

CUSP配置示例

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简介

本文档介绍思科统一SIP代理(CUSP)的示例CLI和GUI配置，其中调试与四种不同的呼叫路由方案匹配。

先决条件

要求

Cisco 建议您具有以下主题的基础知识：

- 会话初始协议 (SIP)
- 思科统一SIP代理(CUSP)

使用的组件

本文档中的信息基于CUSP。

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

配置

本节介绍四种呼叫路由方案的配置。

注意：使用[命令查找工具（仅限注册用户）](#)可获取有关本部分所使用命令的详细信息。

场景 1

呼叫流:IP电话1 — CME — SIP — CUSP — SIP — CUCM — IP电话2

从注册到CallManager Express(CME)的IP电话1拨打408 202 2102，以便通过CUSP访问注册到Cisco Unified Communications Manager(CUCM)的IP电话2。

CME在此场景中充当公共交换电话网络(PSTN)。

1. SIP邀请从CME进入CUSP。

```
[DsTransportListener-2] DEBUG 2013.02.27 19:15:59:245 DsSipLlApi.Wire -
Received UDP packet on 14.128.100.169:5060 ,source 14.128.100.150:57878
INVITE sip:4082022102@14.128.100.169:5060 SIP/2.0
Via: SIP/2.0/UDP 14.128.100.150:5060;branch=z9hG4bK21F2555
Remote-Party-ID: "4082025555" <sip:4082025555@14.128.100.150>;
party=calling;screen=yes;privacy=off
From: "4082025555" <sip:4082025555@14.128.100.150>;tag=81D7430C-1D2
To: <sip:4082022102@14.128.100.169>
Date: Wed, 27 Feb 2013 19:15:59 GMT
Call-ID: F3E5F396-804811E2-9818EC62-1B7185EE@14.128.100.150
Supported: 100rel,timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Cisco-Guid: 4091813662-2152206818-2551376994-0460424686
User-Agent: Cisco-SIPGateway/IOS-12.x
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
CSeq: 101 INVITE
Timestamp: 1361992559
Contact: <sip:4082025555@14.128.100.150:5060>
Expires: 180
Allow-Events: telephone-event
Max-Forwards: 69
Content-Type: application/sdp
Content-Disposition: session;handling=required
Content-Length: 410

v=0
o=CiscoSystemsSIP-GW-UserAgent 1007 629 IN IP4 14.128.100.150
s=SIP Call
c=IN IP4 14.128.100.150
t=0 0
m=audio 16930 RTP/AVP 18 101
c=IN IP4 14.128.100.150
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
m=video 17954 RTP/AVP 97
c=IN IP4 14.128.100.150
```

```
b=TIAS:1000000
a=rtpmap:97 H264/90000
a=fmtp:97 profile-level-id=42801E;packetization-mode=0
```

```
--- end of packet ---
```

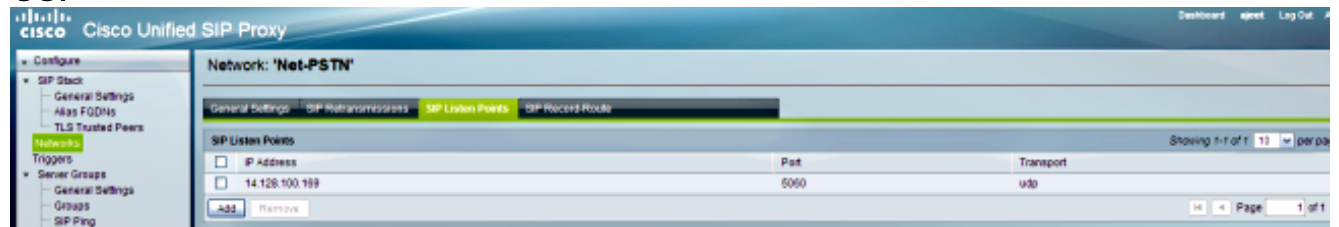
2. 呼叫被接受到匹配的网络(Net-PSTN)配置。

CLI

```
sip listen Net-PSTN udp 14.128.100.169 5060

!
sip network Net-PSTN standard
no non-invite-provisional
allow-connections
retransmit-count invite-client-transaction 3
retransmit-count invite-server-transaction 5
retransmit-count non-invite-client-transaction 3
retransmit-timer T1 500
retransmit-timer T2 4000
retransmit-timer T4 5000
retransmit-timer TU1 5000
retransmit-timer TU2 32000
retransmit-timer clientTn 64000
retransmit-timer serverTn 64000
tcp connection-setup-timeout 1000
udp max-datagram-size 1500
end network
!
```

GUI



调试

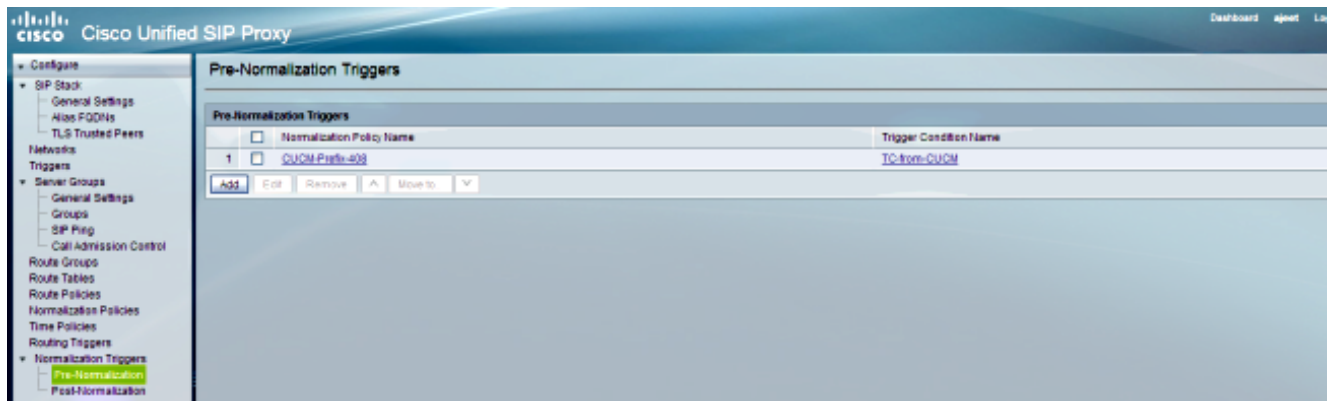
```
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250
conditions.RegexCondition - inNetwork='Net-PSTN'
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250
conditions.RegexCondition - IN_NETWORK: Net-PSTN
```

3. 执行预规范化序列。

CLI

```
trigger pre-normalization sequence 1 policy CUCM-Prefix-408
condition TC-from-CUCM
```

GUI



调试

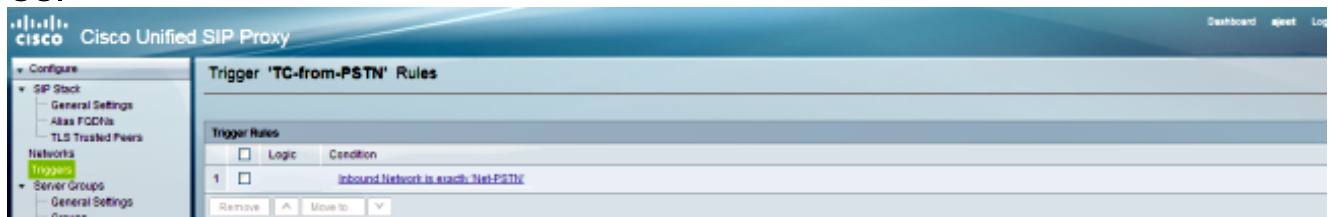
```
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 util.Normalization -
Entering Normalization(moduleRequest:pre-normalize)
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 conditions.RegexCondition -
inNetwork='Net-PSTN'
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 conditions.RegexCondition -
IN_NETWORK: Net-PSTN
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 conditions.AbstractRegexCondition -
pattern(`\QNet-CUCM\E$), toMatch(Net-PSTN) returning false
[REQUESTI.12] INFO 2013.02.27 19:15:59:250 util.Normalization -
skipping pre-normalize, due to either no trigger is configured or triggers
did not evaluate to true or is configured to by-pass
```

4. 触发器条件(TC-from-PSTN)匹配。

CLI

```
!
trigger condition TC-from-PSTN
sequence 1
in-network ^\QNet-PSTN\E$
end sequence
end trigger condition
!
```

GUI



调试

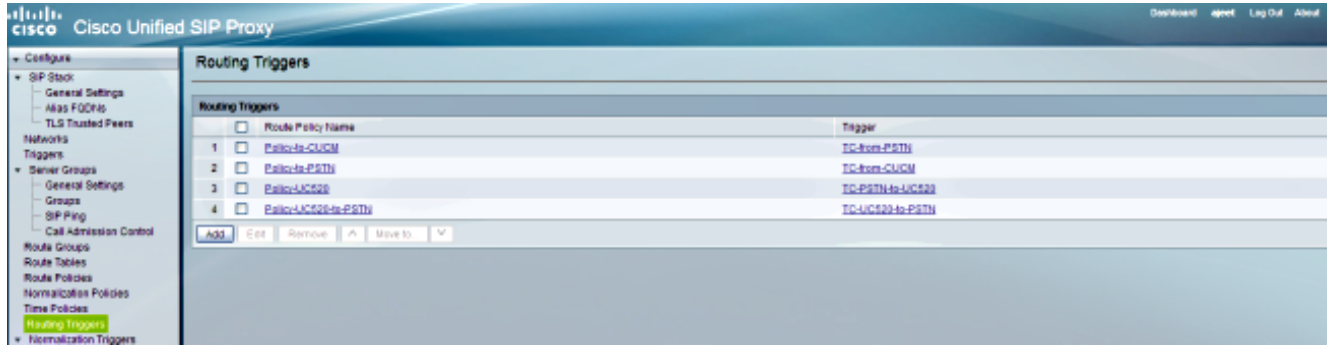
```
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 conditions.RegexCondition -
inNetwork='Net-PSTN'
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 conditions.RegexCondition -
IN_NETWORK: Net-PSTN
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:250 conditions.AbstractRegexCondition -
pattern(`\QNet-PSTN\E$), toMatch(Net-PSTN) returning true
```

5. 选中路由触发器配置以查找基于触发条件(TC-from-PSTN)匹配的路由策略 (策略到 CUCM)。

CLI

trigger routing sequence 1 policy Policy-to-CUCM condition TC-from-PSTN

GUI



调试

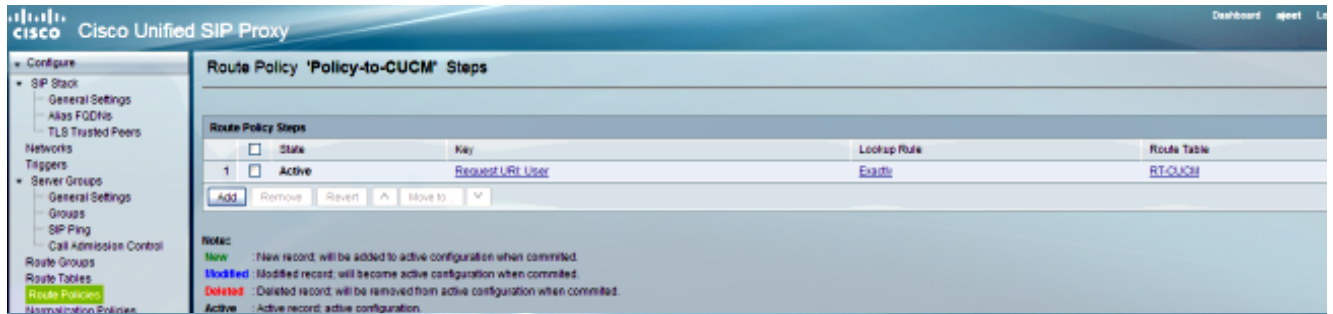
```
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 triggers.ModuleTrigger -
ModuleTrigger.eval() action<Policy-to-CUCM> actionParameter<>
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 triggers.ModuleTrigger -
ModuleTrigger.eval() got the policy, executing it ...
```

6. 检查路由策略 (策略到CUCM) 配置以查找匹配的路由表(RT-CUCM)。

CLI

```
!
policy lookup Policy-to-CUCM
sequence 100 RT-CUCM request-uri uri-component user
modify-key 4082022102 1111
rule exact
end sequence
end policy
!
```

GUI



调试

```

[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.XCLPrefix -
Entering getKeyValue()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.FieldSelector -
getUriPart: URI - sip:4082022102@14.128.100.169:5060 part 6
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.FieldSelector -
Requested field 45
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.FieldSelector -
Returning key 4082022102
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.FieldSelector -
Retrieved Modifier RegexModifier: match= 4082022102, replace=
1111, ignore case= false
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.FieldSelector -
Input field: 4082022102
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:251 nrs.FieldSelector -
Modified field: 1111
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 nrs.XCLPrefix -
Leaving getKeyValue()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 modules.XCLLookup -
table=RT-CUCM, key=1111
[REQUESTI.12] INFO 2013.02.27 19:15:59:252 modules.XCLLookup -
table is RT-CUCM

```

7. 检查路由表(RT-CUCM)配置以查找目标目标(SG-CUCM.ajeet.com)。

CLI

```

!
route table RT-CUCM
key 1111 target-destination SG-CUCM.ajeet.com Net-CUCM
end route table
!

```

GUI

The top screenshot shows the 'Route Table 'RT-CUCM' Routes' configuration page. It features a table with the following data:

State	Key	Route Group	Target Destination	Next Hop	Response	Lookup Route Policy	Default SIP Route	Network
<input type="checkbox"/>	Active	1111	-	SG-CUCM.ajeet.com	-	-	-	Net-CUCM

The bottom screenshot shows the 'Route Table 'RT-CUCM' Route' configuration page. The 'Active Value' section is expanded, showing the following configuration:

- Key: 1111
- Route Type: destination
- Host / Server Group: SG-CUCM.ajeet.com
- Port: (empty)
- Transport Type: none
- Network: Net-CUCM

调试

```

[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 routingtables.RoutingTable -

```

```

Entering lookup()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 routingtables.RoutingTable -
Looking up 1111 in table RT-CUCM with rule exact and modifiers=none
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 routingtables.RoutingTable -
Entering applyModifiers()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 routingtables.RoutingTable -
Leaving applyModifiers(), returning 1111
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 routingtables.RoutingTable -
Leaving lookup()
[REQUESTI.12] INFO 2013.02.27 19:15:59:252 nrs.XCLPrefix -
NRS Routing decision is: RouteTable:RT-CUCM, RouteKey:1111,
TargetDestination:SG-CUCM.ajeet.com, Network:Net-CUCM
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 loadbalancer.LBFactory -
Entering createLoadBalancer()
[REQUESTI.12] INFO 2013.02.27 19:15:59:252 loadbalancer.LBFactory -
lbtype is 3(call-id)
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 loadbalancer.LBFactory -
Leaving createLoadBalancer()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 nrs.XCLPrefix -
Stored NRSAlgResult=isFound=true, isFailure=false, Response=-1,
Routes=[Ruri: SG-CUCM.ajeet.com, Route: null, Network: Net-CUCM,
q-value=1.0radvance=[502, 503]], PolicyAdvance=null
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 nrs.NRSAlgResult -
set policyAdvance as specified in route=RouteTable:RT-CUCM, RouteKey:1111,
TargetDestination:SG-CUCM.ajeet.com, Network:Net-CUCM
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:252 nrs.NRSAlgResult -
no policyAdvance specified in route
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:253 nrs.NRSAlgResult -
set policyAdvance as specified in algorithm={lookupkeymodifier=
[ RegexModifier: match= 4082022102, replace= 1111, ignore case= false],
lookuprule=0, lookupfield=45, lookuplenght=-1, lookuptable=RT-CUCM,
sequence=100, algorithm=1}
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:253 nrs.NRSAlgResult -
no policyAdvance specified in algorithm

```

8. 执行后规范化序列。

注意：此方案不使用后规范化，这就是调试中跳过后规范化的原因。

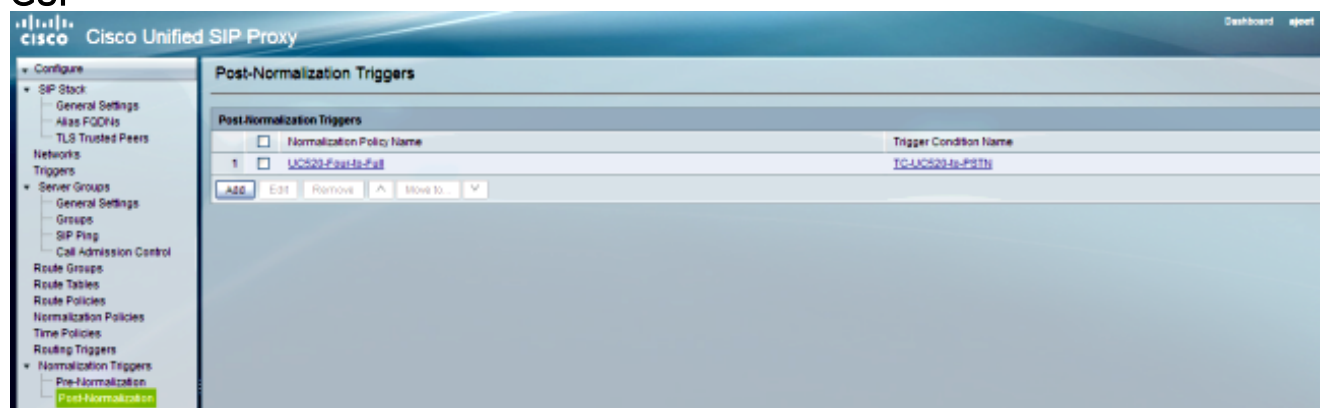
CLI

```

trigger post-normalization sequence 1 policy
UC520-Four-to-Full condition TC-UC520-to-PSTN

```

GUI



调试

```

[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 util.Normalization -
Entering Normalization(moduleRequest:post-normalize)
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 conditions.RegexCondition -

```

```

inNetwork='Net-PSTN'
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 conditions.RegexCondition -
IN_NETWORK: Net-PSTN
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 conditions.AbstractRegexCondition -
pattern(`^QNet-From-UC520\E$`), toMatch(Net-PSTN) returning false
[REQUESTI.12] INFO 2013.02.27 19:15:59:254 util.Normalization -
skipping post-normalize, due to either no trigger is configured or triggers
did not evaluate to true or is configured to by-pass

```

9. 检查服务器组配置以查找元素IP地址，并根据Q值和权重配置将呼叫路由到可能的最佳路由。

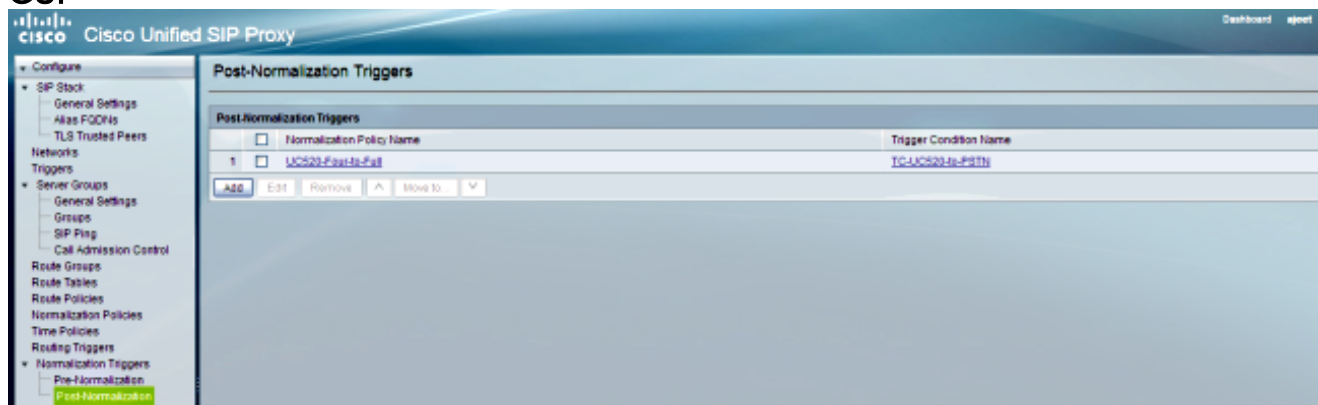
CLI

```

!
server-group sip group SG-CUCM.ajeet.com Net-CUCM
element ip-address 14.128.64.191 5060 udp q-value 1 weight 50
element ip-address 14.128.64.192 5060 udp q-value 1.0 weight 100
failover-resp-codes 503
lbtype global
ping
end server-group
!

```

GUI



调试

```

[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 loadbalancer.LBFactory -
Entering createLoadBalancer()
[REQUESTI.12] INFO 2013.02.27 19:15:59:254 loadbalancer.LBFactory -
lbtype is 0(global)
[REQUESTI.12] INFO 2013.02.27 19:15:59:254 loadbalancer.LBFactory -
Default lbtype is 3(call-id)
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 loadbalancer.LBFactory -
Leaving createLoadBalancer()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 loadbalancer.LBBase -
Entering getServer()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 loadbalancer.LBBase -
Entering initializeDomains()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 servergroups.
ServerGlobalStateWrapper - Net-CUCM:14.128.64.191:5060:1
numTries=2--->isServerAvailable(): true
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:254 servergroups.
ServerGlobalStateWrapper - Net-CUCM:14.128.64.192:5060:1
numTries=2--->isServerAvailable(): true
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 servergroups.AbstractNextHop -
Entering compareDomainNames()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 servergroups.AbstractNextHop -
Leaving compareDomainNames()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 loadbalancer.LBBase -

```



```
Leaving initializeDomains()
[REQUESTI.12] INFO 2013.02.27 19:15:59:255 loadbalancer.LBHashBased -
list of elements in order on which load balancing is done :
{reSgElementWeight=50, reSgElementSgName=SG-CUCM.ajeet.com,
reSgElementTransport=UDP, reSgElementQValue=1.0, reSgElementPort=5060,
reSgElementHost=14.128.64.191}, {reSgElementWeight=100, reSgElementSgName=
SG-CUCM.ajeet.com, reSgElementTransport=UDP, reSgElementQValue=1.0,
reSgElementPort=5060, reSgElementHost=14.128.64.192},
[REQUESTI.12] INFO 2013.02.27 19:15:59:255 loadbalancer.LBHashBased -
Hashing on F3E5F396-804811E2-9818EC62-1B7185EE@14.128.100.150
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 loadbalancer.DsHashAlgorithm -
Entering selectIndex()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 loadbalancer.DsHashAlgorithm -
Leaving selectIndex()
[REQUESTI.12] INFO 2013.02.27 19:15:59:255 loadbalancer.LBHashBased -
Index selected 0
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 servergroups.AbstractNextHop -
Entering compareDomainNames()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 servergroups.AbstractNextHop -
Leaving compareDomainNames()
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 loadbalancer.LBBase -
Server group SG-CUCM.ajeet.com selected {reSgElementWeight=50,
reSgElementSgName=SG-CUCM.ajeet.com, reSgElementTransport=UDP,
reSgElementQValue=1.0, reSgElementPort=5060, reSgElementHost=14.128.64.191}
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:255 loadbalancer.LBBase -
Leaving getServer()
```

10. SIP INVITE将发送到所选元素。

```
[REQUESTI.12] DEBUG 2013.02.27 19:15:59:256 DsSipLlApi.Wire -
Sending UDP packet on 14.128.100.169:32771, destination 14.128.64.191:5060
INVITE sip:4082022102@SG-CUCM.ajeet.com SIP/2.0
Via: SIP/2.0/UDP 14.128.100.169:5061;branch=z9hG4bK.ToYJFeKMyfZGySv.gcLjg~231
Via: SIP/2.0/UDP 14.128.100.150:5060;branch=z9hG4bK21F2555
Max-Forwards: 68
To: <sip:4082022102@14.128.100.169>
From: "4082025555" <sip:4082025555@14.128.100.150>;tag=81D7430C-1D2
Contact: <sip:4082025555@14.128.100.150:5060>
Expires: 180
Remote-Party-ID: "4082025555" <sip:4082025555@14.128.100.150
>;party=calling;screen=yes;privacy=off
Call-ID: F3E5F396-804811E2-9818EC62-1B7185EE@14.128.100.150
CSeq: 101 INVITE
Content-Length: 410
Date: Wed, 27 Feb 2013 19:15:59 GMT
Supported: 100rel,timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Cisco-Guid: 4091813662-2152206818-2551376994-0460424686
User-Agent: Cisco-SIPGateway/IOS-12.x
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
Timestamp: 1361992559
Allow-Events: telephone-event
Content-Type: application/sdp
Content-Disposition: session;handling=required

v=0
o=CiscoSystemsSIP-GW-UserAgent 1007 629 IN IP4 14.128.100.150
s=SIP Call
c=IN IP4 14.128.100.150
t=0 0
m=audio 16930 RTP/AVP 18 101
c=IN IP4 14.128.100.150
a=rtpmap:18 G729/8000
```

```
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
m=video 17954 RTP/AVP 97
c=IN IP4 14.128.100.150
b=TIAS:1000000
a=rtpmap:97 H264/90000
a=fmtp:97 profile-level-id=42801E;packetization-mode=0
```

注意：某些设备（如CUCM）在处理请求之前先验证请求的统一资源标识符(URI)，这意味着可能需要为终端设备配置完全限定域名(FQDN)才能实现此目的。

在CUCM中，**CUCM > System > Enterprise Parameter > Clusterwide Domain Configuration > Cluster Fully Qualified Domain Name**应与服务器组名称相同。



场景 2

呼叫流:IP电话1 — CUCM — SIP — CUSP — SIP — CME — IP电话2

从IP电话2拨打222。408应在前缀上加上“预规范化”，以便访问IP电话1。

CME在此场景中充当PSTN。

1. SIP邀请从CUCM进入CUSP。

```
[DsTransportListener-0] DEBUG 2013.02.28 00:34:03:370 DsSipLlApi.Wire -
Received UDP packet on 14.128.100.169:5061 ,source 14.128.64.192:5060
INVITE sip:2022222@14.128.100.169:5061 SIP/2.0
Via: SIP/2.0/UDP 14.128.64.192:5060;branch=z9hG4bK18012ae333f
From: "SJ Phone 1" <sip:2001@14.128.64.192>;
tag=534264~clb77ee1-4af9-4a41-aed3-3846cd699427-49616146
To: <sip:2022222@14.128.100.169>
Date: Thu, 28 Feb 2013 00:34:03 GMT
Call-ID: 8be55500-12e1a5fb-ab-c040800e@14.128.64.192
Supported: timer,resource-priority,replaces
Min-SE: 1800
User-Agent: Cisco-CUCM8.6
Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE,
REFER, SUBSCRIBE, NOTIFY
CSeq: 101 INVITE
Expires: 180
Allow-Events: presence, kpml
Supported: X-cisco-srtp-fallback,X-cisco-original-called
Call-Info: <sip:14.128.64.192:5060>
;method="NOTIFY;Event=telephone-event;Duration=500"
Cisco-Guid: 2347062528-0000065536-0000000107-3225452558
Session-Expires: 1800
P-Asserted-Identity: "SJ Phone 1" <sip:2001@14.128.64.192>
Remote-Party-ID: "SJ Phone 1" <sip:2001@14.128.64.192>
;party=calling;screen=yes;privacy=off
Contact: <sip:2001@14.128.64.192:5060>
Max-Forwards: 70
Content-Length: 0
```

--- end of packet ---

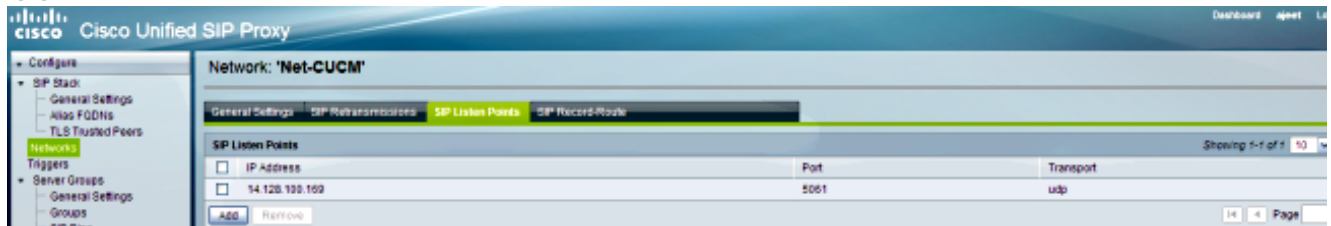
2. 在匹配的网络(Net-CUCM)配置上接受呼叫。

CLI

```
sip listen Net-CUCM udp 14.128.100.169 5061

!
sip network Net-CUCM standard
no non-invite-provisional
allow-connections
retransmit-count invite-client-transaction 3
retransmit-count invite-server-transaction 5
retransmit-count non-invite-client-transaction 3
retransmit-timer T1 500
retransmit-timer T2 4000
retransmit-timer T4 5000
retransmit-timer TU1 5000
retransmit-timer TU2 32000
retransmit-timer clientTn 64000
retransmit-timer serverTn 64000
tcp connection-setup-timeout 1000
udp max-datagram-size 1500
end network
!
```

GUI



调试

```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:373 conditions.RegexCondition -
inNetwork='Net-CUCM'
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:373 conditions.RegexCondition -
IN_NETWORK: Net-CUCM
```

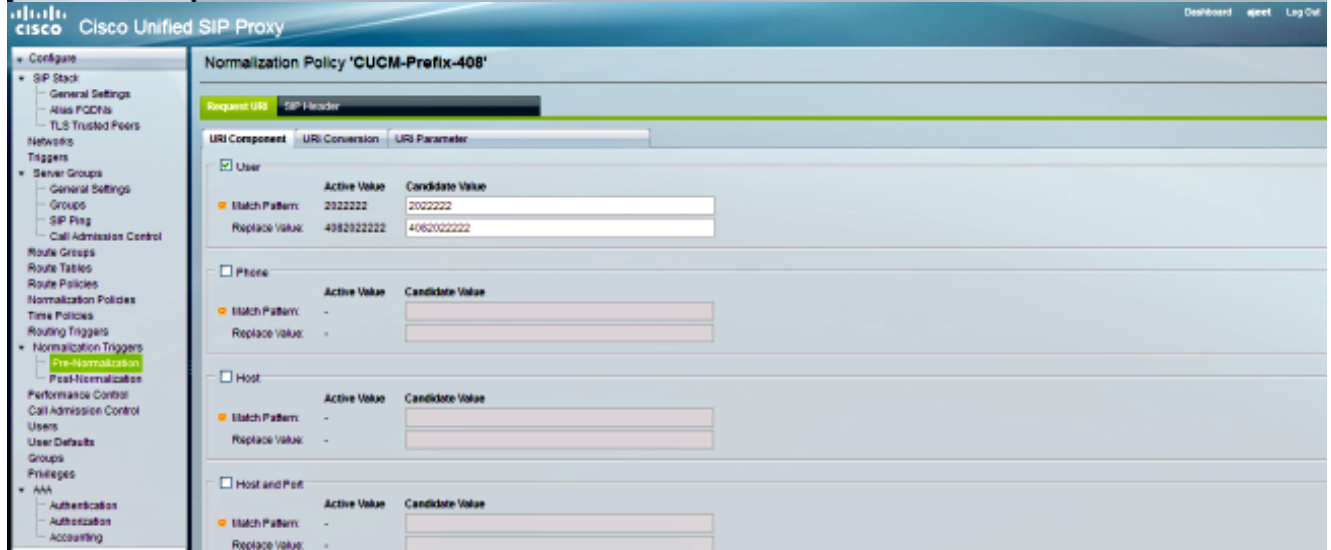
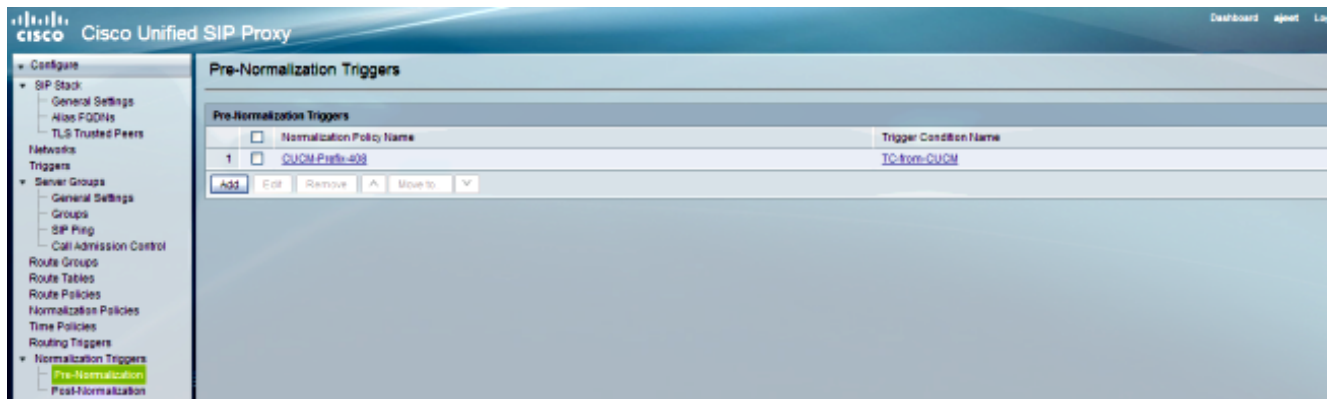
3. 执行预规范化序列。

CLI

```
trigger pre-normalization sequence 1 policy CUCM-Prefix-408
condition TC-from-CUCM

!
policy normalization CUCM-Prefix-408
uri-component update request-uri user 2022222 4082022222
end policy
!
```

GUI



调试

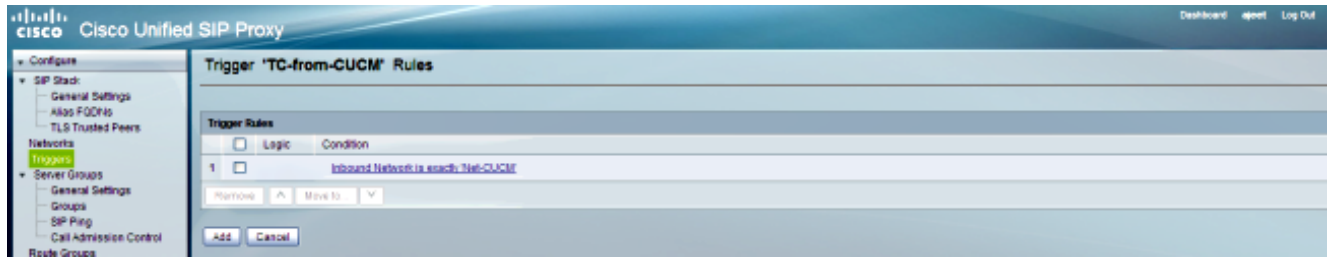
```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:373 util.Normalization -
Entering Normalization(moduleRequest:pre-normalize
)[REQUESTI.12] DEBUG 2013.02.28 00:34:03:373 conditions.RegexCondition -
inNetwork='Net-CUCM'
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:373 conditions.RegexCondition -
IN_NETWORK: Net-CUCM
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.AbstractRegexCondition -
pattern(^\\QNet-CUCM\\E$), toMatch(Net-CUCM) returning true
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 triggers.ModuleTrigger -
ModuleTrigger.eval() action<CUCM-Prefix-408> actionParameter<>
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 triggers.ModuleTrigger -
ModuleTrigger.eval() got the policy, executing it ...
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 normalization.
URIComponentNormalizationAlgorithm - normalizing request-uri
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 normalization.
URIComponentNormalizationAlgorithm -
updating user/phone of the sip:2022222@14.128.100.169:5061 to 408202222
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 util.Normalization -
Leaving Normalization.normalize()
```

4. 触发器条件(TC-from-CUCM)匹配。

CLI

```
!
trigger condition TC-from-CUCM
sequence 1
in-network ^\\QNet-CUCM\\E$
end sequence
end trigger condition
!
```

GUI



调试

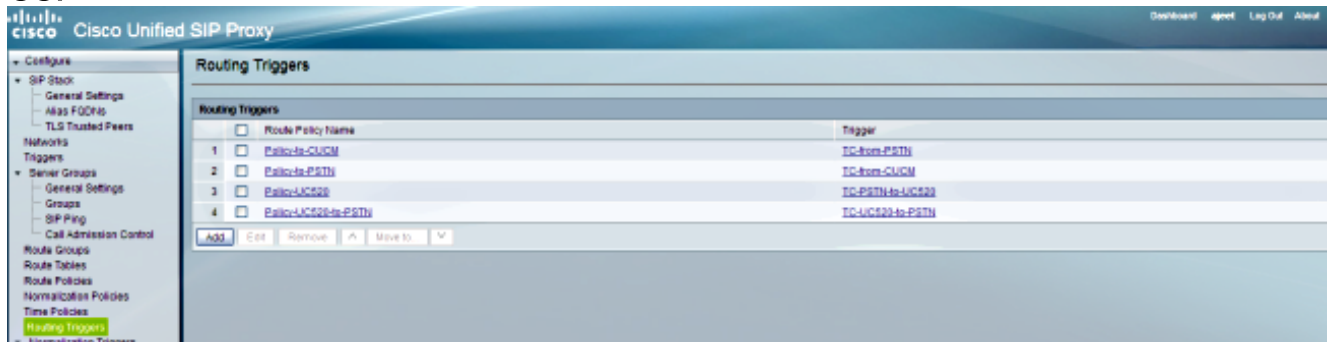
```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.RegexCondition -  
inNetwork='Net-CUCM'  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.RegexCondition -  
IN_NETWORK: Net-CUCM  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.AbstractRegexCondition -  
pattern(^\\QNet-CUCM\\E$), toMatch(Net-CUCM) returning true
```

5. 选中路由触发器配置以发现基于触发条件(TC-from-CUCM)匹配的路由策略 (策略到PSTN)。

CLI

```
trigger routing sequence 2 policy Policy-to-PSTN condition TC-from-CUCM
```

GUI



调试

```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.RegexCondition -  
inNetwork='Net-CUCM'  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.RegexCondition -  
IN_NETWORK: Net-CUCM  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:374 conditions.AbstractRegexCondition -  
pattern(^\\QNet-CUCM\\E$), toMatch(Net-CUCM) returning true  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 triggers.ModuleTrigger -  
ModuleTrigger.eval() action<Policy-to-PSTN> actionParameter<>  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 triggers.ModuleTrigger -  
ModuleTrigger.eval() got the policy, executing it ...
```

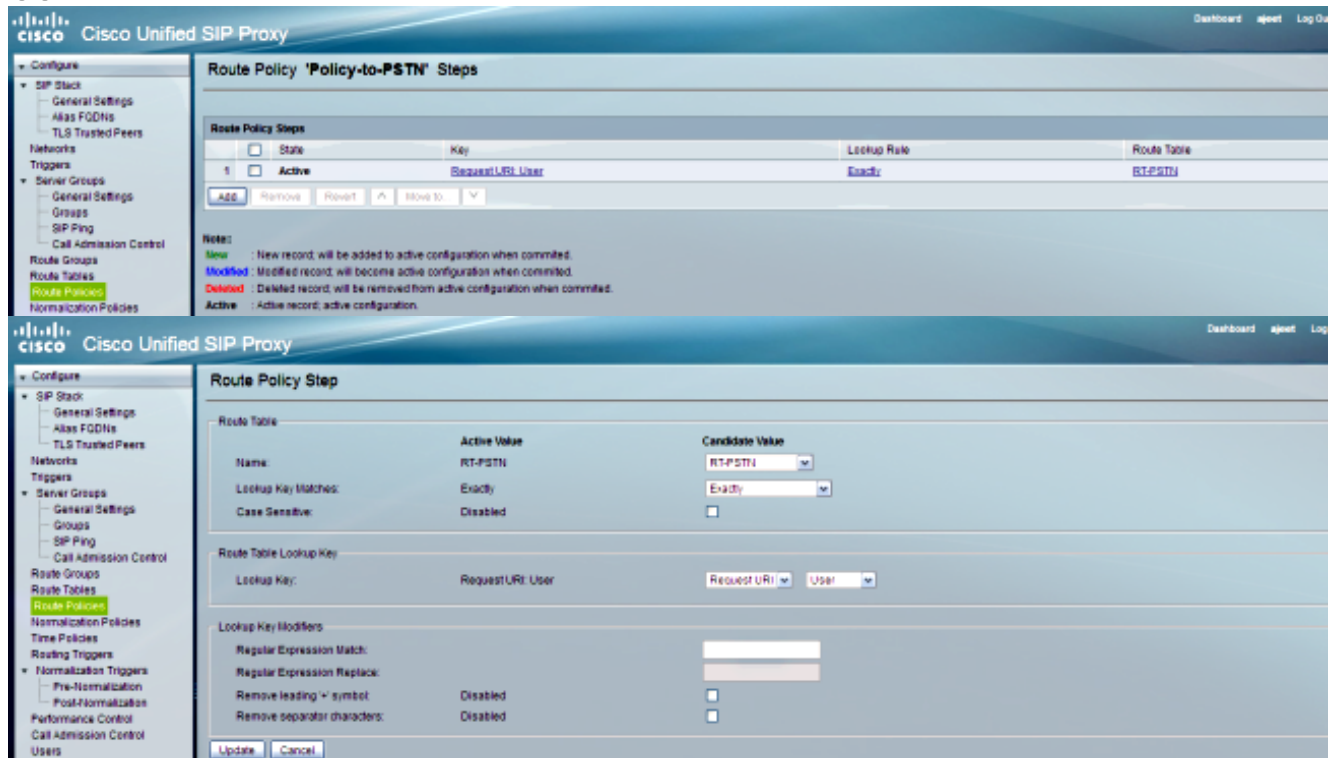
6. 选中路由策略 (策略到PSTN) 配置以查找匹配的路由表(RT-PSTN)。

CLI

```
!  
policy lookup Policy-to-PSTN  
sequence 100 RT-PSTN request-uri uri-component user  
rule exact  
end sequence
```

end policy
!

GUI



调试

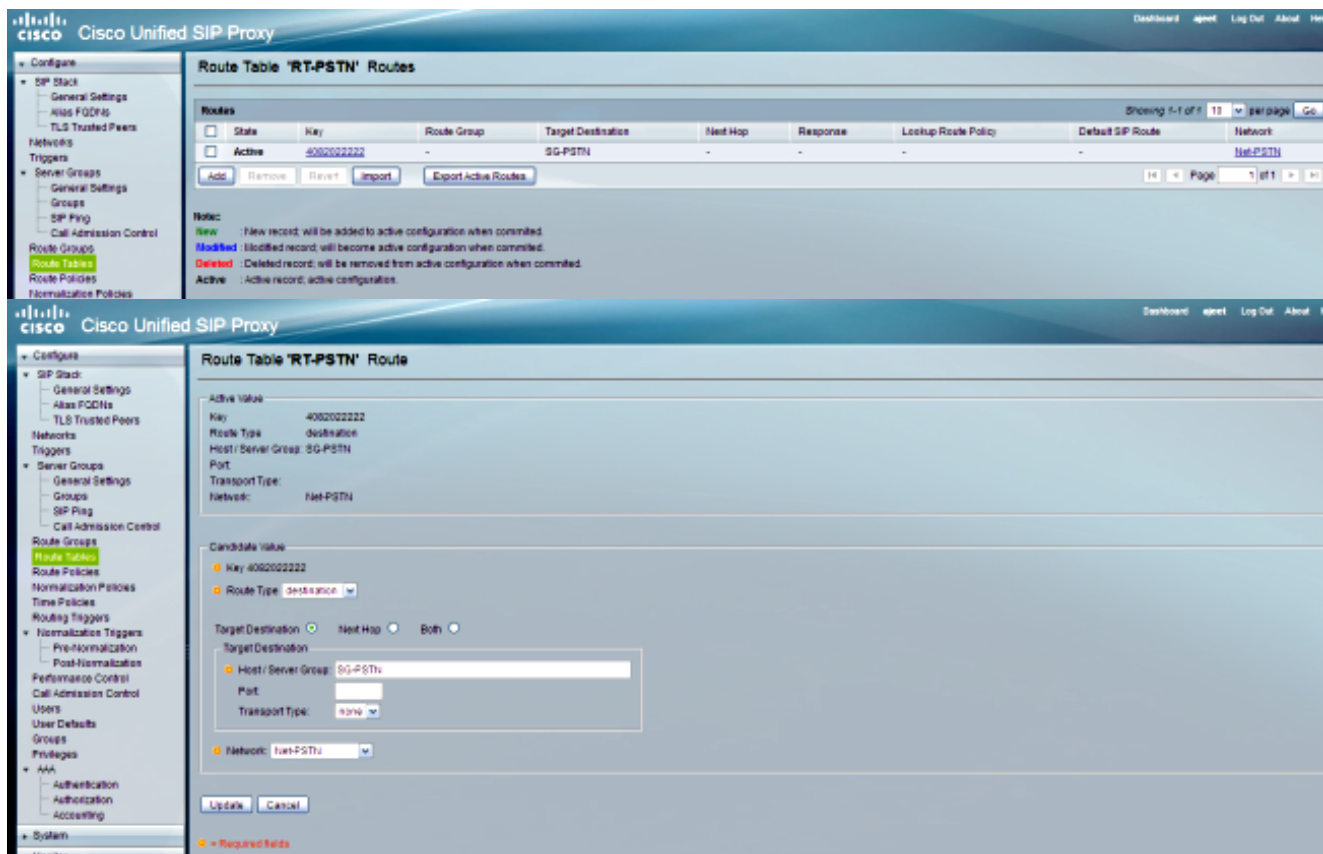
```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 nrs.XCLPrefix -  
Entering getKeyValue()  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 nrs.FieldSelector -  
getUriPart: URI - sip:4082022222@14.128.100.169:5061 part 6  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 nrs.FieldSelector -  
Requested field 45  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 nrs.FieldSelector -  
Returning key 4082022222  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 nrs.XCLPrefix -  
Leaving getKeyValue()  
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:375 modules.XCLLookup -  
table=RT-PSTN, key=4082022222  
[REQUESTI.12] INFO 2013.02.28 00:34:03:376 modules.XCLLookup -  
table is RT-PSTN
```

7. 检查路由表(RT-PSTN)配置以查找目标目标(SG-PSTN)。

CLI

```
!  
route table RT-PSTN  
key 4082022222 target-destination SG-PSTN Net-PSTN  
end route table  
!
```

GUI



调试

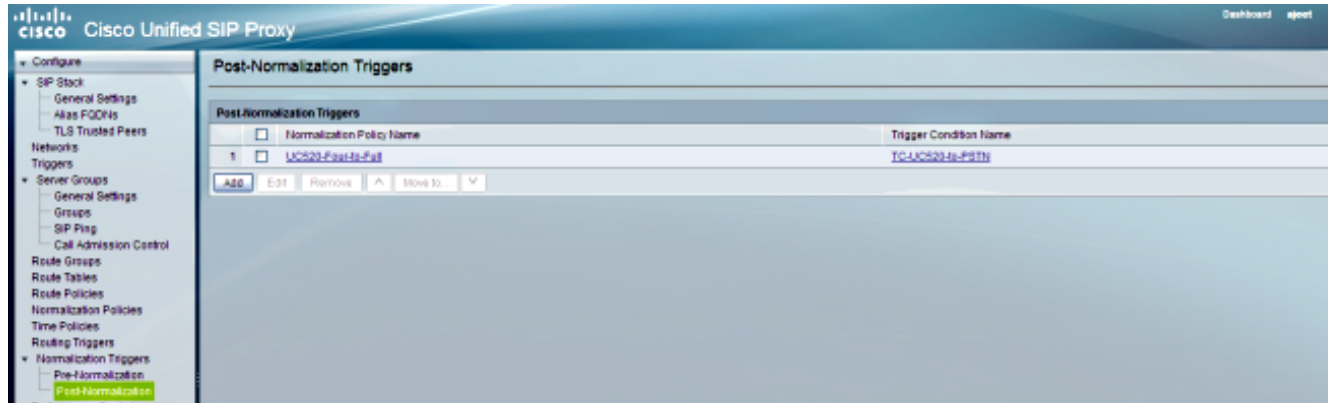
```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 routingtables.RoutingTable -
Entering lookup()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 routingtables.RoutingTable -
Looking up 4082022222 in table RT-PSTN with rule exact and modifiers=none
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 routingtables.RoutingTable -
Entering applyModifiers()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 routingtables.RoutingTable -
Leaving applyModifiers(), returning 4082022222
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 routingtables.RoutingTable -
Leaving lookup()
[REQUESTI.12] INFO 2013.02.28 00:34:03:376 nrs.XCLPrefix -
NRS Routing decision is: RouteTable:RT-PSTN, RouteKey:4082022222,
TargetDestination:SG-PSTN, Network:Net-PSTN
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 loadbalancer.LBFactory -
Entering createLoadBalancer()
[REQUESTI.12] INFO 2013.02.28 00:34:03:376 loadbalancer.LBFactory -
lbtype is 3(call-id)
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 loadbalancer.LBFactory -
Leaving createLoadBalancer()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 nrs.XCLPrefix -
Stored NRSAlgResult=isFound=true, isFailure=false, Response=-1,
Routes=[Ruri: SG-PSTN, Route: null, Network: Net-PSTN, q-value=1.
Oradvance=[502, 503]], PolicyAdvance=null
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 nrs.NRSAlgResult -
set policyAdvance as specified in route=RouteTable:RT-PSTN, RouteKey:4082022222,
TargetDestination:SG-PSTN, Network:Net-PSTN
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 nrs.NRSAlgResult -
no policyAdvance specified in route
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 nrs.NRSAlgResult -
set policyAdvance as specified in algorithm={lookuprule=0, lookupfield=45,
lookuptable=RT-PSTN, sequence=100, algorithm=1}
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:376 nrs.NRSAlgResult -
no policyAdvance specified in algorithm
```

8. 执行后规范化序列。

CLI

```
trigger post-normalization sequence 1 policy UC520-Four-to-Full
condition TC-UC520-to-PSTN
!
```

GUI



调试

```
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 util.Normalization -
Entering Normalization(moduleRequest:post-normalize)
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 conditions.RegexCondition -
inNetwork='Net-CUCM'
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 conditions.RegexCondition -
IN_NETWORK: Net-CUCM
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 conditions.AbstractRegexCondition -
pattern(^\\QNet-From-UC520\\E$), toMatch(Net-CUCM) returning false
[REQUESTI.12] INFO 2013.02.28 00:34:03:378 util.Normalization -
skipping post-normalize, due to either no trigger is configured or triggers
did not evaluate to true or is configured to by-pass
```

9. 检查服务器组(SG-PSTN)配置以查找元素IP地址，并根据Q值和权重配置将呼叫路由到可能的最佳路由。

CLI

```
!
server-group sip group SG-PSTN Net-PSTN
element ip-address 14.128.100.150 5060 udp q-value 1.0 weight 0
failover-resp-codes 503
lbtype global
ping
end server-group
!
```

GUI



调试


```

[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 loadbalancer.LBFactory -
Entering createLoadBalancer()
[REQUESTI.12] INFO 2013.02.28 00:34:03:378 loadbalancer.LBFactory -
lbtype is 0(global)
[REQUESTI.12] INFO 2013.02.28 00:34:03:378 loadbalancer.LBFactory -
Default lbtype is 3(call-id)
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 loadbalancer.LBFactory -
Leaving createLoadBalancer()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 loadbalancer.LBBase -
Entering getServer()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 loadbalancer.LBBase -
Entering initializeDomains()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 servergroups.
ServerGlobalStateWrapper - Net-PSTN:14.128.100.150:5060:1 numTries=
2--->isServerAvailable(): true
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 loadbalancer.LBBase -
Leaving initializeDomains()
[REQUESTI.12] INFO 2013.02.28 00:34:03:378 loadbalancer.LBHashBased -
list of elements in order on which load balancing is done :
{reSgElementWeight=0, reSgElementSgName=SG-PSTN, reSgElementTransport=UDP,
reSgElementQValue=1.0, reSgElementPort=5060, reSgElementHost=14.128.100.150}
, [REQUESTI.12] DEBUG 2013.02.28 00:34:03:378 servergroups.AbstractNextHop -
Entering compareDomainNames()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:379 servergroups.AbstractNextHop -
Leaving compareDomainNames()
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:379 loadbalancer.LBBase -
Server group SG-PSTN selected {reSgElementWeight=0, reSgElementSgName=SG-PSTN,
reSgElementTransport=UDP, reSgElementQValue=1.0, reSgElementPort=5060,
reSgElementHost=14.128.100.150}
[REQUESTI.12] DEBUG 2013.02.28 00:34:03:379 loadbalancer.LBBase -
Leaving getServer()

```

10. SIP INVITE将发送到所选元素。

```

[CT_CALLBACK.13] DEBUG 2013.02.28 00:34:06:260 DsSipLlApi.Wire -
Sending UDP packet on 14.128.100.169:32772, destination 14.128.64.192:
5060SIP/2.0 200 OK
Via: SIP/2.0/UDP 14.128.64.192:5060;branch=z9hG4bK18012ae333f
To: <sip:2022222@14.128.100.169>;tag=82FA7450-F53
From: "SJ Phone 1" <sip:2001@14.128.64.192>
;tag=534264~clb77ee1-4af9-4a41-aed3-3846cd699427-49616146
Contact: <sip:4082022222@14.128.100.150:5060>
Require: timer
Remote-Party-ID: <sip:4082022222@14.128.100.150>
;party=called;screen=no;privacy=off
Call-ID: 8be55500-12e1a5fb-ab-c040800e@14.128.64.192
CSeq: 101 INVITE
Content-Length: 276
Date: Thu, 28 Feb 2013 00:34:03 GMT
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
Allow-Events: telephone-event
Supported: replaces
Supported: sdp-anat
Supported: timer
Server: Cisco-SIPGateway/IOS-12.x
Session-Expires: 1800;refresher=uac
Content-Type: application/sdp
Content-Disposition: session;handling=required

v=0
o=CiscoSystemsSIP-GW-UserAgent 6810 2753 IN IP4 14.128.100.150
s=SIP Call
c=IN IP4 14.128.100.150

```

```
t=0 0
m=audio 16862 RTP/AVP 18 101
c=IN IP4 14.128.100.150
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
a=ptime:20
```

场景 3

呼叫流:IP电话1 - CME 1 - SIP - CUSP - SIP - CME 2 - IP电话2

从IP电话1拨打4001或4002，以访问IP电话2上的分机。

在此场景中，CME 2是UC520，而CME 1充当PSTN。

1. SIP INVITE从CME 1(PSTN)进入CUSP。

```
[DsTransportListener-3] DEBUG 2013.02.28 05:28:57:360 DsSipLlApi.Wire -
Received UDP packet on 14.128.100.169:5062 ,source 14.128.100.150:56578
INVITE sip:4002@14.128.100.169:5062 SIP/2.0
Via: SIP/2.0/UDP 14.128.100.150:5060;branch=z9hG4bK2292567
Remote-Party-ID: <sip:85224044444@14.128.100.150>
;party=calling;screen=no;privacy=off
From: <sip:85224044444@14.128.100.150>;tag=84086F7C-10B8
To: <sip:4002@14.128.100.169>
Date: Thu, 28 Feb 2013 05:28:57 GMT
Call-ID: 9559E957-809E11E2-9856EC62-1B7185EE@14.128.100.150
Supported: 100rel,timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Cisco-Guid: 2446255913-2157842914-2555505762-0460424686
User-Agent: Cisco-SIPGateway/IOS-12.x
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
CSeq: 101 INVITE
Max-Forwards: 70
Timestamp: 1362029337
Contact: <sip:85224044444@14.128.100.150:5060>
Expires: 180
Allow-Events: telephone-event
Content-Type: application/sdp
Content-Disposition: session;handling=required
Content-Length: 276
```

```
v=0
o=CiscoSystemsSIP-GW-UserAgent 3653 4016 IN IP4 14.128.100.150
s=SIP Call
c=IN IP4 14.128.100.150
t=0 0
m=audio 19202 RTP/AVP 18 101
c=IN IP4 14.128.100.150
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
a=ptime:20
```

--- end of packet ---

2. 在匹配的网络(Net-UC520)配置上接受呼叫。

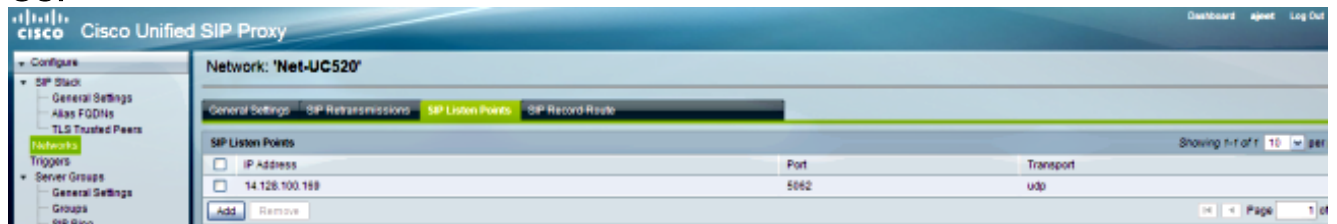
CLI

```
sip listen Net-UC520 udp 14.128.100.169 5062

!
sip network Net-From-UC520 standard
no non-invite-provisional
allow-connections
retransmit-count invite-client-transaction 3
retransmit-count invite-server-transaction 5
retransmit-count non-invite-client-transaction 3
retransmit-timer T1 500
retransmit-timer T2 4000
retransmit-timer T4 5000
retransmit-timer TU1 5000
retransmit-timer TU2 32000
retransmit-timer clientTn 64000
retransmit-timer serverTn 64000
tcp connection-setup-timeout 1000
udp max-datagram-size 1500
end network

!
```

GUI



调试

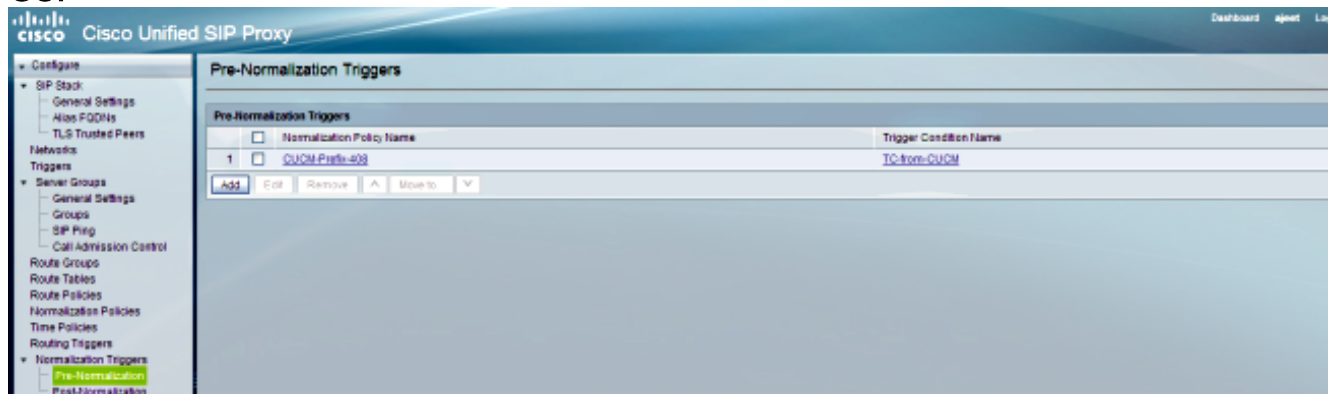
```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:362 conditions.RegexCondition -
inNetwork='Net-UC520'
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:362 conditions.RegexCondition -
IN_NETWORK: Net-UC520
```

3. 执行预规范化序列。

CLI

```
trigger pre-normalization sequence 1 policy CUCM-Prefix-408 condition
TC-from-CUCM
```

GUI



调试

```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:362 util.Normalization -
```

```

Entering Normalization(moduleRequest:pre-normalize)
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:362 conditions.RegexCondition -
inNetwork='Net-UC520'
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:362 conditions.RegexCondition -
IN_NETWORK: Net-UC520
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:362 conditions.AbstractRegexCondition -
pattern(`\QNet-CUCM\E$), toMatch(Net-UC520) returning false
[REQUESTI.10] INFO 2013.02.28 05:28:57:362 util.Normalization -
skipping pre-normalize, due to either no trigger is configured or triggers
did not evaluate to true or is configured to by-pass

```

4. 触发器条件 (TC-PSTN到UC520) 匹配。

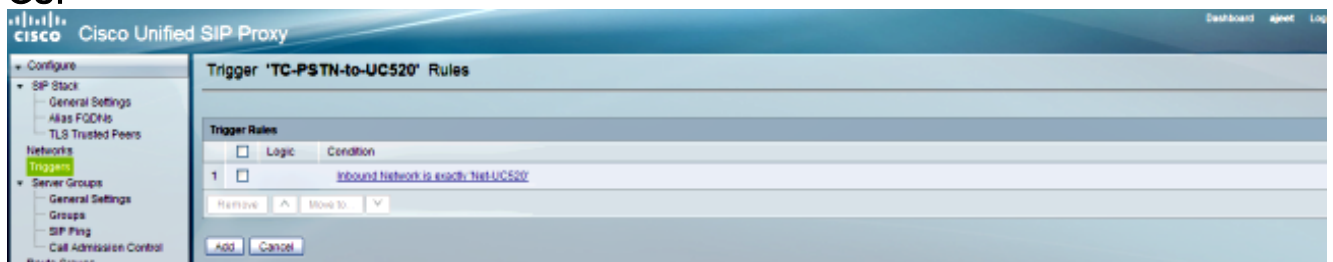
CLI

```

!
trigger condition TC-PSTN-to-UC520
sequence 1
in-network ^\QNet-UC520\E$
end sequence
end trigger condition
!

```

GUI



调试

```

[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 conditions.RegexCondition -
inNetwork='Net-UC520'
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 conditions.RegexCondition -
IN_NETWORK: Net-UC520
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 conditions.AbstractRegexCondition -
pattern(`\QNet-UC520\E$), toMatch(Net-UC520) returning true

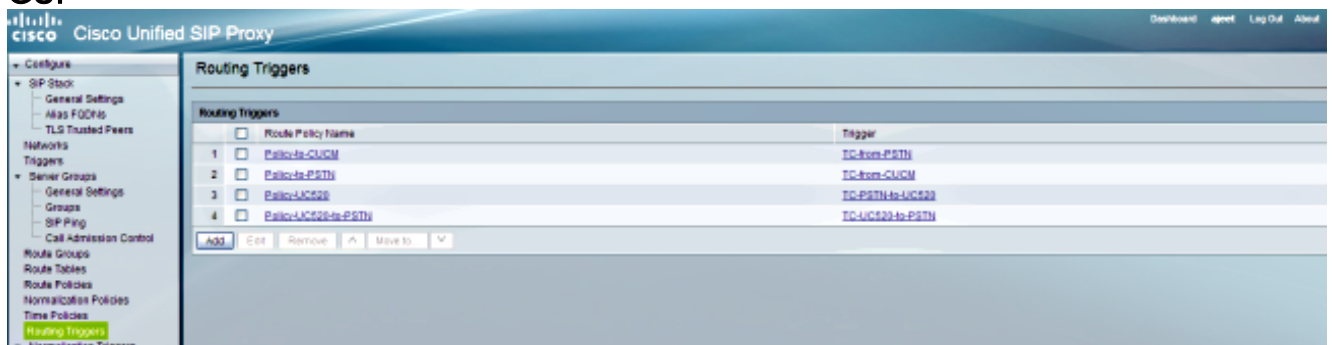
```

5. 选中路由触发器配置以查找基于触发条件 (TC-PSTN到UC520) 匹配的路由策略(Policy-UC520)。

CLI

```
trigger routing sequence 3 policy Policy-UC520 condition TC-PSTN-to-UC520
```

GUI



调试

```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 triggers.ModuleTrigger -
ModuleTrigger.eval() action<Policy-UC520> actionParameter<>
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 triggers.ModuleTrigger -
ModuleTrigger.eval() got the policy, executing it ...
```

6. 检查路由策略(Policy-UC520)配置以查找匹配的路由表(RT-UC520)。

CLI

```
!
policy lookup Policy-UC520
sequence 100 RT-UC520 request-uri uri-component user
modify-key 400[12] 2222
rule exact
end sequence
end policy
!
```

GUI

The top screenshot shows the 'Route Policy 'Policy-UC520' Steps' configuration page. It features a table with columns for 'State', 'Key', 'Lookup Rule', and 'Route Table'. A single step is listed with 'Active' state, key 'Request URI User', lookup rule 'Exact', and route table 'RT-UC520'. Below the table are buttons for 'Add', 'Remove', 'Reset', and 'Move to'. A note section explains the status of records.

The bottom screenshot shows the 'Route Policy Step' configuration page. It displays the following settings:

- Route Table: Name: RT-UC520, Candidate Value: RT-UC520
- Lookup Key Matches: Exactly
- Case Sensitive: Disabled
- Route Table Lookup Key: Lookup Key: Request URI User, Request URI: RequestURI, User: User
- Lookup Key Modifiers: Regular Expression Match: 400[12], Candidate Value: 400[12]; Regular Expression Replace: 2222, Candidate Value: 2222; Remove leading '+' symbol: Disabled; Remove separator characters: Disabled.

调试

```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.XCLPrefix -
Entering getKeyValue()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.FieldSelector -
getUriPart: URI - sip:4002@14.128.100.169:5062 part 6
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.FieldSelector -
Requested field 45
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.FieldSelector -
Returning key 4002
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.FieldSelector -
Retrieved Modifier RegexModifier: match= 400[12], replace= 2222,
ignore case= false
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.FieldSelector -
Input field: 4002
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.FieldSelector -
Modified field: 2222
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 nrs.XCLPrefix -
```

```

Leaving getKeyValue()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:363 modules.XCLLookup -
table=RT-UC520, key=2222
[REQUESTI.10] INFO 2013.02.28 05:28:57:364 modules.XCLLookup -
table is RT-UC520

```

7. 检查路由表(RT-UC520)配置以查找目标目标(RG-UC520)。

CLI

```

!
route table RT-UC520
key 2222 group RG-UC520
end route table
!

```

GUI

The top screenshot shows the 'Route Table 'RT-UC520' Routes' configuration page. It features a table with columns: State, Key, Route Group, Target Destination, Next Hop, Response, Lookup Route Policy, Default SIP Route, and Network. A single route is listed with Key '2222' and Route Group 'RG-UC520'. Below the table are buttons for 'Add', 'Remove', 'Reset', 'Import', and 'Export Active Routes'. A 'Note' section explains the status of records: New (added to active), Modified (becomes active), Deleted (removed from active), and Active (active configuration).

The bottom screenshot shows the 'Route Table 'RT-UC520' Route' configuration page. It displays the 'Active Value' section with fields for Key (2222), Route Type (route-group), and Route Group (RG-UC520). Below is the 'Candidate Value' section with dropdown menus for Key (2222), Route Type (route-group), and Route Group (RG-UC520). 'Update' and 'Cancel' buttons are at the bottom.

调试

```

[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 routingtables.RoutingTable -
Entering lookup()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 routingtables.RoutingTable -
Looking up 2222 in table RT-UC520 with rule exact and modifiers=none
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 routingtables.RoutingTable -
Entering applyModifiers()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 routingtables.RoutingTable -
Leaving applyModifiers(), returning 2222
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 routingtables.RoutingTable -
Leaving lookup()
[REQUESTI.10] INFO 2013.02.28 05:28:57:364 nrs.XCLPrefix -
NRS Routing decision is: RouteTable:RT-UC520, RouteKey:2222, RouteGroup:RG-UC520
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 loadbalancer.LBFactory -
Entering createLoadBalancer()
[REQUESTI.10] INFO 2013.02.28 05:28:57:364 loadbalancer.LBFactory -
lbtype is 3(call-id)
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 loadbalancer.LBFactory -
Leaving createLoadBalancer()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 nrs.XCLPrefix -
Stored NRSAlgResult=isFound=true, isFailure=false, Response=-1,
Routes=[Ruri: SG-UC520, Route: null, Network: Net-UC520, q-value=1.
OrAdvance=[502, 503]], PolicyAdvance=null
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 nrs.NRSAlgResult -
set policyAdvance as specified in route=RouteTable:RT-UC520, RouteKey:2222,

```

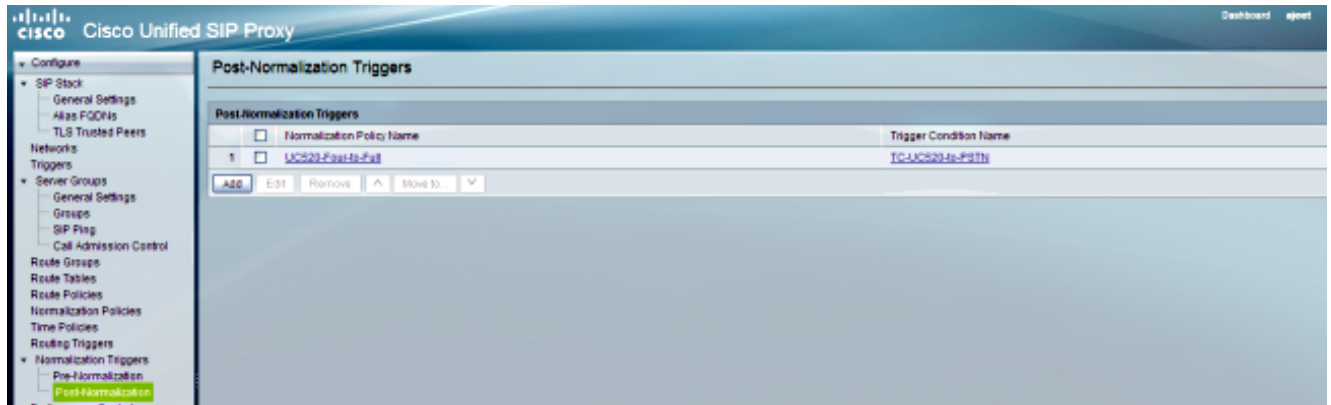
```
RouteGroup:RG-UC520
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 nrs.NRSAlgResult -
no policyAdvance specified in route
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 nrs.NRSAlgResult -
set policyAdvance as specified in algorithm={lookupkeymodifier=
[ RegexModifier: match= 400[12], replace= 2222, ignore case= false],
lookuprule=0, lookupfield=45, lookuplenght=-1, lookuptable=RT-UC520,
sequence=100, algorithm=1}
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:364 nrs.NRSAlgResult -
no policyAdvance specified in algorithm
```

8. 执行后规范化序列。

CLI

```
trigger post-normalization sequence 1 policy UC520-Four-to-Full
condition TC-UC520-to-PSTN
```

GUI



调试

```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 util.Normalization -
Entering Normalization(moduleRequest:post-normalize)
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 conditions.RegexCondition -
inNetwork='Net-UC520'
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 conditions.RegexCondition -
IN_NETWORK: Net-UC520
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 conditions.AbstractRegexCondition -
pattern(^\\QNet-From-UC520\\E$), toMatch(Net-UC520) returning false
[REQUESTI.10] INFO 2013.02.28 05:28:57:365 util.Normalization -
skipping post-normalize, due to either no trigger is configured or
triggers did not evaluate to true or is configured to by-pass
```

9. 检查路由组配置以查找元素IP地址，并根据Q值和权重设置将呼叫路由到可能的最佳路由。

CLI

```
!
route group RG-UC520
element target-destination SG-UC520 Net-UC520 q-value 1.0
failover-codes 502 - 503
weight 0
end element
end route
!

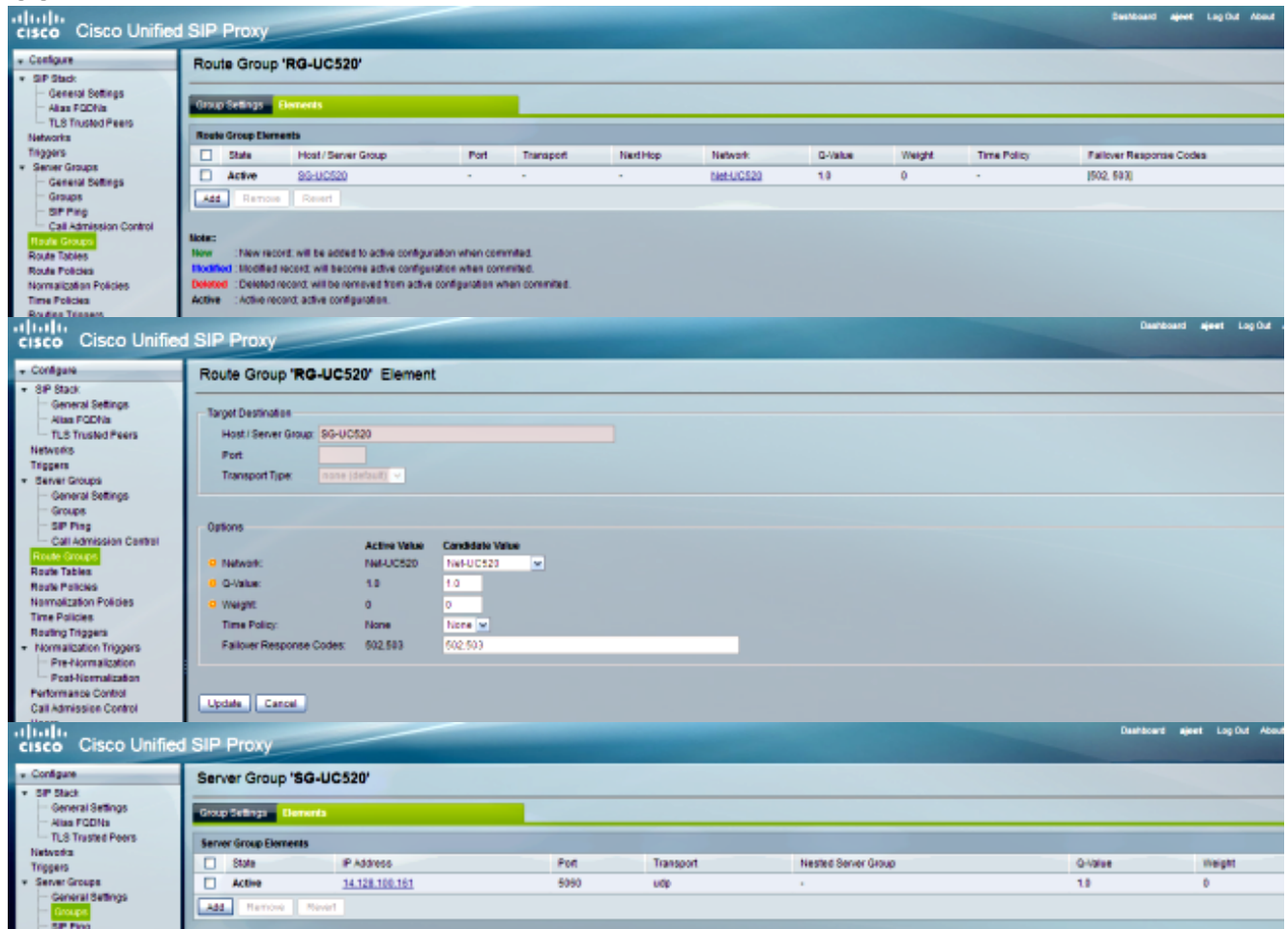
!
server-group sip group SG-UC520 Net-UC520
element ip-address 14.128.100.161 5060 udp q-value 1.0 weight 0
```

```

failover-resp-codes 503
lbtype global
ping
end server-group
!

```

GUI



调试

```

[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 loadbalancer.LBFactory -
Entering createLoadBalancer()
[REQUESTI.10] INFO 2013.02.28 05:28:57:365 loadbalancer.LBFactory -
lbtype is 0(global)
[REQUESTI.10] INFO 2013.02.28 05:28:57:365 loadbalancer.LBFactory -
Default lbtype is 3(call-id)
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 loadbalancer.LBFactory -
Leaving createLoadBalancer()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 loadbalancer.LBBase -
Entering getServer()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 loadbalancer.LBBase -
Entering initializeDomains()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:365 servergroups.
ServerGlobalStateWrapper - Net-UC520:14.128.100.161:5060:1 numTries=
2--->isServerAvailable(): true
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:366 loadbalancer.LBBase -
Leaving initializeDomains()
[REQUESTI.10] INFO 2013.02.28 05:28:57:366 loadbalancer.LBHashBased -
list of elements in order on which load balancing is done :
{reSgElementWeight=0, reSgElementSgName=SG-UC520, reSgElementTransport=UDP,
reSgElementQValue=1.0, reSgElementPort=5060, reSgElementHost=14.128.100.161},
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:366 servergroups.AbstractNextHop -
Entering compareDomainNames()

```



```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:366 servergroups.AbstractNextHop -
Leaving compareDomainNames()
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:366 loadbalancer.LBBase -
Server group SG-UC520 selected {reSgElementWeight=0, reSgElementSgName=SG-UC520,
reSgElementTransport=UDP, reSgElementQValue=1.0, reSgElementPort=5060,
reSgElementHost=14.128.100.161}
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:366 loadbalancer.LBBase -
Leaving getServer()
```

10. SIP INVITE将发送到所选元素。

```
[REQUESTI.10] DEBUG 2013.02.28 05:28:57:367 DsSipLlApi.Wire -
Sending UDP packet on 14.128.100.169:32773, destination 14.128.100.161:5060
INVITE sip:4002@SG-UC520 SIP/2.0
Via: SIP/2.0/UDP
14.128.100.169:5062;branch=z9hG4bK.ToYJFeKMyfZGySv.gcLjg~~237
Via: SIP/2.0/UDP 14.128.100.150:5060;branch=z9hG4bK2292567
Max-Forwards: 69
To: <sip:4002@14.128.100.169>
From: <sip:85224044444@14.128.100.150>;tag=84086F7C-10B8
Contact: <sip:85224044444@14.128.100.150:5060>
Expires: 180
Remote-Party-ID: <sip:85224044444@14.128.100.150>
;party=calling;screen=no;privacy=off
Call-ID: 9559E957-809E11E2-9856EC62-1B7185EE@14.128.100.150
CSeq: 101 INVITE
Content-Length: 276
Date: Thu, 28 Feb 2013 05:28:57 GMT
Supported: 100rel,timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Cisco-Guid: 2446255913-2157842914-2555505762-0460424686
User-Agent: Cisco-SIPGateway/IOS-12.x
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
Timestamp: 1362029337
Allow-Events: telephone-event
Content-Type: application/sdp
Content-Disposition: session;handling=required

v=0
o=CiscoSystemsSIP-GW-UserAgent 3653 4016 IN IP4 14.128.100.150
s=SIP Call
c=IN IP4 14.128.100.150
t=0 0
m=audio 19202 RTP/AVP 18 101
c=IN IP4 14.128.100.150
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
a=ptime:20
```

场景 4

呼叫流：IP电话1 — CME 1 — SIP — CUSP — SIP — CME 2 — IP电话2

从IP电话2拨打444，该电话已更改为415 240 4444（带后规范化），以便访问IP电话1。

在此场景中，CME 2是UC520，而CME 1充当PSTN。

1. SIP邀请从CME 2(UC520)进入CUSP。

```
[DsTransportListener-1] DEBUG 2013.02.28 07:06:57:220 DsSipLlApi.Wire -
Received UDP packet on 14.128.100.169:5063 ,source 14.128.100.161:59404
INVITE sip:4444@14.128.100.169:5063 SIP/2.0
Date: Thu, 28 Feb 2013 07:09:20 GMT
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
From: <sip:4001@14.128.100.161>;tag=256D566C-22AC
Allow-Events: telephone-event
Supported: 100rel,timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Remote-Party-ID: <sip:4001@14.128.100.161>
;party=calling;screen=no;privacy=off
Cisco-Guid: 2598740490-2158760418-2150671243-2598404062
Timestamp: 1362035360
Content-Length: 543
User-Agent: Cisco-SIPGateway/IOS-12.x
To: <sip:4444@14.128.100.169>
Contact: <sip:4001@14.128.100.161:5060>
Expires: 180
Content-Type: multipart/mixed;boundary=uniqueBoundary
Call-ID: 9B62C157-80AC11E2-8035A38B-9AE07FDE@14.128.100.161
Via: SIP/2.0/UDP 14.128.100.161:5060;branch=z9hG4bK21E82
CSeq: 101 INVITE
Max-Forwards: 70
Mime-Version: 1.0
```

```
--uniqueBoundary
Content-Type: application/sdp
Content-Disposition: session;handling=required
```

```
v=0
o=CiscoSystemsSIP-GW-UserAgent 3418 2914 IN IP4 14.128.100.161
s=SIP Call
c=IN IP4 14.128.100.161
t=0 0
m=audio 17618 RTP/AVP 18 101
c=IN IP4 14.128.100.161
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
a=ptime:20
```

```
--uniqueBoundary
Content-Type: application/gtd
Content-Disposition: signal;handling=optional
```

```
IAM,
GCI,9ae5a20a80ac11e28030a38b9ae07fde
```

```
--- end of packet ---
```

2. 在匹配的网络(Net-From-UC520)配置上接受呼叫。

CLI

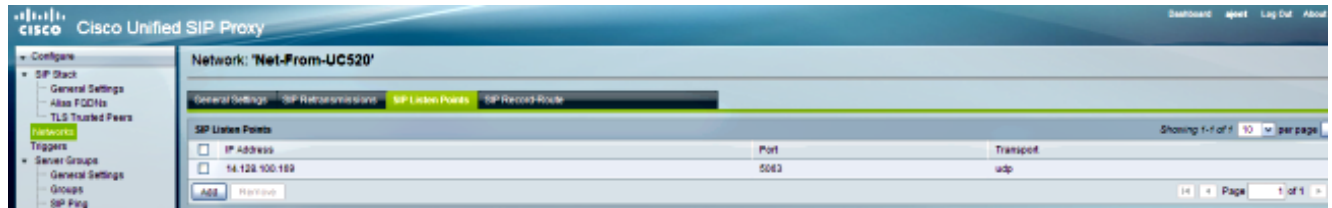
```
sip listen Net-From-UC520 udp 14.128.100.169 5063
!
sip network Net-From-UC520 standard
no non-invite-provisional
allow-connections
retransmit-count invite-client-transaction 3
```

```

retransmit-count invite-server-transaction 5
retransmit-count non-invite-client-transaction 3
retransmit-timer T1 500
retransmit-timer T2 4000
retransmit-timer T4 5000
retransmit-timer TU1 5000
retransmit-timer TU2 32000
retransmit-timer clientTn 64000
retransmit-timer serverTn 64000
tcp connection-setup-timeout 1000
udp max-datagram-size 1500
end network
!

```

GUI



调试

```

[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.RegexCondition -
inNetwork='Net-From-UC520'
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.RegexCondition -
IN_NETWORK: Net-From-UC520

```

3. 执行预规范化序列。

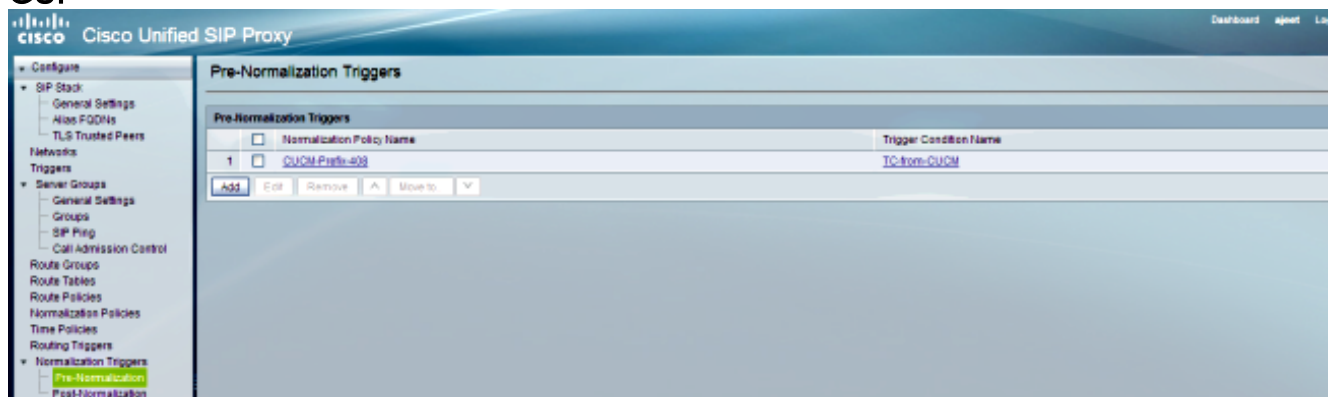
CLI

```

trigger pre-normalization sequence 1 policy CUCM-Prefix-408 condition
TC-from-CUCM

```

GUI



调试

```

[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 util.Normalization -
Entering Normalization(moduleRequest:pre-normalize)
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.RegexCondition -
inNetwork='Net-From-UC520'
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.RegexCondition -
IN_NETWORK: Net-From-UC520
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.AbstractRegexCondition -
pattern(^\\QNet-CUCM\\E$), toMatch(Net-From-UC520) returning false
[REQUESTI.5] INFO 2013.02.28 07:06:57:229 util.Normalization -
skipping pre-normalize, due to either no trigger is configured or triggers
did not evaluate to true or is configured to by-pass

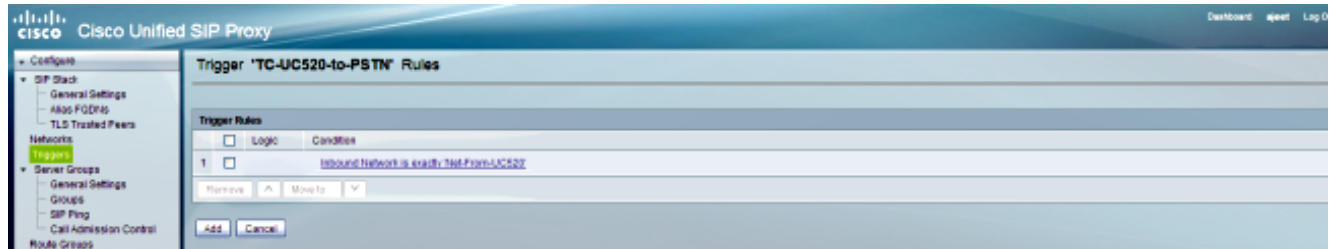
```

4. 触发器条件 (TC-UC520到PSTN) 匹配。

CLI

```
!  
trigger condition TC-UC520-to-PSTN  
sequence 1  
in-network ^\QNet-From-UC520\E$  
end sequence  
end trigger condition  
!
```

GUI



调试

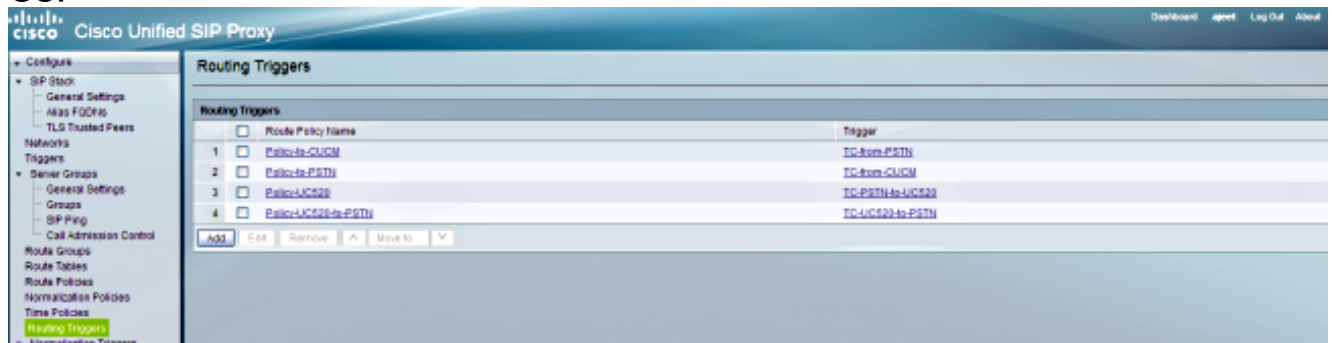
```
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.RegexCondition -  
inNetwork='Net-From-UC520'  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:229 conditions.RegexCondition -  
IN_NETWORK: Net-From-UC520  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 conditions.AbstractRegexCondition -  
pattern(^\\QNet-From-UC520\\E$), toMatch(Net-From-UC520) returning true
```

5. 选中路由触发器配置以查找基于触发条件(TC-UC520-to-PSTN)匹配的路由策略(Policy-UC520-to-PSTN)。

CLI

```
trigger routing sequence 4 policy Policy-UC520-to-PSTN condition  
TC-UC520-to-PSTN
```

GUI



调试

```
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 triggers.ModuleTrigger -  
ModuleTrigger.eval() action<Policy-UC520-to-PSTN> actionParameter<>  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 triggers.ModuleTrigger -  
ModuleTrigger.eval() got the policy, executing it ...
```

6. 选中路由策略(Policy-UC520-to-PSTN)配置以查找匹配的路由表(RT-UC520-PSTN)。

CLI

```

!
policy lookup Policy-UC520-to-PSTN
sequence 100 RT-UC520-PSTN request-uri uri-component user
modify-key 4444 3333
rule exact
end sequence
end policy
!

```

GUI



调试

```

[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.XCLPrefix -
Entering getKeyValue()
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.FieldSelector -
getUriPart: URI - sip:4444@14.128.100.169:5063 part 6
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.FieldSelector -
Requested field 45
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.FieldSelector -
Returning key 4444
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.FieldSelector -
Retrieved Modifier RegexModifier: match= 4444, replace= 3333,
ignore case= false
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.FieldSelector -
Input field: 4444
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.FieldSelector -
Modified field: 3333
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 nrs.XCLPrefix -
Leaving getKeyValue()
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 modules.XCLLookup -
table=RT-UC520-PSTN, key=3333
[REQUESTI.5] INFO 2013.02.28 07:06:57:230 modules.XCLLookup -
table is RT-UC520-PSTN

```

7. 检查路由表(RT-UC520-PSTN)配置以查找目标目标(RG-UC520)。

CLI

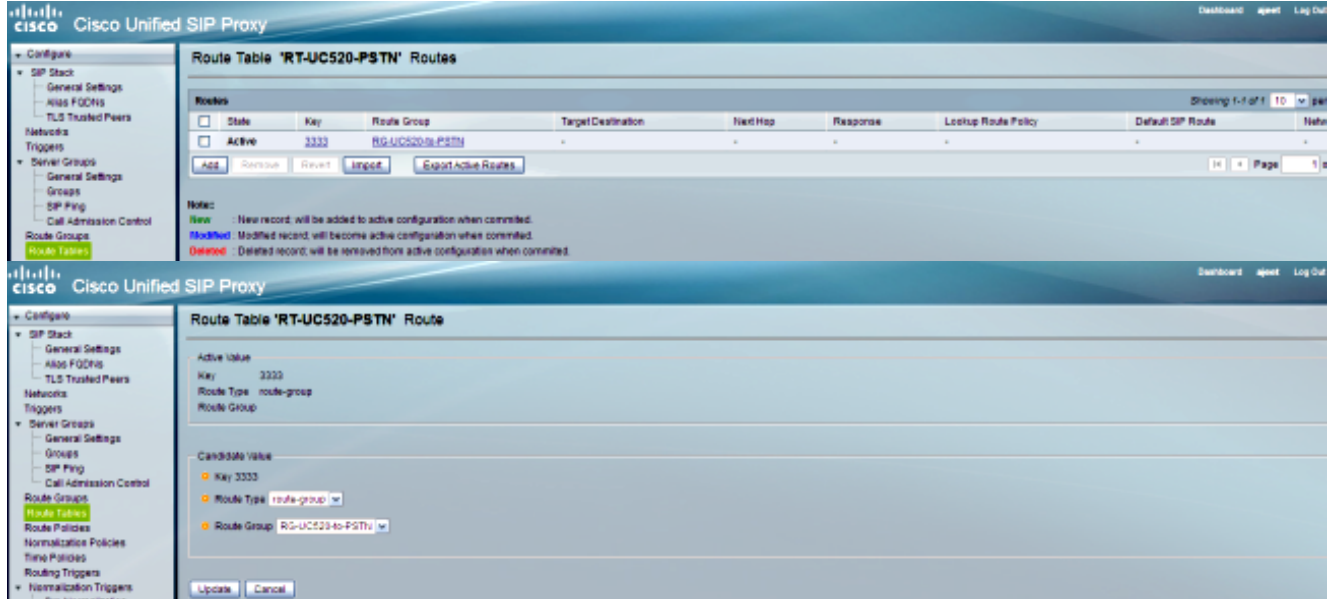
```

!
route table RT-UC520-PSTN
key 3333 group RG-UC520-to-PSTN

```

end route table
!

GUI



调试

```
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:230 routingtables.RoutingTable -  
Entering lookup()  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 routingtables.RoutingTable -  
Looking up 3333 in table RT-UC520-PSTN with rule exact and modifiers=none  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 routingtables.RoutingTable -  
Entering applyModifiers()  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 routingtables.RoutingTable -  
Leaving applyModifiers(), returning 3333  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 routingtables.RoutingTable -  
Leaving lookup()  
[REQUESTI.5] INFO 2013.02.28 07:06:57:231 nrs.XCLPrefix -  
NRS Routing decision is: RouteTable:RT-UC520-PSTN, RouteKey:3333,  
RouteGroup:RG-UC520-to-PSTN  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 loadbalancer.LBFactory -  
Entering createLoadBalancer()  
[REQUESTI.5] INFO 2013.02.28 07:06:57:231 loadbalancer.LBFactory -  
lotype is 3(call-id)  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 loadbalancer.LBFactory -  
Leaving createLoadBalancer()  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.XCLPrefix -  
Stored NRSAlgResult=isFound=true, isFailure=false, Response=-1,  
Routes=[Ruri: 14.128.100.150, Route: null, Network: Net-From-UC520,  
q-value=1.0radvance=[502, 503]], PolicyAdvance=null  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.NRSAlgResult -  
set policyAdvance as specified in route=RouteTable:RT-UC520-PSTN,  
RouteKey:3333, RouteGroup:RG-UC520-to-PSTN  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.NRSAlgResult -  
no policyAdvance specified in route  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.NRSAlgResult -  
set policyAdvance as specified in algorithm={lookupkeymodifier=  
[RegexModifier: match= 4444, replace= 3333, ignore case= false],  
lookuprule=0, lookupfield=45, lookuplength=-1, lookuptable=RT-UC520-PSTN,  
sequence=100, algorithm=1}  
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.NRSAlgResult -  
no policyAdvance specified in algorithm
```

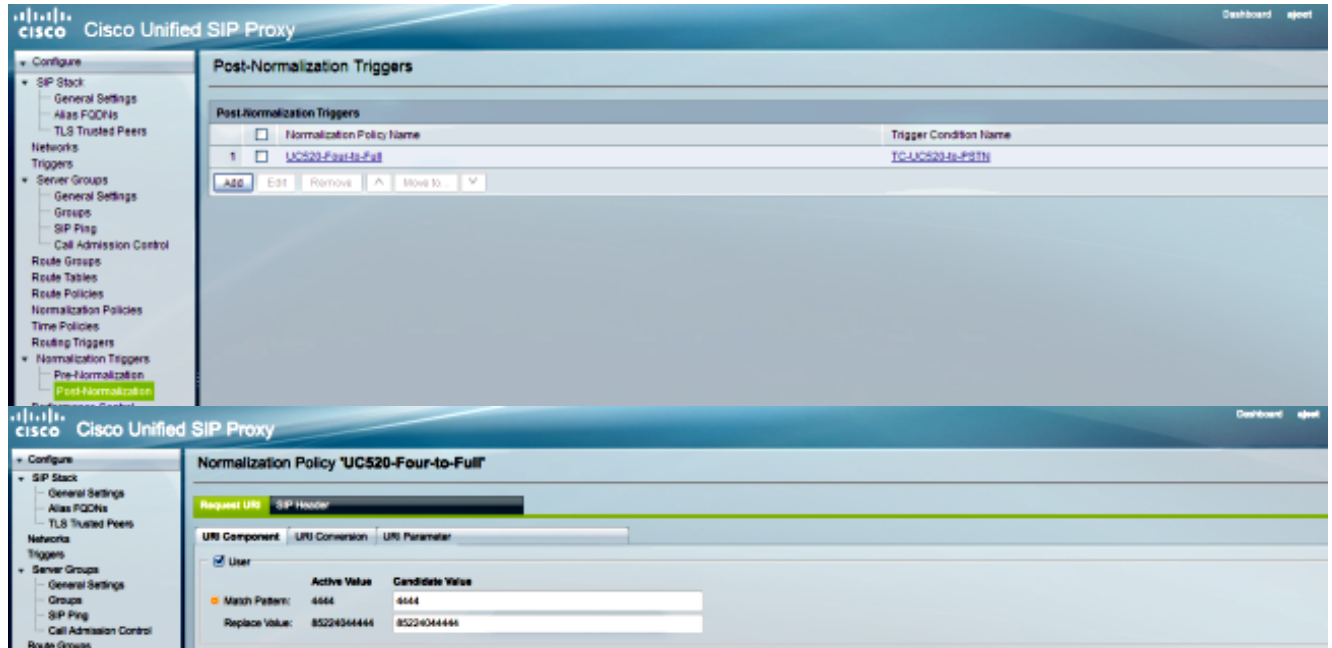
8. 执行后规范化序列。

CLI

```
trigger post-normalization sequence 1 policy UC520-Four-to-Full
condition TC-UC520-to-PSTN
```

```
!
policy normalization UC520-Four-to-Full
uri-component update request-uri user 4444 85224044444
end policy
!
```

GUI



调试

```
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 util.Normalization -
Entering Normalization(moduleRequest:post-normalize)
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 conditions.RegexCondition -
inNetwork='Net-From-UC520'
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 conditions.RegexCondition -
IN_NETWORK: Net-From-UC520
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 conditions.AbstractRegexCondition -
pattern(^QNet-From-UC520\E$), toMatch(Net-From-UC520) returning true
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 triggers.ModuleTrigger -
ModuleTrigger.eval() action<UC520-Four-to-Full> actionParameter<>
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 triggers.ModuleTrigger -
ModuleTrigger.eval() got the policy, executing it ...
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 normalization.URIComponentNormalizationAlgorithm
-
normalizing request-uri
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 normalization.URIComponentNormalizationAlgorithm
-
updating user/phone of the sip:4444@14.128.100.150 to 85224044444
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 util.Normalization -
Leaving Normalization.normalize()
```

9. 检查路由组配置以查找元素IP地址，并根据Q值和权重设置将呼叫路由到可能的最佳路由。

CLI

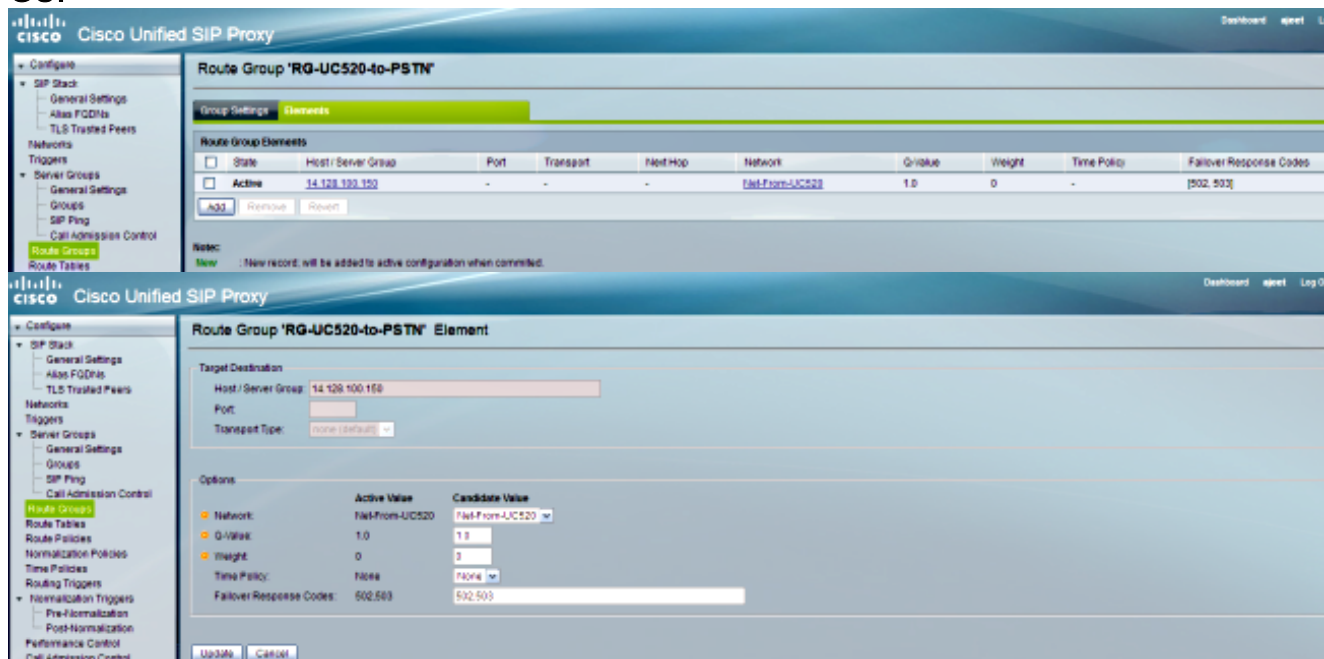
```
!
route group RG-UC520-to-PSTN
element target-destination 14.128.100.150 Net-From-UC520 q-value 1.0
```

```

failover-codes 502 - 503
weight 0
end element
end route
!

```

GUI



调试

```

[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 loadbalancer.LBBase -
Entering getServer()
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 loadbalancer.LBBase -
Entering initializeDomains()
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.NRSRoutes -
routes before applying time policies: [Ruri: 14.128.100.150,
Route: null, Network: Net-From-UC520, q-value=1.0radvance=[502, 503]]
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 nrs.NRSRoutes -
routes after applying time policies: [Ruri: 14.128.100.150, Route:
null, Network: Net-From-UC520, q-value=1.0radvance=[502, 503]]
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:231 loadbalancer.LBBase -
Leaving initializeDomains()
[REQUESTI.5] INFO 2013.02.28 07:06:57:231 loadbalancer.LBHashBased -
list of elements in order on which load balancing is done : Ruri:
14.128.100.150, Route: null, Network: Net-From-UC520, q-value=
1.0radvance=[502, 503],
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 loadbalancer.LBBase -
Server group route-sg selected Ruri: 14.128.100.150, Route: null,
Network: Net-From-UC520, q-value=1.0radvance=[502, 503]
[REQUESTI.5] DEBUG 2013.02.28 07:06:57:232 loadbalancer.LBBase -
Leaving getServer()

```

10. SIP INVITE将发送到所选元素。

```

[REQUESTI.5] DEBUG 2013.02.28 07:06:57:233 DsSipLlApi.Wire -
Sending UDP packet on 14.128.100.169:32770, destination 14.128.100.150:5060
INVITE sip:85224044444@14.128.100.150 SIP/2.0
Via: SIP/2.0/UDP
14.128.100.169:5063;branch=z9hG4bK.ToYJfEKMyfZGySv.gcLjg~~238
Via: SIP/2.0/UDP 14.128.100.161:5060;branch=z9hG4bK21E82
Max-Forwards: 69
To: <sip:4444@14.128.100.169>
From: <sip:4001@14.128.100.161>;tag=256D566C-22AC

```


Contact: <sip:4001@14.128.100.161:5060>
Expires: 180
Remote-Party-ID: <sip:4001@14.128.100.161>
;party=calling;screen=no;privacy=off
Call-ID: 9B62C157-80AC11E2-8035A38B-9AE07FDE@14.128.100.161
CSeq: 101 INVITE
Content-Length: 543
Date: Thu, 28 Feb 2013 07:09:20 GMT
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
SUBSCRIBE, NOTIFY, INFO, REGISTER
Allow-Events: telephone-event
Supported: 100rel,timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Cisco-Guid: 2598740490-2158760418-2150671243-2598404062
Timestamp: 1362035360
User-Agent: Cisco-SIPGateway/IOS-12.x
Content-Type: multipart/mixed;boundary=uniqueBoundary
MIME-Version: 1.0

--uniqueBoundary
Content-Type: application/sdp
Content-Disposition: session;handling=required

v=0
o=CiscoSystemsSIP-GW-UserAgent 3418 2914 IN IP4 14.128.100.161
s=SIP Call
c=IN IP4 14.128.100.161
t=0 0
m=audio 17618 RTP/AVP 18 101
c=IN IP4 14.128.100.161
a=rtpmap:18 G729/8000
a=fmtp:18 annexb=no
a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-16
a=ptime:20

--uniqueBoundary
Content-Type: application/gtd
Content-Disposition: signal;handling=optional

IAM,
GCI,9ae5a20a80ac11e28030a38b9ae07fde

所有四种方案的配置

以下是本文档中描述的所有四种呼叫场景的完整CUSP配置：

```
ajeesting-cusp-8.5.3(cusp)# show configuration active verbose
Building CUSP configuration...
!
server-group sip global-load-balance call-id
server-group sip retry-after 0
server-group sip element-retries udp 2
server-group sip element-retries tls 1
server-group sip element-retries tcp 1
sip dns-srv
enable
no naptr
end dns
!
no sip header-compaction
```

```
!  
sip logging  
sip max-forwards 70  
sip network Net-CUCM standard  
no non-invite-provisional  
allow-connections  
retransmit-count invite-client-transaction 3  
retransmit-count invite-server-transaction 5  
retransmit-count non-invite-client-transaction 3  
retransmit-timer T1 500  
retransmit-timer T2 4000  
retransmit-timer T4 5000  
retransmit-timer TU1 5000  
retransmit-timer TU2 32000  
retransmit-timer clientTn 64000  
retransmit-timer serverTn 64000  
tcp connection-setup-timeout 1000  
udp max-datagram-size 1500  
end network
```

```
!  
sip network Net-From-UC520 standard  
no non-invite-provisional  
allow-connections  
retransmit-count invite-client-transaction 3  
retransmit-count invite-server-transaction 5  
retransmit-count non-invite-client-transaction 3  
retransmit-timer T1 500  
retransmit-timer T2 4000  
retransmit-timer T4 5000  
retransmit-timer TU1 5000  
retransmit-timer TU2 32000  
retransmit-timer clientTn 64000  
retransmit-timer serverTn 64000  
tcp connection-setup-timeout 1000  
udp max-datagram-size 1500  
end network
```

```
!  
sip network Net-PSTN standard  
no non-invite-provisional  
allow-connections  
retransmit-count invite-client-transaction 3  
retransmit-count invite-server-transaction 5  
retransmit-count non-invite-client-transaction 3  
retransmit-timer T1 500  
retransmit-timer T2 4000  
retransmit-timer T4 5000  
retransmit-timer TU1 5000  
retransmit-timer TU2 32000  
retransmit-timer clientTn 64000  
retransmit-timer serverTn 64000  
tcp connection-setup-timeout 1000  
udp max-datagram-size 1500  
end network
```

```
!  
sip network Net-UC520 standard  
no non-invite-provisional  
allow-connections  
retransmit-count invite-client-transaction 3  
retransmit-count invite-server-transaction 5  
retransmit-count non-invite-client-transaction 3  
retransmit-timer T1 500  
retransmit-timer T2 4000  
retransmit-timer T4 5000  
retransmit-timer TU1 5000
```

```
retransmit-timer TU2 32000
retransmit-timer clientTn 64000
retransmit-timer serverTn 64000
tcp connection-setup-timeout 1000
udp max-datagram-size 1500
end network
!
sip overload reject retry-after 0
sip peg-counting 2 86400
sip privacy service
sip queue message
drop-policy head
low-threshold 80
size 2000
thread-count 20
end queue
!
sip queue radius
drop-policy head
low-threshold 80
size 2000
thread-count 20
end queue
!
sip queue request
drop-policy head
low-threshold 80
size 2000
thread-count 20
end queue
!
sip queue response
drop-policy head
low-threshold 80
size 2000
thread-count 20
end queue
!
sip queue st-callback
drop-policy head
low-threshold 80
size 2000
thread-count 10
end queue
!
sip queue timer
drop-policy none
low-threshold 80
size 2500
thread-count 8
end queue
!
sip queue xcl
drop-policy head
low-threshold 80
size 2000
thread-count 2
end queue
!
route recursion
!
sip tcp connection-timeout 30
sip tcp max-connections 256
!
```

```
no sip tls
!
trigger condition TC-PSTN-to-UC520
sequence 1
in-network ^\QNet-UC520\E$
end sequence
sequence 2
in-network ^\QNet-CUCM\E$
end sequence
end trigger condition
!
trigger condition TC-UC520-to-PSTN
sequence 1
in-network ^\QNet-From-UC520\E$
end sequence
end trigger condition
!
trigger condition TC-from-CUCM
sequence 1
in-network ^\QNet-CUCM\E$
end sequence
end trigger condition
!
trigger condition TC-from-PSTN
sequence 1
in-network ^\QNet-PSTN\E$
end sequence
sequence 2
in-network ^\QNet-CUCM\E$
message request
end sequence
end trigger condition
!
trigger condition mid-dialog
sequence 1
mid-dialog
end sequence
end trigger condition
!
accounting
no enable
no client-side
no server-side
end accounting
!
server-group sip group SG-CUCM.ajeet.com Net-CUCM
element ip-address 14.128.64.191 5060 udp q-value 1 weight 50
element ip-address 14.128.64.192 5060 udp q-value 1.0 weight 100
failover-resp-codes 503
lbtype global
ping
end server-group
!
server-group sip group SG-PSTN Net-PSTN
element ip-address 14.128.100.150 5060 udp q-value 1.0 weight 0
failover-resp-codes 503
lbtype global
ping
end server-group
!
server-group sip group SG-UC520 Net-UC520
element ip-address 14.128.100.161 5060 udp q-value 1.0 weight 0
failover-resp-codes 503
lbtype global
```

```
ping
end server-group
!
route group RG-UC520
element target-destination SG-UC520 Net-UC520 q-value 1.0
failover-codes 502 - 503
weight 0
end element
end route
!
route group RG-UC520-to-PSTN
element target-destination 14.128.100.150 Net-From-UC520 q-value 1.0
failover-codes 502 - 503
weight 0
end element
end route
!
route table RT-CUCM
key 1111 target-destination SG-CUCM.ajeet.com Net-CUCM
end route table
!
route table RT-PSTN
key 4082022222 target-destination SG-PSTN Net-PSTN
end route table
!
route table RT-UC520
key 2222 group RG-UC520
end route table
!
route table RT-UC520-PSTN
key 3333 group RG-UC520-to-PSTN
end route table
!
policy normalization CUCM-Prefix-408
uri-component update request-uri user 2022222 4082022222
end policy
!
policy normalization UC520-Four-to-Full
uri-component update request-uri user 4444 852240444444
end policy
!
policy lookup Policy-UC520
sequence 100 RT-UC520 request-uri uri-component user
modify-key 400[12] 2222
rule exact
end sequence
end policy
!
policy lookup Policy-UC520-to-PSTN
sequence 100 RT-UC520-PSTN request-uri uri-component user
modify-key 4444 3333
rule exact
end sequence
end policy
!
policy lookup Policy-to-CUCM
sequence 100 RT-CUCM request-uri uri-component user
modify-key 4082022102 1111
rule exact
end sequence
end policy
!
policy lookup Policy-to-PSTN
sequence 100 RT-PSTN request-uri uri-component user
```

```
rule exact
end sequence
end policy
!
trigger routing sequence 1 policy Policy-to-CUCM condition
TC-from-PSTN
trigger routing sequence 2 policy Policy-to-PSTN condition
TC-from-CUCM
trigger routing sequence 3 policy Policy-UC520 condition
TC-PSTN-to-UC520
trigger routing sequence 4 policy Policy-UC520-to-PSTN condition
TC-UC520-to-PSTN
trigger pre-normalization sequence 1 policy CUCM-Prefix-408
condition TC-from-CUCM
trigger post-normalization sequence 1 policy UC520-Four-to-Full
condition TC-UC520-to-PSTN
!
server-group sip ping-options Net-CUCM 14.128.100.169 4001
method OPTIONS
ping-type proactive 2500
timeout 2000
end ping
!
server-group sip global-ping
sip cac session-timeout 720
sip cac Net-CUCM 14.128.64.191 5060 udp limit -1
sip cac Net-CUCM 14.128.64.192 5060 udp limit -1
sip cac Net-PSTN 14.128.100.150 5060 udp limit -1
sip cac Net-UC520 14.128.100.161 5060 udp limit -1
!
no sip cac
!
sip listen Net-CUCM udp 14.128.100.169 5061
sip listen Net-From-UC520 udp 14.128.100.169 5063
sip listen Net-PSTN udp 14.128.100.169 5060
sip listen Net-UC520 udp 14.128.100.169 5062
!
call-rate-limit 200
!
end
ajeensing-cusp-8.5.3(cusp)#
```

验证

当前没有可用于此配置的验证过程。

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- [思科统一SIP代理版本8.5的CLI配置指南](#)
- [思科统一SIP代理版本8.5的GUI管理指南](#)
- [CUSP呼叫处理](#)

- [技术支持和文档 - Cisco Systems](#)