

CPS에서 5012(DIAMETER_UNABLE_TO_COMPLIANCE) 로 인한 VoLTE 통화 실패 문제 해결

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소개

이 문서에서는 CPS(Cisco Policy Suite)에서 5012(DIAMETER_UNABLE_TO_COMPLIANCE)로 인한 VoLTE(Voice over Long Term Evolution) 통화 실패 문제를 해결하는 방법에 대해 설명합니다.

문제

CPS에서 5012(DIAMETER_UNABLE_TO_COMPLIANCE) 때문에 VoLTE 통화 실패가 보고되었습니다.

다음은 CPS에서 수신한 명령 코드 Rx_AAR(265) -Request를 볼 수 있는 통합 엔진 로그이며, 결과 코드 DIAMETER_UNABLE_TO_COMPLIANCE(5012)를 사용하여 Rx 인터페이스를 통해 CPS에서 IP Multimedia Subsystem(IMS)으로 다시 전송됩니다.

```
===== HOSTNAME-qnsXX [yyyy-mm-dd 15:32:00,673] =====
```

```
POLICY RESULT ERROR: null
```

```
session action = None
```

```
TRIGGER: Message: com.broadhop.diameter2.messages.DiameterRequestMessage
```

```
Application Id: Rx (16777236)
```

```
Command Code: Rx_AAR (265)
```

```
Dest realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
```

```
Device protocol: RX_TGPP
```

```
End to end id: 204492743 (0x0c304fc7)
```

```
Hop by hop id: 2985189310 (0xb1ee5fbe)
```

```
Origin state: 0
```


Command Code: Rx_AAR (265)

Dest realm: YYYY.mncXYZ.mccXYZ.3gppnetwork.org

Device protocol: RX_TGPP

End to end id: 90747852 (0x0568b3cc)

Hop by hop id: 2509770985 (0x959810e9)

Origin state: 0

Stack name: null

Origin host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org

Origin realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org

Session-Id: pcsf-stdn.imsgrout1-111-

1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgrout1-111-1111111

Auth-Application-Id: 16777236

Media-Component-Description:

Media-Component-Number: 1

Media-Sub-Component:

Flow-Number: 1

Flow-Description:

Media-Sub-Component:

Flow-Number: 2

Codec-Data: uplink\r\noffer\r\nnm=audio 50010 RTP/AVP 99 97 105 96\r\n\r\nna=rtpmap:99 AMR-WB/16000/1\r\n\r\nna=fmtp:99 mode-change-capability=2;max-red=0\r\n\r\nna=rtpmap:97 AMR/8000/1\r\n\r\nna=fmtp:97 mode-change-capability=2;max-red=0\r\n\r\nna=rtpmap:105 telephone-event/16000\r\n\r\nna=fmtp:105 0-15\r\n\r\nna=rtpmap:96 telephone-event/8000\r\n\r\nna=fmtp:96 0-15\r\n\r\nna=curr:qos local none\r\n\r\nna=curr:qos remote none\r\n\r\nna=des:qos mandatory local sendrecv\r\n\r\nna=des:qos optional remote sendrecv\r\n\r\nna=ptime:20\r\n\r\nna=maxptime:240\r\n\r\n

(0x75706c696e6b0d0a6f666665720d0a6d3d617564696f203530303130205254502f415650203939203937203130352039360d0a613d7274706d61703a393920414d522d57422f31363030302f310d0a613d666d74703a3939206d6f64652d6368616e67652d6361706162696c6974793d323b6d61782d7265643d300d0a613d7274706d61703a393720414d522f383030302f310d0a613d666d74703a3937206d6f64652d6368616e67652d6361706162696c6974793d323b6d61782d7265643d300d0a613d7274706d61703a3130352074656c6570686f66e652d6576656e742f31363030300d0a613d666d74703a31303520302d31350d0a613d7274706d61703a39362074656c6570686f66e652d6576656e742f383030300d0a613d666d74703a393620302d31350d0a613d637572723a716f73206c6f63616c206e6f66e650d0a613d637572723a716f732072656d6f7465206e6f66e650d0a613d6465733a716f73206d616e6461746f7279206c6f63616c2073656e64726563760d0a613d6465733a716f73206f7074696f66e616c2072656d6f74652073656e64726563760d0a613d7074696d653a32300d0a613d6d6178)

Codec-Data: downlink\r\nanswer\r\nnm=audio 36602 RTP/AVP 97

96\r\n\r\nna=rtpmap:97 AMR/8000/1\r\n\r\nna=fmtp:97 mode-set=0,2,4,7; mode-change-period=2; mode-change-capability=2; mode-change-neighbor=1; max-red=0\r\n\r\nna=rtpmap:96 telephone-event/8000\r\n\r\nna=fmtp:96 0-15\r\n\r\nna=curr:qos local sendrecv\r\n\r\nna=curr:qos remote none\r\n\r\nna=des:qos mandatory local sendrecv\r\n\r\nna=des:qos mandatory remote sendrecv\r\n\r\nna=conf:qos remote sendrecv\r\n\r\nna=maxptime:40\r\n\r\n(0x646f776e6c696e6b0d0a616e737765720d0a6d3d617564696f203336363032205254502f4156502039372039360d0a613d7274706d61703a393720414d522f383030302f310d0a613d666d74703a3937206d6f64652d7365743d302c322c342c373b206d6f64652d6368616e67652d706572696f643d323b206d6f64652d6368616e67652d6361706162696c6974793d323b206d6f64652d6368616e67652d6e65696768626f723d313b206d61782d7265643d300d0a613d7274706d61703a39362074656c6570686f66e652d6576656e742f383030300d0a613d666d74703a393620302d31350d0a613d637572723a716f73206c6f63616c2073656e64726563760d0a613d637572723a716f732072656d6f7465206e6f66e650d0a613d6465733a716f73206d616e6461746f7279206c6f63616c2073656e64726563760d0a613d6465733a716f73206d616e6461746f72792072656d6f74652073656e64726563760d0a613d636f66e663a716f732072656d6f74652073656e64726563760d0a613d6d6178707)

DEBUG MSGS:

INFO : (core) Tagging message with ID: RX_TGPP

INFO : (rx) Sending 265 Message on session pcsf-stdn.imsgrout1-111-

1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgrout1-111-1111111

INFO : (balance) Error found, rolling back transaction

ERROR : (core) Error processing policy request: null

SERVICE CALC MSGS:

USE CASES:

SENT MESSAGES (asynchronous):

```
Message: com.broadhop.diameter2.messages.DiameterResponseMessage
Application Id: Rx (16777236)
Command Code: Rx_AAA (265)
Dest host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
Dest realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
Device protocol: RX_TGPP
End to end id: 90747852 (0x0568b3cc)
Hop by hop id: 2509770985 (0x959810e9)
Origin state: 0
Stack name: null
Origin realm: YYYY.ims.mncXYZ.mccXYZ.3gppnetwork.org
Session-Id: pcsf-stdn.imsgrp1-111-1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgrp1-111-1111111
Auth-Application-Id: 16777236
QPS-Internal-Route-Record-Host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
QPS-Internal-Route-Record-Realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
Result-Code: DIAMETER_UNABLE_TO_COMPLY (5012)
```

성공 사례:(엔진 로그)

성공 사례의 경우 업링크 및 다운링크 코덱에 모두 Hex 데이터가 표시되지 않으며 성공 사례 및 장애 사례에서 모두 AAR에 차이가 없습니다.

성공 사례는 INFO를 참조하십시오.(코어) **키벌 로드 성공**

:imsiFramedIpKey:111111111111111111:172.16.xx.yy에서 오류 시나리오에서 나타나지 않았습니다.

```
HOSTNAME-qnsXX [yyyy-mm-dd 15:33:30,543]
POLICY RESULT SUCCESS:
  session action = None
  domainId = IMS
  locationId = ims
  SERVICES: IMS_DEFAULT
  TRIGGER: Message: com.broadhop.diameter2.messages.DiameterRequestMessage
    Application Id: Rx (16777236)
    Command Code: Rx_AAR (265)
    Dest realm: YYYY.ims.mncXYZ.mccXYZ.3gppnetwork.org
    Device protocol: RX_TGPP
    End to end id: 182837146 (0x0ae5df9a)
    Hop by hop id: 2274945953 (0x8798eba1)
    Origin state: 0
    Stack name: null
    Origin host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
    Origin realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
    Session-Id: pcsf-stdn.imsgrp1-111-1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgrp1-111-1111111
    Auth-Application-Id: 16777236
    Media-Component-Description:
      Media-Component-Number: 1
      Media-Sub-Component:
        Flow-Number: 1
      Media-Sub-Component:
        Flow-Number: 2
    Codec-Data: uplink\r\noffer\r\nm=audio 5008 RTP/AVP 116 107 118
96 111 110\r\na=rtpmap:116 AMR-WB/16000/1\r\na=fmtp:116 mode-change-capability=2;max-red=220\r\na=rtpmap:107 AMR-WB/16000/1\r\na=fmtp:107 octet-align=1;mode-change-capability=2;max-red=220\r\na=rtpmap:118 AMR/8000/1\r\na=fmtp:118 mode-change-capab
```

ility=2;max-red=220\r\na=rtpmap:96 AMR/8000/1\r\na=fmtp:96 octet-align=1;mode-change-
capability=2;max-red=220\r\na=rtpmap:111 telephone-event/16000\r\na=fmtp:111 0-15\r\na=
rtpmap:110 telephone-event/8000\r\na=fmtp:110 0-15\r\na=curr:qos local none\r\na=curr:qos remote
none\r\na=des:qos mandatory local sendrecv\r\na=des:qos optional remote sen
drecv\r\na=ptime:20\r\na=maxptime:240\r\n (uplink
offer

m=audio 50008 RTP/AVP 116 107 118 96 111 110 **Note: Codec-Data is in readable form not like how
it was in failure case.**

a=rtpmap:116 AMR-WB/16000/1
a=fmtp:116 mode-change-capability=2;max-red=220
a=rtpmap:107 AMR-WB/16000/1
a=fmtp:107 octet-align=1;mode-change-capability=2;max-red=220
a=rtpmap:118 AMR/8000/1
a=fmtp:118 mode-change-capability=2;max-red=220
a=rtpmap:96 AMR/8000/1
a=fmtp:96 octet-align=1;mode-change-capability=2;max-red=220
a=rtpmap:111 telephone-event/16000
a=fmtp:111 0-15
a=rtpmap:110 telephone-event/8000
a=fmtp:110 0-15
a=curr:qos local none
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos optional remote sendrecv
a=ptime:20
a=maxptime:240

)
Codec-Data: downlink\r\nanswer\r\nm=audio 3302 RTP/AVP 118
110\r\na=rtpmap:118 AMR/8000/1\r\na=fmtp:118 mode-set=0,2,4,7; mode-change-period
=2; mode-change-capability=2; mode-change-neighbor=1; max-red=0\r\na=rtpmap:110 telephone-
event/8000\r\na=fmtp:110 0-15\r\na=curr:qos local sendrecv\r\na=curr:qos remote no
ne\r\na=des:qos mandatory local sendrecv\r\na=des:qos mandatory remote sendrecv\r\na=conf:qos
remote sendrecv\r\na=maxptime:40\r\n (downlink
answer

m=audio 3302 RTP/AVP 118 110
a=rtpmap:118 AMR/8000/1
a=fmtp:118 mode-set=0,2,4,7; mode-change-period=2; mode-change-capability=2; mode-change-
neighbor=1; max-red=0
a=rtpmap:110 telephone-event/8000
a=fmtp:110 0-15
a=curr:qos local sendrecv
a=curr:qos remote none
a=des:qos mandatory local sendrecv
a=des:qos mandatory remote sendrecv
a=conf:qos remote sendrecv
a=maxptime:40
)

Media-Type: AUDIO (0)
Max-Requested-Bandwidth-UL: 64000
Max-Requested-Bandwidth-DL: 41000
Flow-Status: ENABLED (2)
RS-Bandwidth: 0
RR-Bandwidth: 0

Subscription-Id:

Subscription-Id-Type: END_USER_SIP_URI (2)
Subscription-Id-Data:

sip:+911234567890@ims.mncXYZ.mccXYZ.3gppnetwork.org

Subscription-Id:

Subscription-Id-Type: END_USER_IMSI (1)
Subscription-Id-Data: <1111111111111111>

AF-Charging-Identifier: "PCSF:1-sbc"

Specific-Action: INDICATION_OF_LOSS_OF_BEARER (2)
Specific-Action: INDICATION_OF_RECOVERY_OF_BEARER (3)
Specific-Action: INDICATION_OF_RELEASE_OF_BEARER (4)

```

Specific-Action: IP_CAN_CHANGE (6)
Framed-IP-Address: 172.16.xx.yy (0x0aAAAAcB)
Supported-Features:
    Vendor-Id: XXXX

Service-Info-Status: FINAL SERVICE INFORMATION (0)
QPS-Internal-Route-Record-Host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
QPS-Internal-Route-Record-Realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
DEBUG MSGS:
    INFO : (core) Tagging message with ID: RX_TGPP
    INFO : (core) Successful load by key:
imsiFramedIpKey:1111111111111111:172.16.xx.yy <<<<<<<<<
    INFO : (core) Start session triggered
    INFO : (rx) Success binding to Gx session 0008-
diameterproxy.AAAA.cisco.com;11111111;11111111;5c765a28-3b02 by IMSI And IP Address
    INFO : (TGPP) [Rel8, Rel9, Rel10] features supported for Vendor-Id XXXX,
Feature-List-ID X
    INFO : (core) domain: IMS
    INFO : (rx) Sending AAA Message on session pcsf-stdn.imsgr oup1-111-
1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgr oup1-111-1111111
    INFO : (gx) Installing preconfigured rule: _1_1_2_AF_AUDIO
    INFO : (gx) Installing preconfigured rule: _1_1_1_AF_AUDIO
    INFO : (et) Event trigger 2 added
    INFO : (et) Event trigger 5 added
    INFO : (et) Event trigger 6 added
    INFO : (et) Event trigger 7 added
    INFO : (gx) Sending RAR Message on session 0008-
diameterproxy.AAAA.cisco.com;11111111;11111111;5c765a28-3b02
SERVICE CALC MSGS:
USE CASES:
    INFO : (use-cases) Use case 'XXXX IMS Default', status: true, Condition: No
Condition Set
SENT MESSAGES (asynchronous):
Message: com.broadhop.diameter2.messages.DiameterResponseMessage
Application Id: Rx (16777236)
Command Code: Rx AAA (265)
Dest host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
Dest realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
Device protocol: RX_TGPP
End to end id: 182837146 (0x0ae5df9a)
Hop by hop id: 2274945953 (0x8798eba1)
Origin state: 0
Stack name: null
Origin realm: pcrf.mncXYZ.mccXYZ.3gppnetwork.org
Session-Id: pcsf-stdn.imsgr oup1-111-
1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgr oup1-111-1111111
Auth-Application-Id: 16777236
IP-CAN-Type: 3GPP_EPS (5)
RAT-Type: EUTRAN (1004)
Supported-Features:
    Vendor-Id: XXXX

QPS-Internal-Route-Record-Host: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
QPS-Internal-Route-Record-Realm: XXXX.ims.mncXYZ.mccXYZ.3gppnetwork.org
Result-Code: DIAMETER_SUCCESS (2001)

```

통합 qns 로그에서 Gx와 Rx 세션의 바인딩도 발생하지 않는 것으로 보입니다.통합 qns 로그에서 여기에 표시된 예외로 볼 수 있습니다.

```
HOSTNAME-qnsXX yyyy-mm-dd 02:23:03,445 [pool-3-thread-1] WARN
c.b.policy.impl.RulesPolicyService - An exception was thrown while executing a policy action.

java.lang.NullPointerException: null <<<<<<<<<<

    at
com.broadhop.diameter2.policy.rx.tgpp.DiameterRxTGPPDeviceMgr.getGxSession(DiameterRxTGPPDeviceM
gr.java:1104)

    at
com.broadhop.diameter2.policy.rx.tgpp.DiameterRxTGPPDeviceMgr.filterEvent(DiameterRxTGPPDeviceMg
r.java:7418)

    at com.broadhop.blueprint.master.MasterBlueprint.filterEvent(MasterBlueprint.java:1283)

    at
com.broadhop.blueprint.master.MasterBlueprint.executionPreSession2(MasterBlueprint.java:245)

    at
com.broadhop.policy.Rule_Execute_Presession_Phase_2__392a9765_1022_4823_b082_cde9f22abf37__e4Baw
WmREeKEu46lGH_XOQ__0.consequence(Unknown Source)
```

솔루션

전체 DB 스캔 스로틀이 활성화되고 5로 설정됩니다. Rx AAR의 수가 증가하여 110(5*22)을 초과하
며 동시에 Rx AAA 응답 5012가 관찰됩니다.

스로틀이 5로 설정되고 22개의 QNS VM이 있으며 전체 DB 스캔은 110개의 요청만 허용하기 때문
입니다.

다른 모든 요청은 오류 응답과 함께 삭제됩니다. 모든 AAR 요청은 조회 가능 키에 IMSlandframedIP
키를 아직 구성하지 않았기 때문에 전체 DB 검사를 수행합니다.

다음은 문제를 해결하는 절차입니다.

1단계. **PB** - cluster - lookaside 키 접두사에 imsiFramedIpKey를 추가합니다.

2단계. 게시될 때까지 기다립니다(게시한 후 5분 대기).

3단계. "Cluster Manager" 터미널로 돌아가 restart.sh 스크립트를 사용하여 qns 프로세스를 재시작
합니다.

4단계. 재시작 작업이 완료되면 diagannostics.sh 스크립트를 실행하여 CPS가 실행 중인지 확인합
니다.

5단계. telnet 명령을 사용하여 QNS OSGI 콘솔 중 하나에 로그인합니다.

```
telnet <qns vm host name> 9091 [Eg:- telnet qns01 9091]
```

Execute "rebuildAllSkRings" command on OSGI console to rebuild the configured "Lookaside Key Prefixes" so qns process start utilizing it

```
osgi> rebuildAllSkRings
```

Please wait until execution completes

Execute "disconnect" command on console and it waits for user input just press "Enter" key to come out from OSGI console.

```
osgi> disconnect
```

Disconnect from console? (y/n; default=y)

Connection closed by foreign host.