

L7 ポリシーを使用するルータ モードでの CSM の設定

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概要

このドキュメントでは、レイヤ 7 (L7) のポリシーを使用してルータ モードで設定されているコンテンツ スイッチング モジュール (CSM) の設定例を説明します。

デフォルトポリシーの概念はまたこの資料で説明されます。CSM はサーバ起こされた接続を破棄するために設定されます。簡単な ICMP プローブは同様に設定されます。

[はじめに](#)

[表記法](#)

ドキュメント表記の詳細は、『[シスコ テクニカル ティップスの表記法](#)』を参照してください。

[前提条件](#)

このドキュメントに関する固有の要件はありません。

[使用するコンポーネント](#)

このドキュメントは、特定のソフトウェアやハードウェアのバージョンに限定されるものではありません。

このドキュメントの情報は、特定のラボ環境にあるデバイスに基づいて作成されたものです。こ

のドキュメントで使用するすべてのデバイスは、クリアな（デフォルト）設定で作業を開始しています。対象のネットワークが実稼働中である場合には、どのような作業についても、その潜在的な影響について確実に理解しておく必要があります。

背景理論

クライアント（かクライアントに接続するアップストリーム ルータ）およびサーバは 2 別々の VLAN に一般的にあります。IP サブネット設定によっては、CSM は次の 2 つのモードで動作できます：

- **ルータ モード**—クライアント および サーバ VLAN は 2 つの個別の IP サブネットで設定されます。規格 Server Load Balancing（SLB）環境では、VIP はクライアント IP サブネットに属し、サーバはクライアント側から直接到達することができないサーバ IP サブネットに属します。ルータ モードの CSM は VIP を一致する場合着呼要求がサーバに渡されないようにしません。
- **ブリッジモード**—クライアント および サーバ VLAN は同じ IP サブネットの一部です。CSM はそれら二つの VLAN 間のパケットを繋ぎます。標準 SLB 環境では、VIP およびサーバは両方同じ IP サブネットにあります。VIP と一致しないすべての着呼要求はつながれた VLAN（接続がクライアントにから来たら、サーバ VLAN に送信され繋がれます、接続がサーバから来たら、クライアント VLAN に送信されます）。

設定

この項では、このドキュメントで説明する機能の設定に必要な情報を提供します。次のコンフィギュレーションは下記のネットワークダイアグラムに表される同じ Catalyst 6500 に完全に常駐します。設定は別々のピースにどの一部が CSM をとりわけ参照し、どの一部がレイヤ 2/3（L2/3）（MSFC）を参照するかよりよく説明します分けられます Catalyst の設定。

注: このドキュメントで使用されているコマンドの詳細を調べるには、[Command Lookup Tool](#)（登録ユーザ専用）を使用してください。

ネットワーク図

このドキュメントでは次の図に示すネットワーク

設定

このドキュメントでは、次の設定を使用します。

- Catalyst 6000 - CSM スロット 4
- 物理的な Catalyst 6000 - および論理インターフェイス

Catalyst 6000 - CSM スロット 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 is 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 ! !
```

物理的な Catalyst 6000 -および論理インターフェイス

```
!

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

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

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

確認

このセクションでは、設定が正常に動作しているかどうかを確認する際に役立つ情報を提供しています。

確認

```
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 csrp = 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#
```

トラブルシューティング

現在のところ、この設定に関する特定のトラブルシューティング情報はありません。

関連情報

- [Catalyst 6000 ファミリー Content Switching Module インストールおよび設定に関する注意書き、リリース 2.2](#)
- [コンテンツ ネットワーキング ダウンロード \(登録ユーザ専用\)](#)
- [テクニカルサポートとドキュメント - Cisco Systems](#)