



# Configuring Virtual Servers, Maps, and Policies

This chapter describes how to configure content switching and contains these sections:

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## Configuring Virtual Servers

This section describes how to configure virtual servers and contains these sections:

- [Configuring TCP Parameters, page 6-4](#)
- [Configuring Partial Serverfarm Failover, page 6-5](#)
- [Configuring Virtual Server Dependency, page 6-6](#)
- [Configuring Redirect Virtual Servers, page 6-7](#)



### Note

When a virtual server is configured with an IP address, it starts replying to ARP requests for that specific IP, even if it is still out of service. This feature is important when migrating operational virtual servers from existing devices over to the CSM-S. Make sure that a virtual server on the CSM-S is never configured with the same IP of another device in the same network.

Virtual servers represent groups of real servers and are associated with real server farms through policies. Configuring virtual servers requires that you set the attributes of the virtual server by specifying the default server farm (default policy) and that you associate other server farms through a list of policies. The default server farm (default policy) is used if a request does not match any SLB policy or if there are no policies associated with the virtual server.

Before you can associate a server farm with the virtual server, you must configure the server farm. For more information, see the [“Configuring Server Farms” section on page 5-1](#). Policies are processed in the order in which they are entered in the virtual server configuration. For more information, see the [“Configuring Policies” section on page 6-10](#).

You can configure each virtual server with a pending connection timeout to terminate connections quickly if the switch becomes flooded with traffic. This connection applies to a transaction between the client and server that has not completed the request and reply process.

In a service provider environment in which different customers are assigned different virtual servers, you may need to balance the connections to prevent an individual server from absorbing most or even all of the connection resources on the CSM-S. You can limit the number of connections going through the CSM-S to a particular virtual server by using the VIP connection watermarks feature. With this feature, you may set limits on each virtual server, allowing a fair distribution of connection resources among all virtual servers.

**Note**

You can configure a single virtual server to operate at either Level 4 or Level 7. To configure a virtual server to operate at Level 4, specify the server farm (default policy) as part of the virtual server configuration. (See Step 3 in the following task table.) To configure a virtual server to operate at Level 7, add SLB policies in the configuration of the virtual server. (See Step 7 in the following task table.)

The CSM-S can load balance traffic from any IP protocol. When you configure a virtual server in virtual server submode, you must define the IP protocol that the virtual server will accept. You cannot assign multiple specific TCP or UDP ports to one virtual server, but you can assign all ports using the **any** keyword. If assigning all ports is not acceptable in your application, you must define a virtual server for each port that you want to assign. You can also implement port translation by configuring NAT on the server farm and specifying a translation port in the real server configuration.

**Note**

Although all IP protocols have a protocol number, the CSM-S allows you to specify TCP or UDP by name instead of requiring you to enter their numbers.

Configure the virtual server in the virtual server configuration submode.

To configure virtual servers, perform this task:

	Command	Purpose
Step 1	Router(config-module-csm)# <b>owner</b> <i>owner-name</i> <b>address</b> <i>street-address-information</i> <b>billing-info</b> <i>billing-address-information</i> <b>email-address</b> <i>email-information</i> <b>maxconns</b> 1:MAXULONG	Restricts access to virtual servers to a specific owner object.
Step 2	Router(config-module-csm)# <b>vserver</b> <i>virtserver-name</i>	Identifies the virtual server and enters the virtual server configuration mode <sup>1, 2</sup> .
Step 3	Router(config-slb-vserver)# <b>vs-owner</b> <i>owner-name</i> <b>maxconns</b> 1:MAXULONG	Sets the owner object name for this virtual server.
Step 4	Router(config-slb-vserver)# <b>virtual</b> <i>ip-address</i> [ <i>ip-mask</i> ] <i>protocol</i> <i>port-number</i> [ <b>service ftp</b> ]	Sets the IP address for the virtual server optional port number or name and the connection coupling and type <sup>2</sup> . The <i>protocol</i> value is <b>tcp</b> , <b>udp</b> , <b>Any</b> (no port number is required), or a <i>number</i> value (no port number is required).
Step 5	Router(config-slb-vserver)# <b>serverfarm</b> <i>serverfarm-name</i>	Associates the default server farm with the virtual server <sup>2, 3</sup> . Only one server farm is allowed. If the server farm is not specified, all the requests not matching any other policies will be discarded.
Step 6	Router(config-slb-vserver)# <b>sticky</b> <i>duration</i>	(Optional) Configures connections from the client to use the same real server <sup>2, 3</sup> . The default is sticky off.

	Command	Purpose
Step 7	Router(config-slb-vserver) # <b>sticky</b> <i>group-number reverse</i>	(Optional) Ensures that the CSM-S changes connections in the appropriate direction back to the same source.
Step 8	Router(config-slb-vserver) # <b>client</b> <i>ip-address network-mask [exclude]</i>	(Optional) Restricts which clients are allowed to use the virtual server <sup>2, 3</sup> .
Step 9	Router(config-slb-vserver) # <b>slb-policy</b> <i>policy-name</i>	(Optional) Associates one or more content switching policies with a virtual server <sup>2</sup> .
Step 10	Router(config-slb-vserver) # <b>inservice</b>	Enables the virtual server for use by the CSM <sup>2</sup> .
Step 11	Router# <b>show module csm slot vserver</b> <b>[details]</b>	Displays information for virtual servers that are defined for content switching.

1. Enter the **exit** command to leave a mode or submenu. Enter the **end** command to return to the menu's top level.
2. The **no** form of this command restores the defaults.
3. These parameters refer to the default policy.

This example shows how to configure a virtual server named barnett, associate it with the server farm named bosco, and configure a sticky connection with a duration of 50 minutes to sticky group 12:

```
Router(config)# mod csm 2
Router(config-module-csm) # sticky 1 cookie foo timeout 100
Router(config-module-csm) # exit
Router(config-module-csm) #
Router(config-module-csm) # serverfarm bosco
Router(config-slb-sfarm) # real 10.1.0.105
Router(config-slb-real) # inservice
Router(config-slb-real) # exit
Router(config-slb-sfarm) #
Router(config-slb-sfarm) # vserver barnett
Router(config-slb-vserver) # virtual 10.1.0.85 tcp 80
Router(config-slb-vserver) # serverfarm bosco
Router(config-slb-vserver) # sticky 50 group 12
Router(config-slb-vserver) # inservice
Router(config-slb-vserver) # exit
Router(config-module-csm) # end
```

This example shows how to configure a virtual server, named vs1, with two policies and a default server farm when client traffic matches a specific policy. The virtual server will be load balanced to the server farm attached to that policy. When client traffic fails to match any policy, the virtual server will be load balanced to the default server farm named bosco.

```
Router(config)# mod csm 2
Router(config-module-csm) # map map3 url
Router(config-slb-map-url) # match protocol http url *finance*
Router(config-slb-map-url) #
Router(config-slb-map-url) # map map4 url
Router(config-slb-map-url) # match protocol http url *mail*
Router(config-slb-map-url) #
Router(config-slb-map-url) # serverfarm bar1
Router(config-slb-sfarm) # real 10.1.0.105
Router(config-slb-real) # inservice
Router(config-slb-real) #
Router(config-slb-real) # serverfarm bar2
Router(config-slb-sfarm) # real 10.1.0.106
Router(config-slb-real) # inservice
Router(config-slb-real) #
Router(config-slb-real) # serverfarm bosco
```

```

Router(config-slb-sfarm) # real 10.1.0.107
Router(config-slb-real) # inservice
Router(config-slb-real) #
Router(config-slb-real) # policy pc1
Router(config-slb-policy) # serverfarm bar1
Router(config-slb-policy) # url-map map3
Router(config-slb-policy) # exit
Router(config-module-csm) #
Router(config-module-csm) # policy pc2
Router(config-slb-policy) # serverfarm bar2
Router(config-slb-policy) # url-map map4
Router(config-slb-policy) # exit
Router(config-module-csm) #
Router(config-module-csm) # vserver bar1
Router(config-slb-vserver) # virtual 10.1.0.86 tcp 80
Router(config-slb-vserver) # slb-policy pc1
Router(config-slb-vserver) # slb-policy pc2
Router(config-slb-vserver) # serverfarm bosco
Router(config-slb-vserver) # inservice
Router(config-slb-vserver) #

```

This example shows how to configure port translation between the virtual server listening at port 9000 and two real servers, one at port 9001 and the other at port 9002:

```

Router(config) # mod csm 2
Router(config-module-csm) # serverfarm bosco
Router(config-slb-sfarm) # nat server
Router(config-slb-sfarm) # no nat client
Router(config-slb-sfarm) # real 10.6.0.111 9001
Router(config-slb-real) # inservice
Router(config-slb-real) # exit
Router(config-slb-sfarm) # real 10.6.0.112 9002
Router(config-slb-real) # inservice
Router(config-slb-real) # exit
Router(config-slb-sfarm) # exit

Router(config-module-csm) # vserver barnett
Router(config-slb-vserver) # virtual 192.168.11.100 9000
Router(config-slb-vserver) # serverfarm bosco
Router(config-slb-vserver) # persistent rebalance
Router(config-slb-vserver) # inservice

```

## Configuring TCP Parameters

Transmission Control Protocol (TCP) is a connection-oriented protocol that uses known protocol messages for activating and deactivating TCP sessions. In server load balancing, when adding or removing a connection from the connection database, the Finite State Machine correlates TCP signals such as SYN, SYN/ACK, FIN, and RST. When adding connections, these signals are used for detecting server failure and recovery and for determining the number of connections per server.

The CSM-S also supports User Datagram Protocol (UDP). Because UDP is not connection-oriented, protocol messages cannot be generically sniffed (without knowing details of the upper-layer protocol) to detect the beginning or end of a UDP message exchange. Detection of UDP connection termination is based on a configurable idle timer. Protocols requiring multiple simultaneous connections to the same real server are supported (such as FTP). Internet Control Management Protocol (ICMP) messages destined for the virtual IP address are also handled (such as ping).

To configure TCP parameters, perform this task:

	Command	Purpose
Step 1	Router(config-module-csm)# <b>vserver</b> <i>virtserver-name</i>	Identifies the virtual server and enters the virtual server configuration mode <sup>1, 2</sup> .
Step 2	Router(config-slb-vserver)# <b>idle</b> <i>duration</i>	Configures the amount of time (in seconds) that connection information is maintained in the absence of packet activity for a connection <sup>2</sup> . Valid values for <i>duration</i> are 0 (connections remain open indefinitely) through 65535 seconds; the default value is 3600.  <b>Note</b> If you specify <b>idle 0</b> , connections are created but are never automatically removed from the connection table, which can potentially consume all resources until you remove the connections. Use the <b>INFINITE_IDLE_TIME_MAXCONNS</b> environmental variable to specify the maximum number of connections.

1. Enter the **exit** command to leave a mode or submode. To return to the Router (config)> top level of the menu, enter the **end** command.
2. The **no** form of this command restores the defaults.

This example shows how to configure TCP parameters for virtual servers:

```
Router(config-module-csm)# vserver barnett
Router(config-slb-vserver)# idle 10
```

The CSM-S provides support for fragmented TCP packets. The TCP fragment feature only works with VIPs that have Level 4 policies defined and will not work for SYN packets or for Layer 7 policies. To support fragmented TCP packets, the CSM-S matches the TCP fragments to existing data flows or by matching the bridging VLAN ID. The CSM-S will not reassemble fragments for Layer 7 parsing. Because the CSM-S has a finite number of buffers and fragment ID buckets, packet resending is required when there are hash collisions.

When enabling TCP splicing, you must designate a virtual server as a Layer 7 device even when it does not have a Layer 7 policy. This option is only valid for the TCP protocol.

To configure TCP splicing, perform this task:

## Configuring Partial Serverfarm Failover

When you configure a backup server farm, you can define two threshold values that specify how many active real servers are required for a server farm to remain healthy and how many active real servers are required for the server farm to be reactivated.

If you do not specify these threshold values, a server farm will fail when all real servers in the server farm fail. In this case, the primary server farm becomes operational again when one real server in the server farm becomes healthy.

	Command	Purpose
Step 1	Router(config-module-csm)# <b>vserver</b> <i>virtserver-name</i>	Identifies the virtual server and enters the virtual server configuration mode.
Step 2	Router(config-slb-vserver)# <b>serverfarm</b> <i>primary_serverfarm</i> [ <b>backup</b> <i>backup_serverfarm</i> [ <b>threshold</b> <b>outservice</b> <i>real_value</i> <b>inservice</b> <i>real_value</i> ] [ <b>sticky</b> ]]	Associates the default server farm with the virtual server and defines the backup server farm.  The <b>outservice</b> value specifies the minimum number of active real servers required for the server farm to remain healthy. The <b>inservice</b> value specifies the number of active real servers required for the server farm to be reactivated.  The valid range for both values is 1 up to the maximum number of real servers supported; the <b>outservice</b> value must be lower than the <b>inservice</b> value.

The following example shows how to configure the backup server farm to become active when there are less than three healthy real servers in the server farm, and it shows how the primary server farm becomes active again when there are six healthy real servers in the server farm:

```
Router(config-slb-sfarm)# vserver barnett
Router(config-slb-vserver)# serverfarm bosco backup BACKUP threshold outservice 3
inservice 6
```

## Configuring Virtual Server Dependency

You can configure the CSM-S to track a virtual server. This feature provides the ability to automatically take the dependent virtual server out of service if the tracked virtual server is taken out of service or fails.

To configure virtual server dependency, perform this task:

	Command	Purpose
Step 1	Router(config-module-csm)# <b>vserver</b> <i>dependent_virtserver_name</i>	Identifies the dependant virtual server and enters the virtual server configuration mode.
Step 2	Router(config-slb-vserver)# <b>virtual</b> <i>ip-address</i> [ <i>ip-mask</i> ] <i>protocol</i> <i>port-number</i> [ <b>service</b> { <b>ftp</b>   <b>rtsp</b>   <b>termination</b> }]	Sets the IP address for the dependant virtual server optional port number or name and the connection coupling and type <sup>2</sup> . The <i>protocol</i> value is <b>tcp</b> , <b>udp</b> , <b>any</b> (no port number is required), or a <i>number</i> value (no port number is required).
Step 3	Router(config-slb-vserver)# <b>status-tracking</b> <i>tracked_virtserver_name</i>	Identifies the tracked virtual server. When this virtual server is taken out of service or fails, the dependent virtual server identified in Step 1 is automatically taken out of service.

This example shows how to configure virtual servers A and C to be automatically taken out of service when virtual server B is taken out of service or fails:

```
Router(config-slb-sfarm)# vserver A
Router(config-slb-vserver)# virtual 10.1.0.85 tcp 80
Router(config-slb-vserver)# status-tracking B
Router(config-slb-vserver)# exit
Router(config-slb-sfarm)# vserver C
Router(config-slb-vserver)# virtual 10.1.0.86 tcp 80
Router(config-slb-vserver)# status-tracking B
```

## Configuring Redirect Virtual Servers

	Command	Purpose
Step 1	Router(config-module-csm) # <b>vserver</b> <i>virtserver-name</i>	Identifies the virtual server and enters the virtual server configuration mode <sup>1, 2</sup> .
Step 2	Router(config-slb-vserver) # <b>vserver</b> <b>tcp-protect</b>	Designates the virtual server for TCP splicing <sup>2</sup> .
Step 3	Router(config-slb-vserver) # <b>virtual</b> <b>100.100.100.100 tcp any service</b> <b>tcp-termination</b>	Enables TCP splicing.

1. Enter the **exit** command to leave a mode or submode. To return to the Router (config)> top level of the menu, enter the **end** command.
2. The **no** form of this command restores the defaults.

The **redirect-vserver** command is a server farm submode command that allows you to configure virtual servers dedicated to real servers. This mapping provides connection persistence, which maintains connections from clients to real servers across TCP sessions.

To configure redirect virtual servers, perform this task:

	Command	Purpose
Step 1	Router(config-slb-sfarm) # <b>redirect-vserver</b> <i>name</i>	Configures virtual servers dedicated to real servers and enters the redirect server submode <sup>1, 2</sup> .
Step 2	Router(config-slb-redirect-v) # <b>webhost</b> <b>relocation</b> <i>relocation string</i>	Configures the destination URL host name when redirecting HTTP requests that arrive at this server farm. Only the beginning of the URL can be specified in the relocation string. The remaining portion is taken from the original HTTP request <sup>2</sup> .
Step 3	Router(config-redirect-v) # <b>webhost</b> <b>backup</b> <i>backup string</i>	Configures the relocation string that is sent in response to HTTP requests in the event that the redirect server is out of service. Only the beginning of the relocation string can be specified. The remaining portion is taken from the original HTTP request <sup>2</sup> .
Step 4	Router(config-redirect-v) # <b>virtual</b> <i>v_ipaddress</i> <b>tcp</b> <i>port</i>	Configures the redirect virtual server IP address and port <sup>2</sup> .
Step 5	Router(config-redirect-v) # <b>idle</b> <i>duration</i>	Sets the CSM-S connection idle timer for the redirect virtual server <sup>2</sup> .
Step 6	Router(config-redirect-v) # <b>client</b> <i>ip-address network-mask</i> [ <b>exclude</b> ]	Configures the combination of the IP address and network mask used to restrict those clients are allowed to access the redirect virtual server <sup>2</sup> .
Step 7	Router(config-redirect-v) # <b>inservice</b>	Enables the redirect virtual server and begins advertisements <sup>2</sup> .
Step 8	Router(config-redirect-v) # <b>ssl</b> <i>port</i>	(Optional) Enables SSL forwarding by the virtual server.
Step 9	Router# <b>show module csm vserver redirect</b> [ <b>detail</b> ]	Shows all redirect servers configured.

1. Enter the **exit** command to leave a mode or submode. Enter the **end** command to return to the menu's top level.

- The **no** form of this command restores the defaults.

This example shows how to configure redirect virtual servers to specify virtual servers to real servers in a server farm:

```
Router (config)# serverfarm FARM1
Router (config-slb-sfarm)# redirect-vserver REDIR_1
Router (config-slb-redirect-)# webhost relocation 127.1.2.30 301
Router (config-slb-redirect-)# virtual 172.1.2.30 tcp www
Router (config-slb-redirect-)# inservice
Router (config-slb-redirect-)# exit
Router (config-slb-sfarm)# redirect-vserver REDIR_2
Router (config-slb-redirect-)# webhost relocation 127.1.2.31 301
Router (config-slb-redirect-)# virtual 172.1.2.31 tcp www
Router (config-slb-redirect-)# inservice
Router (config-slb-redirect-)# exit
Router (config-slb-sfarm)# real 10.8.0.8
Router (config-slb-real)# redirect-vserver REDIR_1
Router (config-slb-real)# inservice
Router (config-slb-sfarm)# real 10.8.0.9
Router (config-slb-real)# redirect-vserver REDIR_2
Router (config-slb-real)# inservice
Router (config-slb-real)# end
Router# show module csm serverfarm detail
```

## Configuring Maps

You configure maps to define multiple URLs, cookies, HTTP headers, and return codes into groups that can be associated with a policy when you configure the policy. (See the “[Configuring Policies](#)” section on page 6-10.) Regular expressions for URLs (for example, *url1* and *url2*) are based on UNIX filename specifications. See [Table 6-1](#) for more information.

To add a URL map, perform this task:

	Command	Purpose
Step 1	Router (config-module-csm) # <b>map</b> <i>url-map-name</i> <b>url</b>	Creates a group to hold multiple URL match criteria <sup>1, 2</sup> .
Step 2	Router (config-slb-map-url) # <b>match protocol http</b> <b>url</b> <i>url-path</i>	Specifies a string expression to match against the requested URL <sup>2</sup> .

- Enter the **exit** command to leave a mode or submode. Enter the **end** command to return to the menu’s top level.
- The **no** form of this command restores the defaults.

**Table 6-1** Special Characters for Matching String Expressions

Convention	Description
*	Zero or more characters.
?	Exactly one character.
	<b>Note</b> You must precede the question mark with a <b>Ctrl-V</b> command to prevent the CLI Parser from interpreting it as a help request

**Table 6-1 Special Characters for Matching String Expressions (continued)**

Convention	Description
\	Escaped character.
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.
.\a	Alert (ASCII 7).
.\b	Backspace (ASCII 8).
.\f	Form-feed (ASCII 12).
.\n	New line (ascii 10).
.\r	Carriage return (ASCII 13).
.\t	Tab (ASCII 9).
.\v	Vertical tab (ASCII 11).
.\0	Null (ASCII 0).
.\\	Backslash.
.\x##	Any ASCII character as specified in two-digit hex notation.

To add a cookie map, perform this task:

	Command	Purpose
<b>Step 1</b>	Router(config)# <b>map</b> <i>cookie-map-name</i> <b>cookie</b>	Configures multiple cookies into a cookie map <sup>1</sup> .
<b>Step 2</b>	Router(config-slb-map-cookie)# <b>match</b> <b>protocol http cookie</b> <i>cookie-name</i> <b>cookie-value</b> <i>cookie-value-expression</i>	Configures multiple cookies <sup>1</sup> .

1. The **no** form of this command restores the defaults.

This example shows how to configure maps and associate them with a policy:

```
Router(config-module-csm)# serverfarm pl_url_url_1
Router(config-slb-sfarm)# real 10.8.0.26
Router(config-slb-real)# inservice
Router(config-slb-real)# exit
Router(config-slb-sfarm)# exit
Router(config-slb-policy)# serverfarm pl_url_url_1
Router(config-slb-policy)# url-map url_1
Router(config-slb-policy)# exit
Router(config-module-csm)# serverfarm pl_url_url_2
Router(config-slb-sfarm)# real 10.8.0.27
Router(config-slb-real)# inservice
Router(config-slb-real)# exit
Router(config-slb-sfarm)# exit
Router(config-module-csm)# map url_1 url
Router(config-slb-map-url)# match protocol http url /url1
Router(config-slb-map-url)# exit
Router(config-module-csm)# map url_2 url
Router(config-slb-map-url)# match protocol http url /url/url/url
Router(config-slb-map-url)# match protocol http url /reg/*long.*
Router(config-slb-map-url)# exit
```

```

Router(config-module-csm)# policy policy_url_1
Router(config-module-csm)# policy policy_url_2
Router(config-slb-policy)# serverfarm pl_url_url_2
Router(config-slb-policy)# url-map url_2
Router(config-slb-policy)# exit
Router(config-module-csm)# vserver vs_url_url
Router(config-slb-vserver)# virtual 10.8.0.145 tcp 80
Router(config-slb-vserver)# slb-policy policy_url_1
Router(config-slb-vserver)# slb-policy policy_url_2
Router(config-slb-vserver)# inservice
Router(config-slb-vserver)# exit

```

Using the **map** command, you create a map group with the type HTTP header. When you enter the **map** command, you are placed in a submode where you can specify the header fields and values for the CSM-S to search for in the request.

To create a map for the HTTP header, perform this task:

Command	Purpose
Router(config-module-csm)# <b>map</b> name <b>header</b>	Creates and names an HTTP header map group.

For more information about header maps, see the “[Configuring Generic Header Parsing](#)” section on page 6-12.

To create a map for return code checking, perform this task:

Command	Purpose
Router(config-module-csm)# <b>map</b> name <b>retcode</b>	Creates and names a return code map group.

To configure HTTP return error code checking, perform this task:

Command	Purpose
Router(config-slb-sfarm)# <b>retcode-map</b> name_of_map	Configures HTTP return error code checking.

For more information about return code maps, see the “[Understanding and Configuring HTTP Return Code Checking](#)” section on page 11-9.

## Configuring Policies

Policies are access rules that traffic must match when balancing to a server farm. Policies allow the CSM-S to balance Layer 7 traffic. Multiple policies can be assigned to one virtual server, creating multiple access rules for that virtual server. When configuring policies, you first configure the access rules (maps, client-groups, and sticky groups) and then you combine these access rules under a particular policy.

**Note**

You must associate a server farm with a policy. A policy that does not have an associated server farm cannot forward traffic. The server farm associated with a policy receives all the requests that match that policy.

When the CSM-S is able to match policies, it selects the policy that appears first in the policy list. Policies are located in the policy list in the sequence in which they were bound to the virtual server.

A policy can be matched even if all the servers in the associated server farm are down. The default behavior of the policy in that case is not to accept those connections and send back a reset (RST) to the clients. To change this behavior, add a backup server farm for that policy.

When you add the **backup** *sorry-serverfarm* [**sticky**] option to the backup server farm, this option defines whether the sticky group applied to the primary server farm is also applied for the backup server farm. If you do not specify stickiness for the primary server farm, then stickiness is not applied to the backup server farm.

For example, if you have a sticky group configured for a policy, the primary server farm in this policy becomes sticky. The client will be stuck to the configured real server in the primary server farm. When all of the real servers in the primary server farm fail, new requests from this client are sent to the backup server farm. When the real server in the primary server farm comes back to the operational state, the following actions result:

- The existing connections to the backup real server continue to be serviced by the backup real server.
- The new requests from the client are sent to the backup real server if the sticky option is enabled for the backup server farm.
- The new requests go back to the primary real server if the sticky option is not used on the backup server farm.

You can reorder the policies in the list by removing policies and reentering them in the correct order. To remove and enter policies, enter the **no slb-policy** *policy name* command and the **slb-policy** *policy name* command in the virtual server submode.

To configure load-balancing policies, perform this task:

	<b>Command</b>	<b>Purpose</b>
<b>Step 1</b>	Router(config-module-csm)# <b>policy</b> <i>policy-name</i>	Creates the policy and enters the policy submode to configure the policy attributes <sup>1</sup> .
<b>Step 2</b>	Router(config-slb-policy)# <b>url-map</b> <i>url-map-name</i>	Associates a URL map to a policy <sup>2</sup> . You must have previously created and configured the URL maps and cookie maps with the <b>map</b> command. See the “ <a href="#">Configuring Generic Header Parsing</a> ” section on page 6-12.
<b>Step 3</b>	Router(config-slb-policy)# <b>cookie-map</b> <i>cookie-map-name</i>	Associates a cookie map to a policy <sup>2</sup> .
<b>Step 4</b>	Router(config-slb-policy)# <b>header-map</b> <i>name</i>	Associates an HTTP header map to a policy.
<b>Step 5</b>	Router(config-slb-policy)# <b>sticky-group</b> <i>group-id</i>	Associates this policy to a specific sticky group <sup>2</sup> .
<b>Step 6</b>	Router(config-slb-policy)# <b>client-group</b> <i>value</i>   <i>std-access-list-name</i>	Configures a client filter associated with a policy. Only standard IP access lists are used to define a client filter.

	Command	Purpose
Step 7	Router(config-slb-policy)# <b>serverfarm</b> <i>serverfarm-name</i>	Configures the server farm serving a particular load-balancing policy. Only one server farm can be configured per policy <sup>2</sup> .
Step 8	Router(config-slb-policy)# <b>set ip dscp</b> <i>dscp-value</i>	Marks traffic with a DSCP value if packets matched with the load-balancing policy <sup>2</sup> .
Step 9	Router(config-slb-policy)# <b>nat client</b> { <i>client-pool-name</i>   <b>static</b> }	(Optional) Enables the NAT mode client <sup>2</sup> . <b>Note</b> If both the serverfarm and the policy are configured with client NAT, the policy takes precedence over the server farm.

1. Enter the **exit** command to leave a mode or submode. Enter the **end** command to return to the menu's top level.
2. The **no** form of this command restores the defaults.

This example assumes that the URL map, map1, has already been configured and shows how to configure server load-balancing policies and associate them to virtual servers:

```
Router(config-slb-policy)# serverfarm pl_sticky
Router(config-slb-sfarm)# real 10.1.0.105
Router(config-slb-sfarm)# inservice
Router(config-slb-policy)# exit
Router(config-module-csm)# policy policy_sticky_ck
Router(config-slb-policy)# serverfarm pl_sticky
Router(config-slb-policy)# url-map map1
Router(config-slb-policy)# exit
Router(config-module-csm)# vserver vs_sticky_ck
Router(config-slb-vserver)# virtual 10.1.0.80 tcp 80
Router(config-slb-vserver)# slb-policy policy_sticky_ck
Router(config-slb-sfarm)# inservice
Router(config-slb-policy)# exit
```

## Configuring Generic Header Parsing

In software release 2.1(1), the CSM-S supports generic HTTP request header parsing. The HTTP request header contains fields that describe how content should be formatted to meet the user's requirements.

## Understanding Generic Header Parsing

The CSM-S uses the information it learns by parsing and matching fields in the HTTP header along with policy information to make load-balancing decisions. For example, by parsing the browser-type field in the HTTP header, the CSM-S can determine if a user is accessing the content with a mobile browser and can select a server that contains content formatted for a mobile browser.

An example of a HTTP Get request header record is as follows:

```
GET /?u HTTP/1.1<0D><0A>
Accept: image/gif, image/x-xbitmap, image/jpeg, image/pjpeg<0D><0A>
Referer: http://www.yahoo.com/<0D><0A>
Accept-Language: en-us<0D><0A>
Accept-Encoding: gzip, deflate<0D><0A>
User-Agent: Mozilla/4.0 (compatible; MSIE 5.0; Windows NT; DigExt)<0D><0A>
Host: finance.yahoo.com<0D><0A>
Connection: Keep-Alive<0D><0A>
Cookie: B=51g3cjstaq3vm; Y=1<0D><0A>
```

```
<0D><0A>
```

## Generic Header Parsing Configuration

You configure generic header parsing by entering commands that instruct the CSM-S to perform policy matching on fields in the HTTP header. These sections describe how to configure generic header parsing on the CSM-S:

- [Creating a Map for the HTTP Header, page 6-13](#)
- [Specifying Header Fields and Match Values, page 6-13](#)
- [Assigning an HTTP Header Map to a Policy, page 6-14](#)
- [Assigning the Policy to a Virtual Server, page 6-14](#)
- [Generic Header Parsing Example, page 6-14](#)

### Creating a Map for the HTTP Header

Using the **map** command, you create a map group with the type HTTP header. When you enter the **map** command, you are placed in a submode where you can specify the header fields and values for the CSM-S to search for in the request.

To create a map for the HTTP header, perform this task:

Command	Purpose
Router(config-module-csm)# <b>map name header</b>	Creates and names a HTTP header map group.



#### Note

Other map types include a URL and a cookie.

### Specifying Header Fields and Match Values

You can specify the name of the field and the corresponding value for the CSM-S to match when receiving an HTTP request by using the **match** command.

To specify head fields and match values, perform this task:

Command	Purpose
Router(config-slb-map-header)# <b>match protocol http header field header-value expression</b>	Specifies the name of the field and value. The field can be any HTTP header except cookie. You can configure a cookie map if you want to configure a cookie header.



#### Note

The CSM-S allows you to specify one or more fields in the HTTP header to be the criteria for policy matching. When multiple fields are configured in a single HTTP header group, all of the expressions in this group must match to satisfy this criteria.

## Assigning an HTTP Header Map to a Policy

In policy submode, you specify the header map to include in that policy. The header map contains the HTTP header criteria to be included in a policy.

To assign an HTTP header map to a policy, perform this task:

	Command	Purpose
Step 1	Router(config-module-csm)# <b>policy</b> <i>policy-name</i>	Creates a policy.
Step 2	Router(config-slb-policy)# <b>header-map</b> <i>name</i>	Assigns an HTTP header map to a policy.



### Note

By default, a policy rule can be satisfied with any HTTP header information. The HTTP URL and HTTP cookie are specific types of header information and are handled separately by the CSM-S.

## Assigning the Policy to a Virtual Server

In virtual server submode, specify the name of the policy that has the header map assigned by using the **vserver** *virtserver-name* command.

To specify a policy with a header map assigned, perform this task:

	Command	Purpose
Step 1	Router(config-module-csm)# <b>vserver</b> <i>virtserver-name</i>	Configures a virtual server.
Step 2	Router(config-slb-policy)# <b>header-map</b> <i>name</i>	Assigns an HTTP header map to a policy.

## Generic Header Parsing Example

This example shows how to configure generic header parsing:

```
Router(config)# mod csm 2
Router(config-module-csm)# !!!configure generic header map
Router(config-module-csm)# map map2 header
Router(config-slb-map-heaer)# $col http header Host header-value *.yahoo.com

Router(config-slb-map-header)# !!! configure serverfarm
Router(config-slb-map-header)# serverfarm farm2
Router(config-slb-sfarm)# real 10.1.0.105
Router(config-slb-real)# inservice
Router(config-slb-real)# exit
Router(config-slb-sfarm)# exit

Router(config-module-csm)# !!! configurate policy
Router(config-module-csm)# policy pc2
Router(config-slb-policy)# serverfarm farm2
Router(config-slb-policy)# header-map map2
Router(config-slb-policy)# exit
```

```
Router(config-module-csm)# !!! config vserver  
Router(config-module-csm)# vserver vs2  
Router(config-slb-vserver)# virtual 10.1.0.82 tcp 80  
Router(config-slb-vserver)# slb-policy pc2  
Router(config-slb-vserver)# inservice  
Router(config-slb-vserver)# end  
Router(config)# show module csm 2 map det
```

