在路由器模式下使用L7策略配置CSM

目录

简介

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。CSM配置切服务器发出的连接。一个简单ICMP探测配置。

开始使用前

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

先决条件

本文档没有任何特定的前提条件。

使用的组件

本文档不限于特定的软件和硬件版本。

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。本文档中使用的所有设备最初均采用原始（默认）配置。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行路由器）和服务器通常位于两个独立的VLAN上。根据IP子网配置，CSM能在以下二个模式中运行：

- **路由器模式**—客户端和服务器VLAN配置作为两个明显的IP子网。在标准服务器负载均衡(SLB)环境中，VIP属于客户端IP子网；服务器属于服务器IP子网，不能直接地从客户端到达。如果这些请求和VIP不匹配的话，CSM在路由器模式下不会允许把流入请求传递到服务器那里。
- **网桥模式**—客户端和服务器VLAN是同样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，VIP和服务器位于同一个IP子网。所有与VIP不匹配的流入请求被桥接到相关的VLAN (如果连接来自客户端，它将被发送到服务器VLAN；如果连接来自服务器，它将被发送到客户端VLAN)。

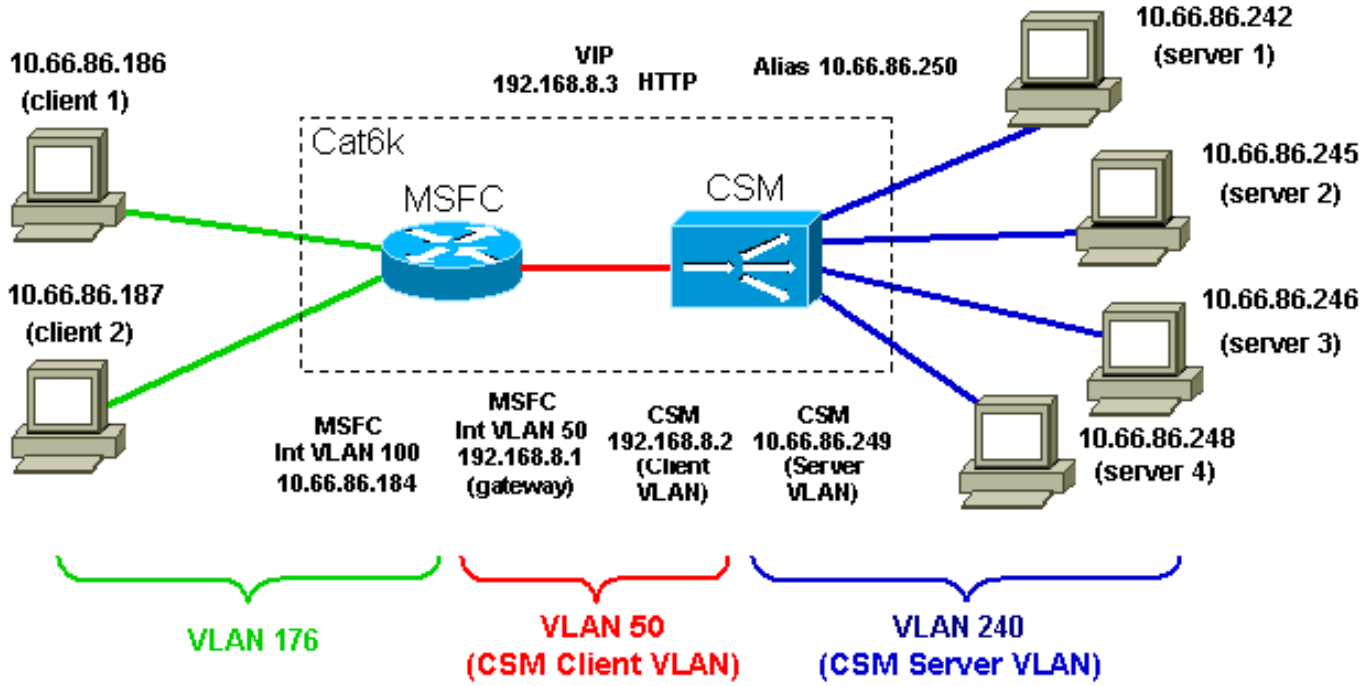
配置

本部分提供有关如何配置本文档所述功能的信息。以下配置完全驻留在下面网络图表示的同一个Catalyst 6500上。该配置分成单独部分，以便更好地说明哪个部件特定参考CSM，哪个部件参考Catalyst的层2/3(L2/3) (MSFC)的配置。

注意： 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）。

网络图

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
- 物理的Catalyst 6000 -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 ! !
```

物理的Catalyst 6000 -和逻辑接口

```
!


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.
```

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

验证

```
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#
```

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- Catalyst 6000系列内容交换模块安装和配置注释，版本2.2
- 内容网络下载(注册用户)
- 技术支持和文档 - Cisco Systems