CloudControl Central



Installation and Operations Guide



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1 INTRODUCTION

Purpose of this Guide

This guide is intended to provide information about how to install and operate the Cloud Control Central component of the Alcatel-Lucent CloudControl.

Related Documents

For information about installation and operation of the CloudControl Detector, see the *CloudControl Detector Installation and Operations Guide*. For information about how to use the CloudControl Filter, see the *CloudControl Filter Installation and Operations Guide*.

What is CloudControl?

The Internet is under increasing assault from Distributed Denial of Service (DDoS), virus, worm, and Phishing attacks. At the same time, some companies report that up to 90% of their email traffic is spam.

Alcatel-Lucent CloudControlTM is a new category of security network appliances that allows victims of DoS attacks to fight back. CloudControl enables Enterprises and Service Providers to dynamically collaborate for "zapping" the junk traffic in the cloud before it clogs the access pipe.

With CloudControl, Service Providers can offer enterprises a new service that helps protect them from DoS and other junk traffic. It also provides enterprises with the control they need when filtering such traffic. Alcatel-Lucent is now working closely with Service Providers to bring CloudControl to market in the form of a Value Added service for enterprises.

Components

CloudControl consists of three main components that are deployed as follows:

CloudControl Central centralized management system at the Service Provider's
Network Operations Center.
CloudControl Filters in the cloud.
CloudControl Detector appliance at the enterprise.

CloudControl Filter

The CloudControl Filterbox is a high-performance packet filter appliance responsible for blocking or rate limiting traffic. The CloudControl Filter is typically installed in the Service Provider network in the traffic path from the Internet to the enterprise.

It can be deployed in various ways, but the best way to think of it is as a two-port bridge device that sits in the access line from the ISP to the subscriber, much like a network-hosted firewall.

The CloudControl filter receives requests via FPP for filter installation or removal from CloudControlTM Central. The filter resides in the bearer plane of the service provider network at its edges:

- Ingress edge: where data destined to the subscriber enters the service provider's network
- Egress edge: where data destined to the subscriber exits the service provider's network

The CloudControl filter supports wireline speed filtering and packet header processing. It may be configured in either in-line ("bump-in-the-wire") or adjunct modes. Port relays are provided for traffic "fail-through"

CloudControl Central

CloudControl Central is the centralized management system that manages enterprise customer accounts, processes denunciations from CloudControl Detectors, provisions filters to the CloudControl Filterboxes, and monitors the status of the CloudControl components. The CloudControl Central servers are installed in the Network or Security Operations Center (NOC/SOC) of the Service Provider.

These servers each are assigned some part of the network, but also peer with each other to provide redundancy and fast delivery of filters to the best defense points.

CloudControl Central supports manual configuration of network topology inventory data. It receives and authenticates denunciations from the Detector (via DP) and installs/removes filters in the CloudControl Filter in the bearer plane (via FPP).

CloudControl Central collects and reports network operations and service level performance statistics, but does not interact directly with bearer traffic

CloudControl Detector

The CloudControl Detector is an appliance that detects trash traffic, and denounces the IP addresses that need to be blocked. The CloudControl Detector is installed in the enterprise network.

The CloudControl Detector allows enterprises to set Filters for blocking junk traffic in the cloud by sending denunciations of IP addresses that need to be blocked to the CloudControl Filter. It supports:

User-defined filters set by the security manager, based on the enterprise's security
and business policies (e.g., block a competitor's traffic from even getting close to
an enterprise's network, or block traffic from a specific country with which an
enterprise does not do any business).
Demonis City on health into the City of Control Detector

☐ Dynamic filters built into the CloudControl Detector.

☐ Dynamic filters fed by third-party security and policy devices.

System Requirements

Software Requirements

☐ Solaris 10 Operating System, 64-bit

☐ CloudControlTM Central software package

Environmental Requirements

□ 5°C to 35°C (41°F to 95°F)

□ 10-90 percent relative humidity

☐ Non-condensing, 27°C max. wet bulb

Footprint

- ☐ Height: 43.8 mm (1.72 in)
- ☐ Width: 445 mm (17.5 in)
- ☐ Depth: 632 mm (24.8 in)
- ☐ Weight: 18.6 kg (41.1 lbs.)

Redundant Power

- ☐ Dual redundant, hot swappable power supply
- ☐ Maximum DC output 550 W
- ☐ AC power 90-264 V AC (47-63 Hz)

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INSTALLING CLOUDCONTROL CENTRAL

Central is shipped with a hot drive that contains the database, Central software, and Solaris operating system. However, you will need to perform the following tasks to install the device.

- □ Connect Central to the network
- ☐ Install root certificates
- ☐ Set the IP address and host name
- ☐ Set Up User Accounts
- ☐ Issue Certificates for a new Central
- □ Update the Central software

Each is described below.

Connect Central to the Network

1. Establish a network connection using the supplied Ethernet cable. Figure 5 provides a typical view of how Central should be placed within the Service Provider NOC/SOC.

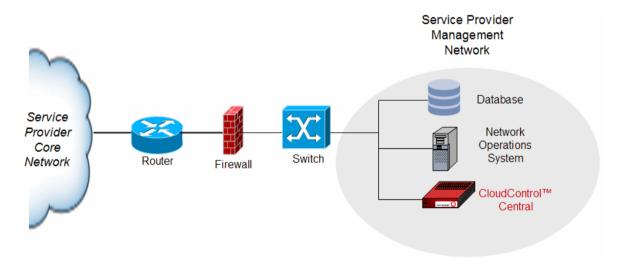


Figure 1. Placement of Central in the Service Provider NOC/SOC

- 2. Connect grounded AC power cords to the AC power connectors on the back panel of the server and to grounded AC power outlets. The Power/OK LED on the front panel flashes, indicating that the unit is in standby power mode.
- 3. Use a ballpoint pen or other stylus to press and release the recessed Power button on the server front panel.
- 4. When main power is applied to the full server, the Power/OK LED next to the Power button lights and remains lit.

Install Root Certificates

Ideally, as the ISP security officer, you already run a CA and already have a root CA certificate to distribute.

1. If you prefer to run a special CA limited just to CloudControl™ operations, you can do the following on Central:

CA=/var/opt/CA; mkdir -p \$CA; cd \$CA wget http://internal.cs.bell-labs.com/~ehg/bs/CA.tar tar -xvf CA.tar && rm CA.tar OPENSSL_CONF=ca.cnf export OPENSSL_CONF make init

- 2. Be sure to record the password you just invented and back up private/root.pem to secure storage, such as a USB flash memory in a safe.
- 3. All the CA operations below assume that OPENSSL_CONF is set and \$CA is the current directory.
- 4. Save the root certificate root.pem on your web server.
- 5. Hand your CloudControlTM Central dministrators a slip of paper with the following:

```
wget http://internal.cs.bell-labs.com/~ehg/bs/root.pem
MD5 Fingerprint=01:AB:AE:E1:AE:DB:5A:62:D8:51:D6:D0:DD:E5:92:72
SHA1
Fingerprint=AC:0A:AA:A6:2F:E8:13:B7:46:CC:69:F0:0C:13:CD:BF:03:9A:35:D7
```

6. Issue certificates for Central's public key, as detailed in the section of this chapter entitled "Issuing Certificates for a New Central."

Set the IP Address

To set the IP address, perform the following steps:

- 1. Log in to Central by using the CLI. You are automatically placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.

5. Enter the interface configuration mode by typing:

ccc(config)# interface type {port | slot/port}

6. Enter the ip address, mask, and gateway information as shown below:

ccc(config-if)# ip address [ip ipaddress] [mask mask] [gateway
gateway]

Issue Certificates for a New Central

To install certificates for a new Central, the following steps must be completed:

Steps for the Central Administrator:

- 1. Open a Unix shell in /etc/opt/ccc and edit ccc.conf to set a password and file Locations.
- 2. Save root.pem to the location specified by cafile.
- 3. Create a keypair and ask for a certificate by entering:

vi /etc/ssl/openssl.cnf # set defaultBits = 2048 openssl req -new -keyout ccc.key -out ccc.csr

- 4. Answer the question "Organizational Unit" as **ZapCentral** and answer **Common Name** as the fully qualified domain name of the Central.
- 5. The encryption password should be the one in ccc.conf but the rest of the questions are unconstrained. There is no need to use a challenge password.
- 6. Save ccc.key to the location specified by keyfile and hand off ccc.csr to you.

Steps for You:

1. Copy the certificate signing request ccc.csr to your CA directory and execute the following:

openssl ca -notext -in csr/ccc.csr -out ccc.cert

- 2. Confirm that OU=ZapCentral and that CN is a fully qualified domain name.
- 3. Return ccc.cert to the Central administrator.

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CONFIGURING CLOUDCONTROL CENTRAL

Central configuration involves a number of activities. At service setup, certificates are exchanged, ccDetectors are identified (hostname/IP address), and a list of destination IP addresses for a particular subscriber are provided and validated before being provisioned into ccCentral. Subscribers set up zones (default zone = all provisioned addresses), and provisioned destination IP addresses are compared against the pre-validated list. If an IP address is not in the list, it is not allowed to be entered into the zone. To avoid ambiguity, zones may not overlap; they must either be distinct or strictly nested (one a complete subset of another).

Denunciations are authenticated upon receipt at ccCentral to ensure they come from a valid ccDetector. If authentication fails, the denunciation is logged and then ignored A particular detector may speak for only one zone (i.e, list of destination IP addresses) Filters are installed against the source IP address for all destination IP addresses in that zone. Subscribers may only denounce and filter traffic destined to their pre-validated list of IP addresses.

Adding or Modifying a Subscriber

To add a subscriber:

- 1. Log in to Central by using the CLI. You are initially placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Type **subscriber** at the prompt:

ccc(config)# subscriber name

6. You can now enter new subscriber information, or change existing subscriber information. When typing the name of a new subscriber, you will be prompted to confirm entry of that name into the system.

To modify a subscriber:

Once you've entered the configuration mode for an existing subscriber by completing steps 1-6 of *To Add a Subscriber* above, you can modify subscriber information as needed by using the commands shown in the table below:

Command	Purpose
ccc(config-subscriber)# name name	Changes the name
ccc(config-subscriber)# chits 1-10000000	Changes the # of chits
ccc(config-subscriber)# primaryContact contactDetails	Changes the primary contact details of the subscriber
ccc(config-subscriber)# secondaryContact contactDetails	Changes the secondary contact details of the subscriber
ccc(config-subscriber)# delete zone { name name id zone-id}	Deletes the zone with the given name or the id, if the zone belongs to this subscriber. Otherwise reports an error.

To delete a subscriber:

- 1. Log in to Central by using the CLI. You are initially placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Type **delete subscriber** at the prompt and enter the subscriber id, as shown below:

ccc(config)# delete subscriber subscriber-id

Adding or Modifying Zones

To Add a Zone for a Subscriber:

- 1. Log in to Central by using the CLI. You are initially placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Enter the subscriber name as shown below:

ccc(config)# subscriber name

6. Enter the zone information as shown below:

ccc(config-subscriber)# zone zone-name

7. You can enter a new zone for the subscriber, or change existing zone information. When typing the name of a new zone, you will be prompted to confirm entry of that zone into the system. (See Appendix A for detailed information about zone configuration commands.)

To Modify a Zone for a Subscriber:

Once you've entered the configuration mode for an existing zone by completing steps 1-6 of *To Add a Zone for a Subscriber* above, you can modify that zone as needed by using the commands shown in the following table:

Command	Purpose
ccc(config-subscriber-zone)# stats	Shows the statistics associated with this zone
ccc(config-subscriber-zone)# rule <i>implicit-filter</i>	Changes the implicit-filter for the zone
ccc(config-subscriber-zone)# ip- address <i>ip-address1</i> [<i>ip-address2</i>] [<i>ip-address3</i>]	Adds the IP addresses to the list of already existing IP addresses
ccc(config-subscriber-zone)# no ip-address <i>ip-address1</i> [<i>ip-address2</i>] [<i>ip-address3</i>]	Removes the IP addresses from the list of existing IP addresses
ccc(config-subscriber-zone)# delete ccd { name name id ccd-id}	Deletes the detector with the given name or the id if the detector belongs to this zone; otherwise reports an error

To Delete a Zone for a Subscriber:

- 1. Log in to Central by using the CLI. You are initially placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Type **delete zone** at the prompt and enter the zone id, as shown below:

ccc(config)# delete zone zone-id

Adding or Modifying Filters

To Add a Filter:

- 1. Log in to Central by using the CLI. You are initially placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Enter the filterbox id as shown below:

ccc(config)# filterbox name

6. You can enter a new filterbox for the subscriber, or change existing zone information. When typing the name of a new zone, you will be prompted to confirm entry of that filterbox into the system. (See Appendix A for detailed information about filterbox configuration commands.)

To Modify a Filter:

Once you've entered the configuration mode for an existing filter by completing steps 1-5 of *To Add a Filter* above, you can modify that filter as needed by using the commands shown in the following table:

Command	Purpose
ccc(config-filterbox)#hostname hostname	Changes the hostname of the filter device
ccc(config-filterbox)# type type	Changes the type of the filter device
ccc(config-filterbox)# location location	Changes the location where the filterbox is located

To Delete a Filter:

- 1. Log in to Central by using the CLI. You are automatically placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Type **delete filterbox** at the prompt and enter the filterbox id, as shown below:

ccc(config)# delete filterbox filterbox-id

Adding or Modifying Detectors

To Add a Detector for a Subscriber:

- 1. Log in to Central by using the CLI. You are initially placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Enter the subscriber name as shown below:

ccc(config)# subscriber {name name / id id}

6. Enter the detector information as shown below:

ccc(config-subscriber-zone)# ccd name

7. You can enter a new detector for the subscriber, or change existing detector information. When typing the name of a new detector, you will be prompted to confirm entry of that detector into the system. (See Appendix A for detailed information about zone configuration commands.)

To Modify a Detector for a Subscriber:

Once you've entered the configuration mode for an existing detector by completing steps 1-6 of *To Add a Detector for a Subscriber* above, you can modify that detector as needed by using the commands shown in the following table:

Command	Purpose
ccc(config-subscriber-zone-ccd)# stats	Shows the statistics associated with this ccd
ccc(config-subscriber-zone-ccd)# name name	Changes the name of the CCD

To Delete a Detector for a Subscriber:

- 1. Log in to Central by using the CLI. You are automatically placed in the user mode.
- 2. Enter the privileged mode by typing **enable** at the **ccc:** prompt.
- 3. Enter your password at the prompt.
- 4. Enter the configuration mode by typing **config**.
- 5. Type **delete** at the prompt and enter the detector id, as shown below:

ccc(config)# delete ccd ccd-id

Viewing Statistics

Once you have configured Central, it's a good idea to view statistics and determine the overall status of the system. To do so, perform these steps:

1. Log in to Central by using the CLI. You are automatically placed in the user mode.

Note: If you were already logged on and in the privileged mode, type **disable** to return to the user mode.

2. You can now view the statistics for each component.

For Zones:

To view zone statistics for a given zone, enter the following:

ccc> show zone-stats [name name / id id]

If the zone name or id is not provided, the details for all the existing zones display. If the zone name is provided and there is more than one zone with the given name, the detail of each such zone is displayed. The information includes:

the total number of denunciations and reprieves received for a zone
the total number of denunciations and reprieves in "pending" state for a zone
the total number of denunciations and reprieves processed (filters installed/removed) for a zone
the total number of denunciations and reprieves (in duplicate) received for a zone (this is fetched through zdp)
the total number of filters hit for a zone

For Detectors:

To view statistics for a given detector, enter the following:

ccc> show ccd-stats [name name / id id]

If the name or id is not provided, the details for all the existing ADMs display. If the detector name is provided and there is more than one detector with the given name, the detail of each such detector is displayed. The information includes:

the total number of denunciations and reprieves received for a given CCD
the total number of denunciations and reprieves in "pending state" for a given CCD

the total number of denunciations and reprieves processed (filters installed/
removed) for a given CCD

the total number of denunciations and reprieves received (in duplicate) for a give	n
CCD (this is fetched through zdp)	

For Filters:

To view statistics for a given filter, enter the following:

ccc> show filterbox-stats [id]

If the id is not provided, the details for all the existing filter boxes display. The information includes:

□ the number of times all the filters belonging to a particular zone on a filter device were hit

Appendix A. CLI Commands for Central

Commands at User Mode

Command	Purpose
ccc> show Subscriber [name name / id id]	Shows the details of the subscriber for the given name or the id, and shows list of all the subscribers by default. If the subscriber name is provided and there is more than one subscriber with the given name, the list of all such subscriber is displayed. This information includes: Subscriber Id Subscriber name Subscriber Contact Information number of credits assigned to the subscriber
ccc> show zone [name name / id id subscriberId subId]	Shows the details of the zone for the given name or the id, shows list of all the zones by default. If the zone name is provided and there is more than one zone with the given name, the list of all such zone is displayed). This information includes: zone id zone name zone's implicit filter list of addresses associated with this zone Subscriber name
ccc> show ccd [name name / id id zoneId zoneId]	Shows the details of the CCD for the given name or the id, and shows list of all the CCDs by default. If the detector name is provided and there is more than one detector with the given name, the list of all such detector is displayed). This information includes: ccd id ccd name zone name subscriber name
ccc> show filterbox [id]	Shows the details of the FilterBox for the given ID, shows all the filter boxes by default). This information includes: • filterdevice id • hostname • type • location

Command	Purpose
ccc> show zone-stats [name name / id id]	Shows the statistics for the given zone. If the zone name or id is not provided, it shows the details for all the existing zones. If zone name is provided and there is more than one zone with the given name, the detail of each such zone is displayed. The information includes: • the total number of denunciations and
	 reprieves received for a zone the total number of denunciations and reprieves in "pending" state for a zone the total number of denunciations and reprieves processed (filters installed/removed) for a zone the total number of denunciations and reprieves (in duplicate) received for a zone (this is fetched through zdp) the total number of filters hit for a zone
ccc> show ccd-stats [name name / id id]	Shows the statistics for the given CCD. If the name or id is not provided, it shows the details for all the existing ADMs. If detector name is provided and there is more than one detector with the given name, the detail of each such detector is displayed. The information includes:
	 the total number of denunciations and reprieves received for a given CCD the total number of denunciations and reprieves in "pending state" for a given CCD the total number of denunciations and reprieves processed (filters installed/removed) for a given CCD the total number of denunciations and reprieves received (in duplicate) for a given CCD (this is fetched through zdp)
ccc> show filterbox stats [id]	Shows the statistics for the given filterbox. If the id is not provided, it shows the details for all the existing filter boxes. The information includes: • the number of times all the filters belonging to a particular zone on a filter device were hit
ccc> show log	Shows the recent activity log

Commands at Privileged Mode

A. Commands at Config ccc# config ccc(config)#

Command	Purpose
ccc(config)# delete subscriber subscriber-id	Deletes the subscriber with the given id
ccc(config)# delete zone zone-id	Deletes the zone with the given id
ccc(config)# delete ccd ccd-id	Deletes the ccd with the given id
ccc(config)# delete filterbox filterbox-id	Deletes the filterbox with the given id

B. Ethernet Interfaces Configuration Commands

Command	Purpose
ccc(config)# interface type {port slot/port}	Enters the interface configuration mode of the given interface
ccc(config-if)# ip address [ip ipaddress] [mask mask] [gateway gateway]	Setting the IP address, mask and gateway
ccc(config-if)# shutdown	Changes the admin state of the interface to down, i.e. it disables the interface
ccc(config-if)# no shutdown	Changes the admin state of the interface to up, i.e., it restarts an interface

C. Subscriber Configuration Commands

Command	Purpose
ccc(config)# subscriber name	Enter the configuration mode for the given subscriber. If the subscriber with the given name doesn't exist, it adds a new subscriber with the confirmation with the user.
ccc(config-subscriber)# name name	Changes the name
ccc(config-subscriber)# chits 1-10000000	Changes the # of chits
ccc(config-subscriber)# primaryContact contactDetails	Changes the primary contact details of the subscriber
ccc(config-subscriber)# secondaryContact contactDetails	Changes the secondary contact details of the subscriber
<pre>ccc(config-subscriber)# delete zone {name name id zone-id}</pre>	Deletes the zone with the given name or the id, if the zone belongs to this subscriber. Otherwise reports an error.

D) Zone Configuration Commands

Command	Purpose
ccc(config-subscriber)# zone { name zone-name id id}	Enters the configuration mode for the given zone. If the zone with the given name doesn't exist, it adds a new zone with the confirmation with the user and it its affirmativeit adds the zone in this subscriber.
ccc(config-subscriber-zone)# stats	Shows the statistics associated with this zone
ccc(config-subscriber-zone)# rule implicit-filter	Changes the implicit-filter for the zone
ccc(config-subscriber-zone)# ip-address <i>ip-address1</i> [<i>ip-address2</i>] [<i>ip-address3</i>]	Adds the IP addresses to the list of already existing IP addresses
ccc(config-subscriber-zone)# no ip-address <i>ip-address1</i> [<i>ip-address2</i>] [<i>ip-address3</i>]	Removes the IP addresses from the list of existing IP addresses
ccc(config-subscriber-zone)# delete ccd {name name id ccd-id}	Deletes the detector with the given name or the id if the detector belongs to this zone; otherwise reports an error

E) CCD Configuration Commands

Command	Purpose
ccc(config-subscriber-zone)# ccd name	Enters the configuration mode for the given CCD. If the CCD with the given name doesn't exist, it adds a new CCD with the confirmation with the user.
ccc(config-subscriber-zone-ccd)# stats	Shows the statistics associated with this CCD
ccc(config-subscriber-zone-ccd)# name name	Changes the name of the CCD

F) FilterBox Configuration Commands

Command	Purpose
ccc(config)# filterbox name	Enters the configuration mode for the filter box. If the filterbox with the given name doesn't exist, it adds the new filterbox with the confirmation with the user.
ccc(config-filterbox)# stats	Shows the statistics associated with this filterbox
ccc(config-filterbox)#hostname hostname	Changes the hostname of the filter device
ccc(config-filterbox)# type type	Changes the type of the filter device
ccc(config-filterbox)# location location	Changes the location where the filterbox is located