



Command Reference

This appendix documents only new or modified commands necessary to configure and monitor the CSG for content billing. All other commands used with this product (those that already exist and have not been modified) are documented in either the Cisco IOS Release 12.2 command reference publications or in the IOS Server Load Balancing feature module.

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accounting (CSG policy)

To define the accounting type and customer string for all flows that comply with a CSG billing policy, use the **accounting** command in CSG policy configuration mode. To delete the rules, use the **no** form of this command.

```
accounting [type {http | ftp | other | wap {connection-oriented | connectionless}} | smtp | pop3 |
rtsp | imap] [customer-string string]
```

```
no accounting [type {http | ftp | other | wap {connection-oriented | connectionless}} | smtp | pop3 |
rtsp | imap] [customer-string string]
```

Syntax Description

| | |
|-------------------------------|--|
| type http | Indicates HTTP accounting. For HTTPS, use type other for port number 443. |
| type ftp | Indicates FTP accounting, and enables Layer 7 inspection of FTP control sessions. |
| type other | Indicates some other type of IP accounting, such as IP, TCP, or UDP. This is the default setting. For HTTPS, use type other for port number 443. |
| type wap | Indicates WAP accounting. |
| connection-oriented | Defines the type of WAP traffic as connection-oriented. |
| connectionless | Defines the type of WAP traffic as connectionless. |
| type smtp | Enables reporting of SMTP data records. |
| type pop3 | Enables reporting of POP3 data records. |
| type rtsp | Enables reporting of RTSP data records. |
| type imap | Enables reporting of IMAP Data Records. |
| customer-string string | (Optional) 1-to-16-byte string to be output to the generated accounting records. |

Defaults

The default accounting type is **other**.

Command Modes

CSG policy configuration

Command History

| Release | Modification |
|--------------------------|--|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(1)C4(1)—12.2(14)ZA | The type wap keyword was added. |
| 3.1(1)C4(3)—12.2(14)ZA2 | The smtp and pop3 keywords were added. |
| 3.1(3)C5(1)—12.2(17d)SXB | The rtsp keyword was added. |
| 3.1(3)C5(5)—12.2(17d)SXD | The imap keyword was added. |

Usage Guidelines

This command is required if accounting records are to be generated for content that satisfies the associated CSG billing policy.

Prepaid service matches are based on the IP address and port number of the control connection to the RTSP server IP.

The default setting for this command (**accounting type other**) is displayed in the output of the **show run** command.

Specifying **type ftp** requires a control TCP connection to server port 21.

Specifying **type rtsp** requires a control TCP connection to server port 554.

If you specify both **type http** and any other type (**type other**, **type ftp**, **type imap**, and so on) for a service, and you enable service-level CDR summarization for the service, the CSG's incremental and cumulative byte counts are not valid. This is because they are a mix of TCP bytes (for the HTTP traffic) and IP bytes (for all other traffic).

When configuring header and URL maps, keep the following considerations in mind:

- Header and URL maps are valid only with accounting types HTTP, RTSP, and WAP.
- If you do not specify an accounting type, the CSG assumes that the session is an HTTP session, and packets matching the policy are not billed (that is, no quota is used, and no CDR is generated).

Examples

The following example shows how to define accounting types and customer strings:

```
ip csg policy WSP_CON_P
    accounting type wap connection-oriented
```

```
ip csg policy WAP_NOCON_P
    accounting type wap connectionless
```

```
ip csg content WAP_CON
    ip any udp 9201
    policy WAP_CON_P
```

```
ip csg content WAP_CONLESS
    ip any udp 9200
    policy WAP_NOCON_P
```

```
ip csg policy SMTP
    accounting type smtp
```

```
ip csg policy POP3
    accounting type pop3
```

```
ip csg content SMTP
    ip any tcp 25
    policy SMTP
    inservice
```

```
ip csg content POP3
    ip any tcp 110
    policy POP3
    inservice
```

```
ip csg policy RTSP
    accounting type rtsp
```

```
ip csg content RTSP
    ip any tcp 554
```

```
policy RTSP
inservice

ip csg policy IMAP
  accounting type imap

ip csg content IMAP
  ip any tcp 143
  policy IMAP
  inservice
```

| Related Commands | Command | Description |
|------------------|-------------------------------|--|
| | ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |

accounting (module CSG)

To download a configured accounting service to a CSG card, use the **accounting** command in module CSG configuration mode. To delete the downloaded accounting service, use the **no** form of this command.

accounting *service-name*

no accounting *service-name*

| Syntax Description | <i>service-name</i> | Name of the configured accounting service to be downloaded. |
|--------------------|---------------------|---|
|--------------------|---------------------|---|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | Module CSG configuration |
|---------------|--------------------------|
|---------------|--------------------------|

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| Usage Guidelines | <p>You must specify at least one client VLAN and one server VLAN in order for the accounting service to be placed inservice. Otherwise, no traffic can flow to the accounting service.</p> <p>You must configure at least one ruleset in order for the accounting service to be placed INSERVICE.</p> |
|------------------|---|
|------------------|---|

| Examples | The following example shows how to download the CSG accounting service A1 to the CSG card in slot 4: |
|----------|--|
|----------|--|

```
module csg 4
  accounting A1
  ruleset R1
```

| Related Commands | Command | Description |
|------------------|----------------------------|--|
| | module csg | Enters module CSG configuration mode for a specified slot. |

activation

To specify the activation mode for a Connection Duration service, use the **activation** command in CSG service configuration mode. To restore the default setting, use the **no** form of this command.

activation [**automatic** | **user-profile**]

no activation

Syntax Description

| | |
|---------------------|---|
| automatic | <p>Activate the Connection Duration service, unless the billing profile indicates that no service should be activated.</p> <p>If you specify the automatic keyword, the CSG activates the Connection Duration service in the user's billing plan automatically, unless the service name is specified with a zero length as the connect service in the billing profile information. The connect service information must be specified in the same message as the subscriber's billing plan.</p> |
| user-profile | <p>Activate the Connection Duration service only if the billing profile specifies this service as the connect service. This is the default setting.</p> <p>If you specify the user-profile keyword, the CSG activates the Connection Duration service for a subscriber only if the service name is specified as a connect service in the billing profile information in an AAA Access-Accept, an AAA Accounting-Start, or a Quota Server User-Profile Response.</p> |

Defaults

The Connection Duration service is activated only if the billing profile specifies this service as the connect service.

Command Modes

CSG service configuration mode

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Examples

The following example specifies **automatic** activation for Connection Duration service **CONNECT**.

```
ip csg service CONNECT
  basis second connect
  activation automatic
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

agent (CSG accounting)

To define the primary and backup Billing Mediation Agents (BMAs) to which billing records are to be sent, use the **agent** command in CSG accounting configuration mode. To remove a BMA from the list of agents, use the **no** form of this command.

agent *ip-address port-number priority*

no agent *ip-address port-number priority*

Syntax Description

| | |
|--------------------|--|
| <i>ip-address</i> | IP address of the BMA you wish to define. The CSG differentiates BMAs based on IP addresses. When you configure a BMA, make sure its IP address matches on both the active CSG and on the backup CSG. |
| <i>port-number</i> | Port number of the BMA you wish to define. The valid range is 1 to 65535. The CSG differentiates BMAs based on port numbers. When you configure a BMA, make sure its port number matches on both the active CSG and on the backup CSG. |
| <i>priority</i> | Allows you to define primary and backup BMAs. You must specify at least one agent. The priority specifies the order of preference of the agents. A lower number indicates a higher priority. If the current agent becomes unusable, the CSG uses the highest priority BMA available. Priorities for different agents do not have to be contiguous. That is, you can have three agents with priorities 1, 5, and 10. The valid range of priorities is 1 to 1000. |

Defaults

Primary and backup BMAs are not defined.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

Accounting records are sent to only those agents identified in the **agent** command. This provides a measure of security to ensure that records are not sent to unauthorized systems.



Note

The CSG does not support multiple agents with the same IP address.

Examples

The following example shows how to configure a primary BMA with priority 1, and a backup BMA with priority 2, for the CSG accounting service A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
  inservice
```

Related Commands

| Command | Description |
|-----------------------------------|--|
| ip csg accounting | Defines content-based accounting as a service. |
| agent activate | Enables support for multiple active BMAs. |
| agent local-port | Defines the port on which the CSG listens for packets from the BMAs. |

agent activate

To enable support for multiple active Billing Mediation Agents (BMAs), use the **agent activate** command in CSG accounting configuration mode. To disable support for multiple active BMAs, use the **no** form of this command.

agent activate [*number* [**sticky seconds**]]

no agent activate [*number* [**sticky seconds**]]

Syntax Description

| | |
|-----------------------|--|
| <i>number</i> | <p>Number of BMAs that the CSG tries to activate at the same time.</p> <p>If you have defined more BMAs than <i>number</i>, and an active BMA fails, the BMA with the highest priority (lowest number) that is not already active is made active.</p> <p>The valid range is 1 through 10. The default value is 1.</p> |
| sticky seconds | <p>Number of seconds of inactivity after which a sticky object is to be deleted.</p> <p>The CSG creates a sticky object to ensure that all the billing records for a user are sent to the same BMA. If the user ID is not available (for example, if the internal table is too small to hold all user ID entries, or if the CSG cannot access the user ID database), the CSG creates two sticky objects, one for the source IP address and one for the destination IP address.</p> <p>These entries are removed from the table based on inactivity. Note that entries that contain a user ID do not age out; they are removed only by RADIUS messages.</p> <p>The valid range is 1 second through 64,000 seconds. The default value is 30 seconds.</p> |

Defaults

The default value for *number* is 1.
The default value for *seconds* is 30 seconds.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|-----------------------|------------------------------|
| 2.2(3)C2(1)—12.1(13)E | This command was introduced. |

Examples

The following example shows how to enable support for multiple active BMAs for the CSG accounting service A1. In this example, up to two BMAs can be active at the same time:

```
ip csg accounting A1
user-group G1
agent activate 2
agent local-port 3775
agent 10.1.2.4 11112 10
agent 10.1.2.5 11113 20
keepalive 3
records batch
records http-statistics
records intermediate bytes 100000 time 3600
records max 250
inservice
```

Related Commands

| Command | Description |
|--|---|
| agent (CSG accounting) | Defines the primary and backup BMAs to which to send billing records. |
| agent local-port | Defines the port on which the CSG listens for packets from the BMAs. |
| ip csg accounting | Defines content-based accounting as a service. |

agent local-port

To define the port on which the CSG is to listen for packets from the Billing Mediation Agents (BMAs), use the **agent local-port** command in CSG accounting configuration mode. To revert to the default value, use the **no** form of this command.

agent local-port *port-number*

no agent local-port

Syntax Description

| | |
|--------------------|--|
| <i>port-number</i> | Port number on which the BMA is to listen. The valid range is 1 to 65535. The default value is 3386, the port number prescribed by GTP', the protocol used to send accounting records. |
|--------------------|--|

Defaults

The default port number is 3386.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

This command accommodates BMAs that configure a port number that is different from the GTP' default.

This local port must be unique with respect to any other local port configured, such as the quota server local port.



Note

The CSG drops requests (such as nodealive, echo, and redirect requests) unless they come from a configured BMA IP address. The CSG also verifies IP addresses contained in NodeAddress IEs against the configured list of BMAs. If there is no match, the CSG drops the request. The CSG does not look at a request's source port, replying to the same port from which the request came.

Examples

The following example shows how to specify local port 3775 as the port on which the CSG listens, instead of the default port, for the CSG accounting service A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
```

```
records max 250  
inservice
```

Related Commands

| Command | Description |
|--|---|
| agent (CSG accounting) | Defines the primary and backup BMAs to which to send billing records. |
| agent activate | Enables support for multiple active BMAs. |
| ip csg accounting | Defines content-based accounting as a service. |

alias (module CSG VLAN)

To assign multiple IP addresses to the CSG, use the **alias** command in module CSG VLAN configuration mode. To remove an alias IP address from the configuration, use the **no** form of this command.

alias *ip-address netmask*

no alias *ip-address netmask*

| Syntax Description | |
|--------------------|---|
| <i>ip-address</i> | Alias IP address; a maximum of 256 addresses are allowed. |
| <i>netmask</i> | Network mask. |

Defaults No default behavior or values.

Command Modes Module CSG VLAN configuration

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines This command allows you to place the CSG on a different IP network than real servers without using a router.

You can also use this command in redundant configurations to ensure that the gateway can access the same IP address regardless of which the CSG is active.

You can specify more than one **alias** command for each VLAN.

Examples The following example shows how to use the **alias** command to assign multiple IP addresses to the CSG:

```
vlan 301 client
 name TO-GGSN-MS-APN
 gateway 31.0.0.10
 ip address 31.0.0.21 255.255.255.0
 route 11.0.0.0 255.255.0.0 gateway 31.0.0.1
 route 11.1.0.0 255.255.0.0 gateway 31.0.0.2
 route 11.2.0.0 255.255.0.0 gateway 31.0.0.3
 route 11.3.0.0 255.255.0.0 gateway 31.0.0.4
 alias 31.0.0.51 255.255.255.0
```

| Related Commands | Command | Description |
|------------------|--|--|
| | show module csg variable | Displays the list of VLANs. |
| | vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

aoc confirmation

To configure a token for use in advice of charge (AoC) URL-rewriting, use the **aoc confirmation** command in CSG user group configuration mode. To remove the token, use the **no** form of this command.

aoc confirmation *token*

no aoc confirmation

Syntax Description

token

A string of up to 15 alphanumeric characters.

To insert a question mark (?) in the string, enter Ctrl-V, then the question mark. To insert a question mark in an editing document, use ASCII code 22. Use TFTP instead of copy-and-paste to keep the question mark.

Defaults

No default behavior or values.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|--------------------------|--|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| 3.1(3)C5(5)—12.2(18)SXD | Support was added for WAP content authorization URL-rewriting. |

Usage Guidelines

URL-rewriting allows a top-off server to append parameters to a URL in order to convey state information to the quota server during a content authorization request. Whenever a content authorization response contains the forward action code, and the URL contains the AoC confirmation token, the token and all trailing characters are removed from the URL before the request is forwarded to the server.

The token is used for both HTTP and WAP content authorization URL-rewriting.

Examples

The following example specifies a token for advice of charge (AoC) URL-rewriting:

```
ip csg user-group A1
  aoc confirmation ?CSG_AOC_OK
```

Related Commands

| Command | Description |
|-----------------------------------|--|
| authorize content | Enables content authorization for a service. |

assign

To associate an IP address with a transport-type value, use the **assign** command in CSG transport-type configuration mode. To remove the association, use the **no** form of this command.

assign *ip-address value*

no assign *ip-address value*

| Syntax Description | <i>ip-address</i> | IP address. |
|--------------------|-------------------|---|
| | <i>value</i> | Transport-type value in the range 1 to 255. |

Defaults No default behavior or values.

Command Modes CSG transport-type configuration

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines The transport-type is used to classify data traffic based on its access path using the NAS-IP reported in RADIUS. Use the **assign** command to associate IP addresses with transport-type values. Transport-type information is reported in fixed record format CDRs.

Examples The following example associates an IPv4 address with a transport-type value:

```
ip csg transport-type
  assign 1.2.3.4 34
```

| Related Commands | Command | Description |
|------------------|---------------------------------------|---|
| | records format | Specifies variable or fixed CDR format. |
| | hostname | Specifies a variable hostname for a CSG module. |
| | owner name | Specifies the name of a service owner. |
| | owner id | Specifies an identifier for a service owner. |
| | ip csg transport-type | Classifies data traffic based on its access path. |
| | class | Specifies a service class value. |

authorize content

To enable Advice of Charge and Per-Event Filtering for the CSG, use the **authorize content** command in CSG service configuration mode.

authorize content

Syntax Description There are no arguments or keywords.

Defaults No default behavior or values.

Command Modes CSG service configuration mode

| Command History | Release | Modification |
|-----------------|-------------------------|------------------------------|
| | 3.1(3)C4(1)—12.2(14)ZA2 | This command was introduced. |

Usage Guidelines If this command is configured, the CSG uses the new ContentAuthReq to alert the quota server of a new transaction, and allows it to direct the CSG (using ContentAuthResp) to perform any of four mutually exclusive actions:

- **FORWARD**: Instructs the CSG to forward the flow without altering the destination.
- **DROP**: Instructs the CSG to drop all packets for this flow.
- **REDIRECT-NAT**: Instructs the CSG to forward all packets for this flow to the IP address provided in the ContentAuthResp. The CSG translates the packet to the IP address and port that were provided.
- **REDIRECT-URL**: Instructs the CSG to redirect the client request to the URL provided in the ContentAuthResp. The CSG sends a Layer 7 redirect to the client (for example, HTTP 302 response) that contains the redirect URL.

Examples The following example illustrates the **authorize content** command:

```
Router(config)# ip csg service service_name
Router(config-csg-service)# authorize content
```

| Related Commands | Command | Description |
|------------------|----------------------------------|---|
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |
| | aoc confirmation | Configures a token for use in advice of charge (AoC) URL-rewriting. |

basis

To specify the billing basis for a CSG content billing service, use the **basis** command in CSG service configuration mode. To use the default billing basis, use the **no** form of this command.

```
basis [byte [exclude mms] {ip | tcp} | {fixed [exclude mms] | second [connect]}
```

```
no basis [byte {ip [exclude mms] | tcp} | {fixed [exclude mms] | second [connect]}
```

Syntax Description

| | |
|--------------------|--|
| byte ip | Billing charge is a function of the IP data volume processed during the user's session. This is the default setting. Note We strongly recommend that you do not specify basis byte ip for HTTP billing. If you do so, the byte counts are the same as if you had specified basis byte tcp . |
| exclude mms | (Optional) MMS traffic is not counted against quota for prepaid users when exclude mms is configured, and the user is authorized for the service. You can configure exclude mms with both byte ip and fixed , but not with byte tcp or second . |
| byte tcp | Billing charge is a function of the TCP data volume processed during the user's session. Note Supplemental usage reporting always reports IP bytes, even if the billing basis is configured for TCP bytes. |
| fixed | Billing charge is a fixed cost, which is deducted each time the first packet for a transaction hits a content-policy pair (that is, deducted for each request). |
| second | Billing charge is duration-based for the CSG service. Unless the connect keyword is also configured, the billing is for the service duration time. |
| connect | Billing charge is based on connection duration time, not service duration time. Note If you specify the connect keyword, the balance and consumed fields in the output of the show module csg accounting command are updated only when there is a Service Reauthorization Request for new quota. |

Defaults

The default setting is **byte ip** (billing charge is a function of the IP data volume processed).

Command Modes

CSG service configuration

Command History

| Release | Modification |
|------------------------|---|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(1)C4(1)—12.2(14)ZA | The exclude mms keyword was added. |

| Release | Modification |
|--------------------------|---------------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | The second keyword was added. |
| 3.1(3)C5(5)—12.2(18)SXD | The connect keyword was added. |

Usage Guidelines

By default the CSG treats MMS traffic like any other WAP traffic, and generates appropriate prepaid and postpaid WAP statistics reports. The content type distinguishes it as MMS traffic. MMS traffic is not counted against quota for prepaid users when either **basis byte ip exclude mms**, or **basis fixed exclude mms** is configured on the service.

For HTTP billing, configuring **basis byte tcp** allows counting of only TCP payload and exclusion of overhead for network retransmission. With this option, the CSG excludes IP and TCP headers from volume counts:

- Prior to the CSG 3.1(3)C5(5), the byte counting is limited to TCP payload plus one byte representing each SYN, and one byte representing the first FIN.
- In the CSG 3.1(3)C5(5) and later, the byte counting is limited to TCP payload.

Retransmitted packets are also not counted.

When a Service Duration Billing Service is a member of a billing plan, and an accounting definition is inservice and downloaded to a CSG module, you cannot modify the basis or meter configuration. You are instructed at the console to configure **no inservice** on the downloaded Accounting definitions.



Note

We recommend that you first remove the service from each billing plan, make the basis changes, and add it back to each billing plan. If you delete it, the service is automatically removed from each billing plan, and you must add it back to each plan after configuring it.

To enable Connection Duration Billing for a service, configure the service name as a service under one or more billing plans in CSG billing configuration mode, then enter the **basis second connect** command in CSG service configuration mode.

Because IMAP metering is byte-based, you cannot configure both **meter imap** and **basis fixed** or **basis second** in the same service. Only **basis byte** is meaningful with **meter imap**.

Examples

The following example shows how to specify fixed billing for the CSG service MOVIES:

```
ip csg service MOVIES
  basis fixed
  content MOVIES_COMEDY policy MOVIES_COMEDY
  content MOVIES_ACTION policy MOVIES_ACTION weight DOUBLE
  idle 12
```

The following commands are used to configure Service Duration Billing for the OFF_NET service.

```
ip csg service OFF_NET
  basis second
  meter minimum 60
  content ANY policy HTTP
  content ANY policy ANY
```

Related Commands

| Command | Description |
|---------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |
| meter increment | Specifies the increments for debiting quota upon completion of a service configured for Service Duration Billing. |

class

To specify a service class value, use the **class** command in CSG service configuration mode. To remove the owner ID, use the **no class** form of this command.

class *value*

no class *value*

Syntax Description

| | |
|--------------|--|
| <i>value</i> | Specifies a value in the range 1 to 255. |
|--------------|--|

Defaults

No default behavior or values.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

Class is used with fixed-record format to identify a service class value. This value is opaque to the CSG and only has meaning for the administrator. It is reported as tariff-class in fixed record format CDRs.

Examples

The following example specifies a class value for the service:

```
ip csg service FOO
  class 7
```

Related Commands

| Command | Description |
|--|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |
| ip csg transport-type mode | Classifies data traffic based on its access path. Specifies that a billing plan is postpaid or prepaid. |
| records format | Specifies variable or fixed CDR format. |
| hostname | Specifies a variable hostname for a CSG module. |
| owner name | Specifies the name of a service owner. |
| owner id | Specifies an identifier for a service owner. |
| assign | Associates an IPv4 address with a transport-type value. |

clear module csg

To clear the CSG, use the **clear module csg** command in privileged EXEC mode.

```
clear module csg {slot | all} {core-dump | counters}
```

| Syntax Description | | |
|--------------------|------------------|--|
| | <i>slot</i> | Indicates the CSG's location in the switch. The range is from 1 through 9. |
| | all | Indicates that the command is to apply to all CSGs in the switch. |
| | core-dump | Clears the CSG core dump. |
| | counters | Clears all CSG statistics. |

Defaults None

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples The following example clears all statistics for all of the CSGs in the switch:

```
clear module csg all counters
```

clear module csm

To clear the CSG, use the **clear module csm** command in privileged EXEC mode.

```
clear module csm {slot | all} {arp-cache ip-address | connections [real | vserver] | counters |
ft active | linecard-configuration | sticky [sticky-group | all]}
```

| Syntax Description | | |
|------------------------------------|--|--|
| <i>slot</i> | | Indicates the CSG's location in the switch. The range is 1 through 9. |
| all | | Indicates that the command is to apply to all CSGs in the switch. |
| arp-cache <i>ip-address</i> | | Clears the Address Resolution Protocol (ARP) cache for the specified CSG. |
| connections | | Clears connections for the specified CSG. All connections are cleared for the specified CSG; use this command to clear selected connections. |
| real | | (Optional) Clears connections for only the real servers. |
| vserver | | (Optional) Clears connections for only the virtual servers. |
| counters | | Clears all statistics for the specified CSG. |
| ft active | | This keyword does not apply in a CSG environment. |
| linecard-configuration | | This keyword does not apply in a CSG environment. |
| sticky | | This keyword does not apply in a CSG environment. |
| <i>sticky-group</i> | | This argument does not apply in a CSG environment. |
| all | | This keyword does not apply in a CSG environment. |

Defaults If you specify the **connections** keyword and you do not specify **real** or **vserver**, all connections are cleared.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines When a connection is closed, a reset (RST) is sent to both the client and the server. Counters reset all the CSG statistics information, except for the **show module csg tech-support** counters, which are reset any time you run the **show** command.

Examples The following example clears all connections for all the CSGs in the switch:

```
clear module csm all connections
```

client (CSG content)

To define the client IP address spaces that can use the CSG content server, use the **client** command in CSG content configuration mode. To remove a client definition, use the **no** form of this command.

```
client [include | exclude] {any | ip-address [netmask]}
```

```
no client [include | exclude] {any | ip-address [netmask]}
```

Syntax Description

| | |
|-------------------|---|
| include | (Optional) Indicates that the specified client can use the CSG content server. This is the default setting. |
| exclude | (Optional) Indicates that the specified client cannot use the CSG content server. Flows from excluded clients are blocked. |
| any | Identifies all clients. This is the default setting. |
| <i>ip-address</i> | Client IP address. The default is 0.0.0.0 (all clients). |
| <i>netmask</i> | (Optional) Client IP network mask. You can express the network mask in either IP dotted notation (<i>n.n.n.n</i>) or prefix notation (<i>/nn</i> , where <i>nn</i> is the number of leading 1 bits). For example, 255.255.0.0 and /16 are equivalent network masks. The default client IP network mask is 0.0.0.0 or /0. |

Defaults

All clients are included and can use the CSG content server.

The default client IP address is 0.0.0.0 (all clients).

The default client IP network mask is 0.0.0.0 or /0.

Command Modes

CSG content configuration

Command History

| Release | Modification |
|-------------------------|-------------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(3)C5(3)—12.2(18)SXD | The usage guidelines were modified. |

Usage Guidelines

You can use more than one **client** command to define more than one client.

The **include** and **exclude** settings are used only with the “default” policy, which is used only if all customer-defined policies fail to match.

The *netmask* argument is applied to the source IP address of incoming connections. The result must match the *ip-address* argument, or the **include** and **exclude** settings are not applied to the user packet.

The **include** and **exclude** settings are not applied at all if the **ip csg block** command is configured.

If you define content with a network mask of 255.255.255.255 or /32 (that is, all subnets), a virtual server is created and the CSG's MAC address is entered as the host's address in the CSG's ARP cache. Because of this, you cannot have hosts directly connected to the CSG, coupled with content with a network mask of 255.255.255.255 or /32 that matches those hosts.

Examples

The following example allows only clients from 10.4.4.x access to the CSG content server:

```
ip csg content MOVIES_COMEDY
client 10.4.4.0 255.255.255.0
idle 120
ip 172.18.45.0/24 tcp 8080
policy POLICY1
replicate connection tcp
vlan MOVIES_COMEDY
inservice
```

Related Commands

| Command | Description |
|--------------------------------|--|
| ip csg content | Defines content for the CSG accounting services, and enters CSG accounting configuration mode. |

client-group (CSG policy)

To reference a standard access list that is part of a CSG billing policy, use the **client-group** command in CSG policy configuration mode. To delete the reference, use the **no** form of this command.

client-group {*std-access-list-number* | *std-access-list-name*}

no client-group {*std-access-list-number* | *std-access-list-name*}

Syntax Description

| | |
|-------------------------------|---|
| <i>std-access-list-number</i> | Standard IP access list number. The valid range is 1 to 99. |
| <i>std-access-list-name</i> | Standard access list name. |

Defaults

All clients can access the content.

Command Modes

CSG policy configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The **client-group** command is used to qualify clients for the CSG accounting service. The conditions specified in the referenced access list must be true in order for the flows to be processed by the CSG accounting services. If the conditions are not true, the flows are not processed (that is, traffic flows through with no accounting).

If you reference an access list that includes a **deny** statement, and that **deny** statement is matched, then traffic is blocked, there is no accounting, and the CSG does not check the next policy.

The referenced access list is applied to the VLAN interfaces.

You can reference more than one access list for a single policy by using multiple **client-group** commands in CSG policy configuration mode.

For WAP 1.x, URL maps take precedence over access lists.

For WAP1.x and RTSP, the policy used to determine the next hop address is chosen based solely on access control lists (ACLs), not URL maps. As a result, you can choose the next hop from one policy for routing and from a different policy for billing.

You can use next-hop with client groups as long as a given client group is always sent to the same next hop. You cannot send a given client group to two or more different next hops based on a policy. For example, the following configuration is valid, because both policies use **client group 1** and **next-hop 1**:

```
policy A
  accounting type wap connection-oriented
  url A
  client group 1
  next-hop 1
policy B
  accounting type wap connection-oriented
  url B
```

```

client group 1
next-hop 1
content WAP-CON
policy A
policy B

```

The following configuration is not valid, because policy A uses **client group 1** and **next-hop 1**, but policy B uses **client group 1** and **next-hop 2**:

```

policy A
  accounting type wap connection-oriented
  url A
  client group 1
  next-hop 1
policy B
  accounting type wap connection-oriented
  url B
  client group 1
  next-hop 2
content WAP-CON
policy A
policy B

```

Examples

The following example shows how to reference client group 44 for the CSG policy MOVIES_COMEDY:

```

ip csg policy MOVIES_COMEDY
  accounting type http customer-string MOVIES_COMEDY
  client-group 44
  client-ip http-header x-forwarded-for
  header-map MOVIES
  url-map MOVIES

```

Related Commands

| Command | Description |
|-------------------------------|--|
| ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |
| next-hop | Defines a next-hop IP address. |

client-ip (CSG policy)

To specify that the user's IP address is to be obtained from the URL header after the **x-forwarded-for** keyword, use the **client-ip** command in CSG policy configuration mode. To specify that the user's IP address is to be obtained from the IP header, use the **no** form of this command.

client-ip http-header x-forwarded-for

no client-ip http-header x-forwarded-for

Syntax Description

http-header x-forwarded-for Specifies that the user's IP address is to be obtained from the URL header after the **x-forwarded-for** keyword.

Defaults

No default behavior or values.

Command Modes

CSG policy configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The conditions specified in the referenced header map must be true in order for the flows to be processed by the CSG accounting services. If the conditions are not true, the flows are not processed.

Examples

The following example shows how to reference a client IP address specification in a CSG policy:

```
ip csg policy MOVIES_COMEDY
 accounting type http customer-string MOVIES_COMEDY
 client-group 44
 client-ip http-header x-forwarded-for
 header-map MOVIES
 url-map MOVIES
```

Related Commands

| Command | Description |
|-------------------------------|--|
| ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |

content (CSG ruleset)

To add a content reference to a CSG ruleset, use the **content** command in CSG ruleset configuration mode. To remove a content reference, use the **no** form of this command.

content *content-name*

no content *content-name*

| | | |
|---------------------------|---------------------|--|
| Syntax Description | <i>content-name</i> | Name of a configured content for this ruleset. |
|---------------------------|---------------------|--|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|---------------------------|
| Command Modes | CSG ruleset configuration |
|----------------------|---------------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | <p>The <i>content-name</i> argument must match the <i>content-name</i> argument on an ip csg content command.</p> <p>If you configure more than one content name using multiple ip csg content commands, you can configure more than one content command in CSG ruleset configuration mode. Each content must be associated with a different Layer 3/Layer 4 definition, as configured with ip commands in CSG content configuration mode.</p> |
|-------------------------|--|



| | |
|-------------|---|
| Note | If you assign an inbound VLAN to each content, using the VLAN to differentiate the contents within the same ruleset, the contents can be associated with the same Layer 3/Layer 4 definition. |
|-------------|---|

| | |
|-----------------|--|
| Examples | The following example shows how to add references to contents MOVIES_COMEDY and MOVIES_ACTION to ruleset R1: |
|-----------------|--|

```
ip csg ruleset R1
content MOVIES_COMEDY
content MOVIES_ACTION
```

| | | |
|-------------------------|--------------------------------|--|
| Related Commands | Command | Description |
| | ip csg ruleset | Configures a CSG billing ruleset, and enters CSG ruleset configuration mode. |

content (CSG service)

To define a content and policy as a member of a CSG billing service, and optionally to assign a weight to this content, use the **content** command in CSG service configuration mode. To remove a content name from the billing service, use the **no** form of this command.

```
content content-name policy policy-name [weight weight-name]
```

```
no content content-name policy policy-name [weight weight-name]
```

Syntax Description

| | |
|----------------------------------|--|
| content-name | Name of the content for this service. The name can be 1 to 15 characters long, uppercase or lowercase letters (The CSG changes all letters to uppercase), numbers, and any special characters. |
| policy <i>policy-name</i> | Name of a configured policy to apply to the content for this service. |
| weight <i>weight-name</i> | (Optional) Name of a configured billing weight. |

Defaults

No default behavior or values.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

Content can reference more than one policy. Therefore, you can have multiple **content** commands with the same *content-name* argument, but different *policy-name* arguments.

To make a specific content free, reference a *weight-name* that has a *weight-value* of 0.

Examples

The following example shows how to define content for the CSG service MOVIES. In this example:

- Policy MOVIES_COMEDY is applied to content MOVIES_COMEDY.
- Policy MOVIES_ACTION is applied to content MOVIES_ACTION.
- Content MOVIES_ACTION is given a billing weight named DOUBLE.

```
ip csg service MOVIES
basis fixed
content MOVIES_COMEDY policy MOVIES_COMEDY
content MOVIES_ACTION policy MOVIES_ACTION weight DOUBLE
idle 120
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

database

To identify the server that answers user ID queries, use the **database** command in CSG user group configuration mode. To disable the database server, use the **no** form of this command.

database *ip-address port-number*

no database *ip-address port-number*

| Syntax Description | | |
|--------------------|--------------------|--|
| | <i>ip-address</i> | The IP address of the server that answers user ID queries. |
| | <i>port-number</i> | The port number of the server that answers user ID queries. The valid range is 1 to 65535. |

Defaults No default behavior or values.

Command Modes CSG user group configuration

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples The following example shows how to specify user database IP address 10.1.2.3 and port number 11111 for the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
```

debug ip csg

To set the flags to obtain debugging output for the various CSG components, use the **debug ip csg** command in privileged EXEC mode. To disable the debugging feature, use the **no** form of this command.

```
debug ip csg {all | agent | api | cpu | ftp | gtp | imap | module number | pop3 | quota | radius |
record storage slot | rtsp | smtp | timer | tlv | udb | users [prepaid] | wap | xml}
```

```
no debug ip csg {all | agent | api | cpu | ftp | gtp | imap | module number | pop3 | quota | radius |
record storage slot | rtsp | smtp | timer | tlv | udb | users [prepaid] | wap | xml}
```

Syntax Description

| | |
|-----------------------------------|---|
| all | Generates debugging output for all CSG components. |
| agent | Generates debugging output for the agent component. |
| api | Generates debugging output for the API call trace component. |
| cpu | Generates debugging output for the CPU component. |
| ftp | Generates debugging output for the FTP component. |
| gtp | Generates debugging output for the GTP component. |
| imap | Generates debugging output for the IMAP component. |
| module <i>number</i> | Restricts debugging output to only the specified CSG module. |
| pop3 | Generates debugging output for the POP3 component. |
| quota | Generates debugging output for the quota server component. |
| radius | Generates debugging output for the RADIUS component. |
| record storage <i>slot</i> | Sets the flag to generate debugging output for the Persistent Storage Device (PSD) module, and denotes PSD slot number. |
| rtsp | Generates debugging output for the RTSP component. |
| smtp | Generates debugging output for the SMTP component. |
| timer | Generates debugging output for the timer component. |
| tlv | Generates debugging output for the TLV component. |
| udb | Generates debugging output for the UDB component. |
| users | Generates debugging output for the user component. |
| prepaid | Generates debugging output for only the prepaid users component. |
| xml | Generates debugging output for the XML component. |
| wap | Generates debugging output for the WAP component. |

Defaults

The default values apply to all active CSG modules (cards). The **module** option restricts debugging to a specific card. If you enter the **module** command, debugging is turned off for all other cards; however, the debugging flags set remains in effect for the selected module.

If you want to see most but not all debugging output, you can use the **all** option to turn on all debugging flags, then use the **no** form of this command to turn off any options that do not interest you.

Command Modes

Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------------------|--|
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |
| | 3.1(1)C3(1)—12.2(14)ZA | The cpu , quota , prepaid , and users keywords were added. |
| | 3.1(3)C4(1)—12.2(14)ZA2 | The record storage keyword and <i>slot</i> argument was added. |
| | 3.1(3)C5(1)—12.2(17d)SXB | The rtsp keyword was added. |
| | 3.1(3)C5(3)—12.2(18)SXD | The ftp keyword was added. |
| | 3.1(3)C5(5)—12.2(18)SXD | The imap keyword was added. |

Usage Guidelines

Once the debug flags are set, they are automatically sent to the CSG card when a configuration is downloaded. Similarly, changes in the debug settings are sent to the CSGs being debugged.

You can use the **show debug** command to display the debug flag settings.

Examples

The following example shows how to turn on debugging for **rtsp** and **udb** on module 3:

```
debug ip csg module 3
debug ip csg rtsp
debug ip csg udb
```

entries max

To define the maximum number of entries allowed in the CSG User Table, use the **entries max** command in CSG user group configuration mode. To return to the default value, use the **no** form of this command.

entries max *entries-number*

no entries max *entries-number*

Syntax Description

| | |
|-----------------------|---|
| <i>entries-number</i> | <p>The maximum number of entries allowed in the User Table. If the User Table is full, or if there is no memory left for new entries, the CSG uses a Least Recently Used (LRU) algorithm to purge the oldest idled entries. The oldest idled entries are those that have idled the longest since all of the user's sessions were terminated or timed out.</p> <p>The valid range is 0 to an unlimited number of entries. The default number of entries is 25,000. A value of 0 specifies an unlimited number of entries.</p> <p>The actual number of entries in the User Table depends on several variables, including the traffic model being used, the number of RADIUS attributes reported, and so on. Even if you set <i>entries-number</i> to a very large number, such as 300,000, the CSG might never store that many entries in the User Table.</p> |
|-----------------------|---|

Defaults

The default number of entries is 25,000.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

The User Table identifies all users known to the CSG. The table is populated based on the contents of RADIUS Accounting Start messages, or from the user database, if either feature is enabled in your configuration.

Examples

The following example shows how to specify a maximum of 100,000 cache entries for the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
```

```
radius server 10.13.14.15
radius userid User-Name
redirect nat 10.33.33.3
```

Related Commands

| Command | Description |
|----------------------------|---|
| database | Server that answers user ID queries. |
| radius key | Specifies the CSG to be the RADIUS endpoint for accounting records, and specifies the secret key. |

failover

To set the time for a standby CSG to wait before becoming an active CSG, use the **failover** command in fault-tolerant configuration mode. To remove the failover configuration, use the **no** form of this command.

failover *failover-time*

no failover *failover-time*

| | | |
|---------------------------|----------------------|---|
| Syntax Description | <i>failover-time</i> | Amount of time, in seconds, the CSG must wait after the last heartbeat message is received before assuming the other CSG is not operating. The valid range is 1 to 65535 seconds. The default value is 3 seconds. |
|---------------------------|----------------------|---|

Defaults The default failover time is 3 seconds.

Command Modes Fault-tolerant configuration

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples The following example shows how to set a failover period of 6 seconds:

```
ft group 123 vlan 5
failover 6
heartbeat-time 2
priority 12
```

| | | |
|-------------------------|---------------------------------------|--|
| Related Commands | Command | Description |
| | ft group (module CSG) | Enters fault-tolerant configuration mode and configures fault tolerance. |
| | show module csg ft | Displays statistics and counters for the CSG fault-tolerant pair. |

flags

To specify IP, TCP, or WAP flag bit masks and values for CSG quota refund, use the **flags** command in CSG refund configuration mode. To remove the flags, use the **no** form of this command.

flags {*ip mask* | *tcp mask* | *wap*} *value*

no flags {*ip mask* | *tcp mask* | *wap*} *value*

| Syntax Description | |
|--------------------|---|
| ip | All IP protocol connections other than TCP or WAP. |
| tcp | TCP connections |
| wap | WAP connections. |
| <i>mask</i> | The <i>mask</i> for an ip or tcp flag must match that reported to the BMA for connection termination. The range for <i>mask</i> is 0x01 to 0xFF. |
| <i>value</i> | The <i>value</i> for an ip , tcp , or wap flag, which must match that reported to the BMA for connection termination. <ul style="list-style-type: none"> For an ip or tcp flag, the range for <i>value</i> is from 0x00 to 0xFF. For a wap flag, <i>value</i> can be 0x00, 0x01, 0x02, or 0x04. |

Defaults No default behavior or values.

Command Modes CSG refund configuration

| Command History | Release | Modification |
|-----------------|--------------------------|--|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| | 3.1(3)C5(5)—12.2(18)SXD | Combined the flags and flags wap commands. |

Usage Guidelines The **ip** flag *values* are:

- 0x01: Connection initiator.
 - 0: The connection was initiated by the subscriber. The source address is associated with the user ID.
 - 1: The connection was initiated by the network. The destination address is associated with the user ID.
- 0x80: Connection terminated due to lack of authorization failure.
 - 0: The connection was not terminated as a result of an authorization failure.
 - 1: The connection was terminated as a result of an authorization failure.
- 0x7E: Reserved.

The **tcp** flag *values* are:

- 0x01: Connection initiator.
 - 0: The connection was initiated by the subscriber. The source address is associated with the user ID.
 - 1: The connection was initiated by the network. The destination address is associated with the user ID.
- 0x02: TCP termination type.
 - 0: Normal TCP termination (FIN or RST).
 - 1: Connection timed out.
- 0x04: Persistent Connection (multiple sequential transactions per TCP connection).
 - 0: The reported connection is not a persistent connection.
 - 1: The reported connection is a persistent connection.
- 0x08: Destination Initiated Close (valid only if TCP termination type is 0).
 - 0: The connection teardown was initiated by the source IP in the flow.
 - 1: The connection teardown was initiated by the destination IP in the flow.
- 0x10: Destination Side FIN (valid only if TCP termination type is 0).
 - 0: The destination side never sent a FIN (it might have sent an RST).
 - 1: The destination side sent a FIN.
- 0x20: Source Side FIN (valid only if TCP termination type is 0).
 - 0: The source side never sent a FIN (it might have sent an RST).
 - 1: The source side sent a FIN.
- 0x40: Connection not closed (valid only for HTTP1.1).
 - 0: The connection has been closed.
 - 1: The connection is not closed yet, and TCP close bits have no meaning.
- 0x80: Connection terminated due to lack of authorization failure.
 - 0: The connection was not terminated as a result of an authorization failure.
 - 1: The connection was terminated as a result of an authorization failure.

The **wap** flag *values* are:

- 0x00: Normal.
- 0x01: Aborted.
- 0x02: Incomplete.
- 0x04: Forced abort.

Examples

The following example shows how to set flags for IP, TCP, and WAP:

```
ip csg refund COMPANY-REFUND
  retcode http 500 509
  retcode wap 0x44 0x50
  retcode ftp 454
  flags tcp 43 00
  flags ip 80 80
  flags wap 08
```

Related Commands

| Command | Description |
|-------------------------------|---|
| ip csg refund | Specifies the refund policy that can then be applied to the various services, and enters CSG refund configuration mode. |
| retcode | Specifies the range of application return codes for which the CSG refunds quota. |

ft group (module CSG)

To enter fault-tolerant configuration mode and configure fault tolerance, use the **ft group** command in module CSG configuration mode. To remove the fault-tolerant configuration, use the **no** form of this command.

```
ft group group-id vlan vlan-id
```

```
no ft group
```

| Syntax Description | | |
|--------------------|----------------------------|---|
| | <i>group-id</i> | ID of the fault-tolerant group. Both of the CSGs must have the same group ID. The range is from 1 to 254. |
| | vlan <i>vlan-id</i> | VLAN, identified by its VLAN ID, over which heartbeat messages are to be sent. Both of the CSGs must have the same VLAN ID. The valid range is 2 to 4095. |

| Defaults | |
|----------|--------------------------------|
| | No default behavior or values. |

| Command Modes | |
|---------------|--------------------------|
| | Module CSG configuration |

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| Usage Guidelines | |
|------------------|---|
| | A fault-tolerant group is comprised of two Catalyst 6000 series switches, each containing a CSG configured for fault-tolerant operation. Each fault-tolerant group appears to network devices as a single device. A network might have more than one fault-tolerant group, but the CSG supports only one fault-tolerant group per VLAN trunk. |

The characteristics of each fault-tolerant group are defined by the following commands:

- [failover](#)
- [heartbeat-time](#)
- [priority](#)

Examples

The following example shows how to configure a fault-tolerant group named 123, with heartbeat messages sent over VLAN 5:

```

module csg 4
  accounting A1
  ft group 123 vlan 5
    failover 6
    heartbeat-time 2
  priority 12
  ruleset R1
  vlan 30 client
  vlan 40 server

```

Related Commands

| Command | Description |
|------------------------------------|--|
| failover | Sets the time for a standby CSG to wait before becoming an active CSG. |
| heartbeat-time | Sets the time before heartbeat messages are transmitted by the CSG. |
| priority | Sets the priority of the CSG. |
| show module csg ft | Displays statistics and counters for the CSG fault-tolerant pair. |

gateway (module CSG VLAN)

To configure a gateway IP address, use the **gateway** command in module CSG VLAN configuration mode. To remove the gateway from the configuration, use the **no** form of this command.

gateway *ip-address*

no gateway *ip-address*

Syntax Description

ip-address IP address of the client-side gateway.

Defaults

No default behavior or values.

Command Modes

Module CSG VLAN configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

You can configure up to 7 gateways per VLAN with a total of up to 255 gateways for the entire system. A gateway must be in the same network as specified in the **ip address VLAN** command.

To support RADIUS endpoint, the CSG requires a route to 255.255.255.255. You can configure the route by using the **gateway (module CSG VLAN)** command or the **route (module CSG VLAN)** command. For example:

gateway 31.0.0.6

or:

route 255.255.255.255 255.255.255.255 gateway 31.0.0.6



Note

If you already have a gateway configured, you do not need to configure an additional gateway for the RADIUS endpoint.

Examples

The following example shows how to configure a client-side gateway IP address:

```
vlan 301 client
 name TO-GGSN-MS-APN
 gateway 31.0.0.10
 ip address 31.0.0.21 255.255.255.0
 route 11.0.0.0 255.255.0.0 gateway 31.0.0.1
 route 11.1.0.0 255.255.0.0 gateway 31.0.0.2
 route 11.2.0.0 255.255.0.0 gateway 31.0.0.3
 route 11.3.0.0 255.255.0.0 gateway 31.0.0.4
 alias 31.0.0.51 255.255.255.0
```

| Related Commands | Command | Description |
|------------------|--|--|
| | ip address (module CSG VLAN) | Assigns an IP address to the CSG VLAN. |
| | show module csg variable | Displays the list of VLANs. |
| | vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

header-map

To reference a header map that is part of a CSG billing policy, use the **header-map** command in CSG policy configuration mode. To delete the reference, use the **no** form of this command.

header-map *header-map-name*

no header-map *header-map-name*

| | |
|---------------------------|---|
| Syntax Description | <i>header-map-name</i> Name of a header map, as configured with an ip csg map command. |
|---------------------------|---|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|--------------------------|
| Command Modes | CSG policy configuration |
|----------------------|--------------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | The conditions specified in the referenced header map must be true in order for the flows to be processed by the CSG accounting services. If the conditions are not true, the flows are not processed. |
|-------------------------|--|

| | |
|-----------------|--|
| Examples | The following example shows how to reference header map MOVIES for the CSG policy MOVIES_COMEDY: |
|-----------------|--|

```
ip csg policy MOVIES_COMEDY
  accounting type http customer-string MOVIES_COMEDY
  client-group 44
  client-ip http-header x-forwarded-for
  header-map MOVIES
  url-map MOVIES
```

| | | |
|-------------------------|------------------------------------|--|
| Related Commands | Command | Description |
| | ip csg map | Defines the CSG billing content filters (URL and header maps), and enters CSG map configuration mode. |
| | ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |
| | match (header map) | Specifies a header match pattern for a CSG billing map. |
| | match (URL map) | Specifies a URL match pattern for a CSG billing map. |
| | url-map | References a URL map that is part of a CSG billing policy. |

heartbeat-time

To set the time before heartbeat messages are transmitted by the CSG, use the **heartbeat-time** command in fault-tolerant configuration mode. To restore the default heartbeat interval, use the **no** form of this command.

heartbeat-time *heartbeat-time*

no heartbeat-time *heartbeat-time*

| | | |
|---------------------------|-----------------------|--|
| Syntax Description | <i>heartbeat-time</i> | Time interval between heartbeat transmissions, in seconds. The valid range is 1 to 65535 seconds. The default value is 1 second. |
|---------------------------|-----------------------|--|

| | |
|-----------------|---|
| Defaults | The default heartbeat time is 1 second. |
|-----------------|---|

| | |
|----------------------|------------------------------|
| Command Modes | Fault-tolerant configuration |
|----------------------|------------------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples The following example shows how to set the heartbeat time to 2 seconds:

```
ft group 123 vlan 5
  failover 6
  heartbeat-time 2
  priority 12
```

| | | |
|-------------------------|---------------------------------------|--|
| Related Commands | Command | Description |
| | ft group (module CSG) | Enters fault-tolerant configuration mode and configures fault tolerance. |
| | show module csg ft | Displays statistics and counters for the CSG fault-tolerant pair. |

hostname

To specify a variable hostname for a CSG module, use the **hostname** command in module CSG configuration mode. To remove the hostname, use the **no** form of this command.

hostname *name*

no hostname

| Syntax Description | <i>name</i> | 1- to 20-character hostname for the CSG module. |
|--------------------|-------------|---|
|--------------------|-------------|---|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | Module CSG configuration |
|---------------|--------------------------|
|---------------|--------------------------|

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

| Usage Guidelines | This command assigns a hostname to a CSG module that is reported in fixed-record format. |
|------------------|--|
|------------------|--|

| Examples | The following example specifies a hostname for the CSG module in slot 3: |
|----------|--|
|----------|--|

```
module ContentServicesGateway 3
  hostname MYHOST
```

| Related Commands | Command | Description |
|------------------|---------------------------------------|---|
| | assign | Associates an IPv4 address with a transport-type value. |
| | class | Specifies a service class value. |
| | ip csg transport-type | Classifies data traffic based on its access path. |
| | mode | Specifies that a billing plan is postpaid or prepaid. |
| | owner id | Specifies an identifier for a service owner. |
| | owner name | Specifies the name of a service owner. |
| | records format | Specifies variable or fixed CDR format. |

idle (CSG content)

To specify the minimum amount of time that the CSG maintains an idle content connection, use the **idle** command in CSG content configuration mode. To restore the default idle duration value, use the **no** form of this command.

idle *duration*

no idle *duration*

Syntax Description

| | |
|-----------------|---|
| <i>duration</i> | Idle content timer duration in seconds. If there are no flows on a content connection for more than <i>duration</i> seconds, the CSG assumes the connection is idle and ends the connection. Valid values range from 4 to 65535 seconds. The default is 3600 seconds (1 hour). |
|-----------------|---|

Defaults

The default idle duration is 3600 seconds (1 hour).

Command Modes

CSG content configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

RTSP billing in the CSG is based on inspection of the RTSP SETUP and TEARDOWN messages that are exchanged between the client and server. The CSG builds the RTSP CDR immediately after the RTSP TEARDOWN signal if the URL exactly matches that from the RTSP SETUP signal. Otherwise, the CSG builds the CDR after any condition that causes the flows to be terminated. Examples include:

- When the idle content timer expires. By default, this timer is set to 3600 seconds (1 hour). To receive the RTSP CDRs sooner, set the timer to a smaller value, such as 60 seconds. (Do not set the timer to less than 60 seconds for RTSP.)
- When a service_stop is triggered (for example, when the access server sends a RADIUS Accounting Stop for the user).

The CSG tracks usage on a per-session basis. UDP protocols do not have an end-of-session indicator and simply idle out. For that reason, for UDP and WAP 1.x, setting the content idle timer to a low value (for example, 30 seconds) allows the CSG to quickly recognize that a session has ended and generate billing records accordingly. Other service-level features of the CSG that count sessions (such as passthrough mode and service-level CDRs) are similarly affected by the content idle timer setting.

Examples

The following example shows how to configure a 120-second idle timer for the CSG content MOVIES_COMEDY:

```
ip csg content MOVIES_COMEDY
  client 10.4.4.0 255.255.255.0
  idle 120
  ip 172.18.45.0/24 tcp 8080
  policy POLICY1
  replicate connection tcp
  vlan MOVIES_COMEDY
  inservice
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg content | Defines content for the CSG accounting services, and enters CSG content configuration mode. |

idle (CSG service)

To specify the minimum amount of time that the CSG maintains a service with no user sessions, use the **idle** command in CSG service configuration mode. To restore the default idle duration value, use the **no** form of this command.

idle *duration*

no idle *duration*

Syntax Description

| | |
|-----------------|--|
| <i>duration</i> | Idle service timer duration in seconds. If a user's quota for a service is unused for more than <i>duration</i> seconds, the CSG assumes the service is idle and sends a ServiceStop to free up the resources. Valid values range from 10 to 65535 seconds. The default is 300 seconds (5 minutes). |
|-----------------|--|

Defaults

The default idle duration is 300 seconds.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

For RTSP, do not set the timer to less than 60 seconds.

Examples

The following example shows how to configure a 120-second idle timer for the CSG service MOVIES:

```
ip csg service MOVIES
basis fixed
content MOVIES_COMEDY policy MOVIES_COMEDY
content MOVIES_ACTION policy MOVIES_ACTION weight DOUBLE
idle 120
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

inservice (CSG content)

To activate the content service on each CSG, use the **inservice** command in CSG content configuration mode. To suspend the content service, use the **no** form of this command.

inservice

no inservice

Syntax Description This command has no arguments or keywords.

Defaults The default value is **no inservice**.

Command Modes CSG content configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

When you activate the **inservice** command, the CSG verifies the parameters semantically. If the CSG detects an error, the command fails.

Examples

The following example shows how to place the CSG content MOVIES_COMEDY in service:

```
ip csg content MOVIES_COMEDY
client 10.4.4.0 255.255.255.0
idle 120
ip 172.18.45.0/24 tcp 8080
policy POLICY1
replicate connection tcp
vlan MOVIES_COMEDY
inservice
```

Related Commands

| Command | Description |
|--------------------------------|--|
| ip csg content | Defines content for the CSG accounting services, and enters CSG accounting configuration mode. |

ip

To define the Layer 3/Layer 4 subset of flows that can be processed by the CSG accounting services, use the **ip** command in CSG content configuration mode. To delete the content definition, use the **no** form of this command.

```
ip {any | ip-address [netmask]} [protocol [port-number]]
```

```
no ip {any | ip-address [netmask]} [protocol [port-number]]
```

Syntax Description

| | |
|--------------------|---|
| any | All Layer 3/Layer 4 flows can be processed. This is the default setting. |
| <i>ip-address</i> | IP address for which Layer 3/Layer 4 flows can be processed. |
| <i>netmask</i> | Mask identifying the network from which Layer 3/Layer 4 flows can be processed. You can express the network mask in either IP dotted notation (<i>n.n.n.n</i>) or prefix notation (<i>/nn</i> , where <i>nn</i> is the number of leading 1-bits). For example, 255.255.0.0 and /16 are equivalent network masks. The default network mask is 255.255.255.255 or /32, which means flows to a specific host can be processed. |
| <i>protocol</i> | Protocol type of Layer 3/Layer 4 flows that can be processed: <ul style="list-style-type: none"> • any—Flows of any protocol type can be processed. This is the default setting. • tcp—Only TCP flows can be processed. • udp—Only UDP flows can be processed. • <i>protocol-number</i>—Number identifying the protocol whose flows can be processed. The valid range is 0 to 255, where 0 means the same as any. |
| <i>port-number</i> | Port number from which Layer 3/Layer 4 flows can be processed. The valid range is 0 to 65535, where 0 means flows from any port number can be processed. |

Defaults

All Layer 3/Layer 4 flows can be processed.

If you specify an IP address but no network mask, the default network mask is 255.255.255.255 or /32 (flows to a specific host can be processed).

If you do not specify a protocol, flows of any protocol type can be processed.

If you specify a protocol but no port number, the default port number is 0, which means flows from any port number can be processed.

Command Modes

CSG content configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

This command is required to place content in service.

UDP ports 9200 and 9201 are well-known WSP and WTP WAP ports. When a policy with **accounting type wap** is associated with a content, use even-numbered UDP ports to designate WSP traffic, and odd-numbered ports to designate WTP traffic.

Although you can use this command to specify a port number for Layer 3 content (**ip any any port-number**), the CSG does not support Layer 3 content rules. The CSG ignores the specified port number, and the **show module csg content** command displays the port number as 0.

Examples

The following example shows how to specify that, for content MOVIES_COMEDY, only flows for IP address 172.18.45.0/24 and TCP port 8080 are to be processed by the CSG accounting services:

```
ip csg content MOVIES_COMEDY
  client 10.4.4.0 255.255.255.0
  idle 120
  ip 172.18.45.0/24 tcp 8080
  policy POLICY1
  replicate connection tcp
  vlan MOVIES_COMEDY
  inservice
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg content | Defines content for the CSG accounting services, and enters CSG content configuration mode. |

ip address (module CSG VLAN)

To assign an IP address to the CSG VLAN, use the **ip address** command in module CSG VLAN configuration mode. To remove the CSG IP address from the configuration, use the **no** form of this command.

ip address *ip-address netmask*

no ip address *ip-address netmask*

| Syntax Description | | |
|--------------------|--|---|
| <i>ip-address</i> | | IP address for the CSG; only one management IP address is allowed per VLAN. |
| <i>netmask</i> | | Network mask. |

Defaults No default behavior or values.

Command Modes Module CSG VLAN configuration

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines This command is applicable for both server-side and client-side VLANs.

Examples The following example shows how to assign an IP address to the CSG VLAN:

```
vlan 301 client
 name TO-GGSN-MS-APN
 gateway 31.0.0.10
 ip address 31.0.0.21 255.255.255.0
 route 11.0.0.0 255.255.0.0 gateway 31.0.0.1
 route 11.1.0.0 255.255.0.0 gateway 31.0.0.2
 route 11.2.0.0 255.255.0.0 gateway 31.0.0.3
 route 11.3.0.0 255.255.0.0 gateway 31.0.0.4
 alias 31.0.0.51 255.255.255.0
```

| Related Commands | Command | Description |
|------------------|--|--|
| | show module csg variable | Displays the list of VLANs. |
| | vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

ip csg accounting

To define content-based client accounting as a service, and to enter CSG accounting configuration mode, use the **ip csg accounting** command in global configuration mode. To turn off the service, use the **no** form of this command.

ip csg accounting *service-name*

no ip csg accounting *service-name*

Syntax Description

| | |
|---------------------|--|
| <i>service-name</i> | Name of the accounting service: <ul style="list-style-type: none"> In the CSG Releases 2.2.(1)C(1) through 2.2(3)C2(1), the name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, underscores, and the special characters #, @, and \$. The first character must be a letter. In the CSG Release 3.1(1)C3(1) or later, the name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|---------------------|--|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

The characteristics of each accounting service are defined by the following commands:

- agent (CSG accounting)**
- agent activate**
- agent local-port**
- keepalive**
- records batch**
- records format**
- records http-statistics**
- records intermediate**
- records max**
- record-storage**
- record-storage local-port**
- report http header**

- [report radius attribute](#)
- [report usage](#)
- [user-group](#)

Examples

The following example shows how to configure a CSG accounting service named A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
  inservice
```

Related Commands

| Command | Description |
|---|---|
| agent (CSG accounting) | Defines the BMA to which to send billing records. |
| agent activate | Enables support for multiple active BMAs. |
| agent local-port | Defines the port on which the CSG listens for packets from the BMAs. |
| inservice (CSG content) | Starts the accounting service in each CSG configuration. |
| keepalive | Defines the keepalive time interval (in seconds). The time in which a message from the BMA must be received. |
| records batch | Batches billing records into a single message before sending them to the BMA. |
| records http-statistics | Sends the HTTP Statistics data record to the BMA. |
| records intermediate | Enables the generation of intermediate billing records. |
| records max | Defines the maximum number of billing records that can be stored or queued in the CSG before they are forwarded to the Billing Mediation Agent (BMA). |
| user-group | Associates a user group with a specific accounting service. |

ip csg billing

To define a billing plan to be used for prepaid billing, and to enter CSG billing configuration mode, use the **ip csg billing** command in global configuration mode. To delete the billing plan, use the **no** form of this command.

ip csg billing *billing-plan-name*

no ip csg billing *billing-plan-name*

Syntax Description

| | |
|--------------------------|--|
| <i>billing-plan-name</i> | Name of the billing plan, which is a set of services. When the CSG encounters a new client, the CSG retrieves its billing plan. The name can be 1 to 64 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|--------------------------|--|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The characteristics of each billing plan are defined by the following commands:

- [mode](#)
- [service](#)

Examples

The following example shows how to define a CSG billing plan named REGULAR:

```
ip csg billing REGULAR
 service MOVIES
 service BROWSING
```

Related Commands

| Command | Description |
|-------------------------|---|
| service | Associates a service with a CSG billing plan. |

ip csg block

To force the CSG to drop packets that do not match a configured billing policy, use the **ip csg block** command in global configuration mode. To restore the default behavior, enabling the CSG to forward the packets without billing, use the **no** form of this command.

ip csg block

no ip csg block

Syntax Description There are no arguments or keywords.

Defaults No default behavior or values.

Command Modes Global configuration

| Command History | Release | Modification |
|-----------------|-------------------------|------------------------------|
| | 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Usage Guidelines By default, if packets do not match any billing policy, the CSG forwards the packets without billing. This command causes the CSG to drop the packets instead.

Examples The following example shows how to force the CSG to drop packets that do not match any billing policy:

```
ip csg block
```

ip csg content

To define content for the CSG accounting services, and to enter CSG content configuration mode, use the **ip csg content** command in global configuration mode. To delete the content definition, use the **no** form of this command.

ip csg content *content-name*

no ip csg content *content-name*

Syntax Description

| | |
|---------------------|---|
| <i>content-name</i> | Name that identifies the content. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|---------------------|---|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The characteristics of each content definition are defined by the following commands:

- [client \(CSG content\)](#)
- [idle \(CSG content\)](#)
- [inservice \(CSG content\)](#)
- [ip](#)
- [pending](#)
- [policy \(CSG content\)](#)
- [replicate connection tcp](#)
- [vlan \(CSG content\)](#)

If the content specification does not match any service listed under a user's billing plan, the CSG considers the service to be either free or postpaid. The CSG does not try to authorize the user with the quota server for the service.

If multiple policies are defined under **ip csg content**, they must all have the same accounting type. As an example, if one of the policies is configured with **accounting type wap**, they all must have **accounting type wap**.

Examples

The following example shows how to define the CSG content named MOVIES_COMEDY:

```
ip csg content MOVIES_COMEDY
  client 10.4.4.0 255.255.255.0
  idle 120
  ip 172.18.45.0/24 tcp 8080
  policy POLICY1
  replicate connection tcp
  vlan MOVIES_COMEDY
  inservice
```

Related Commands

| Command | Description |
|--|--|
| client (CSG content) | Defines the client IP address spaces that can use the CSG content server. |
| idle (CSG content) | Specifies the minimum amount of time that the CSG maintains an idle content connection. |
| inservice (CSG content) | Activates the content service on each CSG. |
| ip | Defines the Layer 3/Layer 4 subset of flows that can be processed by the CSG accounting services. |
| policy (CSG content) | References a CSG billing policy. |
| replicate connection tcp | Replicates the connection state for all TCP connections to the CSG content servers on the backup system. |
| vlan (CSG content) | Restricts the CSG billing content to a single source VLAN. |

ip csg map

To define the CSG billing content filters (URL maps and header maps), and to enter CSG URL map or header map configuration mode, use the **ip csg map** command in global configuration mode. To turn off the service, use the **no** form of this command.

```
ip csg map map-name {url | header}
```

```
no ip csg map map-name {url | header}
```

Syntax Description

| | |
|-----------------|--|
| <i>map-name</i> | Name of the map. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
| url | Defines a URL content filter, and enters CSG URL map configuration mode. |
| header | Defines a header content filter, and enters CSG header map configuration mode. |

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The CSG maps are used to match URLs or headers against a pattern to determine whether flows are to be processed by the CSG accounting services.

The URLs or headers that are to be matched against a pattern are defined by the following commands:

- [match \(header map\)](#)
- [match \(URL map\)](#)

When configuring a map, keep the following considerations in mind:

- When you enter a new or changed URL match pattern using the **match (URL map)** command, the CSG console becomes non-responsive while the CSG downloads the entire configuration, which can take a long time. Therefore, we recommend that you configure the URL match pattern during your maintenance window, or during off-peak hours.
- You cannot specify different types of match patterns in a given map. For example, a map can include one or more **match (header map)** statements, but it cannot include both **match (header map)** statements and **match (url map)** statements.

- You can specify up to two maps in a given policy: one for header matching and one for URL matching. For example, the following is a valid configuration:

```
ip csg map HOSTMAP
  match header host1 value *.2*.44
!
ip csg map URLMAP
  match url */mobile/index.wml
!
ip csg policy MAP-POLICY
  header-map HOSTMAP
  url-map URLMAP
```

In this example, a flow must match both HOSTMAP and URLMAP in order to match policy MAP-POLICY.

Examples

The following example shows how to configure a CSG URL map named MOVIES:

```
ip csg map MOVIES url
  match url *.movies_(comedy|action|drama).com/*.mpeg
```

Related Commands

| Command | Description |
|------------------------------------|--|
| header-map | References a header map that is part of a CSG billing policy. |
| ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |
| match (header map) | Specifies a header match pattern for a CSG billing map. |
| match (URL map) | Specifies a URL match pattern for a CSG billing map. |
| url-map | References a URL map that is part of a CSG billing policy. |

ip csg policy

To define a policy for qualifying flows for the CSG accounting services, and to enter CSG policy configuration mode, use the **ip csg policy** command in global configuration mode. To turn off the service, use the **no** form of this command.

ip csg policy *policy-name*

no ip csg policy *policy-name*

Syntax Description

| | |
|--------------------|--|
| <i>policy-name</i> | Name of a policy that applies to the content for this service. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|--------------------|--|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The characteristics of each policy are defined by the following commands:

- [accounting \(CSG policy\)](#)
- [client-group \(CSG policy\)](#)
- [client-ip \(CSG policy\)](#)
- [header-map](#)
- [next-hop](#)
- [url-map](#)

When configuring a map, keep the following considerations in mind:

- You cannot specify different types of match patterns in a given map. For example, a map can include one or more **match (header map)** statements, but it cannot include both **match (header map)** statements and **match (url map)** statements.
- You can specify up to two maps in a given policy: one for header matching and one for URL matching. For example, the following is a valid configuration:

```
ip csg map HOSTMAP
 match header host1 value *.2.*.44
!
ip csg map URLMAP
 match url */mobile/index.wml
!
```

```
ip csg policy MAP-POLICY
  header-map HOSTMAP
  url-map URLMAP
```

In this example, a flow must match both HOSTMAP and URLMAP in order to match policy MAP-POLICY.

Examples

The following example shows how to configure a CSG policy named MOVIES_COMEDY:

```
ip csg policy MOVIES_COMEDY
  accounting type http customer-string MOVIES_COMEDY
  client-group 44
  client-ip http-header x-forwarded-for
  header-map MOVIES
  url-map MOVIES
```

Related Commands

| Command | Description |
|---|--|
| accounting (CSG policy) | Defines the accounting type and customer string for all flows that comply with a CSG billing policy. |
| client-group (CSG policy) | References a standard access list that is part of a CSG billing policy. |
| client-ip (CSG policy) | Specifies that the user's IP address is to be obtained from the URL header after the x-forwarded-for keyword. |
| header-map | References a header map that is part of a CSG billing policy. |
| url-map | References a URL map that is part of a CSG billing policy. |

ip csg refund

To specify the refund policy that can then be applied to the various services, and to enter CSG refund configuration mode, use the **ip csg refund** command in global configuration mode. To disable this feature, use the **no** form of the command.

ip csg refund *refund-policy-name*

no ip csg refund *refund-policy-name*

Syntax Description

refund-policy-name Name of a policy that applies to the content for this service.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

The characteristics of each policy are defined by the following commands:

- [flags](#)
- [retcode](#)

If refund is enabled for a CSG prepaid service, you cannot download more than 0x6FFFFFFF bytes of data in a given transaction.

Examples

The following example shows how to configure the **ip csg refund** command:

```
ip csg refund COMPANY-REFUND
  retcode http 500 509
  retcode wap 0x44 0x50
  retcode ftp 454
  flags tcp FF 14
  flags wap FF 08
```

Related Commands

| Command | Description |
|-------------------------|--|
| flags | Specifies IP, TCP, or WAP flag bit masks and values for which the CSG refunds quota. |
| retcode | Specifies the range of application return codes for which the CSG refunds quota. |

ip csg ruleset

To configure a CSG billing ruleset, and to enter CSG ruleset configuration mode, use the **ip csg ruleset** command in global configuration mode. To delete the ruleset, use the **no** form of this command.

ip csg ruleset *ruleset-name*

no ip csg ruleset *ruleset-name*

| | | |
|---------------------------|---------------------|--|
| Syntax Description | <i>ruleset-name</i> | Name of the CSG billing ruleset. A ruleset is a list of all content names that are to be downloaded to a specific CSG card. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|---------------------------|---------------------|--|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|----------------------|
| Command Modes | Global configuration |
|----------------------|----------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| | |
|-------------------------|---|
| Usage Guidelines | The characteristics of each ruleset are defined by the content (CSG ruleset) command. |
|-------------------------|---|

Examples The following example shows how to configure a CSG billing ruleset named R1:

```
ip csg ruleset R1
content MOVIES_COMEDY
content MOVIES_ACTION
```

| | | |
|-------------------------|---------------------------------------|--|
| Related Commands | Command | Description |
| | content (CSG ruleset) | Adds a content reference to a CSG ruleset. |

ip csg service

To define a content billing service, and to enter CSG service configuration mode, use the **ip csg service** command in global configuration mode. To turn off the service, use the **no** form of this command.

ip csg service *service-name*

no ip csg service *service-name*

Syntax Description

| | |
|---------------------|--|
| <i>service-name</i> | Name of the content billing service, which is a component of a billing plan that is subscribed to by users. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|---------------------|--|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The CSG allows you to define a pool of up to 255 services. You can authorize each user for any number of services from that pool, but we recommend that the billing system not authorize each user for more than 10 active services. Exceeding this guideline could lead to the following problems:

- The increase in the number of quota authorizations per user can overload the quota server, as well as CSG.
- As the number of services for which a user is actively authorized increases, the user's quota becomes fragmented. Although the CSG allows the billing system to recall and redistribute the quota so that the user is not denied service due to quota fragmentation, the process increases overhead in both the quota server and the CSG.

The characteristics of each content billing service are defined by the following commands:

- [activation](#)
- [authorize content](#)
- [basis](#)
- [class](#)
- [content \(CSG service\)](#)
- [idle \(CSG service\)](#)
- [meter exclude service-idle](#)
- [meter imap](#)

- [meter increment](#)
- [meter initial](#)
- [meter minimum](#)
- [owner id](#)
- [owner name](#)
- [passthrough](#)
- [records granularity](#)
- [refund-policy](#)
- [verify](#)
- [zero-quota abort type](#)

Examples

The following example shows how to define a CSG content billing service named MOVIES:

```
ip csg service MOVIES
basis fixed
content MOVIES_COMEDY policy MOVIES_COMEDY
content MOVIES_ACTION policy MOVIES_ACTION weight DOUBLE
idle 120
```

Related Commands

| Command | Description |
|---------------------------------------|--|
| basis | Specifies the billing basis for a CSG content billing service. |
| content (CSG service) | Defines content as a member of a CSG billing service, identifies a policy to apply to this content, and optionally assigns a weight to this content. |
| idle (CSG service) | Specifies the minimum amount of time that the CSG maintains a service with no user sessions. |

ip csg snmp timer

To define SNMP timers for lost CSG records, and to enter CSG SNMP timer configuration mode, use the **ip csg snmp timer** command in global configuration mode. To restore the default setting, use the **no** form of this command.

```
ip csg snmp timer {agent | quota-server} interval
```

```
no ip csg snmp timer {agent | quota-server} interval
```

Syntax Description

| | |
|---------------------|---|
| agent | Defines an SNMP timer for lost CSG agent records. |
| quota-server | Defines an SNMP timer for lost CSG quota server records. |
| <i>interval</i> | Interval, in seconds, of the CSG SNMP timer. The valid range is 1 second to 2,147,483,647 seconds. The default setting is 60 seconds. |

Defaults

The default SNMP timer interval is 60 seconds.

Command Modes

Global configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(3)—12.2(18)SXD | This command was introduced. |

Examples

The following example defines a 300-second CSG SNMP agent timer and enters CSG SNMP timer configuration mode:

```
ip csg snmp timer agent 300
```

ip csg transport-type

To classify data traffic based on its access path, and to enter CSG transport-type configuration mode, use the **ip csg transport-type** command in global configuration mode. To remove transport-type information, use the **no** form of this command.

ip csg transport-type

no class ip csg transport-type

Syntax Description There are no arguments or keywords.

Defaults No default behavior or values.

Command Modes Global configuration

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines Transport-type is used to classify data traffic based on its access path using the NAS-IP reported in RADIUS. Use the **assign** command to associate IP addresses with transport-type values. Transport-type information is reported in fixed record format CDRs.

Usage Guidelines The characteristics of each ruleset are defined by the **assign** command.

Examples The following example creates a transport-type table and enters transport-type configuration mode:

```
ip csg transport-type
  assign 1.2.3.4 6
  assign 2.5.3.1 7
  assign 6.6.7.5 0
```

| Related Commands | Command | Description |
|------------------|-----------------------|---|
| | records format | Specifies variable or fixed CDR format. |
| | hostname | Specifies a variable hostname for a CSG module. |
| | owner name | Specifies the name of a service owner. |
| | owner id | Specifies an identifier for a service owner. |
| | assign | Associates an IPv4 address with a transport-type value. |

| Command | Description |
|-----------------------|---|
| class | Specifies a service class value. |
| mode | Specifies that a billing plan is postpaid or prepaid. |

ip csg user-group

To create a group of end users for which you want to generate accounting records, and to enter CSG user group configuration mode, use the **ip csg user-group** command in global configuration mode. To delete a group of users, use the **no** form of this command.

ip csg user-group *group-name*

no ip csg user-group *group-name*

Syntax Description

| | |
|-------------------|---|
| <i>group-name</i> | Name of the group you want to create: <ul style="list-style-type: none"> In the CSG Releases 2.2.(1)C(1) through 2.2(3)C2(1), the name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, underscores, and the special characters #, @, and \$. The first character must be a letter. In the CSG Release 3.1(1)C3(1), the name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
|-------------------|---|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

The **ip csg user-group** command configures parameters related to mapping IP addresses to user IDs. You cannot delete a user group that is referenced by an accounting service. First, you must disassociate the user group from the accounting service. See the **user-group** command in CSG accounting configuration mode for more details.

The characteristics of this group of users are defined by the following commands:

- [aoc confirmation](#)
- [database](#)
- [entries max](#)
- [quota activate](#)
- [quota local-port](#)
- [quota server](#)
- [radius acct-port](#)
- [radius ack error](#)

- [radius handoff](#)
- [radius key](#)
- [radius monitor](#)
- [radius parse strict](#)
- [radius pod attribute](#)
- [radius pod nas](#)
- [radius pod timeout](#)
- [radius server](#)
- [radius start restart session-id](#)
- [radius stop purge](#)
- [radius userid](#)
- [redirect](#)
- [user-profile server](#)
- [verify confirmation](#)

Examples

The following example shows how to create the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
  redirect wap www.topoff.com/wap
  redirect http www.topoff.com/http
  aoc confirmation AOC_OK
```

Related Commands

| Command | Description |
|----------------------------------|--|
| database | Server that answers user ID queries. |
| entries max | Defines the maximum number of entries in the memory cache to retain information about users belonging to this group. |
| quota local-port | Configures the local port on which the CSG receives communications from quota servers. |
| quota server | Configures the quota servers that return billing quota values for users. |
| radius acct-port | Configures the RADIUS listening port when it is different from the established RADIUS default of 1813. |
| radius key | Specifies that the CSG is the RADIUS accounting server to obtain user ID accounting records. |
| radius monitor | Tightens the parsing rules for RADIUS flows. |

| Command | Description |
|---|---|
| radius proxy | Enables RADIUS proxy. |
| radius start restart session-id | RADIUS attribute used to extract the user IDs from a RADIUS record. |
| redirect | Redirects client flows to an alternate IP address when the client's quota is exhausted. |

ip csg weight

To define a symbolic name for a CSG billing weight, and to enter CSG weight configuration mode, use the **ip csg weight** command in global configuration mode. To remove the weight name, use the **no** form of this command.

ip csg weight *weight-name weight-value*

no ip csg weight *weight-name weight-value*

Syntax Description

| | |
|---------------------|--|
| <i>weight-name</i> | Name of the billing weight. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. |
| <i>weight-value</i> | Number of quadrans to deduct for each billable object that uses this billing weight. The valid range is -32768 quadrans to +32767 quadrans. The default billing weight is 1 quadran, which means 1 quadran is deducted for each billable object. A value of 0 means the associated content is free. |

Defaults

The default billing weight is 1 quadran.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

To make a content free, assign a *weight-value* of 0.

The same weight can occur in multiple rules, specified in multiple billing services. If a weight changes, and you use numeric constants for weights, each occurrence of the weight must be updated. However, if you define symbolic weight names, you need only update a single definition for each weight. The result is a more readable configuration, and price lists that are easier to manage.

Examples

The following example shows how to define a CSG billing weight named DOUBLE with a weight value of 2 quadrans:

```
ip csg weight DOUBLE 2
```

keepalive

To define the keepalive time interval used to test the health of Billing Mediation Agents (BMAs) and quota servers, use the **keepalive** command in CSG accounting configuration mode. To reset the keepalive timer to the default value, use the **no** form of this command.

keepalive *number-of-seconds*

no keepalive

Syntax Description

| | |
|--------------------------|---|
| <i>number-of-seconds</i> | Time, in seconds, that is used to determine the health of BMAs and quota servers. The valid ranges is 1 to 86,400 seconds. The default value is 60 seconds. |
|--------------------------|---|

Defaults

The default value is 60 seconds.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples

The following example shows how to specify a keepalive time of 3 seconds for the CSG accounting service A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
  inservice
```

Related Commands

| Command | Description |
|--|---|
| agent (CSG accounting) | Defines the primary and backup BMAs to which to send billing records. |

match (header map)

To specify a header match pattern for a CSG billing map, use the **match** command in CSG header map configuration mode. To delete the header match pattern, use the **no** form of this command.

```
match protocol protocol header header-name [value pattern]
```

```
no match protocol protocol header header-name [value pattern]
```

Syntax Description

| | |
|----------------------------------|--|
| protocol <i>protocol</i> | Default application protocol: http —This is the only supported application protocol, and it is the default setting. |
| header <i>header-name</i> | Header field that is to be matched against the input header. The <i>header-name</i> argument is the name of the HTTP header keyword, such as host . |
| value | (Optional) Specific value corresponding to the header that is to be matched against the input header. |
| <i>pattern</i> | (Optional) Regular expression that is to be matched against the input header. |

Defaults

The default protocol is HTTP.

If you specify a *header-name* argument and you do not specify a *pattern* argument, then the header match is TRUE if *header-name* is present in the HTTP flow.

Command Modes

CSG header map configuration

Command History

| Release | Modification |
|-------------------------|-------------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(3)C5(3)—12.2(18)SXD | The usage guidelines were modified. |

Usage Guidelines

Header maps are valid only with accounting types HTTP, RTSP, and WAP (specified using the **accounting** command in CSG policy configuration mode). If you do not specify an accounting type, the CSG assumes that the session is an HTTP session, and packets matching the policy are not billed (that is, no quota is used, and no CDR is generated).

When configuring a map, keep the following considerations in mind:

- You cannot specify different types of match patterns in a given map. For example, a map can include one or more **match (header map)** statements, but it cannot include both **match (header map)** statements and **match (url map)** statements.

- You can specify up to two maps in a given policy: one for header matching and one for URL matching. For example, the following is a valid configuration:

```
ip csg map HOSTMAP
  match header host1 value *.2*.44
!
ip csg map URLMAP
  match url */mobile/index.wml
!
ip csg policy MAP-POLICY
  header-map HOSTMAP
  url-map URLMAP
```

In this example, a flow must match both HOSTMAP and URLMAP in order to match policy MAP-POLICY.

- If you have configured too many maps, or if your maps are too complex, the CSG generates the following syslog message:

```
%CSM_SLB-3-UNEXPECTED: Module 3 unexpected error:
Current configuration exceed memory limit for rule table.
```

If you see this message, you must reduce the number and complexity of the maps in your configuration.

To ensure that your maps are configured correctly, use the following command:

```
show module csg slot tech-support processor 4 | include LB common pool
```

If the **last config change** field in the output is zero, your maps are configured correctly.

You can specify more than one **match** command in CSG header map configuration mode to specify multiple header match expressions for a given header map:

- You can configure more than one **match header** command in a given header map, but they must reference different headers.

For example, the following is a valid configuration, because the first **match header** command references header **Host** and the other references header **User-Agent**:

```
ip csg map HDR1
  match header Host value www.cisco.com
  match header User-Agent valuemyagent
```

But the following is not a valid configuration, because both **match header** commands reference header **Host**:

```
ip csg map HDR1
  match header Host valuewww.cisco.com
  match header Host valuemy.cisco.com
```

- If the header matches *all* of the header match expressions, then the match is TRUE and the flows can be processed by the CSG accounting services (unless there is another map associated with this policy that is FALSE).
- If the header *does not* match *even one* of the header match expressions, then the match is FALSE and the flows are not processed by the CSG accounting services, even if other maps for this policy match TRUE.
- The CSG treats each header match pattern as a double-wildcard match, which means that a header match pattern that includes even a single wildcard, such as **match header host* 1.2.3.4**, is treated as a triple-wildcard match. The more wildcard matches you use, the fewer header maps and header

match patterns the CSG can handle, depending on your configuration. Therefore, to optimize the performance of the CSG, minimize the number of header match patterns that are applied to a CSG content configuration, and minimize the number of wildcards used in header match patterns.

- The header match expressions are case-sensitive. For example, if you define the following header match expression:

```
match header host1 value *.2.*.44
```

but the actual HTTP header keyword is **HOST1**, the header *does not* match the header match expression, the match is FALSE, and the flow is not processed by the CSG accounting services.

Table B-1 shows the special characters that you can use in header match expressions.

Table B-1 Special Characters for Matching String Expressions

| Convention | Description |
|-------------------------|---|
| * | Zero or more characters. |
| + | Zero or more repeated instances of the token preceding the +. |
| ? | Zero or one character. |
| <code>\character</code> | Escaped character. Examples: <code>\?</code> Match on a question mark (<code>\<ctrl-v>?</code>) <code>\+</code> Match on a plus sign <code>*</code> Match on an asterisk <code>\a</code> Alert (ASCII 7) <code>\b</code> Backspace (ASCII 8) <code>\f</code> Form-feed (ASCII 12) <code>\n</code> New line (ASCII 10) <code>\r</code> Carriage return (ASCII 13) <code>\t</code> Tab (ASCII 9) <code>\v</code> Vertical tab (ASCC 11) <code>\0</code> Null (ASCII 0) <code>\\</code> Back slash |
| Bracketed range [0-9] | Matching any single character from the range. |
| A leading ^ in a range | Do not match any in the range. All other characters represent themselves. |
| <code>.\x##</code> | Any ASCII character as specified in two-digit hex notation. For example, <code>\x3f</code> yields a ? for a one-character wild card match. |

Examples

The following example shows how to specify header match patterns for map HDR1. In this example, the header match is TRUE *only* for host **www.cisco.com** and user agent **myagent**. Any other combination of host and IP address matches FALSE:

```
ip csg map HDR1
  match header Host value www.cisco.com
  match header User-Agent value myagent
```

Related Commands

| Command | Description |
|-------------------------------|--|
| header-map | References a header map that is part of a CSG billing policy. |
| ip csg map | Defines the CSG billing content filters (URL and header maps), and enters CSG map configuration mode. |
| ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |

| Command | Description |
|---------------------------------|--|
| match (URL map) | Specifies a URL match pattern for a CSG billing map. |
| url-map | References a URL map that is part of a CSG billing policy. |

match (URL map)

To specify a URL match pattern for a CSG billing map, use the **match** command in CSG URL map configuration mode. To delete the match pattern, use the **no** form of this command.

match *protocol protocol* [**method** *method*] *url pattern*

no match *protocol protocol* [**method** *method*] *url pattern*

| Syntax Description | | |
|---------------------------------|--|---|
| protocol <i>protocol</i> | Default application protocol: | http —This is the only supported application protocol, and it is the default setting. |
| method <i>method</i> | Method to be matched. Valid methods are: | <ul style="list-style-type: none"> • Extension method name of 1 to 15 characters • connect—CONNECT method • delete—DELETE method • get—GET method • head—HEAD method • options—OPTIONS method • post—POST method • put—PUT method • trace—TRACE method |
| url <i>pattern</i> | Regular URL expression to be matched against the input URL. The pattern can include up to 128 characters, including wildcards and UNIX string-matching special characters. | |

Defaults The default application protocol is HTTP.

Command Modes CSG URL map configuration

| Command History | Release | Modification |
|-----------------|-------------------------|-------------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| | 3.1(3)C5(3)—12.2(18)SXD | The usage guidelines were modified. |

Usage Guidelines URL maps are valid only with accounting types HTTP, RTSP, and WAP (specified using the **accounting** command in CSG policy configuration mode). If you do not specify an accounting type, the CSG assumes that the session is an HTTP session, and packets matching the policy are not billed (that is, no quota is used, and no CDR is generated).

When configuring a map, keep the following considerations in mind:

- When you enter a new or changed URL match pattern using the **match (URL map)** command, the CSG console becomes non-responsive while the CSG downloads the entire configuration, which can take a long time. Therefore, we recommend that you configure the URL match pattern during your maintenance window, or during off-peak hours.
- You cannot specify different types of match patterns in a given map. For example, a map can include one or more **match (header map)** statements, but it cannot include both **match (header map)** statements and **match (url map)** statements.
- You can specify up to two maps in a given policy: one for header matching and one for URL matching. For example, the following is a valid configuration:

```
ip csg map HOSTMAP
  match header host1 value *.2.*.44
!
ip csg map URLMAP
  match url */mobile/index.wml
!
ip csg policy MAP-POLICY
  header-map HOSTMAP
  url-map URLMAP
```

In this example, a flow must match both HOSTMAP and URLMAP in order to match policy MAP-POLICY.

- If you have configured too many maps, or if your maps are too complex, the CSG generates the following syslog message:

**%CSM_SLB-3-UNEXPECTED: Module 3 unexpected error:
Current configuration exceed memory limit for rule table.**

If you see this message, you must reduce the number and complexity of the maps in your configuration.

To ensure that your maps are configured correctly, use the following command:

show module csg slot tech-support processor 4 | include LB common pool

If the **last config change** field in the output is zero, your maps are configured correctly.

You can specify more than one **match** command in CSG URL map configuration mode to specify multiple URL match expressions for a given URL map:

- If the URL matches *any* of the URL match expressions, then the match is TRUE and the flows can be processed by the CSG accounting services (unless there is another map associated with this policy that is FALSE).
- If the URL *does not* match any of the URL match expressions, then the match is FALSE and the flows are not processed by the CSG accounting services, even if other maps for this policy match TRUE.
- The URL match expressions are case-sensitive. For example, if you define the following URL match expression:

```
match protocol http url http://url-string
```

but a subscriber enters the following URL in a Web browser:

```
HTTP://url-string
```

the URL *does not* match the URL match expression, the match is FALSE, and the flow is not processed by the CSG accounting services.

Therefore, consider upper- and lowercase combinations carefully when creating URL match expressions.

- When you configure URL match patterns for RTSP streams, keep in mind that you must account for trailing stream IDs in RTSP stream names. For example, URL match pattern ***.mpeg** does not match **rtsp://1.1.1.254:554/movie.mpeg/streamid=0** because the stream name has a trailing **/streamid=0**. To match such RTSP stream names, use a URL match pattern such as ***.mpeg***.
- Depending on your configuration, the CSG can handle up to 1000 single-wildcard URL match patterns (for example, ***movies** or **movies***, but not ***movies***) or up to 11 double-wildcard URL match patterns (for example, ***movies*** or **http://test.*movies.com/*.mpeg**). Double-wildcard URL match patterns are also known as keyword URL match patterns. If you want to use keyword URL match patterns, keep the following considerations in mind in order to optimize the CSG's performance:
 - Minimize the number of URL match patterns that are applied to a given CSG content definition.
 - Minimize the number of keyword URL match patterns that you use. In general, it is better to use multiple single-wildcard URL match patterns instead of individual keyword URL match pattern.
 - Combine multiple keyword URL match patterns into a single pattern using UNIX string-matching special characters. For example, ***.movies_comedy.com/*.mpeg**, ***.movies_action.com/*.mpeg**, and ***.movies_drama.com/*.mpeg** can be combined into the following single pattern:

```
*.movies_(comedy|action|drama).com/*.mpeg
```

And the following patterns:

```
*.movies_comedy.com/*.mpeg
```

```
*.movies_action.com/*.mpeg
```

```
*.movies_drama.com/*.mpeg
```

```
*.clips_comedy.com/*.mpeg
```

```
*.clips_action.com/*.mpeg
```

```
*.clips_drama.com/*.mpeg
```

can be combined into the following single pattern:

```
*(.movies|clips)*?*(comedy|action|drama).com/*.mpeg
```

Remember that the entire pattern, including wildcards and UNIX string-matching special characters, cannot exceed 128 characters.

- When adding or changing URL match patterns, check their impact on the CSG's memory:
 1. Enter the **show module csg status** command in privileged EXEC mode to check the status of the configuration change.
 2. When the status changes from PENDING (the change has not yet downloaded) to COMPLETE, SUCCESS (the change has downloaded successfully), enter the **show module csm memory** command in privileged EXEC mode. This command displays the CSG's total memory used versus total memory available.
- For WAP 1.x, URL maps take precedence over access lists.
- For WAP1.x and RTSP, the policy used to determine the next hop address is chosen based solely on access control lists (ACLs), not URL maps. As a result, you can choose the next hop from one policy for routing and from a different policy for billing.

Table B-2 shows the special characters that you can use in URL match expressions.

Table B-2 Special Characters for Matching String Expressions

| Convention | Description |
|-------------------------|---|
| * | Zero or more characters. |
| + | Zero or more repeated instances of the token preceding the +. |
| ? | Zero or one character. |
| <code>\character</code> | Escaped character. Examples: <code>\?</code> Match on a question mark (<code>\<ctrl-v>?</code>) <code>\+</code> Match on a plus sign <code>*</code> Match on an asterisk <code>\a</code> Alert (ASCII 7) <code>\b</code> Backspace (ASCII 8) <code>\f</code> Form-feed (ASCII 12) <code>\n</code> New line (ASCII 10) <code>\r</code> Carriage return (ASCII 13) <code>\t</code> Tab (ASCII 9) <code>\v</code> Vertical tab (ASCC 11) <code>\0</code> Null (ASCII 0) <code>\\</code> Back slash |
| Bracketed range [0-9] | Matching any single character from the range. |
| A leading ^ in a range | Do not match any in the range. All other characters represent themselves. |
| <code>.\x##</code> | Any ASCII character as specified in two-digit hex notation. For example, <code>\x3f</code> yields a ? for a one-character wild card match. |

Examples

The following example shows how to specify URL match patterns for map MOVIES. In this example, the URL match is TRUE for `*.movies_comedy.com/*.mpeg`, for `*.movies_action.com/*.mpeg`, for `*.movies_drama.com/*.mpeg`, and for any other URLs that match the pattern:

```
ip csg map MOVIES url
  match url *.movies_(comedy|action|drama).com/*.mpeg
```

Related Commands

| Command | Description |
|------------------------------------|--|
| header-map | References a header map that is part of a CSG billing policy. |
| ip csg map | Defines the CSG billing content filters (URL and header maps), and enters CSG map configuration mode. |
| ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |
| match (header map) | Specifies a header match pattern for a CSG billing map. |

| Command | Description |
|--|--|
| url-map | References a URL map that is part of a CSG billing policy. |
| show module csg status | Displays whether the CSG is online and, if so, the CSG chassis slot location and whether the configuration download is complete. |

meter exclude service-idle

To exclude the final service idle from the usage calculation when the service is configured for Service Duration Billing, use the **meter exclude service-idle** command in CSG service configuration mode. To return to the default behavior, use the **no** form of the command.

meter exclude service-idle

no meter exclude service-idle

Syntax Description This command has no arguments or keywords

Defaults The default behavior is to include the service-idle in the usage.

Command Modes CSG service configuration

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines Configuration of this command can lead to situations where charging is reduced because the next service access occurs after the service idles, instead of before the service idles.

Examples The following example shows how to configure Service Duration Billing for the OFF_NET service:

```
ip csg service OFF_NET
  meter exclude service-idle
```

| Related Commands | Command | Description |
|------------------|--------------------------------|---|
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

meter imap

To specify which Internet Message Access Protocol (IMAP) bytes are billed for when doing prepaid debits, use the **meter imap** command in CSG service configuration mode. To return to the default behavior, use the **no** form of the command.

meter imap [**body-only** | **body-header** | **body-other**]

no meter imap

| Syntax | Description |
|--------------------|---|
| body-only | Only BODY IMAP bytes are to be counted when performing prepaid debits. |
| body-header | Only BODY and HEADER IMAP bytes are to be counted when performing prepaid debits. |
| body-other | Only BODY and OTHER IMAP bytes are to be counted when performing prepaid debits. |

Defaults

All IMAP bytes are to be counted when performing prepaid debits.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(1)C6(2)—12.2(18)SXE | This command was introduced. |

Usage Guidelines

You can configure only one **meter imap** command per service. The billing basis for the service must be **byte**. The three categories of bytes are BODY, HEADER, and OTHER, determined as follows:

- BODY—The bytes are classified as BODY if a fetch request or response is encountered for one of the following specifications (including any appended “<>” subset variants):
 - BODY[]
 - BODY[#]
 - BODY[TEXT]
 - BODY[#.TEXT]
 - BODY.PEEK[]
 - BODY.PEEK[#]
 - BODY.PEEK[TEXT]
 - BODY.PEEK[#.TEXT]
 - RFC822
 - RFC822.TEXT

- **HEADER**—If the bytes cannot be classified as **BODY**, then they are classified as **HEADER** if a fetch request or response is encountered for one of the following specifications (including any appended “<>” subset variants):
 - **BODY[HEADER]**
 - **BODY[#.HEADER]**
 - **BODY.PEEK[HEADER]**
 - **BODY.PEEK[#.HEADER]**
 - **RFC822.HEADER**
- **OTHER**—If request or response cannot be classified as **BODY** or **HEADER**, then it is classified as **OTHER**. **OTHER** examples include:
 - SYN/FIN/ACK/RST packets that do not contain a payload
 - Non-**HEADER** or **BODY** IMAP commands such as **3 select inbox**
 - Retransmitted packets
 - Anything else that is not considered **BODY** or **HEADER**
 - If the session becomes encrypted or enters **PASSTHRU** mode, subsequent packets for the session cannot be parsed and are treated as **OTHER**.

Because IMAP metering is byte-based, you cannot configure both **meter imap** and **basis fixed** or **basis second** in the same service. Only **basis byte** is meaningful with **meter imap**.

Examples

The following example shows how to configure IMAP to count only **BODY** bytes when performing prepaid debits:

```
ip csg service S1
  meter imap body-only
```

meter increment

To specify the increments for debiting quota upon completion of a service configured for Service Duration Billing, use the **meter increment** command in CSG service configuration mode. To restore the default behavior, use the **no** form of the command.

meter increment *value*

no meter increment *value*

Syntax Description

value

Specifies the increment, in seconds, for debiting quota upon completion of a service configured for Service Duration Billing. For example, to enable the CSG to charge quota per-minute instead of per-second, specify **meter increment 60**.

The valid range is 1 to 65535. The default value is 1.

Note The value for quadrans is always denoted as seconds.

Defaults

The default value is 1.

Command Modes

CSG service configuration

Command History

Release

Modification

3.1(3)C5(1)—12.2(17d)SXB This command was introduced.

Usage Guidelines

If **basis second** is configured for the service, the network usage (usage excluding the initial charge) is rounded up to the nearest integer multiple of the increment value when the Service Stop is sent. For an increment value of **60**, the CSG does not round up 120 seconds of network usage, but does round up 163 seconds or 173 seconds of network usage to 180 quadrans before calculating total usage for reporting in the Service Stop.



Note

The round-up of network usage is not reflected in calculations for the Usage TLV in Service Reauthorization Requests.

The increment value is considered when determining if sufficient quota exists for granting network access for a session. For instance, if the increment is **60**, the network usage is 50, and the balance is 10, network access is permitted. However, if the increment is **60**, the network usage is 70, and the balance is 10, network access is not permitted because the balance is not sufficient to satisfy the entire increment (that is, a minimum of 1 minute of quota would be required to allow access for a portion of the minute).

Examples

The following example shows how to configure meter increments for Service Duration Billing for the OFF_NET service.

```
ip csg service OFF_NET
  basis second
  meter minimum 60
  meter increment 100
  content ANY policy HTTP
  content ANY policy ANY
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

meter initial

To specify the initial quota debited from the balance at the beginning of a service when the service is configured for Service Duration Billing, use the **meter initial** command in CSG service configuration mode. To restore the default behavior, use the **no** form of the command.

meter initial *value*

no meter initial *value*

Syntax Description

| | |
|--------------|--|
| <i>value</i> | Specifies the initial quota, in quadrans, debited from the balance at the beginning of a service when the service is configured for Service Duration Billing. The debit occurs when the CSG grants the first network access for a session mapped to the service. The initial value is not rounded up to the nearest increment value. The valid range is 0 to 65535. The default value is 0. |
|--------------|--|

Defaults

The default value is 0.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

This command allows “connection set-up charges” to be applied to a service.

Examples

The following example shows how to configure **meter initial** values for Service Duration Billing for the OFF_NET service.

```
ip csg service OFF_NET
  basis second
  meter initial 60
  content ANY policy HTTP
  content ANY policy ANY
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

meter minimum

To specify the minimum number of quadrans debited for a service or session, excluding the value in **meter initial**, use the **meter minimum** command in CSG service configuration mode. To return to the default behavior, use the **no** form of the command.

meter minimum *value*

no meter minimum *value*

Syntax Description

value Specifies minimum number of quadrans debited for a service or session, excluding the value in **meter initial**. For example, to force the CSG to debit 90 quadrans when less than 90 quadrans of network usage were used for the service, specify **meter minimum 90**. If the initial value is 20 quadrans and the minimum is 90 quadrans, then the minimum total charge is 110 quadrans. The minimum value is applied only if at least 1 session is granted network access for the service.

The valid range is 0 to 65535. The default value is 0.

Defaults

The default value is 0.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

If service duration is configured in the **basis** command, the usage is rounded up to the minimum value when the service stop is sent. For a minimum value of 90, 63 seconds of network usage is rounded up to 90 quadrans for calculating usage in the Service Stop, but 150 seconds of network usage is not rounded up.



Note The round-up of network usage is not reflected in calculations for the Usage TLV in Service Reauthorization Requests.

Examples

The following example shows how to configure **meter minimum** values for Service Duration Billing for the OFF_NET service.

```
ip csg service OFF_NET
  basis second
  meter minimum 60
  content ANY policy HTTP
  content ANY policy ANY
```

| Related Commands | Command | Description |
|------------------|--------------------------------|---|
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

mode

To specify that a billing plan is postpaid or prepaid, use the **mode** command in CSG billing configuration mode. To return to the default mode, use the **no** form of this command.

mode [**postpaid** | **prepaid**]

no mode

Syntax Description

| | |
|-----------------|---|
| postpaid | Specifies a postpaid billing service. |
| prepaid | Specifies a prepaid billing service. This is the default setting. |

Defaults

The default setting is **prepaid**.

Command Modes

CSG billing configuration

Command History

| Release | Modification |
|--------------------------|--|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| 3.1(3)C5(3)—12.2(18)SXD | Support for using variable record format with mode postpaid to enable service correlation of postpaid CDRs was added. |

Usage Guidelines

Mode postpaid is used with both fixed- and variable-record format to enable service correlation of postpaid CDRs.

Examples

The following example specifies **mode postpaid**.

```
ip csg billing FOO
 mode postpaid
```

Related Commands

| Command | Description |
|---------------------------------------|---|
| assign | Associates an IP address with a transport-type value. |
| class | Specifies a service class value. |
| hostname | Specifies a variable hostname for a CSG module. |
| ip csg transport-type | Classifies data traffic based on its access path. |
| owner id | Specifies an identifier for a service owner. |
| owner name | Specifies the name of a service owner. |
| records format | Specifies variable or fixed CDR format. |

module csg

To enter module CSG configuration mode for a specified slot, use the **module csg** command in global configuration mode. To remove the **module csg** configuration, use the **no** form of this command.

module csg *slot-number*

no module csg *slot-number*



Caution

For Cisco IOS releases prior to 12.2(18)SXD, entering the **no** form of this command (**no module csg slot-number**) removes your existing **module csg** configuration with no warning message!

For Cisco IOS releases 12.2(18)SXD and later, the CSG issues a warning message and does not remove your existing **module csg** configuration unless you have already removed all underlying accounting.

Syntax Description

| | |
|--------------------|------------------------------------|
| <i>slot-number</i> | Slot number where the CSG resides. |
|--------------------|------------------------------------|

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

The full syntax for this command is **module ContentServicesGateway slot-number**; **module csg slot-number** is a valid shortcut.

The following commands in module CSG configuration mode specify which accounting services to download, as well as the binding of VLANs with the accounting service:

- [accounting \(module CSG\)](#)
- [ruleset](#)
- [vlan \(module CSG\)](#)

Examples

The following example shows how to configure the CSG in slot 4:

```
module csg 4
  accounting A1
  ft group 123 vlan 5
  ruleset R1
  vlan 30 client
  vlan 32 client
  vlan 40 server
```

| Related Commands | Command | Description |
|------------------|---|--|
| | accounting (module CSG) | Downloads a configured accounting service to a CSG card. |
| | ft group (module CSG) | Enters fault-tolerant configuration mode and configures fault tolerance. |
| | ruleset | Downloads all content defined by a ruleset to a CSG card. |
| | vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

next-hop

To define a next-hop IP address, use the **next-hop** command in CSG policy configuration mode. To return to the default mode, use the **no** form of this command.

next-hop *ip-address*

no next-hop *ip-address*

| | | |
|---------------------------|--------------------------------|------------------------------|
| Syntax Description | <i>ip-address</i> | IP address of the next hop. |
| Defaults | No default behavior or values. | |
| Command Modes | CSG policy configuration | |
| Command History | Release | Modification |
| | 3.1(3)C5(3)—12.2(18)SXD | This command was introduced. |

Usage Guidelines You can use next-hop with client groups as long as a given client group is always sent to the same next hop. You cannot send a given client group to two or more different next hops based on a policy. For example, the following configuration is valid, because both policies use **client group 1** and **next-hop 1**:

```
policy A
  accounting type wap connection-oriented
  url A
  client group 1
  next-hop 1
policy B
  accounting type wap connection-oriented
  url B
  client group 1
  next-hop 1
content WAP-CON
  policy A
  policy B
```

The following configuration is not valid, because policy A uses **client group 1** and **next-hop 1**, but policy B uses **client group 1** and **next-hop 2**:

```
policy A
  accounting type wap connection-oriented
  url A
  client group 1
  next-hop 1
policy B
  accounting type wap connection-oriented
  url B
  client group 1
  next-hop 2
content WAP-CON
```

```
policy A
policy B
```

If you associate more than one policy with the same content definition, the CSG determines the next-hop based on the first policy match within any data flow (TCP connection). The CSG reports all subsequent policy matches within that flow as configured, but ignores the next-hop information.

- For **type http** accounting, the first policy match is based on the first HTTP request within a persistent connection.
- For other Layer 7 inspection, the first policy match is based on the first packet. For example for **type wap** accounting, the first policy match is based on the WSP connection request.

Traffic initiated from a next-hop does not require a virtual server/content definition in order to be routed through the CSG.

Examples

The following example specifies **next-hop**.

```
ip csg policy FTP-MS-APN
  accounting type ftp customer-string FTP-POL
  client-group 11
  next-hop 33.0.0.150
```

Related Commands

| Command | Description |
|---|--|
| client-group (CSG policy) | References a standard access list that is part of a CSG billing policy. |
| ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |

owner id

To specify an identifier for a service owner, use the **owner id** command in CSG service configuration mode. To remove the owner ID, use the **no** form of this command.

owner id *id*

no owner id *id*

| Syntax Description | <i>id</i> | 1- to 15-character string identifying a service owner. |
|--------------------|-----------|--|
|--------------------|-----------|--|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | CSG service configuration |
|---------------|---------------------------|
|---------------|---------------------------|

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

| Usage Guidelines | Use this command with fixed-record format to identify a service owner. |
|------------------|--|
|------------------|--|

| Examples | The following example specifies an owner ID for the service: |
|----------|--|
|----------|--|

```
ip csg service FOO
  owner id ABC123456
```

| Related Commands | Command | Description |
|------------------|---------------------------------------|---|
| | assign | Associates an IPv4 address with a transport-type value. |
| | class | Specifies a service class value. |
| | hostname | Specifies a variable hostname for a CSG module. |
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |
| | ip csg transport-type | Classifies data traffic based on its access path. |
| | mode | Specifies that a billing plan is postpaid or prepaid. |
| | owner name | Specifies the name of a service owner. |
| | records format | Specifies variable or fixed CDR format. |

owner name

To specify the name of a service owner, use the **owner name** command in CSG service configuration mode. To remove the owner name, use the **no** form of this command.

owner name *name*

no owner name

| Syntax Description | <i>name</i> | 1- to 38-character string specifying the name of the service. |
|--------------------|-------------|---|
|--------------------|-------------|---|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | CSG service configuration |
|---------------|---------------------------|
|---------------|---------------------------|

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

| Usage Guidelines | Owner name is used with fixed-record format to identify a service owner. |
|------------------|---|
|------------------|---|

| Examples | The following example specifies an owner name for the service: |
|----------|--|
|----------|--|

```
ip csg service FOO
  owner name ABC_CORP
```

| Related Commands | Command | Description |
|------------------|---------------------------------------|---|
| | assign | Associates an IPv4 address with a transport-type value. |
| | class | Specifies a service class value. |
| | hostname | Specifies a variable hostname for a CSG module. |
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |
| | ip csg transport-type | Classifies data traffic based on its access path. |
| | mode | Specifies that a billing plan is postpaid or prepaid. |
| | owner id | Specifies an identifier for a service owner. |
| | records format | Specifies variable or fixed CDR format. |

passthrough

To enable passthrough mode for a service, use the **passthrough** command in CSG service configuration mode. To disable passthrough mode, use the **no** form of this command.

passthrough *quota-grant*

no passthrough *quota-grant*

| | | |
|---------------------------|--------------------|---|
| Syntax Description | <i>quota-grant</i> | Size of each quota grant to give to the service. The <i>quota-grant</i> is also called the default quota. Range is 1 to 2147483647. |
|---------------------------|--------------------|---|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|---------------------------|
| Command Modes | CSG service configuration |
|----------------------|---------------------------|

| | | |
|------------------------|-------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | <p>Use this command to enable the CSG to grant quota to the service when at least one quota server is configured, but none are active.</p> <p>If you enable passthrough mode for a service, do not disable quota server reassignment for user groups associated with that service. That is, do not configure no quota server reassign in CSG user group configuration mode for user groups associated with the service.</p> |
|-------------------------|--|

| | |
|-----------------|---|
| Examples | <p>The following example specifies that the CSG grants 65535 quadrans of quota to the service NAME each time the service runs low on quota:</p> |
|-----------------|---|

```
ip csg service NAME
  passthrough 65535
```

| | | |
|-------------------------|--------------------------------|---|
| Related Commands | Command | Description |
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

pending

To set the pending connection timeout, use the **pending** command in CSG content configuration mode. To restore the default, use the no form of this command.

pending *timeout*

no pending

Syntax Description

| | |
|----------------|--|
| <i>timeout</i> | Time, in seconds, to wait before a connection is considered unreachable. The valid range is 4 seconds to 65535 seconds. The default value is 30 seconds. |
|----------------|--|

Defaults

The default pending timeout is 30 seconds.

Command Modes

CSG content configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(3)—12.2(18)SXD | This command was introduced. |

Usage Guidelines

The pending connection timeout sets the response time for terminating connections if a switch becomes flooded with traffic. The pending connections are configurable on a per-content basis.

Examples

This example shows how to set the pending timer:

```
ip csg content MOVIES_COMEDY
  pending 300
```

Related Commands

| Command | Description |
|---|--|
| ip csg content | Defines content for the CSG accounting services, and enters CSG accounting configuration mode. |
| show module csg content | Displays statistics and counters for the CSG content. |

policy (CSG content)

To reference a CSG billing policy, use the **policy** command in CSG content configuration mode. To delete a policy reference, use the **no** form of this command.

policy *policy-name*

no policy *policy-name*

Syntax Description

| | |
|--------------------|--|
| <i>policy-name</i> | Name of a configured CSG billing policy. |
|--------------------|--|

Defaults

No default behavior or values.

Command Modes

CSG content configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

If accounting records are to be generated for this content definition, you must reference at least one policy that contains the **accounting** command.

You can reference more than one policy in a given content definition, using multiple **policy** commands.

If multiple policies are defined under **ip csg content**, they must all have the same accounting type. For example, if one of the policies is configured with **accounting type wap**, they all must have **accounting type wap**.

Examples

The following example shows how to reference a policy named POLICY1:

```
ip csg content MOVIES_COMEDY
client 10.4.4.0 255.255.255.0
idle 120
ip 172.18.45.0/24 tcp 8080
policy POLICY1
replicate connection tcp
vlan MOVIES_COMEDY
inservice
```

Related Commands

| Command | Description |
|---|--|
| ip csg content | Defines content for the CSG accounting services, and enters CSG accounting configuration mode. |
| show module csg content | Displays statistics and counters for the CSG content. |

priority

To set the priority of the CSG, use the **priority** command in fault-tolerant configuration mode. To restore the priority default value, use the **no** form of this command.

priority *value*

no priority

| | | |
|---------------------------|--------------|---|
| Syntax Description | <i>value</i> | Priority of the CSG. The valid range is 1 to 254. The default value is 10. A higher number indicates a higher priority. |
|---------------------------|--------------|---|

| | |
|-----------------|-----------------------------------|
| Defaults | The default priority value is 10. |
|-----------------|-----------------------------------|

| | |
|----------------------|------------------------------|
| Command Modes | Fault-tolerant configuration |
|----------------------|------------------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | The CSG with the largest priority value is the primary CSG in the fault-tolerant pair when the modules are both operating. |
|-------------------------|--|

| | |
|-----------------|--|
| Examples | The following example shows how to set the priority value to 12: |
|-----------------|--|

```
ft group 123 vlan 5
  failover 6
  heartbeat-time 2
  priority 12
```

| | | |
|-------------------------|---------------------------------------|--|
| Related Commands | Command | Description |
| | ft group (module CSG) | Enters fault-tolerant configuration mode and configures fault tolerance. |
| | show module csg ft | Displays statistics and counters for the CSG fault-tolerant pair. |

quota activate

To simultaneously activate multiple quota servers, and to assign a quota server to each user, use the **quota activate** command in CSG user group configuration mode. To deactivate quota servers, use the **no** form of this command.

quota activate *number*

no quota activate *number*

| | | |
|---------------------------|---------------|--|
| Syntax Description | <i>number</i> | Identifies a specific quota server to activate, or to assign to a specific user. You can use any number from 1 through 10. |
|---------------------------|---------------|--|

| | |
|-----------------|-------------------------|
| Defaults | The default value is 1. |
|-----------------|-------------------------|

| | |
|----------------------|-------------------------------|
| Command Modes | CSG user group configuration. |
|----------------------|-------------------------------|

| Command History | Release | Modification |
|------------------------|------------------------|------------------------------|
| | 3.1(1)C4(1)—12.2(14)ZA | This command was introduced. |

| | |
|-----------------|---|
| Examples | The following example shows how to activate quota 2 and assign it to user U1: |
|-----------------|---|

```
ip csg user U1
(config-csg-group)# quota activate 2
```

quota local-port

To configure the local port on which the CSG receives communications from quota servers, use the **quota local-port** command in CSG user group configuration mode. To remove a quota local-port configuration, use the **no** form of this command.

quota local-port *port-number*

no quota local-port *port-number*

Syntax Description

port-number

The port number on which the CSG is to receive communications from quota servers. The valid range is 1 to 65535. The quota local port and the agent local port cannot be the same.

Defaults

No quota local ports are configured.

Command Modes

CSG user group configuration

Command History

Release

Modification

3.1(1)C3(1)—12.2(14)ZA

This command was introduced.

Usage Guidelines

For prepaid billing, you must specify a quota local port.



Note

The CSG drops requests (such as nodealive, echo, and redirect requests) unless they come from a configured quota server IP address. The CSG also verifies IP addresses contained in NodeAddress IEs against the configured list of quota servers. If there is no match, the CSG drops the request. The CSG does not look at a request's source port, replying to the same port from which the request came.

Examples

The following example configures quota local port 6666 for the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
```

| Related Commands | Command | Description |
|------------------|-----------------------------------|--|
| | ip csg user-group | Creates a group of end users for which you want to generate accounting records |

quota server

To configure the quota servers that return billing quota values for users, use the **quota server** command in CSG user group configuration mode. To remove a quota server configuration, use the **no** form of this command.

quota server {*ip-address port-number priority* | **reassign**}

no quota server {*ip-address port-number priority* | **reassign**}

Syntax Description

| | |
|--------------------|---|
| <i>ip-address</i> | IP address of the quota server. The CSG differentiates quota servers based on IP addresses. When you configure a quota server, make sure its IP address matches on both the active CSG and on the backup CSG. |
| <i>port-number</i> | Port number of the quota server. The valid range is 1 to 65535. The CSG differentiates quota servers based on port numbers. When you configure a quota server, make sure its port number matches on both the active CSG and on the backup CSG. |
| <i>priority</i> | Allows you to define primary and backup quota servers. The priority specifies the order of preference of the quota servers. A lower number indicates a higher priority. If the current quota server becomes unusable, the CSG uses the highest priority quota server available. The range of priorities is from 1 to 1000, but you can configure only up to 10 quota servers. Each quota server must be configured with a unique priority. Priorities for different quota servers do not have to be sequential. That is, you can have three quota servers with priorities 1, 5, and 10, respectively. |
| reassign | Enables quota server reassignment after a failure. |

Defaults

No quota servers are configured, and quota servers are reassigned after a failure.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|--|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(1)C6(2)—12.2(18)SXE | The reassign keyword was added. |

Usage Guidelines

For prepaid billing, you must specify at least one quota server. You can specify up to 10 quota servers, each with a unique IP address and a unique priority.

A quota server can recognize a duplicate quota-download request, as when general packet radio service (GPRS) tunnelling protocol (GTP) retransmits a packet. When the quota server detects a duplicate quota-download request, it resends the same quota that it sent for the original request.

**Note**

The CSG does not support multiple quota servers that have the same IP address.

To disable quota server reassignment (that is, to prevent the CSG from assigning a new quota server to a user if the original quota server fails), use the **no** form of this command with the **reassign** keyword.

If you enable passthrough mode for a service (by using the **passthrough** command in CSG service configuration mode), do not disable quota server reassignment for user groups associated with that service. That is, do not configure **no quota server reassign** for user groups associated with the service.

Examples

The following example configures two quota servers for the CSG user-group G1 with priorities 1 and 2:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
```

Related Commands

| Command | Description |
|-----------------------------------|--|
| ip csg user-group | Creates a group of end users for which you want to generate accounting records |

radius acct-port

To configure the RADIUS listening port when it is different from the established RADIUS default of 1813, use the **radius acct-port** command in CSG user group configuration mode. To return to the default value, use the **no** form of this command.

radius acct-port *port-number*

no radius acct-port

| | | |
|---------------------------|--------------------|---|
| Syntax Description | <i>port-number</i> | Listening port number of the RADIUS server. The valid range is 1 to 65535. The default port number is 1813. |
|---------------------------|--------------------|---|

| | |
|-----------------|----------------------------------|
| Defaults | The default port number is 1813. |
|-----------------|----------------------------------|

| | |
|----------------------|------------------------------|
| Command Modes | CSG user group configuration |
|----------------------|------------------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples The following example shows how to configure RADIUS listening port 7777 for the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
```

| | | |
|-------------------------|---|---|
| Related Commands | Command | Description |
| | radius key | Specifies the CSG to be the RADIUS endpoint for accounting records, and specifies the secret key. |
| | radius start restart session-id | Specifies the RADIUS attribute used to extract the user identifier from a RADIUS record. |

radius ack error

To enable the CSG to generate a RADIUS response to an Accounting Start Request or Accounting Interim Request when it encounters an error condition, use the **radius ack error** command in CSG user group configuration mode. To prevent RADIUS responses to errors, use the **no** form of this command.

radius ack error

no radius ack error

Syntax Description

There are no arguments or keywords.

Defaults

The CSG generates a RADIUS response to an Accounting Start Request or Accounting Interim Request when it encounters an error condition.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(1)C6(2)—12.2(18)SXE | This command was introduced. |

Usage Guidelines

Use the **no** form of this command to prevent the CSG from acknowledging the following errors:

1. The User Table entry cannot be created due to resource constraints.
2. The CSG parses the Accounting Request and encounters RADIUS protocol errors.
3. The CSG parses the Accounting Request and a billing plan is specified in the Accounting Request, but it does not match a billing plan in the CSG configuration.
4. The CSG parses the Accounting Request and a quota server is specified in the Accounting Request, but it does not match a quota server in the CSG configuration.
5. The CSG parses the Accounting Request and a connect service is specified in the Accounting Request, but it does not match a connect service in the CSG configuration.

For errors 3, 4, and 5, the CSG can parse the configuration VSA from the Access-Accept. If the CSG uses any attribute from the Access-Accept that does not match the CSG configuration, the CSG does not send a RADIUS response to the Accounting Request.

For RADIUS accounting requests processed as a result of matching a **radius endpoint** command, the CSG does not send a RADIUS acknowledgement.

For RADIUS accounting requests processed as a result of matching a **radius proxy** command, the CSG does not forward the Accounting Request to the RADIUS server.

To prevent existing entries from being reused for new users when the User Table is full, use the **no** form of this command, **no radius ack error**.

■ radius ack error

Examples

The following examples shows how to prevent RADIUS responses to RADIUS Accounting Start Requests and Accounting Interim Requests when errors are encountered.

```
ip csg usergroup UGROUP
  no radius ack error
```

Related Commands

| Command | Description |
|------------------------|---|
| radius endpoint | Identifies the CSG as an endpoint for RADIUS Accounting messages. |
| radius proxy | Specifies that the CSG should be a proxy for RADIUS messages. |

radius endpoint

To identify the CSG as an endpoint for RADIUS Accounting messages, use the **radius endpoint** command in module CSG configuration mode. To remove the endpoint identification, use the **no** form of this command.

radius endpoint *csg_addr* **key** [*encrypt*] *secret-string* [**table** *table-name*]

no radius endpoint *csg_addr* **key** [*encrypt*] *secret-string* [**table** *table-name*]

Syntax Description

| | |
|--------------------------------|--|
| <i>csg_addr</i> | Specifies the CSG IP address. The CSG IP address must be a virtual IP address, and it must be unique. The CSG IP address must not be specified in other CSG commands, and it must not match any real IP address, virtual IP address, or alias IP address configured on the CSG. |
| key | Specifies a RADIUS key. |
| <i>encrypt</i> | (Optional) Indicates how the <i>secret-string</i> is represented when the configuration is displayed (for example, show run), or how it is written to nonvolatile memory (for example, wr mem). The possible values are 0 and 7 : <ul style="list-style-type: none"> 0—The <i>secret-string</i> is stored in plain text. This is the default setting. 7—The <i>secret-string</i> is encrypted before it is displayed or written to nonvolatile memory. <p>Note If your router is configured to encrypt all passwords, then the password is represented as 7 plus the encrypted text. See the Cisco IOS service command for more details.</p> |
| <i>secret-string</i> | 1- to 64-character clear password. All characters are valid; case is significant. The <i>secret-string</i> is always sent in plain text to the CSG module when the configuration is downloaded. <i>Secret-string</i> must match the secret specified on the RADIUS client (for example, the GGSN). |
| table <i>table-name</i> | (Optional) Associates the specified table name with the RADIUS endpoint. The <i>table-name</i> argument is a 1-to-15 character string identifying the table. The CSG stores the table name as all-uppercase ASCII characters. |

Defaults

The *secret-string* is stored in plain text.

Command Modes

Module CSG configuration

Command History

| Release | Modification |
|-------------------------|---|
| 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |
| 3.1(1)C6(2)—12.2(18)SXE | The table keyword and <i>table-name</i> argument were added. |

Usage Guidelines

A RADIUS Accounting message sent to the specified *csg_addr* (and any port) is parsed, and then acknowledged, by the CSG.

The User Table identifies all users known to the CSG. The table is populated based on the contents of RADIUS Accounting Start messages, or from the user database, if either feature is enabled in your configuration. User table entries created as a result of RADIUS messaging through **radius endpoint** definition with a **table** configured are indexed by the configured *table-name*. This enables the CSG to segment the user space and removes ambiguity if multiple users share the same IP address, provided that their entries were instantiated by RADIUS flows to CSG radius definitions bound to different table-names.

To change the RADIUS endpoint *table-name* associated with a given *csg_addr*, you must first enter the **no** form of the **radius endpoint** command for that *csg_addr*, then enter the command with the new *table-name*.

To support RADIUS endpoint, the CSG requires a route to 255.255.255.255. You can configure the route by using the **gateway (module CSG VLAN)** command or the **route (module CSG VLAN)** command. For example:

```
gateway 31.0.0.6
```

or:

```
route 255.255.255.255 255.255.255.255 gateway 31.0.0.6
```

**Note**

If you already have a gateway configured, you do not need to configure an additional gateway for the RADIUS endpoint.

When the CSG2 is configured as a RADIUS endpoint, the CSG2 drops all RADIUS packets other than RADIUS Accounting-Request messages.

Examples

The following example shows how to identify the CSG as a RADIUS endpoint:

```
module csg 3
 radius endpoint 1.2.3.4 key secret
```

The following example illustrates how to use the **radius endpoint** command to create an endpoint point that maps to table ACME_VLAN, to be used as part of a user index for users created as a result of traffic to this **radius endpoint** definition.

```
module csg 3
 radius endpoint 1.2.3.4 key secret table ACME_VLAN
```

Related Commands

| Command | Description |
|-------------------------------|--|
| radius userid | Specifies the RADIUS attribute used to extract the user identifier from a RADIUS record. |

radius handoff

To configure RADIUS handoff support, use the **radius handoff** command in CSG user group configuration mode. To turn off the timer, use the **no** form of this command.

radius handoff [*duration*]

no radius handoff

Syntax Description

| | |
|-----------------|--|
| <i>duration</i> | Handoff timer duration in seconds. The handoff timer is started when an Accounting Stop is received. If the handoff timer expires before an accounting start for a user is seen, the CSG assumes a handoff did not occur and deletes the User Table entry for the user. Valid values range from 0 to 43200 seconds. The default is 0 seconds (no handoff timer). |
|-----------------|--|

Defaults

The default *duration* is 0 seconds (no handoff timer).

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Usage Guidelines

The User Table identifies all users known to the CSG. The table is populated based on the contents of RADIUS Accounting Start messages, or from the user database, if either feature is enabled in your configuration.

Examples

The following example shows how to specify a RADIUS handoff timer duration of 1000 seconds:

```
ip csg user-group G1
  radius handoff 1000
```

radius key

To specify and configure the CSG to be the RADIUS endpoint for accounting records, and to designate that the CSG is to use the accounting records to maintain user IDs, use the **radius key** command in CSG user group configuration mode. To delete the key and disable RADIUS, use the **no** form of this command.

radius key [*encrypt*] *secret-string*

no radius key

Syntax Description

encrypt

Indicates how the *secret-string* is represented when the configuration is displayed (for example, **show run**), or how it is written to nonvolatile memory (for example, **wr mem**).

The possible values are **0** and **7**:

- **0**—The *secret-string* is stored in plain text. This is the default setting.
- **7**—The *secret-string* is encrypted before it is displayed or written to nonvolatile memory.

Note If your router is configured to encrypt all passwords, then the password is represented as 7 plus the encrypted text. See the Cisco IOS **service** command for more details.

secret-string

1- to 64-character clear password. All characters are valid; case is significant.

The *secret-string* is always sent in plain text to the CSG module when the configuration is downloaded.

Secret-string must match the secret specified on the RADIUS client (for example, the GGSN).

Defaults

The *secret-string* is stored in the plain text.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples

The following example shows how to specify the RADIUS key SECRET_PASSWORD for the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
```

```
quota server 10.1.6.7 999 2
radius acct-port 7777
radius key SECRET_PASSWORD
radius parse strict
radius server 10.13.14.15
radius userid User-Name
redirect nat 10.33.33.3
```

Related Commands

| Command | Description |
|---|---|
| radius start restart session-id | Specifies the search RADIUS attribute used to extract the user identifier from a RADIUS record. |
| radius acct-port | Configures the RADIUS listening port when it is different from the RADIUS default of 1813. |

radius monitor

To specify that the CSG should monitor the RADIUS flows to the specified server, use the **radius monitor** command in CSG user group configuration mode. To stop monitoring the RADIUS flows, use the **no** form of this command.

```
radius monitor server_addr server_port [key [encrypt] secret-string]
```

```
no radius monitor server_addr server_port [key [encrypt] secret-string]
```

Syntax Description

| | |
|----------------------|---|
| <i>server_addr</i> | Specifies the server address to monitor. |
| <i>server_port</i> | Specifies the port number to monitor. |
| key | (Optional) Specifies a RADIUS key. |
| <i>encrypt</i> | (Optional) Indicates how the <i>secret-string</i> is represented when the configuration is displayed (for example, show run), or how it is written to nonvolatile memory (for example, wr mem). The possible values are 0 and 7 : <ul style="list-style-type: none"> 0—The <i>secret-string</i> is stored in plain text. This is the default setting. 7—The <i>secret-string</i> is encrypted before it is displayed or written to nonvolatile memory. <p>Note If your router is configured to encrypt all passwords, then the password is represented as 7 plus the encrypted text. See the Cisco IOS service command for more details.</p> |
| <i>secret-string</i> | (Optional) 1- to 64-character clear password. All characters are valid; case is significant. The <i>secret-string</i> is always sent in plain text to the CSG module when the configuration is downloaded. <i>Secret-string</i> must match the secret specified on the RADIUS client (for example, the GGSN). |

Defaults

The *secret-string* is stored in plain text.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

The RADIUS key and encryption level are optional; the CSG always forwards the message. If specified, the CSG parses the message only if the RADIUS authenticator was created using encryption. If the key is not configured, the CSG always parses the message.

All RADIUS messages, including access messages, are forwarded, except when the IP or UDP headers specify a length larger than the physical packet size.

**Note**

The CSG is not a proxy. The network must be set up so that packets are sent through the CSG, not to the CSG.

Examples

The following example illustrates the use of the **radius monitor** command:

```
ip csg user-group G1
 radius userid User-Name
 radius monitor 1.2.3.4 1813 key secret
```

Related Commands

| Command | Description |
|-------------------------------|--|
| radius userid | Specifies the RADIUS attribute used to extract the user identifier from a RADIUS record. |

radius parse strict

To tighten the parsing rules for RADIUS flows, use the **radius parse strict** command in CSG user group configuration mode. To relax the parsing rules, use the **no** form of this command.

radius parse strict

no radius parse strict

Syntax Description This command has no arguments or keywords.

Defaults The parsing rules are relaxed.

Command Modes CSG user group configuration

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines When you configure this command, the CSG fails parsing if the length of the user ID (RADIUS Attribute 1 [User-Name] or RADIUS Attribute 31 [Calling-Station-Id], as configured) is less than the minimum (3).

Examples The following example tightens the parsing rules for RADIUS flows for the CSG user-group G1:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
```

| Related Commands | Command | Description |
|------------------|---|---|
| | radius start restart session-id | Specifies the search RADIUS attribute used to extract the user identifier from a RADIUS record. |
| | radius acct-port | Configures the RADIUS listening port when it is different from the RADIUS default of 1813. |

radius pod attribute

To specify the RADIUS attributes to be copied from the RADIUS Start message and sent to the NAS in the Packet of Disconnect (PoD) message, use the **radius pod attribute** command in CSG user group configuration mode. To disable this feature, use the **no** form of this command.

radius pod attribute *radius_attribute_number*

no radius pod attribute *radius_attribute_number*

| | | |
|---------------------------|--------------------------------|---|
| Syntax Description | <i>radius_attribute_number</i> | Specifies the number of the RADIUS attribute to be copied from the RADIUS Start message and sent to the NAS in the PoD message. |
|---------------------------|--------------------------------|---|

| | |
|-----------------|---|
| Defaults | No RADIUS attributes are sent in the PoD message. |
|-----------------|---|

| | |
|----------------------|------------------------------|
| Command Modes | CSG user group configuration |
|----------------------|------------------------------|

| | | |
|------------------------|-------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | You can specify up to 256 RADIUS attributes. If the RADIUS message does not contain an attribute, the PoD message attribute does not contain the attribute, either. If the list of configured attributes changes, only new RADIUS messages are subject to the new attributes. Attributes already saved continue to be included in the PoD message. |
|-------------------------|--|

When a RADIUS Start request is received, any attributes received from a previous Start request are deleted.

If there are multiple instances of an attribute, all instances are included.

Attributes are included in the PoD message in random order.

| | |
|-----------------|---|
| Examples | The following example shows how to specify RADIUS attributes: |
|-----------------|---|

```
ip csg user-group G1
  radius pod attribute 44
  radius pod attribute 26
```

| | | |
|-------------------------|------------------------------------|--|
| Related Commands | Command | Description |
| | radius pod nas | Specifies the NAS port to which the CSG should send the Packet of Disconnect (PoD) message, and the key to use in calculating the Authenticator. |
| | radius pod timeout | Specifies the number of times to retry the RADIUS Packet of Disconnect (PoD) message if it is not ACKed, and the interval between retransmissions. |

radius pod nas

To specify the NAS port to which the CSG should send the Packet of Disconnect (PoD) message, and the key to use in calculating the Authenticator, use the **radius pod nas** command in CSG user group configuration mode. To restore the default settings, use the **no** form of this command.

radius pod nas [*start-ip end-ip*] *port* **key** [*encrypt*] *secret-string*

no radius pod nas [*start-ip end-ip*] *port* **key** [*encrypt*] *secret-string*

Syntax Description

| | |
|----------------------|---|
| <i>start-ip</i> | Specifies the first NAS IP address in a range of addresses. |
| <i>end-ip</i> | Specifies the last NAS IP address in a range of addresses. |
| <i>port</i> | Specifies the NAS port number to which the PoD message is sent. |
| key | Specifies a RADIUS key. |
| <i>encrypt</i> | <p>(Optional) Indicates how the <i>secret-string</i> is represented when the configuration is displayed (for example, show run), or how it is written to nonvolatile memory (for example, wr mem).</p> <p>The possible values are 0 and 7:</p> <ul style="list-style-type: none"> 0—The <i>secret-string</i> is stored in plain text. This is the default setting. 7—The <i>secret-string</i> is encrypted before it is displayed or written to nonvolatile memory. <p>Note If your router is configured to encrypt all passwords, then the password is represented as 7 plus the encrypted text. See the Cisco IOS service command for more details.</p> |
| <i>secret-string</i> | <p>1- to 64-character clear password. All characters are valid; case is significant.</p> <p>The <i>secret-string</i> is always sent in plain text to the CSG module when the configuration is downloaded.</p> <p><i>Secret-string</i> must match the secret specified on the RADIUS client (for example, the GGSN).</p> |

Defaults

The *secret-string* is stored in plain text.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Usage Guidelines

The PoD message is sent to the NAS IP address specified in the NAS-IP-Address attribute (4) in the Accounting Start message. This command specifies the NAS listen port, as well as the key to use in calculating the Authenticator.

The Accounting Start must have been received on an IP address specified in the enhanced proxy or endpoint (**radius proxy** or **radius endpoint**) command configured in module CSG configuration mode.

In some networks, many NASs might use the same listen port and key. In such networks, you can use this command to specify the range of NAS IP addresses.

If no IP addresses are specified, the port number and key apply to all NASs. The “global” definition is used if a specific range is not configured for the NAS when the PoD message is sent.

Examples

The following example shows how to specify NAS ports and keys:

```
ip csg user-group G1
  radius userid User-Name
  radius pod attribute 44
  radius pod nas 1.1.1.0 1.1.1.255 1700 key secret
  radius pod nas 1701 key password

mod csg 3
  radius proxy 1.2.3.4 5.6.7.8 key secret
```

Related Commands

| Command | Description |
|-----------------------------|--|
| radius pod attribute | Specifies the RADIUS attributes to be copied from the RADIUS Start message and sent to the NAS in the Packet of Disconnect (PoD). |
| radius pod timeout | Specifies the number of times to retry the RADIUS Packet of Disconnect (PoD) message if it is not ACKed, and the interval between retransmissions. |

radius pod timeout

To specify the number of times to retry the RADIUS Packet of Disconnect (PoD) message if it is not ACKed, and the interval between retransmissions, use the **radius pod timeout** command in CSG user group configuration mode. To restore the default timeout, use the **no** form of this command.

radius pod timeout *timeout* **retransmit** *retransmit*

no radius pod timeout *timeout* **retransmit** *retransmit*

Syntax Description

| | |
|-------------------------------------|---|
| <i>timeout</i> | Number of seconds to wait for an ACK or NAK before sending another PoD message. The default timeout is 5 seconds. |
| retransmit <i>retransmit</i> | Number of times to retransmit the message. The default setting is 3 retransmits. |

Defaults

The default timeout is 5 seconds.

The default number of retransmits is 3 retransmits.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Examples

The following example shows how to specify a RADIUS PoD timeout and retries:

```
ip csg user-group G1
 radius pod timeout 30 retransmits 5
```

Related Commands

| Command | Description |
|--------------------------------------|--|
| radius pod attribute | Specifies the RADIUS attributes to be copied from the RADIUS Start message and sent to the NAS in the Packet of Disconnect (PoD). |
| radius pod nas | Specifies the NAS port to which the CSG should send the Packet of Disconnect (PoD) message, and the key to use in calculating the Authenticator. |

radius proxy

To specify that the CSG should be a proxy for RADIUS messages, use the **radius proxy** command in module CSG configuration mode. To stop the CSG from proxying for RADIUS messages, use the **no** form of this command.

```
radius proxy csg_addr server_addr [csg_source_addr] [key [encrypt] secret-string]
[table table-name]
```

```
no radius proxy csg_addr server_addr [csg_source_addr] [key [encrypt] secret-string]
[table table-name]
```

| Syntax Description | | |
|--------------------------------|---|---|
| <i>csg_addr</i> | Specifies the CSG IP address. | The CSG IP address must be a virtual IP address, and it must be unique. The CSG IP address must not be specified in other CSG commands, and it must not match any real IP address, virtual IP address, or alias IP address configured on the CSG or in a /32 content configuration. |
| <i>server_addr</i> | Specifies the server IP address. | |
| <i>csg_source_addr</i> | Specifies the source IP address the CSG is to use when sending packets to the server. By default, <i>csg_source_addr</i> is set to <i>csg_addr</i> . | |
| key | (Optional) Specifies a RADIUS key. | Specify no more than one key for each CSG IP address. |
| <i>encrypt</i> | (Optional) Indicates how the <i>secret-string</i> is represented when the configuration is displayed (for example, show run), or how it is written to nonvolatile memory (for example, wr mem). | <p>The possible values are 0 and 7:</p> <ul style="list-style-type: none"> 0—The <i>secret-string</i> is stored in plain text. This is the default setting. 7—The <i>secret-string</i> is encrypted before it is displayed or written to nonvolatile memory. <p>Note If your router is configured to encrypt all passwords, then the password is represented as 7 plus the encrypted text. See the Cisco IOS service command for more details.</p> |
| <i>secret-string</i> | (Optional) 1- to 64-character clear password. All characters are valid; case is significant. | <p>The <i>secret-string</i> is always sent in plain text to the CSG module when the configuration is downloaded.</p> <p><i>Secret-string</i> must match the secret specified on the RADIUS client (for example, the GGSN).</p> |
| table <i>table-name</i> | Associates the specified table name with the RADIUS proxy. The <i>table-name</i> argument is a 1-to-15 character string identifying the table. The CSG stores the table name as all-uppercase ASCII characters. | |

Defaults

The *secret-string* is stored in plain text.

The *CSG_source_addr* is set to *csg_addr*.

Command Modes

Module CSG configuration

Command History

| Release | Modification |
|--------------------------|---|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| 3.1(3)C5(5)—12.2(18)SXD | The <i>CSG_source_addr</i> argument was added. |
| 3.1(1)C6(2)—12.2(18)SXE | The table keyword and <i>table-name</i> argument were added. |

Usage Guidelines

A message sent to the specified *csg_addr* (and any port) is parsed and then forwarded to the specified server. When forwarded to the server, the source IP address is the *CSG_source_addr*, if configured, or the *CSG_addr* otherwise.

The source port is arbitrarily chosen by the CSG, and the destination port remains unchanged. When a message is received from the server and forwarded to the client, the source IP address is the *CSG_addr* and the source port remains unchanged. The source IP address and port are taken from the destination IP address and port in the original message from the client.

You can configure an optional RADIUS key. If you configure a key, the CSG parses and acts on the message only if the RADIUS authenticator is correct. If the key is not configured, the CSG always parses the message. Whether you configure a key or not, and whether it is correct or not, the CSG always forwards the message.

You can specify up to 32 **radius proxy** commands.

You can specify more than one RADIUS **key** by specifying more than one **radius proxy** command, but each command must specify a unique CSG IP address.

All RADIUS messages are forwarded, except when the IP or UDP headers specify a length larger than the physical packet size.

The User Table identifies all users known to the CSG. The table is populated based on the contents of RADIUS Accounting Start messages, or from the user database, if either feature is enabled in your configuration. User table entries created as a result of RADIUS messaging through **radius proxy** definition with a **table** configured are indexed by the configured *table-name*. This enables the CSG to segment the user space and removes ambiguity if multiple users share the same IP address, provided that their entries were instantiated by RADIUS flows to CSG radius definitions bound to different table-names.

You can define up to 64,511 clients, where a client is defined by its IP address and port.

**Note**

If your network is designed to check the authorization string in RADIUS messages, you should enter a secret-string. Additionally, if you configure the **user-profile server radius remove** command, you might need to configure a secret-string.

To change the RADIUS proxy *table-name* associated with a given *csg_addr*, you must first enter the **no** form of the **radius proxy** command for that *csg_addr*, then enter the command with the new *table-name*.

Examples

The following example illustrates how to use the **radius proxy** command:

```
ip csg user-group G1
  radius userid User-Name
!
mod csg 3
  radius proxy 1.2.3.4 5.6.7.8 key secret
```

The following example illustrates how to use the **radius proxy** command to create a proxy point that maps to table ACME_VLAN, to be used as part of a user index for users created as a result of traffic to this **radius proxy** definition.

```
ip csg user-group G1
  radius userid User-Name
!
mod csg 3
  radius proxy 1.2.3.4 5.6.7.8 key secret table ACME_VLAN
```

Related Commands

| Command | Description |
|-------------------------------|--|
| radius userid | Specifies the RADIUS attribute used to extract the user identifier from a RADIUS record. |

radius server

To enable RADIUS proxy, use the **radius server** command in CSG user group configuration mode. To remove the RADIUS server configuration, use the **no** form of this command.

radius server *ip-address* [*port-number*]

no radius server *ip-address* [*port-number*]

Syntax Description

| | |
|--------------------|--|
| <i>ip-address</i> | The IP address of the RADIUS server. |
| <i>port-number</i> | (Optional) The port number of the RADIUS server. The valid range is 1 to 65535. The default port number is 1813 (the default RADIUS port). |

Defaults

The default port number is 1813.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

When the CSG acts as a RADIUS proxy, proxied messages are forwarded to this RADIUS server.

Examples

The following example configures a RADIUS server for the CSG user-group G1, with IP address 10.13.14.15 and the default RADIUS port, 1813:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
  radius parse strict
  radius server 10.13.14.15
  radius userid User-Name
  redirect nat 10.33.33.3
```

Related Commands

| Command | Description |
|---|---|
| radius start restart session-id | Specifies the search RADIUS attribute used to extract the user identifier from a RADIUS record. |
| radius acct-port | Configures the RADIUS listening port when it is different from the RADIUS default of 1813. |

radius start restart session-id

To delete an existing CSG User Table entry for a specific user, and to create a new entry for that user, use the **radius start restart session-id** command in CSG user group configuration mode.

```
radius start restart session-id {attr_number | {26 | vsa} {vendor_id | 3gpp} sub-attr_number}
```

Syntax Description

| | |
|------------------------|--|
| <i>attr_number</i> | Specifies the RADIUS attribute number. |
| 26 | RADIUS attribute number 26. |
| vsa | Specifies the vendor-specific attribute. |
| <i>vendor_id</i> | Specifies the vendor ID number |
| 3gpp | Specifies the 3gpp vendor ID. |
| <i>sub-attr_number</i> | Specifies the sub-attribute number. |

Defaults

The default behavior is that existing User Table entries are not deleted.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C4(9)—12.2(14)ZA2 | This command was introduced. |

Usage Guidelines

This command:

- Deletes an existing CSG User Table entry for a specific user (when a RADIUS Accounting Start or RADIUS Intermediate Accounting is received).
- Creates a new entry for that user (similar to when a RADIUS Accounting Stop has been received).
- Terminates all sessions for that user.

In order to detect duplicate RADIUS requests (which dictates that the existing entry is not deleted), specify the attribute (which might be a vendor-specific attribute) to be used. If the contents of the specified attribute in the original request match the contents of the attribute in the current request, the request is a duplicate and the existing entry is not deleted.

Examples

The following example shows how to enable the **radius start restart session-id** command:

```
ip csg user-group U1
  radius start restart session-id 44
```

radius stop purge

To specify the attribute (which might be a vendor-specific attribute) that must be included in the RADIUS Accounting Stop request in order for the User Table entry to be deleted, use the **radius stop purge** command in CSG user group configuration mode.

```
radius stop purge {attr_number | {26 | vsa} {vendor_id | 3gpp} sub-attr_number}
```

Syntax Description

| | |
|------------------------|--|
| <i>attr_number</i> | Specifies the RADIUS attribute number. |
| 26 | RADIUS attribute number 26. |
| vsa | Specifies the vendor specific attribute. |
| <i>vendor_id</i> | Specifies the vendor's ID number |
| 3gpp | Specifies the 3gpp vendor ID. |
| <i>sub-attr_number</i> | Specifies the sub-attribute number. |

Defaults

The user entry is deleted when a stop is received.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C4(9)—12.2(14)ZA2 | This command was introduced. |

Usage Guidelines

The **radius stop purge** command specifies the attribute (which might be a vendor-specific attribute) that must be included in the RADIUS Accounting Stop request in order for the User Table entry to be deleted. The contents of the specified attribute are not examined.

The User Table identifies all users known to the CSG. The table is populated based on the contents of RADIUS Accounting Start messages, or from the user database, if either feature is enabled in your configuration.

Examples

The following example shows how to enable the **radius stop purge** command for the CSG user-group U1:

```
ip csg user-group U1
 radius stop purge vsa 3gpp 11
```

radius userid

To specify the RADIUS attribute used to extract the user identifier from a RADIUS record, use the **radius userid** command in CSG user group configuration mode. To specify that no RADIUS attributes are to be used, use the **no** form of this command.

```
radius userid { 1 | 31 | User-Name | Calling-Station-Id }
```

```
no radius userid
```

Syntax Description

| | |
|---------------------------|---|
| 1 | RADIUS attribute number 1. |
| 31 | RADIUS attribute number 31. |
| User-Name | Equivalent to RADIUS attribute number 1. |
| Calling-Station-Id | Equivalent to RADIUS attribute number 31. |

Defaults

No default behavior or values.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

The **radius userid** command specifies that the CSG obtains the user ID from either attribute 1 or 31. If **no radius userid** is specified, user IDs are not obtained from RADIUS messages.

Examples

The following example shows how to specify RADIUS attribute User-Name for the CSG user-group G1:

```
ip csg user-group G1
entries max 100000
database 10.1.2.3 11111
quota local-port 6666
quota server 10.1.4.5 888 1
quota server 10.1.6.7 999 2
radius acct-port 7777
radius key SECRET_PASSWORD
radius parse strict
radius server 10.13.14.15
radius userid User-Name
redirect nat 10.33.33.3
```

| Related Commands | Command | Description |
|------------------|----------------------------------|--|
| | radius key | Specifies the CSG to be the RADIUS endpoint for account records. |
| | radius acct-port | Configures the RADIUS listening port when it is different from the established RADIUS default of 1813. |

records batch

To batch billing records into a single message before sending them to the Billing Mediation Agent (BMA), use the **records batch** command in CSG accounting configuration mode. To send billing records to the BMA as soon as they are created, use the **no** form of this command.

records batch

no records batch

Syntax Description

This command has no arguments or keywords.

Defaults

The default is **records batch**, which batches billing records into a single message.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|-----------------------|------------------------------|
| 2.2(3)C2(1)—12.1(13)E | This command was introduced. |

Usage Guidelines

The **records batch** command batches billing records into a single message. The message is sent when it is full, or when a short time has elapsed. Batching records reduces network overhead and increases the CSG performance.

Examples

The following example batches billing records for the CSG accounting service A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
  inservice
```

Related Commands

| Command | Description |
|-----------------------------------|---|
| ip csg accounting | Defines content-based client accounting as a service, and enters CSG accounting configuration mode. |

records format

To specify variable, fixed, or variable single CDR format, use the **records format** command in CSG accounting configuration mode. To return to the default, use the **no** form of this command.

records format [**fixed** | **variable** | **variable-single-cdr**]

no records format

Syntax Description

| | |
|----------------------------|---------------------------------------|
| fixed | Specifies fixed CDR format. |
| variable | Specifies variable CDR format. |
| variable-single-cdr | Specifies variable single CDR format. |

Defaults

The default setting is **variable**.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|--------------------------|---|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| 3.1(3)C5(5)—12.2(18)SXD | The variable-single-cdr keyword was added. |

Usage Guidelines

Fixed format generates CDRs that always contain the same set of TLVs. Some might have a length of zero. This format is primarily used for integration with legacy billing systems.

Examples

The following example specifies fixed record format:

```
ip csg accounting
  records format fixed
```

Related Commands

| Command | Description |
|------------------------------|---|
| hostname | Specifies a variable hostname for a CSG module |
| mode | Specifies that a billing plan is postpaid or prepaid. |
| owner name | Specifies the name of a service owner. |
| owner id | Specifies an identifier for a service owner. |
| class | Specifies a service class value. |
| ip csg transport-type | Classifies data traffic based on its access path. |

records granularity

To specify the granularity at which billing records (CDRs) should be generated, use the **records granularity** command in CSG service configuration mode. To restore the default granularity, use the **no** form of this command.

```
records granularity {transaction | service {bytes bytes | time seconds | bytes bytes time
seconds}}
```

```
no records granularity
```

| Syntax Description | |
|---------------------|---|
| transaction | Generate CDRs for each transaction. This is the default setting. |
| service | Generate summarized, service-level CDRs. |
| bytes bytes | Number of bytes of data, sent and received by a session, that triggers a CDR. <ul style="list-style-type: none"> For HTTP billing, the CSG counts TCP bytes. For all other billing protocols, the CSG counts IP bytes. <p>The difference between bytes sent and received in two records might not exactly equal the <i>bytes</i> argument, because updates must occur on packet boundaries.</p> <p>The range is from 5000 to 4294967295; however, we recommend an upper limit of 4000000. The default value, if the bytes keyword is not specified, is 0 bytes, indicating no maximum.</p> |
| time seconds | Maximum time, in seconds, between billing records for a session. Records can be sent more frequently if the number of bytes is reached. <p>When a record is sent because the maximum time has been reached, the byte counts reported in the record are approximate.</p> <p>The range is from 60 to 4294967295; however, we recommend an upper limit of 65535. The default value, if the time keyword is not specified, is 0 seconds, indicating no time limit.</p> |

Defaults

If you do not specify the **records granularity** command, CDRs are generated for each transaction.

If you specify **records granularity service**, you must also specify the **bytes** keyword, the **time** keyword, or both:

- If you specify both the **bytes** keyword and the **time** keyword, a billing record is sent as soon as either limit is reached, and both limits are reset.
- If you specify only the **bytes** keyword and not the **time** keyword, the maximum time between billing records for a session is set to 0 seconds, indicating no time limit.
- If you specify only the **time** keyword and not the **bytes** keyword, the number of bytes of data that triggers the sending of a billing record is set to 0 bytes, indicating no maximum.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C5(3)—12.2(18)SXD | This command was introduced. |

Usage Guidelines

You can use this command to reduce the number of records for a service in which transaction level billing is not required.

For example, if a user is accessing the Internet, and the data is billed solely on the basis of volume, generating records for each HTTP transaction is of little use. With service-level CDR summarization enabled, the CSG generates only consolidated records containing service-level usage.

If you specify both **type http** and any other type (**type other**, **type ftp**, **type imap**, and so on) for a service, and you enable service-level CDR summarization for the service, the CSG's incremental and cumulative byte counts are not valid. This is because they are a mix of TCP bytes (for the HTTP traffic) and IP bytes (for all other traffic).

Service-level CDRs are generated only for subscribers with entries in the CSG User Table entry. If a subscriber does not have an entry in the User Table, the CSG generates transaction-level CDRs.

Examples

The following example shows how to specify a service granularity in both IP bytes and seconds:

```
ip csg service A1
  records granularity service byte 10000 time 120
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

records http-statistics

To send the HTTP Statistics data record to the Billing Mediation Agent (BMA), use the **records http-statistics** command in CSG accounting configuration mode. To not send the HTTP Statistics data record to the BMA unless the session fails (for example, if an RST without FIN is received, or if the session times out), use the **no** form of this command.

records http-statistics

no records http-statistics

Syntax Description This command has no arguments or keywords.

Defaults The default is **records http-statistics**, which causes the HTTP Statistics data record to be sent to the BMA whenever the session terminates.

Command Modes CSG accounting configuration

| Command History | Release | Modification |
|-----------------|-----------------------|------------------------------|
| | 2.2(3)C2(1)—12.1(13)E | This command was introduced. |

Examples The following example sends the HTTP Statistics data record to the BMA for the CSG accounting service A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
inservice
```

records intermediate

To enable the generation of intermediate billing records, use the **records intermediate** command in CSG accounting configuration mode. To disable the generation of intermediate billing records, use the **no** form of this command.

records intermediate { **bytes** *bytes* | **time** *seconds* | **bytes** *bytes* **time** *seconds* }

no records intermediate { **bytes** *bytes* | **time** *seconds* | **bytes** *bytes* **time** *seconds* }

Syntax Description

| | |
|----------------------------|--|
| bytes <i>bytes</i> | <p>Number of bytes of data, sent and received by a session, that triggers the sending of an intermediate billing record:</p> <ul style="list-style-type: none"> For HTTP billing, the CSG counts TCP bytes. For all other billing protocols, the CSG counts IP bytes. <p>The difference between bytes sent and received in two records might not exactly equal the <i>bytes</i> argument. A trigger can occur only on a packet boundary. Once triggered, a separate process captures a snapshot of the current byte counts for a session. Between the trigger and the snapshot, additional packets might be counted.</p> <p>The range is from 5000 to 4294967295; however, we recommend an upper limit of 4000000. The default value, if the bytes keyword is not specified, is 0 bytes, indicating that the number of bytes sent and received will not trigger an intermediate record.</p> |
| time <i>seconds</i> | <p>Maximum time, in seconds, between billing records for a session. Records can be sent more frequently if the number of bytes is reached.</p> <p>When a record is sent because the maximum time has been reached, the byte counts reported in the record are approximate.</p> <p>The range is from 5 to 65535. The default value, if the time keyword is not specified, is 0 seconds, indicating no time limit.</p> |

Defaults

If you do not specify the **records intermediate** command, intermediate billing records are not generated.

If you specify the **bytes** keyword but not the **time** keyword, the maximum time between billing records for a session is set to 0 seconds, indicating no time limit.

If you specify the **time** keyword but not the **bytes** keyword, the number of bytes of data that triggers the sending of an intermediate billing record is set to 0 bytes, indicating no maximum.

If you specify both the **bytes** keyword and the **time** keyword, a billing record is sent as soon as either limit is reached, and both limits are reset.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(1)C5(5)—12.2(18)SXD | This command was introduced. |

Examples

The following example shows how to enable intermediate billing records for the CSG accounting plan A1. In this example, intermediate records are generated after 100,000 IP bytes of data are sent and received, or after 3600 seconds (1 hour), whichever comes first:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
inservice
```

Related Commands

| Command | Description |
|-----------------------------------|---|
| ip csg accounting | Defines content-based client accounting as a service, and enters CSG accounting configuration mode. |

records max

To define the maximum number of billing records that can be stored or queued in the CSG before they are forwarded to the Billing Mediation Agent (BMA), use the **records max** command in CSG accounting configuration mode. To revert to the default setting, use the **no** form of this command.

records max *number*

no records max *number*

Syntax Description

| | |
|---------------|---|
| <i>number</i> | Defines the maximum number of billing records that can be stored or queued in the CSG before they are forwarded to the BMA. If the number of queued records exceeds the <i>number</i> argument, the CSG tries to forward the records to the Persistent Storage Device (PSD), if one is available. Otherwise, the CSG discards the billing records. The valid range is 1 to 65535 records. The default value is 10,000 records. |
|---------------|---|

Defaults

The default value is 10,000 records.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Usage Guidelines

This command sets:

- The maximum number of BMA records among all BMAs
- The maximum number of quota server records among all quota servers
- The maximum number of Cisco Persistent Storage Device (PSD) records in the PSD

For example, if you set the **records max** command to 5000, the CSG can store or queue:

- Up to 5,000 total BMA records, shared among all BMAs
- Up to 5,000 total quota server records, shared among all quota servers
- Up to 5,000 total PSD records

If the value configured on the **records max** command is very high, the CSG might crash or be unable to communicate with IOS when its memory is exhausted. The following message might appear on the syslog:

%ICC-4-HEARTBEAT: Card 9 failed to respond to heartbeat

If you see this message, you need to reduce the maximum number of billing records that the CSG is allowed to buffer in memory. To do so, set **records max** to a smaller value, such as 10,000 (the default setting).

Examples

The following example shows how to specify that a maximum of 250 billing records can be queued in the CSG before they are forwarded to the BMA, for the CSG accounting service A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
  inservice
```

Related Commands

| Command | Description |
|--|--|
| agent (CSG accounting) | Defines the primary and backup BMAs to which to send billing records |

record-storage

To define a Persistent Storage Device (PSD) to associate with this accounting group, use the **record-storage** command in CSG accounting configuration mode. To disable the record store, use the **no** form of the command.

record-storage *ip-address* [*port*]

no record-storage *ip-address* [*port*]

Syntax Description

| | |
|-------------------|---|
| <i>ip-address</i> | The destination address for packets going to the storage device. |
| <i>port</i> | (Optional) The source port to be used by the CSG when communicating with a record storage server other than the Persistent Storage Device/Call Data Record Backup (PSD/CDRB). |

Defaults

No default behavior or values.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C4(1)—12.2(14)ZA2 | This command was introduced. |

Usage Guidelines

The **record-storage** command sets the destination address for packets going to the storage device (PSD/CDRB). The PSD/CDRB only listens on port 3386. When the **record-storage** command omits the *port* parameter, the CSG defaults to port 3386. If a storage device is listening on another port, then you should specify that port in the **record-storage local-port** command.



Note

Unless you are using a record-storage server other than the PSD, you need not specify the *port* parameter. Additionally, you must use the **record-storage local-port** command to specify the local port before you use the **record-storage** command to specify the IP address and port of the record-storage server.

Examples

The following example shows how to define a record store destination address of 172.18.12.226:

```
ip csg accounting D
  record-storage local-port 5002
  record-storage 172.18.12.226
```

Related Commands

| Command | Description |
|---|---|
| record-storage local-port | Defines the source port to be used by the CSG when communicating with the record store. |

record-storage local-port

To define the source port to be used by the CSG when communicating with the record store, use the **record-storage local-port** command in CSG accounting configuration mode. To disable the record store, use the **no** form of the command.

record-storage local-port *port*

no record-storage local-port *port*

| | | |
|---------------------------|-------------|---|
| Syntax Description | <i>port</i> | The source port to be used by the CSG when communicating with the record store. |
|---------------------------|-------------|---|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|------------------------------|
| Command Modes | CSG accounting configuration |
|----------------------|------------------------------|

| | | |
|------------------------|-------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(3)C4(1)—12.2(14)ZA2 | This command was introduced. |

| | |
|-------------------------|---|
| Usage Guidelines | The local port is the source port from which the CSG sends packets to the record-storage server, and the port on which the CSG listens for responses. |
|-------------------------|---|



Note

The record-storage local port must not conflict with the quota server, nor with the agent local port.

| | |
|-----------------|--|
| Examples | The following example shows how to define a record store local port of 5002: |
|-----------------|--|

```
ip csg accounting D
 record-storage local-port 5002
 record-storage 172.18.12.226
```

| | | |
|-------------------------|--------------------------------|--|
| Related Commands | Command | Description |
| | record-storage | Defines a Persistent Storage Device (PSD) to associate with this accounting group. |

redirect

To redirect client flows to an alternate IP address when the client's quota is exhausted, use the **redirect** command in CSG user group configuration mode. To remove the redirect, use the **no** form of this command.

redirect [**nat** *ip-address* [*port-number*]] [**wap** *url*] [**http** *url*]

no redirect [**nat** *ip-address* [*port-number*]] [**wap** *url*] [**http** *url*]

Syntax Description

| | |
|--------------------|---|
| nat | Redirects NAT client flows to an alternate IP address when quota is depleted. |
| wap | Redirects WAP client flows to a configured redirect URL when quota is depleted. |
| http | Redirects HTTP client flows to a configured redirect URL when quota is depleted, and configures the default URL for use in HTTP redirection. |
| <i>ip-address</i> | The IP address to which client flows are to be redirected. |
| <i>port-number</i> | (Optional) Port number to which client flows are to be redirected. The valid range is 1 to 65535. If you do not specify a port number, the port number in the user packet is not changed. |
| <i>url</i> | The URL to which client flows are redirected. |

Defaults

No redirect IP address is defined.

If you do not specify a port number, the port number in the user packet is not changed.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|--------------------------|-------------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| 3.1(3)C4(1)—12.2(14)ZA2 | The wap variable was added. |
| 3.1(3)C5(1)—12.2(17d)SXB | The http variable was added. |

Examples

The following example configures redirect NAT for the CSG user-group G1, with flows redirected to IP address 10.33.33.3:

```
ip csg user-group G1
  entries max 100000
  database 10.1.2.3 11111
  quota local-port 6666
  redirect wap http://172.18.12.219:80/redirect/topoff.wml/
  quota server 10.1.4.5 888 1
  quota server 10.1.6.7 999 2
  radius acct-port 7777
  radius key SECRET_PASSWORD
```

```
radius parse strict
radius server 10.13.14.15
radius userid User-Name
redirect nat 10.33.33.3
redirect http http://172.18.12.219:80/redirect/topoff.html/
```

refund-policy

To enable and specify the refunding policy for a CSG prepaid service, use the **refund-policy** command in CSG service configuration mode. To disable the refunding policy, use the **no** form of this command.

refund-policy *policy-name*

no refund-policy *policy-name*

Syntax Description

| | |
|--------------------|---|
| <i>policy-name</i> | Name of the refunding policy to be enabled. |
|--------------------|---|

Defaults

The default is for refunding to be disabled.

Command Modes

CSG service configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

If refund is enabled for a CSG prepaid service, you cannot download more than 0x6FFFFFFF bytes of data in a given transaction.

Examples

The following example enables refund policy **COMPANY-REFUND**:

```
ip csg service BILLBYVOLUME
  basis byte tcp
  refund-policy COMPANY-REFUND
  content BILLBYVOLUME policy BILLBYVOLUME
```

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

replicate connection tcp

To replicate the connection state for all TCP connections to the CSG content servers on the backup system, use the **replicate connection tcp** command in CSG content configuration mode. To disable connection redundancy, use the **no** form of this command.

replicate connection tcp

no replicate connection tcp

Syntax Description

This command has no arguments or keywords.

Defaults

Connection redundancy is not enabled.

Command Modes

CSG content configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

This command is required for stateful failover for replicated TCP connections.

For replication to occur, you must enable Cisco IOS Server Load Balancing (SLB) fault tolerance with the **ft group** command.

With the **replicate connection tcp** command configured, when a connection is established or terminated, the active CSG sends a dummy SYN or RST, respectively, to the fault-tolerant VLAN. This is normal operation. The extra packets are not billed and the destination MAC address is unknown, so the packets do not reach the server. The destination MAC address for the dummy SYN or RST frame is structured as follows:

0x03:xx:yy:00:zz:zz

where:

- **0x03:xx:yy** is the Cisco Organizational Unique Identifier (OUI).
- **zz** is the VLAN of the SYN that initiated the connection.

Examples

The following example shows how to enable TCP replication for the CSG content MOVIES_COMEDY:

```
ip csg content MOVIES_COMEDY
  client 10.4.4.0 255.255.255.0
  idle 120
  ip 172.18.45.0/24 tcp 8080
  policy POLICY1
  replicate connection tcp
  vlan MOVIES_COMEDY
inservice
```

■ replicate connection tcp

| Related Commands | Command | Description |
|------------------|--------------------------------|---|
| | ip csg content | Defines content for the CSG accounting services, and enters CSG content configuration mode. |

report http header

To define the inclusion of multiple HTTP request headers in the CSG HTTP_Header CDR, use the **report http header** command in CSG accounting configuration mode. To disable this configuration, use the **no** form of this command.

report http header *header_name*

no report http header *header_name*

Syntax Description

| | |
|--------------------|--|
| <i>header_name</i> | The name of the request header you want to include in the CSG HTTP_Header CDR. You can specify any number of headers; header names cannot exceed 224 characters. |
|--------------------|--|

Defaults

The default is to only copy the “host,” “user-agent,” and “from” HTTP headers into the CDRs. Any number of headers (up to 256) can be configured.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(3)C4(1)—12.2(14)ZA2 | This command was introduced. |

Examples

The following example shows how to enable reporting HTTP header information:

```
Router(config)# ip csg accounting name
Router(config-csg-accounting)# report http header x-subno
Router(config-csg-accounting)# report http header x-al-session-id
```

report radius attribute

To specify the RADIUS attributes to be copied from the RADIUS Start message into CDRs, use the **report radius attribute** command in CSG accounting configuration mode. To disable this feature, use the **no** form of this command.

report radius attribute *radius_attribute_number*

no report radius attribute *radius_attribute_number*

Syntax Description

| | |
|--------------------------------|---|
| <i>radius_attribute_number</i> | Specifies the RADIUS attribute number to be copied from the RADIUS Start message. |
|--------------------------------|---|

Defaults

The default setting is that no RADIUS attributes are reported.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|-------------------------|---|
| 2.2(1)C(4)—12.1(11b)E3 | This command was introduced. |
| 3.1(3)C4(1)—12.2(14)ZB2 | This command was moved to the CSG accounting configuration mode |

Usage Guidelines

You can specify as many attributes as you want.

If the attribute is not present in the RADIUS message, the attribute is not present in the CDRs, unless **records format fixed** is configured. If the list of configured attributes changes, only new RADIUS requests are subject to the new attributes. Attributes already saved continue to be reported.

When a RADIUS Start request is received, any attributes received from a previous Start request are deleted.

If there are multiple instances of an attribute, they are all reported.

Attributes are reported in the order they exist in the RADIUS message.

Examples

The following example shows how to enable the **report radius attribute** command:

```
ip csg accounting A1
  report radius attribute 3
  report radius attribute 5
  report radius attribute 7
  report radius attribute 44
```

Related Commands

| Command | Description |
|-----------------------------------|---|
| ip csg accounting | Defines content-based client accounting as a service, and to enter CSG accounting configuration mode. |

report usage

To enable supplemental usage reporting, use the **report usage** command in CSG accounting configuration mode. To disable supplemental usage reporting, use the **no** form of this command.

report usage {bytes ip | seconds}

no report usage {bytes ip | seconds}

| Syntax Description | bytes ip | seconds |
|--------------------|--|---|
| | Report the number of IP bytes uploaded and downloaded for each interval. | Report usage in seconds for the interval, as well as the timestamps of the start of the first and last billable sessions in the interval. |

Defaults No default behavior or values.

Command Modes CSG accounting configuration

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | 3.1(3)C6(2)—12.2(18d)SXE | This command was introduced. |

Usage Guidelines Interval report TLVs are generated for SvcReauthorizationRequest, ServiceStop, and QuotaReturn messages. Reports contain statistics since the last report.

If you want to report both IP bytes and usage in seconds, you can specify both **report usage bytes ip** and **report usage seconds**.

Examples The following example shows how to enable supplemental usage reporting for both IP bytes and seconds:

```
ip csg accounting NAME
  report usage bytes ip
  report usage seconds
```

retcode

To specify the range of application return codes for which the CSG refunds quota, use the **retcode** command in CSG refund configuration mode. Use the **no** form of this command to disable this feature.

```
retcode {ftp | http | imap | pop3 | smtp | wap} rc-start [rc-end]
```

```
no retcode {ftp | http | imap | pop3 | smtp | wap} rc-start [rc-end]
```

| Syntax Description | |
|--------------------|---|
| ftp | The CSG refunds quota for File Transfer Protocol (FTP) application return codes. |
| http | The CSG refunds quota for Hypertext Transfer Protocol (HTTP) and Wireless Application Protocol (WAP) 2.x application return codes. Note The http keyword affects only HTTP and WAP 2.x. For WAP 1.x refunds, use the wap keyword. |
| imap | The CSG refunds quota for Internet Message Access Protocol (IMAP) application return codes. |
| pop3 | The CSG refunds quota for Post Office Protocol, version 3 (POP3) application return codes. |
| smtp | The CSG refunds quota for Simple Mail Transfer Protocol (SMTP) application return codes. |
| wap | The CSG refunds quota for Wireless Application Protocol (WAP) 1.x application return codes. Note The wap keyword affects only WAP 1.x. For WAP 2.x refunds, use the http keyword. |
| <i>rc-start</i> | Specifies the beginning of the range of values for specific application return codes. Valid values are 1 to 65535 (0xffff). |
| <i>rc-end</i> | (Optional) Specifies the end of the range of values for specific application return codes. Valid values are the value of <i>rc-start</i> to 65535 (0xffff). If you are specifying a single value as the range, do not specify <i>rc-end</i> . |

Defaults No default behavior or values.

Command Modes CSG refund configuration

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------------|
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| | 3.1(1)C6(2)—12.2(18)SXE | The imap keyword was added. |

Usage Guidelines

For IMAP, keep in mind the following considerations:

- Only return code 554 is used. Return code 554 is used when a transaction ending in an IMAP tagged response was not flagged **OK**.
- The CSG does not support refunding for IMAP. If configured, refunding for IMAP has no effect.

Examples

The following example shows how to enable the **retcode** command:

```
ip csg refund COMPANY-REFUND
retcode http 500 509
retcode wap 0x44 0x50
retcode ftp 454
```

Related Commands

| Command | Description |
|-------------------------------|---|
| flags | Specifies IP, TCP, or WAP flag bit masks and values for which the CSG refunds quota. |
| ip csg refund | Specifies the refund policy that can then be applied to the various services, and enters CSG refund configuration mode. |

route (module CSG VLAN)

To configure networks that are not Layer 2-adjacent to the CSG, use the **route** command in module CSG VLAN configuration mode. To remove the subnet or gateway IP address from the configuration, use the **no** form of this command.

```
route ip-address netmask gateway gw-ip-address
```

```
no route ip-address netmask gateway gw-ip-address
```

Syntax Description

| | |
|----------------------|--|
| <i>ip-address</i> | Subnet IP address. |
| <i>netmask</i> | Network mask. |
| gateway | Keyword to specify that the gateway is configured. |
| <i>gw-ip-address</i> | Gateway IP address. |

Defaults

No default behavior or values.

Command Modes

Module CSG VLAN configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines

Specify the Layer 3 network's subnet address and the gateway IP address to reach the next-hop router. The gateway address must be in the same network as specified in the **ip address VLAN** command.

You can specify up to 4095 **route** commands for each VLAN.

If you are adding a new route to an existing gateway, the new route might not take effect until you remove the gateway and reconfigure it to clear the gateway cached entries.

To support RADIUS endpoint, the CSG requires a route to 255.255.255.255. You can configure the route by using the **gateway (module CSG VLAN)** command or the **route (module CSG VLAN)** command. For example:

```
gateway 31.0.0.6
```

or:

```
route 255.255.255.255 255.255.255.255 gateway 31.0.0.6
```



Note

If you already have a gateway configured, you do not need to configure an additional gateway for the RADIUS endpoint.

Examples

The following example shows how to configure a network to the CSG:

```
vlan 301 client
name TO-GGSN-MS-APN
gateway 31.0.0.10
ip address 31.0.0.21 255.255.255.0
route 11.0.0.0 255.255.0.0 gateway 31.0.0.1
route 11.1.0.0 255.255.0.0 gateway 31.0.0.2
route 11.2.0.0 255.255.0.0 gateway 31.0.0.3
route 11.3.0.0 255.255.0.0 gateway 31.0.0.4
alias 31.0.0.51 255.255.255.0
```

Related Commands

| Command | Description |
|--|--|
| ip address (module CSG VLAN) | Assigns an IP address to the CSG VLAN. |
| show module csg variable | Displays the list of VLANs. |
| vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

ruleset

To download all content defined by a ruleset to a CSG card, use the **ruleset** command in module CSG configuration mode. To delete the downloaded content, use the **no** form of this command.

ruleset *ruleset-name*

no ruleset *ruleset-name*

| | | |
|---------------------------|---------------------|---|
| Syntax Description | <i>ruleset-name</i> | Name of a configured CSG billing ruleset. |
|---------------------------|---------------------|---|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|--------------------------|
| Command Modes | Module CSG configuration |
|----------------------|--------------------------|

| | | |
|------------------------|------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | Configuration commands are sent to the CSG card to provision each content referenced in the ruleset. |
|-------------------------|--|

Examples The following example shows how to download the CSG ruleset R1 to the CSG card in slot 4:

```
module csg 4
  accounting A1
  ft group 123 vlan 5
  ruleset R1
  vlan 30 client
  vlan 32 client
  vlan 40 server
```

| | | |
|-------------------------|----------------------------|--|
| Related Commands | Command | Description |
| | module csg | Enters module CSG configuration mode for a specified slot. |

service

To associate a service with a CSG billing plan, use the **service** command in CSG billing configuration mode. To remove the association, use the **no** form of this command.

service *service-name*

no service *service-name*

| Syntax Description | <i>service-name</i> | Name of a configured CSG billing service. |
|--------------------|---------------------|---|
|--------------------|---------------------|---|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | CSG billing configuration |
|---------------|---------------------------|
|---------------|---------------------------|

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| Usage Guidelines | You can associate more than one service with the same billing plan by using multiple service commands. |
|------------------|---|
|------------------|---|

| Examples | The following example shows how to associate a service with a billing plan: |
|----------|---|
|----------|---|

```
ip csg billing REGULAR
service MOVIES
service BROWSING
```

| Related Commands | Command | Description |
|------------------|--------------------------------|--|
| | ip csg billing | Defines a billing plan to be used for prepaid billing. |

show ip csg accounting

To monitor and display configuration, operation, and statistical information for the CSG billing feature, use the **show ip csg accounting** command in privileged EXEC mode.

```
show ip csg accounting {agent | database | error | quota-server | radius | users {all | statistics |
ip-address [ip-mask] | userid userid}} [detail] [module num] [psd module slot]
```

| Syntax Description | | |
|-------------------------------|--|---|
| agent | | Displays information about the Billing Mediation Agent (BMA) to which to send billing records. |
| database | | Displays information about the server that answers user ID queries. |
| error | | Displays error messages. |
| quota-server | | Displays information about the quota server. |
| radius | | Displays information related to RADIUS. |
| users | | Displays information from the User Table. |
| all | | Displays information for all users. |
| statistics | | Displays performance statistics. |
| <i>ip-address</i> | | Displays information for the specified user IP address. |
| <i>ip-mask</i> | | Displays information for the specified user IP address mask. |
| userid <i>userid</i> | | Displays information for the specified user ID. |
| detail | | Lists detailed statistics for each BMA, followed by a summary of statistics for all BMAs. |
| module <i>num</i> | | Displays information for the specified CSG module. |
| psd module <i>slot</i> | | Displays information pertaining to Persistent Storage Device (PSD) functionality residing on the CSG. |

Defaults No default behavior or values.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------------------|--|
| | 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |
| | 2.2(3)C2(1)—12.1(13)E | This command was modified to support multiple BMAs. |
| | 3.1(1)C3(1)—12.2(14)ZA | The quota-server keyword was added. |
| | 3.1(3)C5(1)—12.2(17d)SXB | Added new output for RADIUS in the users detail variable. |

Usage Guidelines

BMA statistics are kept for each BMA, as well as an aggregate count for all BMAs.

**Note**

Invoking the **show ip csg accounting users all** command might flood your screen with output.

Examples

The following example shows how to display information about the quota server:

```
Router# show ip csg accounting quota-server

----- CSG in slot 4 -----
charging gateway      priority state
-----
10.10.99.1:6923      2 NAWAIT
```

The following example displays the RADIUS attributes being sent to the BMA and quota server, including a short description of the fields.



Note A good understanding of RADIUS protocol is needed to decode these RADIUS values.

The length of the RADIUS VSA is not included in the output; this command shows the value field. In the case of VSA (26), the first four octets are the Vendor ID code.

```
Router# show ip csg accounting users all detail

----- CSG in slot 4 -----
192.168.215.15 31608920094
 bma = 192.168.200.22:3338
  qs = 192.168.221.97:3338, nas = 192.168.210.170, flags = 0x01, sessions = 0
 billing = PREPAID, plan = PLAN1
004:c0a8d2aa      - NAS IP Address (192.168.210.170)
030:41504e31      - Called Station ID (APN1)
007:00000007      - Framed Protocol (GPRS PDP Context)
008:c0a8d70f      - Framed IP Address (192.168.215.15)
026:000028af0111313038303133303038393230303934 (3GPP VSA 10415, IMSI 108013008920094)
031:3331363038393230303934 - Calling Station ID (31608920094)
```

show module csg accounting

To monitor and display configuration, operation, and statistical information for the CSG billing feature, use the **show module csg accounting** command in privileged EXEC mode.

```
show module csg slot accounting {agent | database | error | quota-server | radius | users {all |
statistics | ip-address [ip-mask] | userid userid}} [detail]
```

| Syntax Description | | |
|-----------------------------|--|--|
| <i>slot</i> | | Slot where the CSG resides. |
| agent | | Displays information about the Billing Mediation Agent (BMA) to which to send billing records. |
| database | | Displays information about the server that answers user ID queries. |
| error | | Displays error messages. |
| quota-server | | Displays information about the quota server. |
| radius | | Displays information related to RADIUS. |
| users | | Displays information from the User Table. |
| all | | Displays information for all users. |
| statistics | | Displays performance statistics. |
| <i>ip-address</i> | | Displays information for the specified user IP address. |
| <i>ip-mask</i> | | Displays information for the specified user IP address mask. |
| userid <i>userid</i> | | Displays information for the specified user ID. |
| detail | | Lists detailed statistics for each BMA, followed by a summary of statistics for all BMAs. |

Defaults No default behavior or values.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------------------|---|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| | 3.1(3)C5(1)—12.2(17d)SXB | Output for the detail argument was modified. |
| | 3.1(3)C6(2)—12.2(18)SXE | Output was modified to support the tariff switch feature. |

Usage Guidelines BMA statistics are kept for each BMA, as well as an aggregate count for all BMAs.



Note Invoking the **show module csg accounting users all** command might flood your screen with output.

Examples

The following example shows how to display detailed information about all accounting users on CSG 3:

```
c6k-csg# show module csg 3 accounting users all detail
10.10.10.2      USER_1
  table name = None
  bma = 0.0.0.0:0, qs = 10.10.20.2:5000
  nexthop dl ip = 0.0.0.0, nas = 10.10.10.10, flags = 0x00000011, sessions = 0
  billing = PREPAID, plan = BILLBYTES, handoff timer OFF
  service = SERVICEBYTES, basis = IP bytes, verify = Disabled
  balance = 96607, consumed = 3393
  reserved = 0, pending = 0, trigger = 32768
  current time   = TUE MAR 22 18:22:00 2005
  quota expiry   = TUE MAR 22 18:25:57 2005
  idle expiry    = TUE MAR 22 18:26:57 2005
  earliest reauth = TUE MAR 22 18:22:00 2005
  service id = 0x4240624800000000, transactions = 0, flags = 0x0020
  interval bytes up = 125
  interval bytes down = 3268
  interval seconds = 1
  interval first billable = TUE MAR 22 18:21:57 2005
  interval last billable = TUE MAR 22 18:21:57 2005
Report attributes:
  008:0a0a0a02
  040:00000001
  044:303031
  004:0a0a0a0a
  001:555345525f31
```

Table B-3 describes the fields shown in the display.

Table B-3 show module csg accounting users all detail Field Descriptions

| Field | Description |
|----------------------|---|
| table name | Table name of the VLAN. |
| bma | IP address of the BMA. |
| qs | IP address of the quota server. |
| nexthop dl ip | IP address of the next-hop downlink. |
| nas | IP address of the Network Access Server (NAS). |
| flags | Internal CSG field. |
| sessions | Total number of sessions. |
| billing | Type of billing plan: <ul style="list-style-type: none"> • If the billing plan is prepaid, this field is set to PREPAID. • If the billing plan is postpaid, or if it has a length of zero, this field is set to POSTPAID. • If the CSG cannot determine whether the billing plan is prepaid or postpaid, this field is set to UNKNOWN. |
| plan | Specific billing plan, or (none) if the billing plan is zero-length or is not known to the CSG. |
| handoff timer | Indicates whether the RADIUS handoff timer is on or off. |
| service | Name of the service. |

Table B-3 *show module csg accounting users all detail Field Descriptions (continued)*

| | |
|-------------------------------------|---|
| basis | Billing basis for the service. Possible values are: <ul style="list-style-type: none"> • IP bytes—Billing charge is a function of the IP data volume processed during the user's session. • TCP bytes—Billing charge is a function of the TCP data volume processed during the user's session. • Fixed—Billing charge is a fixed cost, which is deducted each time the first packet for a transaction hits a content-policy pair (that is, deducted for each request). • Second—Billing charge is duration-based for the CSG service. • Second connect—Billing charge is based on connection duration time, not service duration time. |
| verify | Indicates whether service verification is enabled or disabled. |
| balance | Amount of quota remaining. Note If the basis second connect command is configured, the balance field is updated only when there is a service reauthorization request for new quota. |
| consumed | Amount of quota used. Note If the basis second connect command is configured, the consumed field is updated only when there is a service reauthorization request for new quota. |
| reserved | Amount of quota reserved for ongoing transactions. |
| pending | Amount of quota that has been consumed but is not yet been charged against consumed or balance . Quota is typically in pending state to prevent charging until refund conditions are evaluated at the end of the transaction. |
| trigger | Threshold for quota reauthorization. |
| current time | Current timestamp. |
| quota expiry | Timestamp for the quota to expire. |
| idle expiry | Timestamp for the idle timer to expire. |
| earliest reauth | Timestamp for the earliest service reauthorization request for the service. |
| service id | Identifier for the service. |
| transactions | Number of open transactions mapped to the service. |
| flags | Internal CSG field. |
| tariff_switch time | Timestamp of the tariff switch. |
| t/sw consumed | Amount of consumed quota at the time of the tariff switch. |
| t/sw interval bytes up | Number of tariff switch interval usage bytes uploaded since last report. |
| t/sw interval bytes down | Number of tariff switch interval usage bytes downloaded since last report. |
| t/sw interval seconds | Number of tariff switch interval usage seconds since last update. |
| t/sw interval first billable | Timestamp of the first billable session time for this tariff switch report interval. |
| t/sw interval last billable | Timestamp of the last billable session time for this tariff switch report interval. |
| interval bytes up | Number of interval usage bytes uploaded since last report. |
| interval bytes down | Number of interval usage bytes downloaded since last report. |
| interval seconds | Number of interval usage seconds since last update. |

Table B-3 *show module csg accounting users all detail Field Descriptions (continued)*

| | |
|--------------------------------|--|
| interval first billable | Timestamp of the first billable session time for this report interval. |
| interval last billable | Timestamp of the last billable session time for this report interval. |
| Report attributes | Values of any RADIUS attributes associated with the user. For example, 008:0a0a0a02 indicates that RADIUS attribute 8 is associated with the user, with a value of 0a0a0a02 . |

The following example shows how to display performance statistics for accounting users on CSG 4:

```
c6k-csg# show module csg 4 accounting users statistics
Module  Max Entries  Highwater  Current  Overflow
-----  -
4       250000      215282    212452   5778149
```

[Table B-4](#) describes the fields shown in the display.

Table B-4 *show module csg accounting users statistics Field Descriptions*

| Field | Description |
|--------------------|--|
| Module | CSG module number. |
| Max Entries | Maximum number of entries allowed in the User Table, as configured with the entries max command in CSG user group configuration mode. |
| Highwater | Largest number of entries in the User Table since bootup. |
| Current | Current number of entries in the User Table. |
| Overflow | Number of entries reallocated for a new user because the User Table was full or no more storage was available. |

show module csg arp

To display the CSG Address Resolution Protocol (ARP) cache, use the **show module csg slot arp** command in privileged EXEC mode.

show module csg slot arp

| | | |
|---------------------------|--------------------------------|------------------------------|
| Syntax Description | <i>slot</i> | Slot where the CSG resides. |
| Defaults | No default behavior or values. | |
| Command Modes | Privileged EXEC | |
| Command History | Release | Modification |
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples

The following example shows how to display the CSG ARP cache:

```
Router# show module csg 4 arp
```

| Internet Address | Physical Interface | VLAN | Type | Status |
|------------------|--------------------|------|---------|----------------|
| 10.10.99.244 | 00-01-64-F9-1A-45 | 99 | LEARNED | up(0 misses) |
| 10.10.99.250 | 00-02-7E-39-2B-13 | 99 | LEARNED | up(0 misses) |
| 20.20.20.10 | 00-90-BF-99-B8-1C | 820 | LEARNED | up(0 misses) |
| 20.20.20.103 | 00-02-7E-39-25-98 | 820 | --SLB-- | local |
| 20.20.30.103 | 00-02-7E-39-25-98 | 830 | --SLB-- | local |
| 20.20.20.240 | 00-00-00-00-00-00 | 820 | ROUTER | down(4 misses) |
| 20.20.30.250 | 00-00-00-00-00-00 | 830 | ROUTER | down(4 misses) |
| 10.10.99.1 | 08-00-20-B6-3E-7B | 99 | LEARNED | up(0 misses) |
| 10.10.99.3 | 08-00-20-B6-27-7E | 99 | LEARNED | up(0 misses) |
| 10.10.99.40 | 00-07-EC-CC-54-8A | 99 | LEARNED | up(0 misses) |
| 10.10.99.41 | 00-02-7E-39-2B-14 | 99 | LEARNED | up(0 misses) |
| 10.10.99.52 | 00-02-FC-BD-70-0A | 99 | LEARNED | up(0 misses) |
| 10.10.99.55 | 00-E0-34-B7-20-65 | 99 | LEARNED | up(0 misses) |
| 10.10.99.62 | 00-09-43-51-26-0A | 99 | LEARNED | up(0 misses) |
| 10.10.99.67 | 00-02-FC-E0-80-4A | 99 | LEARNED | up(0 misses) |
| 10.10.99.103 | 00-02-7E-39-25-98 | 99 | --SLB-- | local |

show module csg billing

To display statistics and counters for CSG billing, use the **show module csg slot billing** command in privileged EXEC mode.

```
show module csg slot billing {all | plan billing-plan-name}
```

| Syntax Description | | |
|--------------------|--------------------------------------|--|
| | <i>slot</i> | Slot where the CSG resides. |
| | all | Displays statistics for all CSG billing plans. |
| | plan <i>billing-plan-name</i> | Displays statistics for only the specified CSG billing plan. |

Defaults No default behavior or values.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples The following example shows how to display the statistics and counters for all CSG billing plans:

```
C6K-csg# show module csg 3 billing all
CSG billing plan PLAN_A
  service = OFF_NET, basis = seconds (svc), idle = 300
  initial = 0, increment = 0, minimum= 60, exclude-svc-idle = 0
  rule = (TELNET, VANILLA), weight = 1
  rule = (BROWSE, ANYHTTP), weight = 1
```

| Related Commands | Command | Description |
|------------------|--------------------------------|---|
| | ip csg billing | Defines a billing plan to be used for prepaid billing, and enters CSG billing configuration mode. |

show module csg clock

To display time information for the CSG, use the **show module csg slot clock** command in privileged EXEC mode.

show module csg slot clock

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|-------------------------|------------------------------|
| | 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Usage Guidelines The CSG reports all times in Coordinated Universal Time (UTC), regardless of the setting of the **clock timezone** or **clock summer-time** command.

Examples The following example shows how to display time information for the CSG:

```
C6K-csg# show module csg 1 clock
seconds = 1123757186, base = 1122382560, uptime = 1374626
adjusted time = THU AUG 11 10:46:45 2005 UTC
last sync time = THU AUG 11 10:46:11 2005 UTC
```

[Table B-5](#) describes the fields shown in the display.

Table B-5 *show module csg clock Field Descriptions*

| Field | Description |
|-----------------------|--|
| seconds | Seconds since January 1, 1970. |
| base | Internal, unadjusted number of seconds since January 1, 1970. |
| uptime | Seconds since the CSG was last booted. |
| adjusted time | Current date and time. The adjusted time is used as the time stamp TLV for CDRs. |
| last sync time | Date and time of last synchronization update from the Supervisor Engine. |

show module csg conns

To display active connections, use the **show module csg slot conns** command in privileged EXEC mode.

show module csg slot conns [*vserver virtserver-name*] [*client ip-address*] [*detail*]

| Syntax Description | | |
|------------------------|--|---|
| <i>slot</i> | | Slot where the CSG resides. |
| vserver | | (Optional) Keyword to specify the connections associated with a particular virtual server. |
| <i>virtserver-name</i> | | (Optional) Name of the virtual server to be monitored. |
| client | | (Optional) Keyword to specify the connections associated with a particular client IP address. |
| <i>ip-address</i> | | (Optional) IP address of the client to be monitored. |
| detail | | (Optional) Keyword to specify detailed connection information. |

Defaults If no options are specified, the command displays output for all active connections.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines Entering this command might result in a sudden increase in CSG CPU utilization (that is, the percent of the CSG CPU that is in use).

Examples The following example shows how to display active connection data:

```
Router# show module csg 4 conns
  prot vlan source                destination                state
-----
In  TCP  11  100.100.100.2:1754             10.10.3.100:80           ESTAB
Out TCP  12  100.100.100.2:1754             10.10.3.20:80            ESTAB

In  TCP  11  100.100.100.2:1755             10.10.3.100:80           ESTAB
Out TCP  12  100.100.100.2:1755             10.10.3.10:80            ESTAB

Router# show module csg 4 conns detail
  prot vlan source                destination                state
-----
In  TCP  11  100.100.100.2:1754             10.10.3.100:80           ESTAB
Out TCP  12  100.100.100.2:1754             10.10.3.20:80            ESTAB
vs = WEB_VIP, ftp = No, csrpf = False
```

```
In TCP 11 100.100.100.2:1755 10.10.3.100:80 ESTAB
Out TCP 12 100.100.100.2:1755 10.10.3.10:80 ESTAB
vs = WEB_VIP, ftp = No, csrp = False
```

show module csg content

To display statistics and counters for the CSG content, use the **show module csg slot content** command in privileged EXEC mode.

show module csg slot content [*name content-name*] [*detail*]

| Syntax Description | | |
|---------------------------------|--|--|
| <i>slot</i> | | Slot where the CSG resides. |
| name <i>content-name</i> | | (Optional) Name of a configured content. |
| detail | | (Optional) Keyword to display more detailed information. |

Defaults No default behavior or values.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples The following example shows how to display the statistics and counters for the CSG content:

```
Router# show module csg 4 content
content      prot destination          vlan state      conns
-----
HTTP        TCP   20.20.0.0/16:80         ALL  OPERATIONAL  0
OTHER       any  20.20.0.0/16          ALL  OPERATIONAL  0
```

[Table B-6](#) describes the fields shown in the display.

Table B-6 show module csg content Field Descriptions

| Field | Description |
|--------------------|---|
| content | Name of the configured CSG billing content. |
| prot | Protocol type of Layer 3/Layer 4 flows that can be processed by the content: <ul style="list-style-type: none"> any—Flows of any protocol type can be processed. tcp—Only TCP flows can be processed. udp—Only UDP flows can be processed. <i>protocol-number</i>—Number identifying the protocol whose flows can be processed. The valid range is 0 to 255, where 0 means the same as any. |
| destination | The destination address for packets going to the content. |
| vlan | Name of the source VLAN for the content, or ALL if the content is not restricted to a single VLAN. |

Table B-6 *show module csg content Field Descriptions (continued)*

| | |
|--------------|--|
| state | Current state of the content. |
| conns | Number of connections currently using the content. |

The following example shows how to display detailed statistics and counters for the CSG HTTP content named **HTTP-MS**:

```
Router# show module csg 4 content name HTTP-MS detail
HTTP-MS, state = OPERATIONAL, index = 11
  destination = 0.0.0.0/0:80, TCP
  idle = 10, replicate = connection, vlan = ALL, pending = 30
  max parse len = 4000, persist rebalance = TRUE
  conns = 2, total conns = 3
  policy          total conn  client pkts  server pkts
  -----
  HTTP-MS-AHTML   0             0            0
  HTTP-MS-BJPG    1             3            1
  HTTP-FREE        0             0            0
  HTTP-DOUBLE      0             0            0
  HTTP-MS         10            71           59
  (default)       0             0            0
```

**Note**

For HTTP accounting, the “client pkts” and “server pkts” columns might show incorrect values. Therefore, ignore the values in the “client pkts” and “server pkts” columns.

Related Commands

| Command | Description |
|--------------------------------|---|
| ip csg content | Defines content for the CSG accounting services, and enters CSG content configuration mode. |

show module csg ft

To display statistics and counters for the CSG fault-tolerant pair, use the **show module csg slot ft** command in privileged EXEC mode.

show module csg slot ft [detail]

| Syntax Description | |
|--------------------|--|
| <i>slot</i> | Slot where the CSG resides. |
| detail | (Optional) Keyword to display more detailed information. |

Defaults No default behavior or values.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples The following example shows how to display the statistics and counters for the CSG fault-tolerant pair:

```
Router# show module csg 4 ft
FT group 2, vlan 30
This box is active
priority 10, heartbeat 1, failover 3, preemption is off
```

| Related Commands | Command | Description |
|------------------|---------------------------------------|--|
| | ft group (module CSG) | Enters fault-tolerant configuration mode and configures fault tolerance. |

show module csg stats

To display statistics, use the **show module csg slot stats** command in privileged EXEC mode.

show module csg slot stats

| | | |
|---------------------------|--------------------------------|------------------------------|
| Syntax Description | <i>slot</i> | Slot where the CSG resides. |
| Defaults | No default behavior or values. | |
| Command Modes | Privileged EXEC | |
| Command History | Release | Modification |
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples

The following example shows how to display the CSG statistics:

```
Router# show module csg 4 stats

Connections Created:          0
Connections Destroyed:       0
Connections Current:         0
Connections Timed-Out:       0
Connections Failed:          0
Server initiated Connections:
    Created: 25, Current: 0, Failed: 24
L4 Load-Balanced Decisions:  0
L4 Rejected Connections:     25
L7 Load-Balanced Decisions:  0
L7 Rejected Connections:
    Total: 0, Parser: 0,
    Reached max parse len: 0, Cookie out of mem: 0,
    Cfg version mismatch: 0, Bad SSL2 format: 0
L4/L7 Rejected Connections:
    No policy: 0, No policy match 0,
    No real: 0, ACL denied 0,
    Server initiated: 25
Checksum Failures: IP: 0, TCP: 0
Redirect Connections: 0, Redirect Dropped: 0
FTP Connections:           0
MAC Frames:
    Tx: Unicast: 15103, Multicast: 4, Broadcast: 25808,
    Underflow Errors: 0
    Rx: Unicast: 7618, Multicast: 2548994, Broadcast: 44518,
    Overflow Errors: 0, CRC Errors: 0
```

show module csg status

To display whether the CSG is online and, if so, the CSG chassis slot location and whether the configuration download is complete, use the **show module csg slot status** command in privileged EXEC mode.

show module csg slot status

| | | |
|---------------------------|-------------|-----------------------------|
| Syntax Description | <i>slot</i> | Slot where the CSG resides. |
|---------------------------|-------------|-----------------------------|

| | | |
|-----------------|--------------------------------|--|
| Defaults | No default behavior or values. | |
|-----------------|--------------------------------|--|

| | | |
|----------------------|-----------------|--|
| Command Modes | Privileged EXEC | |
|----------------------|-----------------|--|

| Command History | Release | Modification |
|------------------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| | |
|-------------------------|--|
| Usage Guidelines | If the CSG is online, this command shows the CSG chassis slot location and indicates whether the configuration download is complete. |
|-------------------------|--|

| | |
|-----------------|--|
| Examples | The following example shows how to display the CSG status: |
|-----------------|--|

```
Router# show module csg 4 status
SLB Module is online in slot 4.
Configuration Download state:COMPLETE, SUCCESS
```

show module csg tech-support

To display technical support information for the CSG, use the **show module csg slot tech-support** command in privileged EXEC mode.

```
show module csg slot tech-support [all | core-dump | csg | fpga | ft | processor number | slowpath | utilization]
```

| Syntax Description | |
|-------------------------|---|
| <i>slot</i> | Slot where the CSG resides. |
| all | (Optional) Keyword to display all of the available statistics. |
| core-dump | (Optional) Keyword to display all of the most recent statistics for the process that experienced a core dump. |
| csg | (Optional) Keyword to display all of the CSG statistics. |
| fpga | (Optional) Keyword to display all of the FPGA statistics. |
| ft | (Optional) Keyword to display all of the statistics related to fault tolerance. |
| processor number | (Optional) Keyword to display the statistics for the specified processor. |
| slowpath | (Optional) Keyword to display all of the slowpath statistics. |
| utilization | (Optional) Keyword to display all of the utilization statistics (total memory usage). |

Defaults If no options are specified, the command displays all information.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|-------------------------|--|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |
| | 3.1(3)C5(5)—12.2(18)SXD | Added support for IMAP and RADIUS Packet of Disconnect (PoD) statistics. |

Examples The following example shows how to display utilization statistics for the CSG:

```
Router# show module csg 4 tech-support utilization
Resource Utilization:
Memory
  Available Memory      62%    156M
  Allocated Memory     30%    76M
  OS Static Memory      8%     22M
```



Note If **Available Memory** is near zero, there might be a buffer leak.

The following example shows how to display buffer pool statistics for the CSG:

```
Router# show module csg 4 tech-support csg
CSG KUT Stats:
  max = 25000, current = 0, highwater = 0, LRU-steals = 0
  requests = 0, responses = 0, resends = 0, timeouts = 0

CSG Radius Stats:
  starts = 0, stops = 0, other = 0
  client messages received = 0, client messages sent = 0
  max proxy clients exceeded = 0

CSG LogGen Stats:
  session: dups= 0, create err= 0, seq err= 0 (persist 0)
  no session= 0, bad ixp msg= 0
  alloc fail= 0, alloc interm fail= 0
  billing records= 0, no reserve= 0
  msg rcv err= 0, msg send err= 0
  csg_billing_url_rcv= 0, csg_billing_stat_rcv= 0
  csg_billing_ft_notify_rcv= 0, csg_billing_retcode_rcv= 0
  null buffer addr= 0, invalid vsid= 0
  dup url= 0, wap_url_no_sess= 0, wap_url_no_app= 0
  wap url req= 0, wap url resp= 0, wap url frag resp= 0
  nokut duplicate= 0 negative avail= 0 sess delete err= 0
  up-range= 0, down-range= 0
  gtp-rej-error= 0

CSG record storage stats:
  Writes:          = 0, Write Errors:  = 0
  Reads:           = 0, Read Errors:   = 0
  Reads Pending:  = 0, Alloc Errors:   = 0

CSG QM Stats:
  Errors: Alloc Error = 0, Too Many Requests = 0
  Badly formatted message = 0, No Active QS: 0

GTP Application: CSG Billing Agent, Local Port: 3386, TID: b3025f0
  alloc failures = 0, no standby on CG failure = 0
  packets sent = 0, received = 3, failed acks = 0
  packets dropped = 0, rejected = 0, retransmissions = 0
  packets outstanding: current = 0, highwater = 1
  bad records = 0, unknown CG = 0, CG failures = 0
  Charging Gateways: defined = 1, max active = 1
    10.10.99.1:2369          2          ACTIVE

GTP Application: CSG Quota Manager, Local Port: 0, TID: 0
  alloc failures = 0, no standby on CG failure = 0
  packets sent = 0, received = 0, failed acks = 0
  packets dropped = 0, rejected = 0, retransmissions = 0
  packets outstanding: current = 0, highwater = 0
  bad records = 0, unknown CG = 0, CG failures = 0
  Charging Gateways: defined = 0, max active = 1

GTP Application: CSG record storage, Local Port: 0, TID: 0
  alloc failures = 0, no standby on CG failure = 0
  packets sent = 0, received = 0, failed acks = 0
  packets dropped = 0, rejected = 0, retransmissions = 0
  packets outstanding: current = 0, highwater = 0
  bad records = 0, unknown CG = 0, CG failures = 0
  Charging Gateways: defined = 0, max active = 1

CSG HTTP Stats:
  packets= 0, requests= 0, parse failures= 0
  alloc failures= 0, redirects= 0
```

```

CSG FTP Stats:
  vserver: add = 0/0, remove = 0/0, lookup errors = 0
  ftp details: alloc = 0/0, no details = 0
  session lookup errors = 0, dropped data conns = 0
  killed data conns = 0

CSG WAP Stats:
  parses= 0, wap sessions= 0, mms sessions= 0
  connection oriented packets= 0, connectionless packets= 0
  curr trans= 0, total trans= 0, incomplete trans= 0
  billing reports= 0, dup packets= 0, redirects= 0
  disconnects= 0, unknown packets= 0, concat packets= 0
  parse err= 0, alloc fail= 0, drops= 0, refunds= 0
  forced aborts= 0 concat frags= 0 aoc reqs= 0

CSG Mail Stats:
  SMTP messages          = 0
  SMTP packets           = 0
  MAIL retransmits       = 0
  MAIL tcp gaps          = 0
  MAIL ip frags          = 0
  MAIL aoc bypass        = 0
  MAIL alloc fails       = 0
  POP3 messages          = 0
  POP3 packets           = 0
  IMAP header retrievals = 0
  IMAP body retrievals   = 0
  IMAP packets           = 0

CSG RTSP Stats:
  Conns: add = 0, fail = 0, cleanups = 0
  Allocs: sessions = 0, ctl_conns = 0, streams = 0,
  secondary = 0
  Timeouts: sessions = 0, ctl_conns = 0, streams = 0
  Misc: reuse = 0, reuse term = 0, teardowns = 0,
  suspends = 0, patches = 0, interleaved = 0,
  http = 0, no_policy = 0
  Errors: alloc = 0, dups = 0, session = 0,
  patch = 0, rejects = 0

CSG Fragment Stats:
  creates= 0, destroys= 0, timeouts= 0, invalids= 0
  leaders= 0, trailers= 0, drops= 0, unknown= 0
  alloc failures= 0

pkt_drive_bill_drop stats:
  kut_prepaid_nokut = 0, kut_prepaid = 0
  session = 0, session_kill = 0
  brec_url_msg_1 = 0, brec_url_msg_2 = 0, brec_stat_prepaid = 0
  brec_stat_msg_1 = 0, brec_stat_msg_2 = 0, brec_wap_url_msg = 0
  pkt_drive_drain = 0, pkt_drive_redir = 0
  mail_1 = 0, mail_2 = 0, mail_3 = 0
  mail_session_close = 0
  frag_1 = 0, frag_2 = 0, frag_3 = 0, frag_4 = 0
  http_resolved = 0

pkt_drive_bill_queue stats:
  bill_q_ndx_in          =0, bill_q_ndx_out =0
  csg_q_elem_hiwater    =0, csg_q_elem_count =0
  send_threshold         =520, BILL_MAX_SEND_QUEUE =65536
  csg_relinquish         =0, csg_relinquish_cnt =2
  pkt_drops_q_full      =0

```

show module csg tech-support

CSG Clock Stats:

```
seconds = 1130322752, base = 1130322529, uptime = 223
adjusted time = WED OCT 26 10:32:32 2005 UTC
last sync time = WED OCT 26 10:28:49 2005 UTC
```

Timer Wheel Stats:

```
ticks = 228, starts = 126, stops = 4, timeouts = 119, longest = 2
```

Tracebacks:

```
None recorded.
```

Buffer pools:

| Pool Name | total | in-use | free | max | largest | flags |
|------------------|-------|--------|-------|---------|---------|-------|
| CSG BRec | 5000 | 0 | 5000 | 200000 | 5000 | DYN |
| CSG NoKut | 0 | 0 | 0 | 200000 | 0 | DYN |
| CSG IntermBackup | 0 | 0 | 0 | 1000000 | 0 | DYN |
| CSG Intermediate | 0 | 0 | 0 | 1000000 | 0 | DYN |
| CSG Session | 0 | 0 | 0 | 1000000 | 0 | DYN |
| CSG GTP Signals | 50 | 0 | 50 | 0 | 50 | DYN |
| CSG GTP Data | 10000 | 1 | 9999 | 0 | 10000 | DYN |
| CSG KUT Elems | 12500 | 0 | 12500 | 0 | 12500 | DYN |
| CSG IMAP Data | 0 | 0 | 0 | 200000 | 0 | DYN |
| CSG MAIL aoc | 0 | 0 | 0 | 5000 | 0 | DYN |
| CSG Mail Details | 0 | 0 | 0 | 200000 | 0 | DYN |
| CSG WAP URLs | 0 | 0 | 0 | 50000 | 0 | DYN |
| CSG WAP session | 0 | 0 | 0 | 50000 | 0 | DYN |
| CSG WAP details | 0 | 0 | 0 | 50000 | 0 | DYN |
| CSG RTSP Buff | 0 | 0 | 0 | 1000 | 0 | DYN |
| CSG RTSP Fixed | 0 | 0 | 0 | 100000 | 0 | DYN |
| CSG RTSP Str | 0 | 0 | 0 | 200000 | 0 | DYN |
| CSG RTSP Ctl | 0 | 0 | 0 | 100000 | 0 | DYN |
| CSG RTSP Sess | 0 | 0 | 0 | 100000 | 0 | DYN |
| CSG FTP | 0 | 0 | 0 | 50000 | 0 | DYN |
| CSG HTTP FIXED | 0 | 0 | 0 | 100000 | 0 | DYN |
| CSG HTTP Details | 0 | 0 | 0 | 1600000 | 0 | DYN |
| CSG HTTP REQ | 1 | 0 | 1 | 1600000 | 1 | DYN |
| CSG HTTP Header | 4 | 0 | 4 | 6400000 | 4 | DYN |
| CSG buffers | 0 | 0 | 0 | 10240 | 0 | DYN |
| CSG Frag | 0 | 0 | 0 | 16384 | 0 | DYN |
| CSG AOC TokenPkt | 0 | 0 | 0 | 10000 | 0 | DYN |
| CSG AOC TokenReq | 0 | 0 | 0 | 10000 | 0 | DYN |
| CSG HTTPRedirDet | 0 | 0 | 0 | 0 | 0 | DYN |
| CSG HTTPRedirUrl | 0 | 0 | 0 | 0 | 0 | DYN |
| CSG PT Grant | 0 | 0 | 0 | 0 | 0 | DYN |
| CSG KUT RedirNAT | 0 | 0 | 0 | 0 | 0 | DYN |
| CSG KUT RedirURL | 0 | 0 | 0 | 0 | 0 | DYN |
| CSG IMAPSvcStats | 0 | 0 | 0 | 0 | 0 | DYN |
| CSG KUT SvcStats | 0 | 0 | 0 | 1000000 | 0 | DYN |
| CSG KUT Svc | 8000 | 0 | 8000 | 1000000 | 8000 | DYN |
| CSG Svc Connect | 0 | 0 | 0 | 1024 | 0 | DYN |
| CSG Svc Name | 8 | 3 | 5 | 255 | 8 | DYN |
| CSG Svc Rule | 16 | 4 | 12 | 1024 | 16 | DYN |
| CSG QM Request | 0 | 0 | 0 | 10000 | 0 | DYN |
| CSG BPlan Name | 8 | 5 | 3 | 128 | 8 | DYN |

Table B-7 describes the fields shown in the Buffer Pools table in the display.

Table B-7 *show module csg tech-support utilization Field Descriptions*

| Field | Description |
|------------------|--|
| Pool Name | Name of the CSG buffer pool. |
| total | Total number of buffers currently in the pool. |
| in-use | Total number of buffers currently being used. If the values in the in-use column are growing continuously, even during periods of low usage, and are never declining, there might be a buffer leak. Note It is normal for the values in the GTP Data row to grow if the Billing Mediation Agent (BMA) is not available. The growth is limited by the setting of the records max command. |
| free | Total number of buffers currently available. |
| max | Maximum possible number of buffers in the pool. A value of 0 indicates that the buffer is unbounded as long as overall memory is available. |
| largest | Highwater mark for the number of buffers in the pool. |
| flags | Additional information about the specific metric: <ul style="list-style-type: none"> • DYN—Pool can grow dynamically. • GRW—Pool has grown. • SHR—Pool is shrinking. • MAX—Pool is at maximum size. |

The following example shows how to display processor statistics for the CSG:

```
Router# show module csg 4 tech-support processor 2
-----
----- TCP Statistics -----
-----
Aborted rx                3350436013  66840864
New sessions rx           180           0
Total Packets rx          16940          0
Total Packets tx           0             0
Packets Passthrough       697           0
Packets Dropped           0             0
Persistent OOO Packets Dropped 0             0
Persistent Fastpath Tx    0             0
Total Persistent Requests 0             0
Persistent Same Real      0             0
Persistent New Real       0             0

Data Packets rx           877           0
L4 Data Packets rx        877           0
L7 Data Packets rx         0             0
Slowpath Packets rx       7851          0
Relinquish Requests rx    8031          0

TCP xsum failures         0             0

Session Mismatch          0             0
Session Reused while valid 0             0
Unexpected Opcode rx      0             0
Unsupported Proto         0             0
```

show module csg tech-support

```

Session Queue Overflow                0          0
Control->Term Queue Overflow          0          0
t_fifo Overflow                       0          0

L7 Analysis Request Sent              0          0
L7 Successful LB decisions             0          0
L7 Need More Data decisions           0          0
L7 Unsuccessful LB decisions          0          0
L4 Analysis Request Sent              180         0
L4 Successful LB decisions            180         0
L4 Unsuccessful LB decisions          0          0

Transmit:
  SYN                                  0          0
  SYN/ACK                              0          0
  ACK                                   0          0
  RST/ACK                               0          0
  data                                  0          0
Retransmissions:                      0          0

Receive:
  SYN                                   180         0
  SYN/ACK                               0          0
  ACK                                    340         0
  FIN                                    0          0
  FIN/ACK                               340         0
  RST                                    17          0
  RST/ACK                               0          0
  data                                  0          0

Session Redundancy Standby:
  Rx Fake SYN                           0          0
  Rx Repeat Fake SYN                    0          0
  Rx Fake Reset                          0          0
  Fake SYN Sent to NAT                  0          0
  Tx Port Sync                          0          0
  Encap Not Found                       0          0
  Fake SYN, TCP State Invalid            0          0

Session Redundancy Active:
  L4 Requests Sent                      0          0
  L7 Requests Sent                      0          0
  Persistent Requests Sent              0          0
  Rx Fake SYN                           0          0
  Fake SYN Sent to NAT                  0          0

Sessions torn down                      180         0
Rx Close session                        1          0
Slowpath(low pri) buffer allocs         7843        0
Slowpath(high pri) buffer allocs        8           0
Small buffer allocs                     180         0
Medium buffer allocs                    0           0
Large buffer allocs                     0           0
Session table allocs                    180         0

Slowpath(low pri) buffer alloc failures  0           0
Slowpath(high pri) buffer alloc failures 0           0
Small buffer allocs failures            0           0
Medium buffer allocs failures           0           0
Large buffer allocs failures            0           0
Session table allocs failures           0           0

Outstanding slowpath(low pri) buffers    0           0
Outstanding slowpath(high pri) buffers   0           0
Outstanding small buffers                0           0

```

| | | |
|----------------------------|---|---|
| Outstanding medium buffers | 0 | 0 |
| Outstanding large buffers | 0 | 0 |
| Outstanding sessions | 0 | 0 |

show module csg variable

To display the environmental variables in the configuration, use the **show module csg variable** command in privileged EXEC mode.

```
show module csg slot variable [name name] [detail]
```

| Syntax Description | |
|--------------------|---|
| <i>slot</i> | Slot where the CSG resides. |
| name | (Optional) Keyword to display the named variable information. |
| detail | (Optional) Keyword to display the map configuration details. |

Defaults If no variable name is specified, the command displays information about all variables.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|-------------------------|--|
| | 3.1(1)C4(1)—12.2(14)ZA1 | This command was introduced. |
| | 3.1(3)C5(5)—12.2(18)SXD | Added support for several new variables. |

Examples The following example shows how to display the variable configurations:

```
Router# show module csg 3 variable detail
```

```
Name: CSG_BASIS_BYTE_LOW_QUOTA_MAX  Rights: RW
Value: 10000000
Default: 10000000
Valid values: Integer (0 to 10000000)
Description:
Maximum value for the available quota threshold that triggers reauthorization for basis
byte.
.
.
.
```

For a list of all valid variables, see the description of the [variable \(module csg\)](#) command.

| Related Commands | Command | Description |
|------------------|---------------------------------------|---|
| | variable (module csg) | Specifies the environmental variables in the configuration. |

show module csg vlan

To display the list of VLANs, use the **show module csg slot vlan** command in privileged EXEC mode.

```
show module csg slot vlan [client | server | ft] [id vlan-id] [detail]
```

| Syntax Description | |
|--------------------|--|
| <i>slot</i> | Slot where the CSG resides. |
| client | (Optional) Keyword to display only the client VLAN configuration. |
| server | (Optional) Keyword to display only the server VLAN configuration. |
| ft | (Optional) Keyword to display only the fault-tolerant configuration. |
| id | (Optional) Keyword to display the VLAN. |
| <i>vlan-id</i> | (Optional) Keyword to display the specified VLAN. |
| detail | (Optional) Keyword to display the map configuration details. |

Defaults If no options are specified, the command displays information about all VLANs.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Examples The following example shows how to display the VLAN configurations:

```
Router# show module csg 4 vlan

vlan  IP address      IP mask      type
-----
11    10.10.4.2          255.255.255.0  CLIENT
12    10.10.3.1          255.255.255.0  SERVER
30    0.0.0.0            0.0.0.0        FT

Router# show module csg 4 vlan detail
vlan  IP address      IP mask      type
-----
11    10.10.4.2          255.255.255.0  CLIENT
      GATEWAYS
      10.10.4.1
12    10.10.3.1          255.255.255.0  SERVER
30    0.0.0.0            0.0.0.0        FT
```

| Related Commands | Command | Description |
|------------------|-----------------------------------|--|
| | vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

snmp-server enable traps csg

To enable Simple Network Management Protocol (SNMP) notification types that are available on the CSG, use the **snmp-server enable traps csg** command in global configuration mode. To disable CSG notifications, use the **no** form of this command.

```
snmp-server enable traps csg {agent | database | quota-server}
```

```
no snmp-server enable traps csg {agent | database | quota-server}
```

Syntax Description

| | |
|---------------------|---------------------------------|
| agent | Enable SNMP agent server traps. |
| database | Enable SNMP CSG database traps. |
| quota-server | Enable SNMP quota server traps. |

Command Default

If you do not enter the **snmp-server enable traps csg** command, no CSG notifications controlled by this command are sent.

Command Modes

Global configuration

Command History

| Release | Modification |
|-------------------------|------------------------------|
| 3.1(1)C4(3)—12.2(14)ZA2 | This command was introduced. |

Examples

The following example enables CSG database traps:

```
Router(config)# snmp-server enable traps csg database
```

table (module CSG VLAN)

To associate a table name with a VLAN, use the **table** command in module CSG VLAN configuration mode. To remove the table association for the VLAN, use the **no** form of this command.

table *table-name*

no table *table-name*

| | | |
|---------------------------|-------------------|--|
| Syntax Description | <i>table-name</i> | 1-to-15 character string identifying the table. The CSG stores the table name as all-uppercase ASCII characters. |
|---------------------------|-------------------|--|

| | |
|-----------------|--------------------------------|
| Defaults | No default behavior or values. |
|-----------------|--------------------------------|

| | |
|----------------------|-------------------------------|
| Command Modes | Module CSG VLAN configuration |
|----------------------|-------------------------------|

| | | |
|------------------------|-------------------------|------------------------------|
| Command History | Release | Modification |
| | 3.1(1)C6(2)—12.2(18)SXE | This command was introduced. |

| | |
|-------------------------|---|
| Usage Guidelines | <p>The User Table identifies all users known to the CSG. The table is populated based on the contents of RADIUS Accounting Start messages, or from the user database, if either feature is enabled in your configuration. When a table name is associated with a VLAN, User Table entries for user traffic arriving on the VLAN are classified using the configured table name as part of the User Table entry search.</p> <p>You can associate only one table name with each VLAN.</p> |
|-------------------------|---|

| | |
|-----------------|---|
| Examples | The following example associates the ACME_VLAN table with VLAN 254 on module 5: |
|-----------------|---|

```
module csg 5
  vlan 254 client
    table ACME_VLAN
```

| | | |
|-------------------------|--|--|
| Related Commands | Command | Description |
| | radius endpoint | Identifies the CSG as an endpoint for RADIUS Accounting messages. |
| | radius proxy | Specifies that the CSG should be a proxy for RADIUS messages. |
| | show module csg variable | Displays the list of VLANs. |
| | vlan (module CSG) | Creates a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assigns a VLAN ID and optional name, and enters module CSG VLAN configuration mode. |

url-map

To reference a URL map that is part of a CSG billing policy, use the **url-map** command in CSG policy configuration mode. To delete the reference, use the **no** form of this command.

url-map *url-map-name*

no url-map *url-map-name*

| Syntax Description | <i>url-map-name</i> | Name of a URL map, as configured with the ip csg map command. |
|--------------------|---------------------|--|
|--------------------|---------------------|--|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | CSG policy configuration |
|---------------|--------------------------|
|---------------|--------------------------|

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| Usage Guidelines | The conditions specified in the referenced URL map must be true in order for the flows to be processed by the CSG accounting services. If the conditions are not true, the flows are not processed. |
|------------------|---|
|------------------|---|

For WAP 1.x, URL maps take precedence over access lists.

For WAP1.x and RTSP, the policy used to determine the next hop address is chosen based solely on access control lists (ACLs), not URL maps. As a result, you can choose the next hop from one policy for routing and from a different policy for billing.

| Examples | The following example shows how to reference a URL map: |
|----------|---|
|----------|---|

```
ip csg policy MOVIES_COMEDY
 accounting type http customer-string MOVIES_COMEDY
 client-group 44
 client-ip http-header x-forwarded-for
 header-map MOVIES
 url-map MOVIES
```

| Related Commands | Command | Description |
|------------------|-------------------------------|--|
| | header-map | References a header map that is part of a CSG billing policy. |
| | ip csg map | Defines the CSG billing content filters (URL and header maps), and enters CSG map configuration mode. |
| | ip csg policy | Defines a policy for qualifying flows for the CSG accounting services, and enters CSG policy configuration mode. |

| Command | Description |
|------------------------------------|---|
| match (header map) | Specifies a header match pattern for a CSG billing map. |
| match (URL map) | Specifies a URL match pattern for a CSG billing map. |

user-group

To associate a user group with a specific accounting service, use the **user-group** command in CSG accounting configuration mode. To disassociate a user group in order to delete it, use the **no** form of this command.

user-group *group-name*

no user-group *group-name*

Syntax Description

| | |
|-------------------|--|
| <i>group-name</i> | Name of a configured user group to be associated with this accounting service. Only one user group can be associated with each accounting service. |
|-------------------|--|

Defaults

No default behavior or values.

Command Modes

CSG accounting configuration

Command History

| Release | Modification |
|------------------------|------------------------------|
| 2.2(1)C(1)—12.1(11b)E3 | This command was introduced. |

Examples

The following example associates user-group G1 with the CSG accounting group A1:

```
ip csg accounting A1
  user-group G1
  agent activate 2
  agent local-port 3775
  agent 10.1.2.4 11112 10
  agent 10.1.2.5 11113 20
  keepalive 3
  records batch
  records http-statistics
  records intermediate bytes 100000 time 3600
  records max 250
  inservice
```

Related Commands

| Command | Description |
|-----------------------------------|---|
| ip csg accounting | Defines content-based accounting as a service. |
| ip csg user-group | Creates a group of end users for which you want to generate accounting records, and enters CSG user group configuration mode. |

user-profile server

To specify which server is used to obtain the user profile (or billing plan), use the **user-profile server** command in CSG user group configuration mode. To restore the default setting, use the **no** form of this command

```
user-profile server {quota | radius {remove | pass}}
```

```
no user-profile server {quota | radius {remove | pass}}
```

Syntax Description

| | |
|---------------|---|
| quota | Obtains the billing plan from the quota server. |
| radius | Obtains the billing plan from the RADIUS message. |
| remove | Removes the VSA containing the billing plan from the Access-Accept message. |
| pass | Does not remove the VSA containing the billing plan from the Access-Accept message. |

Defaults

If not configured, the default behavior is to obtain the billing plan from the quota server.

Command Modes

CSG user group configuration

Command History

| Release | Modification |
|--------------------------|------------------------------|
| 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |

Usage Guidelines

If not specified, the quota server is used to obtain the billing plan. If **radius** is specified, the RADIUS Access-Accept and RADIUS Accounting-Request messages are parsed for the Cisco VSA, sub-attribute 1, which contains the billing plan name. The VSA is optionally removed from the RADIUS Access-Accept message before the message is sent to the RADIUS client or server.

Keep the following considerations in mind:

- The VSA is removed from the RADIUS Access-Accept message only if **remove** is specified. You should use **remove** only if the RADIUS client cannot tolerate the Cisco VSA in the message.
- We recommend that you use **pass** to reduce processing time on the CSG.
- The user ID must be in the message containing the billing plan.

Examples

The following example illustrates the **user-profile server** command:

```
ip csg user-group G1
  radius userid User-Name
  user-profile server radius pass
```

| Related Commands | Command | Description |
|------------------|-------------------------------|--|
| | radius userid | Specifies the RADIUS attribute used to extract the user identifier from a RADIUS record. |

variable (module csg)

To specify the environmental variables in the configuration, use the **variable** command in module CSG configuration mode. To remove environmental variables from the configuration, use the **no** form of this command.

variable *name value*

no variable *name value*

| Syntax Description | name | Specifies a name string for the variable. See Table B-8 for a list of valid variable names. |
|--------------------|-------|---|
| | value | Specifies a value string for the variable. |

Defaults No default behavior or values.

Command Modes Module CSG configuration

| Command History | Release | Modification |
|-----------------|--------------------------|--|
| | 3.1(1)C4(1)—12.2(14)ZA1 | This command was introduced. |
| | 3.1(3)C5(1)—12.2(17d)SXB | Added support for the MAX_PARSE_LEN_MULTIPLIER variable. |
| | 3.1(3)C5(3)—12.2(18)SXD | Added support for several new variables. |
| | 3.1(3)C5(5)—12.2(18)SXD | Added support for several new variables. |
| | 3.1(3)C6(2)—12.2(18)SXD | Added support for the CSG_FT_CONTENT variable. |

Usage Guidelines [Table B-8](#) lists the environmental values used by the CSG.

Table B-8 Environmental Variables

| Name | Default | Valid Values | Description |
|-------------------------|---------|--------------------------|---|
| ARP_INTERVAL | 300 | Integer (15 to 31536000) | Time (in seconds) between ARPs for configured hosts. |
| ARP_LEARNED_INTERVAL | 14400 | Integer (60 to 31536000) | Time (in seconds) between ARPs for learned hosts. |
| ARP_GRATUITOUS_INTERVAL | 15 | Integer (10 to 31536000) | Time (in seconds) between gratuitous ARPs. |
| ARP_RATE | 10 | Integer (1 to 60) | Seconds between ARP retries. |
| ARP_RETRIES | 3 | Integer (2 to 15) | Count of ARP attempts before flagging a host as down. |

Table B-8 Environmental Variables (continued)

| Name | Default | Valid Values | Description |
|--------------------------------|----------|----------------------------|--|
| ARP_LEARN_MODE | 1 | Integer (0 or 1) | Indicates whether the CSG learns the MAC address on responses only (0) or on all traffic (1). |
| CSG_BASIS_BYTE_LOW_QUOTA_MAX | 10000000 | Integer (0 to 10000000) | Maximum value for the available quota threshold that triggers reauthorization for basis byte. |
| CSG_BASIS_BYTE_RESERVED_MAX | 10000000 | Integer (2048 to 10000000) | Maximum unaccounted quota (basis byte) reserved per IP session. |
| CSG_BASIS_FIXED_LOW_QUOTA_MAX | 10000000 | Integer (0 to 10000000) | Maximum value for the available quota threshold that triggers reauthorization for basis fixed. |
| CSG_BASIS_SEC_LOW_QUOTA | 10 | Integer (5 to 300) | Value for the available quota threshold that triggers reauthorization for basis second. |
| CSG_BILL_Q_HI_THRESHOLD | 5000 | Integer (5000 to 65535) | Threshold for throttling the CSG billing queue. |
| CSG_BILL_Q_LO_THRESHOLD | 3000 | Integer (3000 to 65535) | Threshold for resetting the throttling of the CSG billing queue. |
| CSG_EXTRA_DEBUG | - | String (0 to 255 chars) | String to define extra debugs. |
| CSG_FAST_FIN_TIMEOUT | 10 | Integer (10 to 65535) | Timeout (in seconds) for connection reset after FIN is detected. |
| CSG_FRAG_BUFFER_MAX | 100 | Integer (0 to 65535) | Maximum number of buffered trailers. |
| CSG_FRAG_LIFETIME | 10 | Integer (1 to 255) | Fragment database entry lifetime (seconds). |
| CSG_FRAG_POOL_MAX | 16384 | Integer (1 to 50000) | Maximum fragment database size. |
| CSG_FREE_CONTENT_ACCESS_PERMIT | 0 | Integer (0 or 1) | Permit forwarding of free content in a prepaid service when access to the service is denied. |
| CSG_FT_CONTENT | 0 | Integer (0 or 1) | Replicate session only if configured in content (1) or always (0). |
| CSG_FTP_HA_WAIT_DELAY | 10 | Integer (1 to 60) | Delay, in sixtieths of a second, after sending FTP content information to the backup. |
| CSG_FTP_PWD | 0 | Integer (0 or 1) | Disables injection of the PWD command into the FTP control connection. |
| CSG_GTP_MAX_RETRIES | 3 | Integer (1 to 4294967295) | Maximum number of GTP repolls before link failure. |

Table B-8 Environmental Variables (continued)

| Name | Default | Valid Values | Description |
|-------------------------------|---------|---------------------------|--|
| CSG_GTP_RETRY_TIME | 4 | Integer (2 to 4294967295) | GTP retransmit delay time (in seconds). |
| CSG_GTP_TX_WINDOW | 128 | Integer (1 to 4294967295) | GTP transmit window size. |
| CSG_HTTP_FIXED_INTERM_CDRS | 0 | Integer (0 or 1) | Control the generation of fixed intermediate CDRs for HTTP when records format fixed is configured. |
| CSG_HTTP_PERSISTENCE_DISABLE | 0 | Integer (0 or 1) | Disable HTTP persistent connections. Note This variable is no longer necessary in the CSG. It is made obsolete by the CSG's full pipelining support. |
| CSG_HTTP_1_0_OPERATION | 0 | Integer (0 or 1) | Overwrite HTTP version to 1.0. Note This variable is no longer necessary in the CSG. It is made obsolete by the CSG's full pipelining support. |
| CSG_IXP_FPGA_TRAP_ENABLED | 0 | Integer (0 or 1) | Enable IXP FPGA hang detection. |
| CSG_IXP_WATCHDOG_ENABLED | 1 | Integer (0 or 1) | Enable IXP Watchdog processing. |
| CSG_IXP_WATCHDOG_TIMEOUT | 60 | Integer (30 to 3600) | IXP Watchdog timeout (in seconds). |
| CSG_MAX_BPLANS | 128 | Integer (128; read-only) | Maximum number of CSG billing plans. |
| CSG_PERSISTENT_PARSE | 0 | Integer (0 or 1) | Disables parsing for multiple requests in persistent HTTP connections. Note This variable is no longer necessary in the CSG. It is made obsolete by the CSG's full pipelining support. |
| CSG_QUOTA_BLOCK | 1 | Integer (0 or 1) | Drop (1) or forward (0) packets during quota reconciliation. |
| CSG_RADIUS_PROXY_CLIENT_REUSE | 7200 | Integer (0 to 1000000) | Reuse RADIUS proxy blocks if idle for the specified number of seconds. Specify 0 if you do not want to reuse blocks. |
| CSG_REDIRECTS_INTERVAL | 8 | Integer (0 to 3600) | Time interval, in seconds, for redirecting an out-of-quota subscriber. The start of the interval is the time of the first redirect after a quota grant of zero. |

Table B-8 Environmental Variables (continued)

| Name | Default | Valid Values | Description |
|--------------------------------|---------|----------------------------|---|
| CSG_REDIRECTS_MAX | 15 | Integer (0 to 255) | Maximum number of times a redirect is to be performed for an out-of-quota subscriber during a redirect interval. |
| CSG_RPR_PLUS_DELAY | 90 | Integer (1 to 1200) | Delay (in seconds) after an RPR+ switchover before the CSG detects timeouts. |
| CSG_SVC_CDR_MODE_QGRANT | 65535 | Integer (5000 to 16777216) | Amount of quota reservation for a session matching a service with service-level CDR granularity. |
| CSG_WAP_APPEND_AOC_URL | 0 | Integer (0 or 1) | Append the original URL to the redirect URL sent by the quota server on a Content Authorization REDIRECT_URL response. |
| CSG_WAP_REDIRECTS_MAX | 15 | Integer (1 to 255) | Maximum number of times a redirect attempt is to be performed for a single WAP session. Note This variable is no longer necessary in the CSG. It is replaced by CSG_REDIRECTS_MAX. |
| CSG_WAP_REPORT_ACTUAL_PDU_TYPE | 0 | Integer (0 or 1) | Report the real PDU types parsed in WAP packets. |
| CSG_ZERO_QUOTA_TIMEOUT_INIT | 4 | Integer (1 to 3600) | Initial timeout for reauthorization after quota grant of zero. The value specified for CSG_ZERO_QUOTA_TIMEOUT_INIT must be less than or equal to the value specified for CSG_REDIRECTS_INTERVAL. |
| CSG_ZERO_QUOTA_TIMEOUT_MAX | 60 | Integer (1 to 3600) | Maximum timeout for reauthorization after quota grant of zero. |
| DEBUG_BILL_URL | 1 | Integer (0 or 1) | Enable (1) or disable (0) debugging messages for bill URL messages. |
| DEST_UNREACHABLE_MASK | 0xffff | Integer (0 to 65535) | Bitmask defining which ICMP destination unreachable codes are to be forwarded. |
| HTTP_CASE_SENSITIVE_MATCHING | 1 | Integer (0 or 1) | Indicates whether the URL (cookie, header) matching and sticky are case-sensitive. |

Table B-8 Environmental Variables (continued)

| Name | Default | Valid Values | Description |
|--------------------------|---------|-------------------|---|
| MAX_PARSE_LEN_MULTIPLIER | 1 | Integer (1 to 16) | Multiply the configured MAX_PARSE_LEN by this integer. If you specify too large an integer, you might limit the number of requests that can be processed at one time. |
| ROUTE_UNKNOWN_FLOW_PKTS | 0 | Integer (0 or 1) | Indicates whether to route non-SYN packets that do not match any existing flows. |

Examples

This example shows how to enable the environmental variables configuration:

```
Router (config-module-csg)# variable CSG_BASIS_FIXED_LOW_QUOTA_MAX 1000000
```

Related Commands

| Command | Description |
|--|--|
| module csg | Enters module CSG configuration mode for a specified slot. |
| show module csg variable | Displays the environmental variables in the configuration. |

verify

To enable service verification, use the **verify** command in CSG service configuration mode. To disable this feature, use the **no** form of this command.

verify

no verify

Syntax Description There are no arguments or keywords.

Defaults No default behavior or values.

Command Modes CSG service configuration

| Command History | Release | Modification |
|-----------------|-------------------------|------------------------------|
| | 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. |

Usage Guidelines If this command is configured, the CSG uses the ServiceVerificationRequest to perform the following actions:

- Alert the quota server of a new transaction.
- Allow the quota server to direct the CSG to perform one of the following mutually exclusive actions:
 - DROP**—Drop all packets for this flow.
 - FORWARD**—Forward the flow without altering the destination.
 - REDIRECT-NAT**—Forward all packets for this flow to the IP address provided in the ContentAuthResp. The CSG NATs the packet to the IP address and port provided in the ContentAuthResp.
 - REDIRECT-URL**—Redirect the client request to the URL provided in the ContentAuthResp. The CSG sends a Layer 7 redirect (for example, an HTTP 302 response) to the client that contains the redirect URL.

Examples The following example specifies a token for service verification URL-rewriting:

```
ip csg service SERVICE_NAME
  verify
```

| Related Commands | Command | Description |
|------------------|-------------------------------------|---|
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |
| | verify confirmation | Configures a token for use in service verification URL-rewriting. |

verify confirmation

To configure a token for use in service verification URL-rewriting, use the **verify confirmation** command in CSG user group configuration mode. To remove the token, use the **no** form of this command.

verify confirmation *token*

no verify confirmation *token*

| Syntax Description | <i>token</i> | A string of up to 15 alpha numeric characters. | | | | |
|---------------------------|---|--|--------------|-------------------------|-------------------------------|--|
| Defaults | No default behavior or values. | | | | | |
| Command Modes | CSG user group configuration | | | | | |
| Command History | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>3.1(3)C5(5)—12.2(18)SXD</td> <td>This command was introduced.</td> </tr> </tbody> </table> | Release | Modification | 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. | |
| Release | Modification | | | | | |
| 3.1(3)C5(5)—12.2(18)SXD | This command was introduced. | | | | | |
| Usage Guidelines | <p>URL-rewriting allows a top-off server to append parameters to a URL in order to convey state information to the quota server during a content authorization request. Whenever a service verification response contains the forward action code, and the URL contains the verify confirmation token, the token and all trailing characters are removed from the URL before the request is forwarded to the server.</p> <p>The token is used for both HTTP and WAP service verification URL-rewriting.</p> | | | | | |
| Examples | <p>The following example specifies a token for service verification URL-rewriting:</p> <pre>ip csg user-group A1 verify confirmation ?CSG_VERIFY_OK</pre> | | | | | |
| Related Commands | <table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>verify</td> <td>Enables service verification.</td> </tr> </tbody> </table> | Command | Description | verify | Enables service verification. | |
| Command | Description | | | | | |
| verify | Enables service verification. | | | | | |

vlan (CSG content)

To restrict the CSG billing content to a single source VLAN, use the **vlan** command in CSG content configuration mode. To remove the restriction, use the **no** form of this command.

vlan *vlan-name*

no vlan *vlan-name*

| Syntax Description | <i>vlan-name</i> | Name of the source VLAN for the CSG billing content. |
|--------------------|------------------|--|
|--------------------|------------------|--|

| Defaults | No default behavior or values. |
|----------|--------------------------------|
|----------|--------------------------------|

| Command Modes | CSG content configuration |
|---------------|---------------------------|
|---------------|---------------------------|

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

| Usage Guidelines | The VLAN number is dependent on the CSG card that receives the content definition. When the content is downloaded to a CSG card, the <i>vlan-name</i> argument is mapped to a specific VLAN number. |
|------------------|---|
|------------------|---|

| Examples | The following example shows how to restrict the CSG content billing to a single-source VLAN named MOVIES_COMEDY: |
|----------|--|
|----------|--|

```
ip csg content MOVIES_COMEDY
 client 10.4.4.0 255.255.255.0
 idle 120
 ip 172.18.45.0/24 tcp 8080
 policy POLICY1
 replicate connection tcp
 vlan MOVIES_COMEDY
 inservice
```

| Related Commands | Command | Description |
|------------------|--------------------------------|---|
| | ip csg content | Defines content for the CSG accounting services, and enters CSG content configuration mode. |

vlan (module CSG)

To create a client or server VLAN that defines the Layer 2 paths for the CSG accounting service flows, assign a VLAN ID and optional name, and enter module CSG VLAN configuration mode, use the **vlan** command in module CSG configuration mode. To remove the VLAN from the configuration, use the **no** form of this command.

```
vlan vlan-id { client | server } [vlan-name]
```

```
no vlan vlan-id { client | server } [vlan-name]
```

| Syntax Description | | |
|--------------------|--|--|
| <i>vlan-id</i> | Number of the VLAN. The valid range is 2 to 4095. There is no default value. This VLAN defines the Layer 2 paths for the CSG accounting service flows as well as all filters defined by the service. | Note You cannot use VLAN 1 as a client-side or server-side VLAN for the CSG. |
| client | Keyword to specify a client-side VLAN. | |
| server | Keyword to specify a server-side VLAN. | |
| <i>vlan-name</i> | (Optional) Unique symbolic name of the VLAN. The name can be 1 to 15 characters, uppercase or lowercase letters (the CSG changes all letters to uppercase), numbers, and any special characters. | The <i>vlan-name</i> argument is required if the content specification includes the vlan command in CSG content configuration mode. |

Defaults No default behavior or values.

Command Modes Module CSG configuration

| Command History | Release | Modification |
|-----------------|------------------------|------------------------------|
| | 3.1(1)C3(1)—12.2(14)ZA | This command was introduced. |

Usage Guidelines A VLAN database entry should exist for the given VLAN ID.

When a content configuration is downloaded that includes a **vlan** command that specifies the same *vlan-name* argument, the CSG translates the *vlan-name* argument to the correct *vlan-id* argument when the content is installed on the CSG card.

If the downloaded content configuration does not include a **vlan** command, or if the **vlan** command does not specify a valid *vlan-name* argument, then the content configuration cannot be brought inservice because no source VLAN is defined.

The characteristics of each VLAN are defined by the following commands:

- [alias \(module CSG VLAN\)](#)
- [gateway \(module CSG VLAN\)](#)
- [ip address \(module CSG VLAN\)](#)
- [route \(module CSG VLAN\)](#)
- [table \(module CSG VLAN\)](#)

Examples

The following example shows how to create client-side VLANs with IDs 301, 320, and 400 for the CSG in slot 4:

```
module csg 4
  accounting A1
  ft group 123 vlan 5
  ruleset R1
  vlan 301 client
    name TO-GGSN-MS-APN
    gateway 31.0.0.10
    ip address 31.0.0.21 255.255.255.0
    route 11.0.0.0 255.255.0.0 gateway 31.0.0.1
    route 11.1.0.0 255.255.0.0 gateway 31.0.0.2
    route 11.2.0.0 255.255.0.0 gateway 31.0.0.3
    route 11.3.0.0 255.255.0.0 gateway 31.0.0.4
    alias 31.0.0.51 255.255.255.0
  vlan 320 client
  vlan 400 server
```

Related Commands

| Command | Description |
|--|---|
| alias (module CSG VLAN) | Assigns multiple IP addresses to the CSG. |
| gateway (module CSG VLAN) | Configures a gateway IP address. |
| ip address (module CSG VLAN) | Assigns an IP address to the CSG VLAN. |
| module csg | Enters module CSG configuration mode for a specified slot. |
| route (module CSG VLAN) | Configures networks that are not Layer 2 adjacent to the CSG. |
| show module csg vlan | Displays the list of VLANs. |

zero-quota abort type

To force WAP transactions to be aborted midstream when the user's quota has been depleted, use the **zero-quota abort type** command in CSG service configuration mode. To return to the default behavior, use the **no** form of the command.

zero-quota abort type {wap}

no zero-quota abort type {wap}

| | | |
|---------------------------|---|--|
| Syntax Description | wap | Keyword to specify that WAP transactions be aborted midstream when user's quota is depleted. |
| Defaults | No default behavior or values. | |
| Command Modes | CSG service configuration | |
| Command History | Release | Modification |
| | 3.1(3)C5(1)—12.2(17d)SXB | This command was introduced. |
| Usage Guidelines | This command is configured on a per-service basis. This command configures the WAP cutoff feature. | |
| Examples | The following example shows how to enable the zero-quota abort type command: | |
| | <pre>ip csg service SERVIN_WAP zero-quota abort type wap content WAP_WTP_CONTENT policy WAP_WTP</pre> | |
| Related Commands | Command | Description |
| | ip csg service | Defines a content billing service, and enters CSG service configuration mode. |

■ zero-quota abort type