

在路由器模式下使用L7策略配置CSM

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本文提供了一个在路由器模式下以第七层(L7)策略配置的内容交换模块(CSM)的示例配置。

默认策略的概念在本文也解释。配置CSM切服务器发出的连接。配置一个简单的ICMP探测。

[开始使用前](#)

[Conventions](#)

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

[Prerequisites](#)

本文档没有任何特定的前提条件。

[Components Used](#)

This document is not restricted to specific software and hardware versions.

本文档中的信息都是基于特定实验室环境中的设备创建的。All of the devices used in this document started with a cleared (default) configuration.如果您是在真实网络上操作，请确保您在使用任何命令前已经了解其潜在影响。

[背景理论](#)

客户端(或连接到客户端)的上游路由器和服务器典型地是在两个独立的VLAN。根据IP子网配置，CSM在以下两个模式下能运行：

- **路由器模式**—客户端和服务器VLAN被配置作为两个明显的IP子网。在一个标准的服务器负载均衡(SLB)环境里，VIP属于客户端IP子网，并且服务器属于服务器IP子网，不可能直接地从客户端到达。如果他们不匹配VIP，CSM在路由器模式下不允许流入请求传递到服务器。
- **网桥模式**—客户端和服务器VLAN是同一个IP子网的一部分。在那两VLAN之间的CSM网桥信息包。在一个标准的SLB环境里，VIP和服务器在同一个IP子网。不匹配所有的流入请求VIP桥接对耦合的VLAN (如果连接来自客户端，将被发送到服务器VLAN，并且，如果连接来自服务器，将被发送到客户端VLAN)。

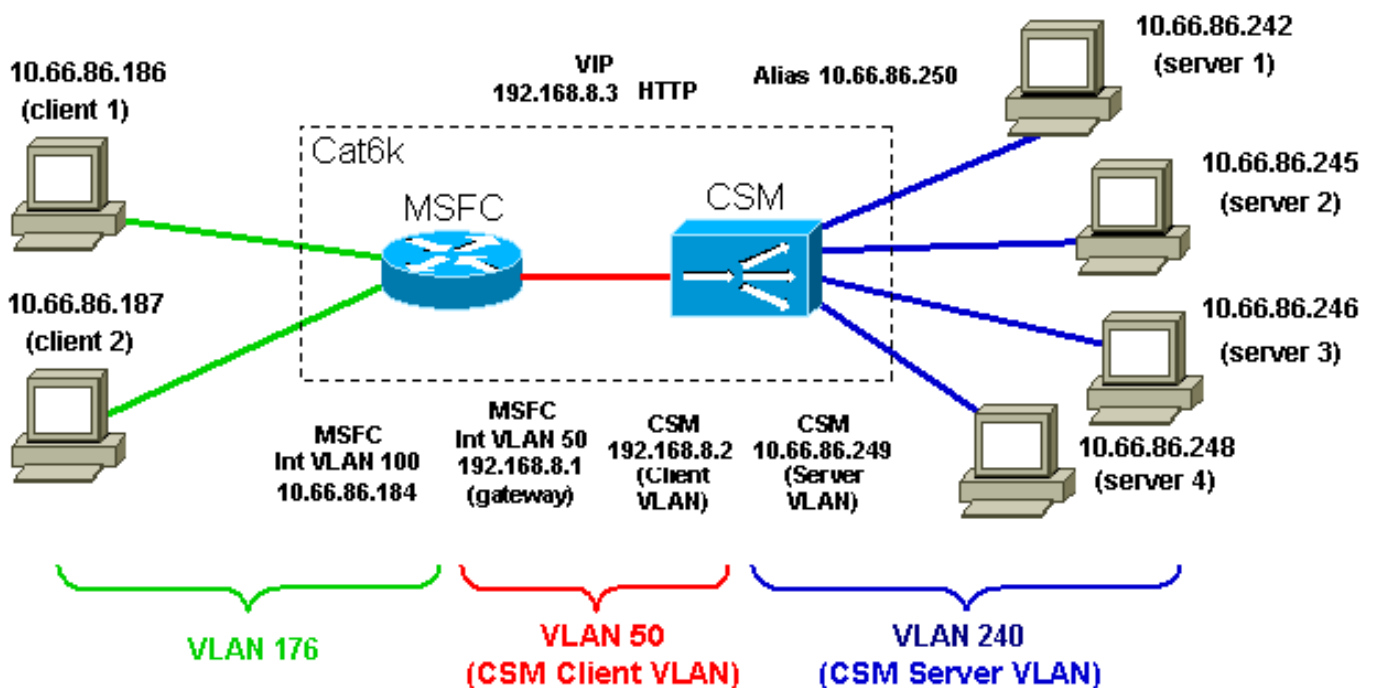
Configure

本部分提供有关如何配置本文档所述功能的信息。以下配置在表示的同样Catalyst 6500完全地位于网络下面的图表。配置分成独立的部分更好说明哪个部分特别地参考CSM，并且哪个部分是指层2/3 (L2/3) (MSFC) Catalyst的配置。

Note: 要查找本文档所用命令的其他信息，请使用[命令查找工具](#) (仅限注册用户)。

Network Diagram

本文档使用下图所示的网络设置。



配置

本文档使用以下配置：

- Catalyst 6000 - CSM插槽4
- Catalyst 6000 - 物理和逻辑接口

Catalyst 6000 - CSM插槽4

```
module ContentSwitchingModule 4
```

```
vlan 50 client
```

```
ip address 192.168.8.2 255.255.255.0
```

```
gateway 192.168.8.1
```

```
!--- Client side VLAN configuration for the CSM in slot  
4. !--- The gateway keyword refers to the MSFC interface  
VLAN 50 IP address. !
```

```
vlan 240 server
```

```
ip address 10.66.86.249 255.255.255.240
```

```
alias 10.66.86.250 255.255.255.240
```

```
!--- Server side VLAN configuration. !--- The IP address  
is different from the one used for the client VLAN 240.  
!--- The CSM is configured in router mode (two VLANs and  
two IP subnets). !--- Bridge mode (two VLANs, only 1 IP  
subnet) is configured specifying !--- the same exact IP  
address for a pair of client and server VLANs on the  
CSM. !--- An alias is not necessary, however, it is a  
good practice, since it is required !--- when migrating  
to a redundant configuration. !--- In that case, active  
and standby CSMs have different IP addresses on the  
VLAN, !--- however, they share the same alias. !--- Real  
servers are configured to point to the alias as their  
default gateway. static drop real 10.66.86.240  
255.255.255.240 !--- Server-originated connections from  
all servers in the 10.66.86.240 subnet !--- are dropped.  
By default, server-originated connections are allowed  
and !--- their source IP (the server IP address) is not  
modified. !--- Other options are allowing server-  
originated connections with !--- their source IP NATed  
to the VIP, or allowing server-originated connections !-  
- with their source IP NATed to a pool of specific IP  
addresses. !--- Note: The static command applies only !-  
- to server originated connections, which do not hit  
any VIPs !--- configured on the CSM.
```

```
!
```

```
probe PING icmp
```

```
interval 5
```

```
failed 30
```

```
!--- This is an example of an Internet Control Message  
Protocol (ICMP) probe. !--- Probes are sent out every  
interval (five) seconds. !--- Once a server goes out of  
service, probes to that server are sent !--- every  
failed (30) second to see if the server has come back  
online. ! serverfarm FARM1 nat server !--- nat server is  
the default configuration of a serverfarm. !--- This
```

means that the CSM performs directed mode !---
(destination IP of incoming connections is changed from
the VIP !--- to the IP address of the selected server)
for that serverfarm. !--- Dispatch mode (only L2
rewrite) can be configured by !--- issuing the **no nat
server** command.

```
no nat client
```

!--- no nat client is the default behavior for a
serverfarm. !--- The CSM by default does not change the
source IP address of !--- incoming requests.

```
real 10.66.86.242  
weight 24  
inservice
```

!--- This is an example of a different weight (the
default is eight). !--- Remember that weights are
relative to the weights of other real servers !---
(weight of eight does not mean that eight consecutive
requests are sent !--- to the same server). !--- Observe
also that there is no port translation configured. !---
A port translation is used to support a server listening
to port 8080. !--- You can also use real 10.66.86.242
8080 for the configuration.

```
real 10.66.86.245  
inservice
```

```
real 10.66.86.246  
inservice
```

```
real 10.66.86.248  
inservice  
probe PING
```

!--- All the servers in the serverfarm are pinged every
five seconds, !--- according to the probe PING
configured above. !--- No predictor was specified, and
the default is round robin.

```
serverfarm FARM2  
nat server  
no nat client  
real 10.66.86.242 23  
inservice  
real 10.66.86.246 23  
inservice
```

!--- The real servers in FARM2 are an example of port
translation. !

```
serverfarm FARM3  
nat server  
no nat client  
real 10.66.86.242  
inservice
```

```
real 10.66.86.245
```

```
inservice
!  
sticky 10 cookie cookiename timeout 20  
  
!--- A sticky group (group number 10) is configured for  
cookie sticky !--- with a timeout of 20 minutes. ! map  
TEST url match protocol http url *jpg* !--- A URL map  
(also HTTP header and cookie maps are available) is  
created. !--- This is the first step in the creation of  
a L7 policy. !--- In this case, only one match sentence  
is configured. In general, !--- multiple match sentences  
can be configured. ! map IE header match protocol http  
header User-Agent header-value *IE* !--- This is another  
example of a map, in this case a HTTP header map. !---  
Observe that the header name needs to perfectly match  
the !--- HTTP header field to be examined, while the  
header value is !--- a regular expression. ! policy TEST  
url-map TEST serverfarm FARM3 !--- Creation of the  
policy named TEST. You can use the same name as !--- the  
one of the map previously created, however, this is not  
a requirement. !--- This is just a way to easily  
remember the association if only one map !--- is  
associated with a policy. !--- In general, a policy can  
include a url-map, a cookie-map, a header-map, !--- a  
client-group, and so on. !--- If all of these conditions  
match (in this example, only the condition !--- url-map  
TEST), the policy has a match, and the specified !---  
serverfarm (FARM3) is used to fulfill that request. !  
policy IE header-map IE serverfarm FARM3 vserver WEB  
virtual 192.168.8.3 tcp www !--- This is a creation of a  
simple virtual server. !--- No IP mask has been  
specified and no VLAN of incoming traffic !--- has been  
specified. !--- This means that this is a simple VIP for  
standard server load balancing. !--- Traffic coming from  
any VLAN and directed to that specific IP address !---  
(192.168.8.3) will match this VIP if it is TCP and if it  
is destined !--- to port 80 (keyword www). serverfarm  
FARM1 sticky 20 group 10 !--- Default Policy: This is  
very important. The two lines above refer !--- to the  
default policy. !--- If there are no other policies  
configured or if none of the configured !--- slb-  
policies has a match, the default policy is used. !---  
In this case, the default policy is used only if neither  
!--- slb-policy TEST or slb-policy IE have a match. !---  
If there are no other matches, the farm FARM1 will be  
used, !--- and the rules of sticky group 10 will be  
applied. !--- If the default serverfarm is not  
configured for a virtual server, !--- and if none of the  
slb-policies has a match, the session will be discarded.  
persistence rebalance !--- Default behaviour for HTTP  
1.1; if multiple GETs are present !--- in the same TCP  
connection, the CSM will examine every GET. !--- If the  
new GET needs to be sent to a different serverfarm, !---  
the connection with the current server is closed and !---  
- a new connection with a new server if opened. !---  
This is completely transparent to the client. slb-policy  
TEST slb-policy IE !--- This is an association of two  
previously configured policies to !--- the virtual  
server WEB. The order is important. !--- In this case,  
if TEST has a match, IE is not even considered, !--- and  
the serverfarm associated with policy TEST is used. !---  
If stickyness had to be configured for these policies,
```

*this would !--- be done at the policy level above (in the policy TEST submode !--- for example). inservice !--
- All virtual servers need to be put in service. !*

```
vserver FTP
  virtual 192.168.8.3 tcp ftp service ftp
```

!--- For FTP, the service ftp keyword needs !--- to be specified. This instructs the CSM to monitor !--- the control channel (port "ftp", 21), !--- and figure out automatically the data port to be used, and map !--- the data channel to the same real server.

!--- Both active and passive types of FTP are supported. serverfarm FARM3 persistent rebalance
inservice ! vserver TELNET virtual 192.168.8.3 tcp telnet serverfarm FARM1 persistent rebalance inservice !
vserver TELNET2 virtual 192.168.8.3 tcp 345 *!--- This is an example of a virtual server listening to port 345, while !--- the default policy (the only policy configured for this virtual server) !--- uses serverfarm FARM2, and real servers in FARM2 are configured !--- for port translation to port 23 (see above).* serverfarm FARM2 persistent rebalance inservice ! !

Catalyst 6000 -物理和逻辑接口

```
!  
  
interface GigabitEthernet1/1  
  no ip address  
  shutdown  
!  
=====
```

!--- Servers are connected to this port. !

```
interface FastEthernet8/1  
  no ip address  
  switchport  
  switchport access vlan 176  
  spanning-tree portfast  
!  
  
interface FastEthernet8/2  
  no ip address  
  switchport  
  switchport access vlan 240  
  spanning-tree portfast
```

!--- Clients are connected to this port.

```

=====
interface Vlan1
no ip address

!--- Default VLAN 1, cannot be configured in the CSM
(CLI will prevent it). !
interface Vlan50
ip address 192.168.8.1 255.255.255.0

!--- Internal VLAN between MSFC and CSM. !--- In this
example, the MSFC on the client side of the CSM is used.
!--- Vlan50 is the client side VLAN of the CSM, and the
CSM !--- is pointing to int vlan 50 IP address as the
default gateway. !
interface Vlan176
ip address 10.66.86.184 255.255.255.240

!--- Observe that VLAN 240 (CSM server side VLAN) is not
created as !--- a L3 entity on the MSFC. You do not want
the MSFC !--- to route between VLAN 50 and 240, thus
skipping the CSM. !--- VLAN 240 is created as a L2
entity in the switch !--- (issue the show vlan command
to verify this). !--- VLAN 50 is also created as a L3
entity on the MSFC. !--- In this example, the MSFC is
used on the client side of the CSM.

```

Verify

本部分所提供的信息可用于确认您的配置是否正常工作。

Verify

```

Router#
Router#sh mod csm 4 vser deta
WEB, type = SLB, state = OPERATIONAL, v_index = 19
  virtual = 192.168.8.3/32:80 bidir, TCP, service =
NONE, advertise = FALSE

!--- 32 bits of mask is the default. The destination IP
of incoming requests !--- needs to be exactly the VIP.
!--- advertise = FALSE refers to the Route Health
Injection feature, !--- where VIPs are advertised with
host routes by the MSFC !--- (used on the client side).
idle = 3600, replicate csrps = none, vlan = ALL, pending
= 30 !--- 3600 seconds of idle timer. !--- If no packets
are sent over a specific session !--- for the idle time,
the CSM tears down that session. !--- The idle timer is
important, especially for non-TCP sessions !--- where
there is no explicit termination of the session. !---
There is no replication configured. In this example, a
standby CSM will !--- simply monitor the active CSM and
eventually become active, however, it !--- will not

```

```

learn sticky database, nor TCP state. !--- The
replication can be configured as none, sticky database,
or TCP state. !--- Traffic can come to this vserver from
any VLAN. !--- This is the default behaviour since no
VLAN was specified in the config. max parse len = 2000,
persist rebalance = TRUE !--- Max depth of inspection
(default 600 bytes, max 4000 bytes). conns = 0, total
conns = 2 !--- Currently open connections and total
connections that have been set up !--- since the last
reset of the counters (clear mod csm 4 counters).
Default policy: server farm = FARM1, backup = sticky:
timer = 20, subnet = 0.0.0.0, group id = 10 !--- Default
policy serverfarm and sticky config (this sticky config
only applies !--- to the default serverfarm; stickiness
for the other policies needs !--- to be configured in
the various "policy" submodes) Policy Tot matches Client
pkts Server pkts -----
----- TEST 1 3 6 IE 2 10 3 (default) 0 0 0 !---
Total number of connections that matched the various
policies and !--- number of packets sent by servers and
clients. TELNET, type = SLB, state = OPERATIONAL,
v_index = 21 virtual = 192.168.8.3/32:23 bidir, TCP,
service = NONE, advertise = FALSE idle = 3600, replicate
csrp = none, vlan = ALL, pending = 30 max parse len =
2000, persist rebalance = TRUE ssl sticky offset = 0,
length = 32 conns = 0, total conns = 0 Default policy:
server farm = FARM1, backup = sticky: timer = 0, subnet
= 0.0.0.0, group id = 0 Policy Tot matches Client pkts
Server pkts -----
----- (default) 14 375 258 TELNET2, type = SLB,
state = OPERATIONAL, v_index = 22 virtual =
192.168.8.3/32:345 bidir, TCP, service = NONE, advertise
= FALSE idle = 3600, replicate csrp = none, vlan = ALL,
pending = 30 max parse len = 2000, persist rebalance =
TRUE ssl sticky offset = 0, length = 32 conns = 0, total
conns = 0 Default policy: server farm = FARM2, backup =
sticky: timer = 0, subnet = 0.0.0.0, group id = 0 Policy
Tot matches Client pkts Server pkts -----
----- (default) 5 24 19 FTP,
type = SLB, state = OPERATIONAL, v_index = 20 virtual =
192.168.8.3/32:21 bidir, TCP, service = ftp, advertise =
FALSE !--- FTP service was configured for this virtual
server that is !--- listening on port 21. idle = 3600,
replicate csrp = none, vlan = ALL, pending = 30 max
parse len = 2000, persist rebalance = TRUE ssl sticky
offset = 0, length = 32 conns = 0, total conns = 0
Default policy: server farm = FARM3, backup = sticky:
timer = 0, subnet = 0.0.0.0, group id = 0 Policy Tot
matches Client pkts Server pkts -----
----- (default) 2 21 16 Router#
Router# Router# Router#sh mod csm 4 sticky ?
  client  sticky associated with a specific client IP
address
  config  list configured sticky groups
  cookie  sticky associated with a HTTP cookie value
  group   sticky associated with a specific group
  ssl     sticky associated with a SSL session id
  |       Output modifiers
  <cr>

Router#
Router#sh mod csm 4 real deta
10.66.86.242, FARM1, state = OPERATIONAL
conns = 0, maxconns = 4294967295, minconns = 0

```



```
!--- There are 0 active connections to this real server.
!--- maxconns and minconns have their default values. !-
-- If changed to something else, they enable the
connection watermarks feature. !--- No more than
maxconns connections will ever be active on this real
server. !--- When the server has reached its maximum,
then the CSM does not send to it !--- any more new
connection until the number of active connections drops
!--- below minconns. weight = 24, weight(admin) = 24,
metric = 0, remainder = 0 !--- Admin weight is
configured, weight is dynamic. !--- If using Dynamic
Feedback Protocol (DFP), the dynamic weight !--- can be
different from the admin. total conns established = 0,
total conn failures = 0 10.66.86.245, FARM1, state =
OPERATIONAL conns = 1, maxconns = 4294967295, minconns =
0 weight = 8, weight(admin) = 8, metric = 0, remainder =
1 total conns established = 193, total conn failures = 0
10.66.86.246, FARM1, state = OPERATIONAL conns = 0,
maxconns = 4294967295, minconns = 0 weight = 8,
weight(admin) = 8, metric = 0, remainder = 0 total conns
established = 563, total conn failures = 0 10.66.86.248,
FARM1, state = OPERATIONAL conns = 0, maxconns =
4294967295, minconns = 0 weight = 8, weight(admin) = 8,
metric = 0, remainder = 0 total conns established = 455,
total conn failures = 0 10.66.86.242:23, FARM2, state =
OPERATIONAL conns = 0, maxconns = 4294967295, minconns =
0 weight = 8, weight(admin) = 8, metric = 0, remainder =
0 total conns established = 3, total conn failures = 0
10.66.86.246:23, FARM2, state = OPERATIONAL conns = 0,
maxconns = 4294967295, minconns = 0 weight = 8,
weight(admin) = 8, metric = 0, remainder = 0 total conns
established = 2, total conn failures = 0 10.66.86.242,
FARM3, state = OPERATIONAL conns = 0, maxconns =
4294967295, minconns = 0 weight = 8, weight(admin) = 8,
metric = 0, remainder = 0 total conns established = 180,
total conn failures = 0 10.66.86.245, FARM3, state =
OPERATIONAL conns = 0, maxconns = 4294967295, minconns =
0 weight = 8, weight(admin) = 8, metric = 0, remainder =
0 total conns established = 179, total conn failures = 0
Router# Router# Router# Router# Router#sh mod csm 4 serv
deta
FARM1, type = SLB, predictor = RoundRobin
    nat = SERVER

!--- Default load balancing algorithm is round robin. !-
-- Default NAT options are nat server (directed mode)
but no nat client. virtuals inservice: 2, reals = 4,
bind id = 0, fail action = none !--- Two active virtual
servers are using this serverfarm. inband health config:
<none> retcode map = <none> Probes: PING, type = icmp
Real servers: 10.66.86.242, weight = 24, OPERATIONAL,
conns = 0 10.66.86.245, weight = 8, OPERATIONAL, conns =
1 10.66.86.246, weight = 8, OPERATIONAL, conns = 0
10.66.86.248, weight = 8, OPERATIONAL, conns = 0 Total
connections = 1 !--- This number indicates the active
connections only. FARM2, type = SLB, predictor =
RoundRobin nat = SERVER virtuals inservice: 1, reals =
2, bind id = 0, fail action = none inband health config:
<none> retcode map = <none> Real servers:
10.66.86.242:23, weight = 8, OPERATIONAL, conns = 0
```

```
10.66.86.246:23, weight = 8, OPERATIONAL, conns = 0
Total connections = 0 FARM3, type = SLB, predictor =
RoundRobin nat = SERVER virtuals inservice: 2, reals =
2, bind id = 0, fail action = none inband health config:
<none> retcode map = <none> Real servers: 10.66.86.242,
weight = 8, OPERATIONAL, conns = 0 10.66.86.245, weight
= 8, OPERATIONAL, conns = 0 Total connections = 0
Router# Router# Router# Router#sh mod csm 4 arp
```

```
!--- This is a very useful command; it shows the ARP
table of the CSM. !--- Remember that this table is
completely distinct from the MSFC ARP table. Internet
Address Physical Interface VLAN Type Status -----
```

```
-----
10.66.86.241 00-30-F2-C9-EB-F8 240 LEARNED up(0 misses)
10.66.86.242 00-02-B3-9D-2C-B9 240 REAL up(0 misses)
10.66.86.243 00-11-25-AB-21-D2 240 LEARNED up(0 misses)
10.66.86.244 00-09-5B-1E-B5-D5 240 LEARNED up(0 misses)
!--- 0 misses refers to the number of unanswered ARP
requests by that device. !--- In this case, all ARPs are
receiving a response, !--- so the server is well
connected. 10.66.86.245 00-0D-88-2F-67-E4 240 REAL up(0
misses) 10.66.86.246 00-02-B3-9D-2C-B9 240 REAL up(0
misses) 10.66.86.247 00-11-25-8D-2F-A8 240 LEARNED up(0
misses) 10.66.86.248 00-0D-88-2F-67-E4 240 REAL up(0
misses) 10.66.86.249 00-03-32-87-B7-B8 240 --SLB-- local
10.66.86.250 00-02-2F-00-14-0C 240 LEARNED up(0 misses)
10.66.86.253 00-0D-60-0F-24-6A 240 LEARNED up(0 misses)
10.66.86.254 00-0D-60-0F-24-5C 240 LEARNED up(0 misses)
192.168.8.1 00-D0-D3-86-B8-0A 50 GATEWAY up(0 misses)
192.168.8.2 00-03-32-87-B7-B8 50 --SLB-- local
192.168.8.3 00-03-32-87-B7-B7 0 VSERVER local Router#
```

```
Router# Router# Router# Router# Router#sh mod csm 4 ?
arp          SLB arp cache listing
capp         SLB Content Application Peering Protocol
information
conns        SLB connection information
dfp          SLB DFP manager information
ft           SLB ft information
gslb         Global Server Load Balancing stats
map          SLB map information
memory       SLB memory information
natpools     SLB client nat pool information
owner        SLB owner information
policy       SLB policy information
probe        SLB probe information
pvlan        SLB pvlan information
reals        SLB real server information
script       SLB script information
serverfarms  SLB server farm information
static       SLB static server NAT information
stats        SLB Statistics
status       SLB status information
sticky       SLB sticky database
tech-support SLB tech debug information
variable     SLB environment variables
vlan         SLB vlan information
vservers     SLB virtual server information
xml-config   SLB XML-config information
```

```
Router#sh mod csm 4 policy ?
name slb policy name
```

```
|      Output modifiers
<cr>

Router#sh mod csm 4 policy
policy:          TEST
type:            SLB
url map:         TEST
serverfarm:      FARM3

policy:          IE
type:            SLB
header map:      IE
serverfarm:      FARM3

Router#
Router#sh mod csm 4 vlan deta
vlan  IP address      IP mask      type
-----
50    192.168.8.2      255.255.255.0  CLIENT
      GATEWAYS
      192.168.8.1
240   10.66.86.249      255.255.255.240  SERVER

Router#
Router#
```

Troubleshoot

目前没有针对此配置的故障排除信息。