Contexts table, choose the context with the configuration that you want to extract, and click **Extract Building Block**.
A popup window appears, asking for a building block name.
- Step 4** In the Name field of the popup window, enter a name for this building block, and click **OK**. The window refreshes with the Primary Attributes window for the newly created building block (Config > Global > *building_block*).
- Step 5** Modify the building block as desired using the information in [Table 16-1](#), or tag and deploy it as described in “[Tagging Building Blocks](#)” section on page 16-9 and “[Applying Building Blocks](#)” section on page 16-9).
-

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Applying Building Blocks, page 16-9](#)
- [Tagging Building Blocks, page 16-9](#)
- [Displaying Building Block Use, page 16-11](#)

Configuring Building Blocks

You can modify a working version of a configuration building block.



Note You can modify only working versions of building blocks; you cannot modify tagged versions of building blocks. If you select a tagged building block version, and then select a configuration option (such as **Load Balancing > Health Monitoring**), you can view the entries for that tagged version, but you cannot modify them.

Procedure

- Step 1** Choose **Config > Building Blocks**.
The All Building Blocks table appears.
- Step 2** Choose the working version of the building block that you want to modify, then choose the attributes that you want to configure. For information about building block configuration options, see [Table 16-1](#).



Note While it is possible to configure VLAN and BVI interfaces in a building block, we recommend that you do not do so. Applying a building block with these attributes configured to a virtual context with different settings can disrupt network traffic.

Step 3 To apply this building block, tag it, and deploy it as described in “[Tagging Building Blocks](#)” section on page 16-9 and “[Applying Building Blocks](#)” section on page 16-9.

Related Topics

- [Enabling the Building Block Feature](#), page 16-5
- [Using Configuration Building Blocks](#), page 16-1
- [Information About Building Block Versions and Tagging](#), page 16-4
- [Creating Building Blocks](#), page 16-5
- [Extracting Building Blocks from Virtual Contexts](#), page 16-6
- [Tagging Building Blocks](#), page 16-9
- [Displaying Building Block Use](#), page 16-11

Configuring Building Block Primary Attributes

Use this procedure to change the description of a configuration building block.

Procedure

-
- Step 1** Choose **Config > Building Blocks**.
- The All Building Blocks table appears.
- Step 2** In the All Building Blocks table, choose the building block that you want to modify, and choose **System > Primary Attributes**.
- The Primary Attributes window appears.
- Step 3** In the Description field of the Primary Attributes window, modify the description as desired.
- Step 4** Do one of the following:
- Click **Save** to save your entries. The window refreshes with the saved information.
 - Click **Tag** to tag the building block. To deploy the tagged building block, see “[Applying Building Blocks](#)” section on page 16-9.
-

Related Topics

- [Enabling the Building Block Feature](#), page 16-5
- [Creating Building Blocks](#), page 16-5
- [Configuring Building Blocks](#), page 16-7
- [Tagging Building Blocks](#), page 16-9

Tagging Building Blocks

You can tag a working copy of a building block. After creating a building block, you must tag it before you can apply it to virtual contexts.

Procedure

Step 1 Choose **Config > Building Blocks**.

The All Building Blocks table appears.

Step 2 In the All Building Blocks table, choose the working copy of the building block that you want to tag, and click **Tag**.

The All Building Blocks table refreshes with the newly tagged building block identified by its version, such as 1.2 or 1.3. A working copy of the building block remains available so that you can use it for future building block versions.

To apply the tagged building block to virtual contexts on your network, see [“Applying Building Blocks” section on page 16-9](#).

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Using Configuration Building Blocks, page 16-1](#)
- [Information About Building Block Versions and Tagging, page 16-4](#)
- [Creating Building Blocks, page 16-5](#)
- [Applying Building Blocks, page 16-9](#)
- [Extracting Building Blocks from Virtual Contexts, page 16-6](#)
- [Displaying Building Block Use, page 16-11](#)

Applying Building Blocks

You can apply building blocks in two ways:

- By selecting a virtual context, then applying the building block. See [“Applying a Building Block to a Single Virtual Context” section on page 16-10](#).
- By selecting the tagged building block, then applying it to one or more virtual contexts. See [“Applying a Building Block to Multiple Virtual Contexts” section on page 16-10](#).

Applying a Building Block to a Single Virtual Context

You can apply a tagged building block to a virtual context using virtual context configuration screens.

**Note**

Before applying a building block to a virtual context, confirm that the VLAN and BVI interfaces are defined correctly for the virtual context. If needed, remove VLAN and BVI interface configuration information from the building block and then apply it.

Procedure

- Step 1** Choose **Config > Devices > All Devices**.
The device tree appears.
- Step 2** Choose the virtual context that you want to apply a building block to, and choose **System > Primary Attributes**.
The Primary Attributes window appears.
- Step 3** In the Tagged Building Block to Apply field, choose the building block you want to apply to the virtual context.
- Step 4** Click **Deploy Now**.

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Applying a Building Block to Multiple Virtual Contexts, page 16-10](#)
- [Using Configuration Building Blocks, page 16-1](#)
- [Information About Building Block Versions and Tagging, page 16-4](#)
- [Extracting Building Blocks from Virtual Contexts, page 16-6](#)
- [Tagging Building Blocks, page 16-9](#)

Applying a Building Block to Multiple Virtual Contexts

You can apply a tagged building block to one or more contexts by using the building block configuration screens.

**Note**

Before applying a building block to a virtual context, confirm that the VLAN and BVI interfaces are defined correctly for the virtual context. If needed, remove VLAN and BVI interface configuration information from the building block and then apply it.

Procedure

- Step 1** Choose **Config > Building Blocks**.
The All Building Blocks table appears.

- Step 2** In the All Building Blocks table, choose the tagged building block that you want to apply to one or more virtual contexts.
- Step 3** Choose **System > Primary Attributes**.
The Primary Attributes configuration window appears.
- Step 4** In the Push Building Block to VCs field of the Primary Attributes configuration window, choose the contexts that you want to apply the building block to in the Available Items list, and click **Add**.
They appear in the Selected Items list.
To remove contexts that you do not want to apply the building block to, choose them in the Selected Items list, then click **Remove**. They items appear in the Available Items list.
- Step 5** Click **Save**. A progress bar reports status and the window refreshes when the operation is complete.
-

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Applying a Building Block to a Single Virtual Context, page 16-10](#)
- [Using Configuration Building Blocks, page 16-1](#)
- [Information About Building Block Versions and Tagging, page 16-4](#)
- [Creating Building Blocks, page 16-5](#)

Displaying Building Block Use

You can identify the virtual contexts using a building block.

Procedure

- Step 1** Choose **Config > Devices**.
The device tree appears.
- Step 2** In the device tree, choose **All VC**.
The Virtual Contexts table appears.
- Step 3** In the Virtual Contexts table, use one of the following methods to display the building blocks being used:
- For a small number of contexts, scan the Building Block column to see which building blocks are in use on virtual contexts.
 - For a large number of contexts, click **Filter**. The window refreshes so that you can enter search criteria. In the field beneath the Building Block column heading, enter a building block name or search string, then click **Go**. The table refreshes with entries that match the search criteria.
-

Related Topics

- [Enabling the Building Block Feature, page 16-5](#)
- [Using Configuration Building Blocks, page 16-1](#)
- [Information About Building Block Versions and Tagging, page 16-4](#)

- [Creating Building Blocks, page 16-5](#)
- [Extracting Building Blocks from Virtual Contexts, page 16-6](#)
- [Tagging Building Blocks, page 16-9](#)