Cisco Wide Area Application Services Quick Configuration Guide

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This document describes how to perform a basic configuration of a Wide Area Application Services (WAAS) network that uses the Web Cache Communication Protocol (WCCP) and has three WAAS devices:

- WAAS Central Manager
- Core Wide Area Application Engine (WAE)
- Edge WAE

The example in this document also shows how to verify that the WAAS application acceleration feature is working properly after you have completed a basic configuration of your WAAS network.

Note If one of the WAE devices that you are configuring is an enhanced network module (NME-WAE) installed in a Cisco access router, you must configure its basic network settings using the access router CLI, not by using the WAAS CLI as described in this document. For details, see the document *Configuring Cisco WAAS Network Modules for Cisco Access Routers*.

Throughout this document, the term WAAS device is used to refer collectively to WAAS Central Managers and WAEs in your network. For detailed command syntax information for any of the CLI commands that are mentioned in this document, see the *Cisco Wide Area Application Services Command Reference*.

This document contains the following sections:

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Autoregistration of WAEs

Autoregistration automatically configures network settings and registers WAEs with WAAS Central Manager. On bootup, devices running the WAAS software (with the exception of the WAAS Central Manager itself) automatically discover WAAS Central Manager and register with it. You do not have to do any manual configuration on the device. Once the WAE is registered, you must approve the device and configure it remotely by using the WAAS Central Manager GUI.

In the example configuration provided in this document, the autoregistration feature is intentionally disabled on the WAEs and you use the setup utility to perform the initial configuration of the device. After you complete the initial configuration of the WAE, you use the WAAS CLI to explicitly configure the WAE to register with a specific WAAS Central Manager.

For more information about the autoregistration feature, see the *Cisco Wide Area Application Services Configuration Guide*.

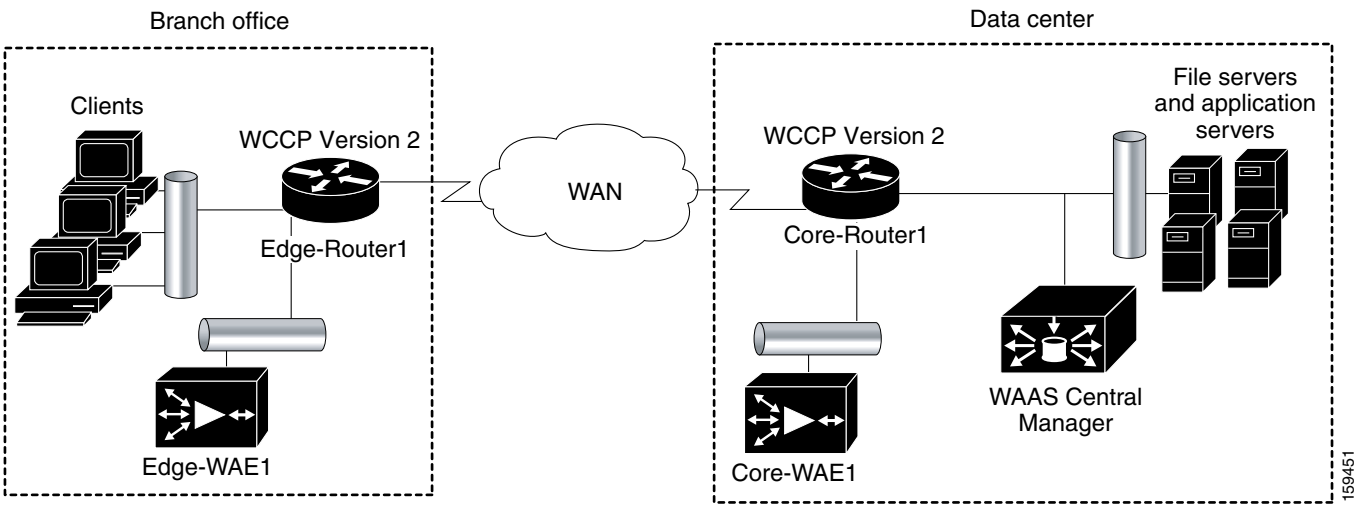
Network Configuration Overview

This section provides an overview of the basic configuration of a WAAS network. It contains the following topics:

Network Configuration Example

The example WAAS network configuration shown in Figure 1 contains one WAAS Central Manager device and two WAEs that will be centrally managed through the WAAS Central Manager device.

Figure 1 WAAS Network Configuration



WAAS Central Manager must run on a dedicated appliance. You should install WAAS Central Manager on a dedicated appliance that is located in your data center so that the WAAS Central Manager device is in the same physical location as your data center's web, file, and application servers.

You should install the Edge WAE in the same branch office as the clients who will be requesting local services (for example, print services) from the Edge WAE.

Summary of the Configuration Process

The following steps summarize the tasks that are required to perform a basic configuration of a WAAS network:

1. Configure the basic network settings and define the primary interface and device mode for each of the WAEs by using the setup utility and the WAAS CLI, beginning with the WAAS Central Manager. Start with the "Configuring the WAAS Central Manager" section on page 5.
2. Configure WCCP Version 2 as the interception method and enable TCP promiscuous mode. See the "Configuring WCCP" section on page 11.
3. Activate the WAEs and enable the predefined application definitions by using the WAAS Central Manager GUI. See the "Activating the WAEs and Enabling Application Acceleration Policies" section on page 16.
4. Verify that the WAAS application acceleration is working properly for HTTP. See the "Verifying Application Acceleration" section on page 19.
5. Change the password for the predefined superuser account. See the "Changing the Administrator Password" section on page 19.

For detailed command syntax information for any of the CLI commands that are mentioned in this document, see the *Cisco Wide Area Application Services Command Reference*.

Checklist for Configuring a WAAS Network

Table 1 specifies the different parameters and data needed to set up and configure the WAAS network. For your convenience, you can enter your values in the table and refer back to it when configuring the WAAS network.

Table 1 Checklist of WAAS Network System Parameters

Parameter	Data Center Values for WAAS Central Manager	Data Center Values for the Core WAE	Branch Office Values for the Edge WAE
Interface speed			
Duplex mode			
IP address			
Subnet mask			
Default gateway			
DNS server 1			
DNS server 2			
DNS domain			
WINS server			
WAAS device (hostname)			
Windows domain controller			
Windows file server(s)			
UNIX file server(s)			
Windows domain			

Configuring the WAAS Network

To perform a basic configuration of a WAAS network that will include one WAAS Central Manager and two WAEs, follow the procedures in the order that they are presented in the following sections:

- Configuring the WAAS Central Manager, page 5
- Configuring the Core WAE, page 7
- Configuring the Edge WAE, page 9
- Configuring WCCP, page 11
- Activating the WAEs and Enabling Application Acceleration Policies, page 16
- Verifying Application Acceleration, page 19
- Changing the Administrator Password, page 19

Configuring the WAAS Central Manager

To install and configure the WAAS Central Manager device, follow these steps:

Step 1 In the data center, unpack and connect the first WAAS device that you want to configure as the WAAS Central Manager device. You must set the port to which the WAE is connected to full duplex. For hardware installation instructions, refer to the hardware installation guide for the WAAS device.

Step 2 Power up the first WAAS device in the data center and open a console connection to configure the basic device network settings (see Table 1) for the WAE.

Note If you are connecting to the WAAS device using a PC as the console, the PC must have terminal emulation software installed. The terminal emulation software should be configured with the following parameters: 9600 baud, 8 data bits, no parity bits, and 1 stop bit.

You must use a console connection rather than a Telnet session for the initial configuration of these basic device network settings on the WAE. Once you have used a console connection to define the device network settings, you can use a Telnet session for subsequent CLI sessions. By default, the Telnet service is enabled on a WAAS device.

Step 3 When a WAAS device boots, you are prompted to run the first-time setup utility (enter basic configuration), which you use to set up the basic device network settings for the WAE. When prompted, enter **y**.

The configuration prompt waits several seconds before proceeding with the WAE boot sequence.

Note If you do not enter **y** in time to enter basic configuration, you will need to log into the WAAS device through the terminal console and run the **setup** EXEC CLI command to manually invoke the setup utility.

Step 4 Enter the required information as prompted by the setup utility. For example, enter the number of the interface that you want to configure on the WAAS device.

```
Please choose an interface to configure from the following list:
1: GigabitEthernet 1/0
2: GigabitEthernet 2/0

Enter choice:

Press the ESC key at any time to quit this session
Enter choice: 1

Do you want to enable DHCP on this interface (y/n) [n]:
```

If you have Dynamic Host Control Protocol enabled in your network, enable DHCP on the WAAS device interface by answering yes (**y**). If you do not have DHCP enabled in your network, answer no (**n**). No is the default.

```
Do you want to enable DHCP on this interface (y/n) [n]:y

Do you want to apply the configurations (y/n) [y]:
```

Apply the interface configuration on the WAAS device.

```
Do you want to apply the configurations (y/n) [y]:y
```

Step 5 Continue to answer the questions displayed in the setup utility until your basic network configuration is complete on the WAAS device.

When finished, you see a summary of the information that you entered. Write down the IP address for future reference. You will need the IP address of the WAAS Central Manager device to launch the WAAS Central Manager GUI, which you will use later in the "Activating the WAEs and Enabling Application Acceleration Policies" section on page 16.

Step 6 Accept the changes when prompted. Once you accept the changes, the device is visible on the network, and it can be pinged.

Step 7 After specifying the basic network parameters for the designated WAAS Central Manager, assign it a primary interface, specify its device mode as central-manager, save the configuration, and then reload the system so that the new configuration will take effect.

```
waas-cm# configure terminal
waas-cm(config)#
waas-cm(config)# primary-interface gigabitEthernet 1/0
waas-cm(config)# device mode central-manager
waas-cm(config)# exit
waas-cm# copy run start
waas-cm# reload
Proceed with reload?[confirm] y
Shutting down all services, will Reload requested by CLI@ttyS0.
Restarting system.
```

The system reboots and the WAAS Central Manager configuration that you just configured is loaded on the WAAS device named waas-cm, which has now been designated as a WAAS Central Manager.

Step 8 When prompted, enter the administrator username and password and press **Enter**.

```
Username: admin
Password:
System Initialization Finished.
```

Step 9 Specify that this device is to function as the primary WAAS Central Manager.

```
waas-cm(config)# central-manager role primary
```

Step 10 Create and initialize the management database and enable the management services on this WAAS Central Manager.

```
waas-cm(config)# cms enable
```

The following message appears:

```
Generating new RPC certificate/key pair
Restarting RPC services

Creating database backup file emerg-debug-db-01-25-2006-15-31.dump
Registering Wide Area Central Manager...
Registration complete.
Please preserve running configuration using 'copy running-config startup-config'.
Otherwise management service will not be started on reload and node will be shown
'offline' in Wide Area Central Manager UI.
management services enabled
```

Step 11 Save the configuration on this WAAS Central Manager.

```
waas-cm(config)# exit
waas-cm# copy run start
```

The initial configuration of the WAAS Central Manager is completed. The next step is to initially configure and register the other two WAAS devices (the Core WAE and the Edge WAE) with this WAAS Central Manager. See the next two sections for details.

Configuring the Core WAE

To install and configure the WAAS Core WAE device, and register it with the WAAS Central Manager, follow these steps:

Step 1 In the data center, unpack and connect the second WAAS device that you want to configure as the Core WAE in the WAAS network. You must set the port to which the WAE is connected to full duplex. For hardware installation instructions, refer to the hardware installation guide for the WAE.

Step 2 Power up the designated Core WAE and open a console connection.

Step 3 When a WAAS device boots, you are prompted to run the first-time setup utility (enter basic configuration), which you use to set up the basic network parameters for the device. When prompted, enter **y**.

The configuration prompt waits several seconds before proceeding with the WAAS device boot sequence.

Note If you do not enter **y** in time to enter basic configuration, you will need to log in to the WAAS device through the terminal console and run the **setup** EXEC CLI command to manually invoke the setup utility. The username is admin and the password is default.

Step 4 Enter the required information as prompted by the setup utility (see Table 1).

Step 5 Continue to answer the questions displayed in the setup utility until your basic network configuration is complete on the Core WAE.

Step 6 When finished, you see a summary of the information that you entered. Accept the changes when prompted. Once you accept the changes, the device is visible on the network, and it can be pinged.

Step 7 After specifying the basic network parameters for the designated Core WAE (Core-WAE1), assign this device's primary interface and specify application-accelerator as its device mode.

```
Core-WAE1# configure terminal
Core-WAE1(config)#
Core-WAE1(config)# primary-interface gigabitEthernet 1/0
Core-WAE1(config)# device mode application-accelerator
```

Step 8 Specify the IP address or hostname of the WAAS Central Manager that Core-WAE1 should register with. For example, specify the IP address of the WAAS Central Manager that you configured earlier in the "Configuring the WAAS Central Manager" section on page 5.

```
Core-WAE1(config)# central-manager address 10.10.10.10
```

Note If DNS is supported in your environment, we recommend that you specify the WAAS Central Manager's fully qualified hostname (for example, waas-cm.abc.com) instead of its IP address when using the **central-manager address** command to register a WAE with the WAAS Central Manager. By using the hostname, you can change the WAAS Central Manager's IP address in the future and you do not need to unregister and reregister all of the WAEs.You only need to change the WAAS Central Manager's IP address in the DNS table for the WAEs to remain registered with the same WAAS Central Manager.

Step 9 Create and initialize the management database and enable the management services on Core-WAE1.

```
Core-WAE1(config)# cms enable

The following message appears:
    Generating new RPC certificate/key pair
    Restarting RPC services

    Registering Wide Area Application Engine...
    Registration complete.
    Please preserve running configuration using 'copy running-config startup-config'.
    Otherwise management service will not be started on reload and node will be shown
    'offline' in Wide Area Central Manager UI.
    management services enabled
```

Step 10 Save the configuration on Core-WAE1.

```
Core-WAE1(config)# end
Core-WAE1# copy run start
```

Step 11 Check the current running WAAS configuration on Core-WAE1.

```
Core-WAE1# show running-config
! WAAS version 4.0.0
!
device mode application-accelerator
!
!
hostname Core-WAE1
!
!
clock timezone America/New_York -5 0
!
!
ip domain-name abc.local
!
!
interface GigabitEthernet 1/0
 ip address 2.2.2.100 255.255.255.0
 no autosense
 bandwidth 100
 full-duplex
 exit
interface GigabitEthernet 2/0
 shutdown
 exit
!
```

```
ip default-gateway 2.2.2.1
!
ip name-server 172.19.228.233
ip name-server 10.10.10.100
!
!
!
!
!
no wccp slow-start enable
!
!
!
username admin password 1 bVmDmMMmZAPjY
username admin privilege 15
!
!
!
!
authentication login local enable primary
authentication configuration local enable primary
!
!
!
central-manager address 10.10.10.10
cms enable
!
! End of WAAS configuration
```

The initial configuration of the Core WAE is completed. The next step is to initially configure and register the designated Edge WAE with the WAAS Central Manager device. See the next section for details.

Configuring the Edge WAE

To install and configure the WAAS Edge WAE device, and register it with the WAAS Central Manager, follow these steps:

Step 1 In the branch office, unpack and connect the third WAAS device that you want to configure as the Edge WAE in the WAAS network. You must set the port to which the WAE is connected to full duplex. For hardware installation instructions, refer to the hardware installation guide for the WAE.

Step 2 Power up the designated Core WAE in the branch office and open a console connection.

Step 3 When a WAAS device boots, you are prompted to run the first-time setup utility (enter basic configuration), which you use to set up the basic network parameters for the WAE. When prompted, enter **y**.

The configuration prompt waits several seconds before proceeding with the WAAS device boot sequence.

Note If you do not enter **y** in time to enter basic configuration, you will need to log in to the WAAS device through the terminal console and run the **setup** EXEC CLI command to manually invoke the setup utility. The username is admin and the password is default.

Step 4 Enter the required information as prompted by the setup utility (see Table 1).

Step 5 Continue to answer the questions displayed in the setup wizard until your basic network configuration is complete on the Edge WAE.

Step 6 When finished, you see a summary of the information that you entered. Accept the changes when prompted. Once you accept the changes, the device is visible on the network, and it can be pinged.

Step 7 After specifying the basic network parameters for the designated Edge WAE (Edge-WAE1), assign the device's primary interface and specify application-accelerator as its device mode.

```
Edge-WAE1# configure terminal
Edge-WAE1(config)#
Edge-WAE1(config)# primary-interface gigabitEthernet 1/0
Edge-WAE1(config)# device mode application-accelerator
```

Step 8 Specify the IP address or hostname of the WAAS Central Manager that Edge-WAE1 should register with. For example, specify the IP address of the WAAS Central Manager that you configured earlier in the "Configuring the WAAS Central Manager" section on page 5.

```
Edge-WAE1(config)# central-manager address 10.10.10.10
```

Note If DNS is supported in your environment, we recommend that you specify the WAAS Central Manager's fully qualified hostname (for example, waas-cm.abc.com) instead of its IP address when using the **central-manager address** command to register a WAE with the WAAS Central Manager. By using the hostname, you can change the WAAS Central Manager's IP address in the future and you do not need to unregister and reregister all of the WAEs.You only need to change the WAAS Central Manager's IP address in the DNS table for the WAEs to remain registered with the same WAAS Central Manager.

Step 9 Create and initialize the management database and enable the management services on Edge-WAE1.

```
Edge-WAE1(config)# cms enable
```

The following message appears:

```
Registration complete.
Please preserve running configuration using 'copy running-config startup-config'.
Otherwise management service will not be started on reload and node will be shown
'offline' in Wide Area Central Manager UI.
management services enabled
```

Step 10 Save the configuration on Edge-WAE1.

```
Edge-WAE1(config)# end
Edge-WAE1# copy run start
```

Step 11 Check the current running configuration for Edge-WAE1.

```
Edge-WAE1# show running-config

! WAAS version 4.0.0
!
device mode application-accelerator
!
!
hostname Edge-WAE1
!
!
!
!
ip domain-name abc.local
```

```
!
!
interface GigabitEthernet 1/0
 ip address 1.1.1.100 255.255.255.0
 no autosense
 bandwidth 100
 full-duplex
 exit
interface GigabitEthernet 2/0
 shutdown
 exit
!
ip default-gateway 1.1.1.1
!
ip name-server 10.10.10.100
!
!
!
!
!
no wccp slow-start enable
!
!
!
username admin password 1 bVmDmMMmZAPjY
username admin privilege 15
!
!
!
!
authentication login local enable primary
authentication configuration local enable primary
!
!
!
central-manager address 10.10.10.10
cms enable
!
! End of WAAS configuration
```

The initial configuration of the Edge WAE is completed. The next step is to configure WCCP. See the next section for details.

Configuring WCCP

WCCP provides the method to transparently redirect client requests to a WAE for processing. To configure basic WCCP, you must enable the WCCP service on at least one router in your network and on your WAE. It is not necessary to configure all of the available WCCP features or services to get your WAE up and running. In this configuration example, because there is a Core WAE and an Edge WAE in the WAAS network, you must configure WCCP Version 2 on four devices, as follows:

- Configuring WCCP on the Core Router, page 12
- Configuring WCCP on the Core WAE, page 13
- Configuring WCCP on the Branch Router, page 14
- Configuring WCCP on the Edge WAE, page 16

Note You must configure these devices to use WCCP Version 2 instead of WCCP Version 1 because WCCP Version 1 supports web traffic (port 80) only. When you enable the TCP promiscuous mode service (WCCP Version 2 services 61 and 62) on a WAE and a router, you do not need to enable the CIFS caching service (WCCP Version 2 service 89) on the router or WAE. When the TCP promiscuous mode service is used, the CIFS caching service is not required. For more information on WCCP configuration, see the *Cisco Wide Area Application Services Configuration Guide*.

Configuring WCCP on the Core Router

To complete a basic WCCP configuration on the router (Core-Router1) in the data center, follow these steps:

Step 1 Log on to Core-Router1 and enter global configuration mode.

```
Core-Router1 configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Core-Router1(config)#
```

Step 2 Enable WCCP Version 2 and WCCP services 61 and 62 (TCP promiscuous mode) on Core-Router1.

```
Core-Router1(config)# ip wccp version 2
Core-Router1(config)# ip wccp 61
Core-Router1(config)# ip wccp 62
```

Step 3 On Core-Router1, configure the LAN interface for redirection. This interface is where traffic will be intercepted from when leaving the data center network toward the WAN.

```
Core-Router1(config)# interface fa1/0.40
Core-Router1(config-subif)#
```

Step 4 Enable WCCP service 61 on the inbound direction of fa1/0.40.

```
Core-Router1(config-subif)# ip wccp 61 redirect in
Core-Router1(config-subif)# exit
```

Step 5 Configure the WAN interface for redirection. This interface is where traffic will be intercepted from when entering the data center network from the WAN.

```
Core-Router1(config)# interface serial0
```

Step 6 Enable WCCP service 62 on the inbound direction of serial0.

```
Core-Router1(config-if)# ip wccp 62 redirect in
Core-Router1(config-if)# exit
```

Step 7 To avoid redirection loops, configure the subinterface where Core-WAE1 will connect to Core-Router1. To avoid a routing loop, Core-WAE1 must not be attached to the same segment (subnet) as the interface on Core-Router1 that is performing the redirection. Make sure that you have a tertiary interface (a separate physical interface) or a subinterface (off the router's LAN port) from which Core-WAE1 connects. In the following example, a subinterface is being used:

```
Core-Router1(config)# interface fa1/0.41
```

Step 8 After you create the subinterface, enter the **ip wccp redirect exclude in** command to specify that Core-Router1 should not repeatedly redirect the same traffic to the local WAE, Core-WAE1.

```
Core-Router1(config-subif)# ip wccp redirect exclude in
```

Step 9 Exit subinterface configuration mode.

```
Core-Router1(config-subif)# exit
Core-Router1(config)
```

Step 10 Enable Cisco Express Forwarding (CEF) on Core-Router1.

```
Core-Router1(config)# ip cef
Core-Router1(config)# end
Core-Router1#
```

Note CEF is not required but it is recommend for improved performance. WCCP can use IP CEF if CEF is enabled on the router.

Step 11 Save the configuration changes that you just made by writing the running configuration to nonvolatile memory.

```
Core-Router1# write memory
Building configuration...
Core-Router1#
```

Step 12 Verify the new configuration for Core-Router1.

```
Core-Router1# show running-configuration
```

The configuration of WCCP on the core router is completed. The next step is to configure WCCP on the Core WAE. See the next section for details.

Configuring WCCP on the Core WAE

To complete a basic WCCP configuration on the data center's Core WAE (Core-WAE1), follow these steps:

Step 1 Log on to Core-WAE1 and enter global configuration mode.

```
Core-WAE1# configure terminal
Core-WAE1(config)#
```

Step 2 Enable WCCP Version 2 on Core-WAE1.

```
Core-WAE1(config)# wccp version 2
Core-WAE1(config)#
```

Step 3 Configure a WCCP router list for the TCP promiscuous mode service (WCCP services 61 and 62). The following example shows how to configure router list 1 for Core-Router1 that has an IP address of 2.2.2.1:

```
Core-WAE1(config)# wccp router-list 1 2.2.2.1
Core-WAE1(config)#
```

Note To create a router list on a WAE, use the **wccp router-list** global configuration command. Enter the IP address of every WCCP-enabled router that will support a particular WCCP service (for example, the TCP promiscuous mode service) for the WAE. If different routers will be used for different WCCP services, you must create more than one router list. Each router list command can contain up to six routers. Multiple router list commands may be used for the same list to specify up to 32 routers. A router list must be contain at least one IP address.

Step 4 On Core-WAE1, turn on the TCP promiscuous mode service and associate this WCCP service with the WCCP router list that you just created (router list number 1). The routers in the list are informed that Core-WAE1 is accepting TCP promiscuous mode service requests.

```
Core-WAE1(config)# wccp tcp-promiscuous router-list-num 1
WCCP configuration for TCP Promiscuous service 61 succeeded.
WCCP configuration for TCP Promiscuous service 62 succeeded.
Please remember to configure WCCP service 61 and 62 on the corresponding router.
```

Step 5 Exit global configuration mode.

```
Core-WAE1(config)# exit
Core-WAE1#
```

Step 6 Save the configuration changes that you just made by writing the running configuration to nonvolatile memory.

```
Core-WAE1# write memory
Core-WAE1#
```

Step 7 Verify the new configuration for Core-WAE1.

```
Core-WAE1# show running-configuration
```

The configuration of WCCP on the Core WAE is completed. The next step is to configure WCCP on the branch router. See the next section for details.

Configuring WCCP on the Branch Router

To complete a basic WCCP configuration on the router (Edge-Router1) in the branch office, follow these steps:

Step 1 Log on to Edge-Router1 and enter global configuration mode.

```
Edge-Router1# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Edge-Router1(config)#
```

Step 2 Enable WCCP Version 2 and WCCP services 61 and 62 (TCP promiscuous mode) on Edge-Router1.

```
Edge-Router1(config)# ip wccp version 2
Edge-Router1(config)# ip wccp 61
Edge-Router1(config)# ip wccp 62
```

Step 3 On Edge-Router1, configure the LAN interface for redirection. This interface is where traffic will be intercepted from when leaving the branch office network toward the WAN.

```
Edge-Router1(config)# interface fa0/0.10
Edge-Router1(config-subif)#
```

Step 4 Enable WCCP service 61 on the inbound direction of fa0/0.10.

```
Edge-Router1(config-subif)# ip wccp 61 redirect in
Edge-Router1(config-subif)# exit
```

Step 5 Configure the WAN interface for redirection. This interface is where traffic will be intercepted from when entering the branch office network from the WAN.

```
Edge-Router1(config)# interface serial0
```

Step 6 Enable WCCP service 62 on the inbound direction of serial0.

```
Edge-Router1(config-if)# ip wccp 62 redirect in
Edge-Router1(config-if)# exit
```

Step 7 To avoid redirection loops, configure the subinterface where Edge-WAE1 will connect to Edge-Router1. To avoid a routing loop, Edge-WAE1 must not be attached to the same segment as Edge-Router1's interface that is performing the redirection. Make sure that you have a tertiary interface or a subinterface (off the router's LAN port) from which Edge-WAE1 connects. In the following example, a subinterface is being used:

```
Edge-Router1(config)# interface fa0/0.11
```

Step 8 After you create the subinterface, enter the **ip wccp redirect exclude in** command to specify that Edge-Router1 should not repeatedly redirect the same traffic to the local WAE, Edge-WAE1.

```
Core-Router1(config-subif)# ip wccp redirect exclude in
```

Step 9 Exit subinterface configuration mode.

```
Edge-Router1(config-subif)# exit
Edge-Router1(config)#
```

Step 10 Enable CEF on Edge-Router1.

```
Edge-Router1(config)# ip cef
Edge-Router1(config)# end
Edge-Router1#
```

Note CEF is not required but it is recommend for improved performance. WCCP can use IP CEF if CEF is enabled on the router.

Step 11 Save the configuration changes that you just made by writing the running configuration to nonvolatile memory.

```
Edge-Router1# write memory
Building configuration...
Edge-Router1#
```

Step 12 Verify the new configuration for Edge-Router1.

```
Edge-Router1# show running-configuration
```

The configuration of WCCP on the branch router is completed. The next step is to configure WCCP on the Edge WAE. See the next section for details.

Configuring WCCP on the Edge WAE

To complete a basic WCCP configuration on the Edge WAE (Edge-WAE1) in the branch office, follow these steps:

Step 1 Log on to Edge-WAE1 and enter global configuration mode.

```
Edge-WAE1# configure terminal
Edge-WAE1(config)#
```

Step 2 Enable WCCP Version 2 on Edge-WAE1.

```
Edge-WAE1(config)# wccp version 2
Edge-WAE1(config)#
```

Step 3 Configure a WCCP router list for the TCP promiscuous mode service (WCCP services 61 and 62). The following example shows router list 1 being created for Edge-Router1 that has an IP address of 1.1.1.1:

```
Edge-WAE1(config)# wccp router-list 1 1.1.1.1
Edge-WAE1(config)#
```

Step 4 On Edge-WAE1, turn on the TCP promiscuous mode service and associate this WCCP service with the WCCP router list that you just created (router list number 1). The routers in the list are informed that Edge-WAE1 is accepting TCP promiscuous mode service requests.

```
Edge-WAE1(config)# wccp tcp-promiscuous router-list-num 1
WCCP configuration for TCP Promiscuous service 61 succeeded.
WCCP configuration for TCP Promiscuous service 62 succeeded.
Please remember to configure WCCP service 61 and 62 on the corresponding router.
```

Step 5 Exit global configuration mode.

```
Edge-WAE1(config)# exit
Edge-WAE1#
```

Step 6 Save the configuration changes that you just made by writing the running configuration to nonvolatile memory.

```
Edge-WAE1# write memory
Edge-WAE1#
```

Step 7 Verify the new configuration for Edge-WAE1.

```
Edge-WAE1# show running-configuration
```

The configuration of WCCP on the Edge WAE is completed. The next step is to activate the WAEs and enable application acceleration policies. See the next section for details.

Activating the WAEs and Enabling Application Acceleration Policies

After the WAE designated as the WAAS Central Manager has been deployed, you can use the WAAS Central Manager GUI to complete the basic configuration of the WAAS network. You can also use the WAAS Central Manager GUI to centrally manage and monitor the geographically dispersed WAEs in the WAAS network.

To access the WAAS Central Manager GUI and complete the initial configuration of the WAAS network, follow these steps:

Step 1 Log in to the WAAS Central Manager GUI, as follows:

a. Enter the following URL in your web browser:

https://*IP_address_of_WAAS Central_Manager***:8443**

For example:

https://10.10.10.10:8443

or

https://*hostname_of_WAAS_Central_Manager***:8443**

For example:

https://waas-cm:8443

Note When you access the WAAS Central Manager GUI, make sure that you use HTTPS instead of HTTP to ensure that data is securely transmitted from the WAAS Central Manager to your web browser.

b. After the Security Alert window appears, click **Yes** to accept the security certificate.

c. After the Login window appears, enter the default username (admin) and the default password (default) for the predefined superuser account and click the **Login** button.

The System Home window of the WAAS Central Manager GUI appears in your browser and indicates the number of WAEs that are in the current configuration of this Central Manager. In this case, there are three devices (the Central Manager, the Core WAE named Core-WAE1, and the Edge WAE named Edge-WAE1) in the current configuration.

Step 2 Activate the Core and Edge WAEs, as follows:

Note For security purposes, you need to approve all WAEs that are being added to the WAAS network. This security feature prevents unauthorized devices from joining the WAAS network.

a. In the WAAS Central Manager GUI, choose **Devices > Devices**.

The WAAS Central Manager window lists three WAAS devices:

- The WAAS Central Manager (waas-cm) in the data center that is the only WAAS device that is currently online. The WAAS Central Manager window indicates that this device is functioning as the primary WAAS Central Manager for this WAAS network.
- The Core WAE (Core-WAE1) in the data center that is recognized by the WAAS Central Manager but is currently inactive.
- The Edge WAE (Edge-WAE1) in the branch office that is recognized by the WAAS Central Manager but is currently inactive.

Note If the WAAS Central Manager window does not list the inactive WAEs, click the **View All Devices** icon in the taskbar. The WAAS Central Manager window is refreshed and should now list the inactive WAEs.

b. In the taskbar, click the **Activate all inactive WAEs** icon to activate the two inactive WAEs (Core-WAE1 and the Edge-WAE1).

   The Activate all inactive WAE window appears. By default, the **Create a new location for each inactive WAE** option is selected and a default location for the inactive WAEs will be created and the inactive WAEs are assigned to that default location. You can create locations as part of the initial configuration, or use default locations to complete the initial configuration and then modify the default locations at a later time. In this configuration example, a default location is used to complete the initial configuration of the WAAS network. For information about how to create and modify locations, see the *Cisco Wide Area Application Services Configuration Guide.*

c. Click **Submit**.

   The current state of Core-WAE1 and Edge-WAE1 is now listed as pending instead of inactive.

Step 3 Enable the predefined application policies and classifications on Edge-WAE1, as follows:

a. Click the **Edit** icon next to Edge-WAE1. The Device Home window for this Edge WAE appears. It indicates that there are not any policies or applications currently enabled on this device.

b. In the taskbar, click the **Restore default Application policy settings** icon.

c. When a dialog box appears prompting you to confirm that you want to restore the default application policy settings, click **Yes.**

d. To save the changes, click **Submit**.

e. To view the application policy settings that are currently applied to Edge-WAE1, choose **Acceleration > Policies** in the Contents pane.

f. To view the application classifiers that are currently applied to Edge-WAE1, choose **Acceleration > Classifiers** in the Contents pane.

The initial configuration of the WAAS network is completed. The next step is to verify that application acceleration is working correctly. See the next section for details.

The WAAS software comes with a set of predefined application policies that help your WAEs classify and optimize some of the most common application traffic. This set of default application policies are for applications that use well-known port numbers. For a list of the predefined application definition policies, see the *Cisco Wide Area Application Services Configuration Guide*.

You can use the WAAS Central Manager GUI to modify these predefined application policies, create new ones, and then centrally distribute these policies to one or more devices in the WAAS network. You can also modify the predefined set of application policies or create new ones through the WAAS CLI. However, we strongly recommend that you use the WAAS Central Manager GUI to perform this task in order to significantly reduce the complexity of this task and to increase the level of consistency. (For CLI command syntax information, see the *Cisco Wide Area Application Services Command Reference*.)

Verifying Application Acceleration

Verify that the WAAS application acceleration feature is working properly for one of the predefined applications. To verify that application acceleration is working properly for the HTTP application, follow these steps:

Step 1 Use Remote Desktop or a similar application to access a client desktop (Client A) at the branch office.

Step 2 From the Client A browser, enter the URL of a web page that resides on a server (Server A) that is located in the data center. The web page should contain links to large files (for example, Microsoft Word or Powerpoint files) that you can download from that page.

Note Make sure that you use HTTP instead of HTTPS to access the web page because you want to test whether application acceleration is working properly for HTTP.

The requested web page appears in Client A's browser.

Step 3 Click one of the links in the web page to download a file.

By clicking a link to download a file to Client A's desktop, this request involves an active transfer that will allow you to verify whether application acceleration is occurring between this client and server for an HTTP request that involves an active transfer.

Step 4 When you are prompted whether you want to open or save this file, click **Save** and specify the location on the client A desktop that you want to save this file (for example, save to a folder on the local disk drive). A dialog box appears indicating that the specified file is being downloaded and saved to the desktop.

Step 5 When the download is completed, the dialog box indicates the file has been downloaded to the specified location and shows the transfer rate of the download. When the dialog box prompts whether you want to open the downloaded file, click **Close** to close the dialog box.

Step 6 From the same web page, click the same download link to download the same file to Client A's desktop.

This second time the file is downloaded in less time and the transfer rate is faster. The significant decrease in the time it took to download the same file to the same desktop a second time indicates that the WAAS application acceleration feature is working properly for HTTP (for active transfer requests that are using HTTP between Client A and Server A).

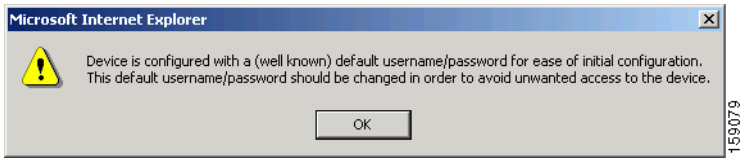
Note You can also verify whether a WAE is intercepting, optimizing, and compressing data by using such CLI commands as the **show statistics tfo savings** and **show statistics dre** EXEC commands. These commands are only supported in application-acceleration device mode; you must run these commands from a CLI session on the WAE. For more information about these CLI commands, see the *Cisco Wide Area Application Services Command Reference*.

Changing the Administrator Password

After you have initially configured your WAAS devices, we strongly recommend that you immediately change the password for the predefined superuser account (the predefined username is admin, the password is default, and the privilege level is superuser, privilege level 15) on each WAAS device.

If the predefined password for this superuser account has not been changed on a WAAS Central Manager, the following dialog box is displayed each time that you log in to the WAAS Central Manager GUI using this superuser account. (See Figure 2.)

Figure 2 Message Indicating the Predefined Password for the Superuser Account Should Be Changed



If you have not changed the predefined password for this superuser account, the console will also display the following message each time that you use this superuser account to log in to the WAAS CLI on any WAAS device:

```
Device is configured with a (well known) default username/password
for ease of initial configuration. This default username/password
should be changed in order to avoid unwanted access to the device.

System Initialization Finished.
waas-cm#
```

To change the password for the superuser account across all WAE devices registered to the Central Manager, follow these steps:

Step 1 Log in to the WAAS Central Manager GUI with the admin account, if you are not already logged in.

Step 2 From the WAAS Central Manager GUI, choose **System > Password**.

The Changing Password for User Account window appears.

Step 3 In the New Password field, enter the new password. Passwords are case sensitive.

Step 4 In the Confirm New Password field, reenter the password for confirmation.

Step 5 Click **Submit**.

The message “Changes Submitted” appears at the bottom of the window confirming that your password has been changed. This password change is implemented on all registered WAEs.

Clock synchronization between the WAEs in a WAAS network is important. On each WAE, be sure to set up a Network Time Protocol (NTP) server to keep the clocks synchronized. For information on setting up an NTP server, see the chapter, “Configuring Other System Settings” in the *Cisco Wide Area Application Services Configuration Guide.*

To set the clock manually, use the **clock** EXEC CLI command on each WAE. For details, see the *Cisco Wide Area Application Services Command Reference*.

After you initially configure your WAAS network for application acceleration, you can perform other WAAS administrative tasks. For details, see the *Cisco Wide Area Application Services Configuration Guide.*

Documentation and Support Information

This section contains the following topics:

Related Documentation

For additional information on the Cisco WAAS software, see the following documentation:

- *Release Note for Cisco Wide Area Application Services*
- *Cisco Wide Area Application Services Command Reference*
- *Cisco Wide Area Application Services Quick Configuration Guide* (this manual)
- *Cisco Wide Area Application Services Configuration Guide*
- *Configuring Cisco WAAS Network Modules for Cisco Access Routers*
- *Regulatory Compliance and Safety Information for the Cisco Content Networking Product Series*
- *Cisco Wide Area Application Engine 511 and 611 Hardware Installation Guide*
- *Cisco Wide Area Application Engine 512 and 612 Hardware Installation Guide*
- *Cisco Wide Area Application Engine 7326 Hardware Installation Guide*
- *Cisco Network Modules Hardware Installation Guide*
- *Cisco Wide Area Application Services Online Help*

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. This section explains the product documentation resources that Cisco offers.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

The Product Documentation DVD is a library of technical product documentation on a portable medium. The DVD enables you to access installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the HTML documentation and some of the PDF files found on the Cisco website at this URL:

http://www.cisco.com/univercd/home/home.htm

The Product Documentation DVD is created and released regularly. DVDs are available singly or by subscription. Registered Cisco.com users can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

Ordering Documentation

You must be a registered Cisco.com user to access Cisco Marketplace. Registered users may order Cisco documentation at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

If you do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Documentation Feedback

You can provide feedback about Cisco technical documentation on the Cisco Technical Support & Documentation site area by entering your comments in the feedback form available in every online document.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you will find information about how to do the following:

- Report security vulnerabilities in Cisco products
- Obtain assistance with security incidents that involve Cisco products
- Register to receive security information from Cisco

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For emergencies only—security-alert@cisco.com

  An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.*x* through 9.*x*.

Never use a revoked encryption key or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT to find other means of encrypting the data before sending any sensitive material.

Product Alerts and Field Notices

Modifications to or updates about Cisco products are announced in Cisco Product Alerts and Cisco Field Notices. You can receive Cisco Product Alerts and Cisco Field Notices by using the Product Alert Tool on Cisco.com. This tool enables you to create a profile and choose those products for which you want to receive information.

To access the Product Alert Tool, you must be a registered Cisco.com user. (To register as a Cisco.com user, go to this URL: http://tools.cisco.com/RPF/register/register.do) Registered users can access the tool at this URL: http://tools.cisco.com/Support/PAT/do/ViewMyProfiles.do?local=en

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the **Cisco Product Identification Tool** to locate your product serial number before submitting a request for service online or by phone. You can access this tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list. This tool offers three search options: by product ID or model name; by tree view; or, for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Tip Displaying and Searching on Cisco.com

If you suspect that the browser is not refreshing a web page, force the browser to update the web page by holding down the Ctrl key while pressing F5.

To find technical information, narrow your search to look in technical documentation, not the entire Cisco.com website. On the Cisco.com home page, click the **Advanced Search** link under the Search box and then click the **Technical Support & Documentation**.radio button.

To provide feedback about the Cisco.com website or a particular technical document, click **Contacts & Feedback** at the top of any Cisco.com web page.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411
Australia: 1 800 805 227
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is "down" or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The Cisco Online Subscription Center is the website where you can sign up for a variety of Cisco e-mail newsletters and other communications. Create a profile and then select the subscriptions that you would like to receive. To visit the Cisco Online Subscription Center, go to this URL:

  http://www.cisco.com/offer/subscribe

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco channel product offerings. To order and find out more about the *Cisco Product Quick Reference Guide*, go to this URL:

  http://www.cisco.com/go/guide

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- Cisco Press publishes a wide range of general networking, training, and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:

  http://www.cisco.com/ipj

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

  http://www.cisco.com/en/US/products/index.html

- Networking Professionals Connection is an interactive website where networking professionals share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

  http://www.cisco.com/discuss/networking

- "What's New in Cisco Documentation" is an online publication that provides information about the latest documentation releases for Cisco products. Updated monthly, this online publication is organized by product category to direct you quickly to the documentation for your products. You can view the latest release of "What's New in Cisco Documentation" at this URL:

  http://www.cisco.com/univercd/cc/td/doc/abtunicd/136957.htm

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Cisco Wide Area Application Services Quick Configuration Guide