

# Troubleshoot VoLTE Call Failure because of 5012 (DIAMETER\_UNABLE\_TO\_COMPLY) at CPS

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## Introduction

This document describes how to troubleshoot Voice over Long Term Evolution(VoLTE) call failure because of 5012 (DIAMETER\_UNABLE\_TO\_COMPLY) at Cisco Policy Suite (CPS).

## Problem

Reported VoLTE call failures because of 5012 (DIAMETER\_UNABLE\_TO\_COMPLY) at CPS.

These are the consolidated-engine logs where you can see the command code Rx\_AAR (265) - Request that was received by the CPS and answer sent back to the IP Multimedia Subsystem (IMS) from the CPS over the Rx interface with result-Code DIAMETER\_UNABLE\_TO\_COMPLY (5012).

```
===== 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
```

**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: 204492743 (0x0c304fc7)

Hop by hop id: 2985189310 (0xb1ee5fbe)

Origin state: 0

Stack name: null

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

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)** <<<<<<<<<<<<

## Troubleshoot

Here is the behavior as seen in consolidated-engine logs:

For failure case, consolidated-engine logs show, 5012 for the Authorization/Authentication Request(AAR), when checked the Req Message, you can see CPS is printing codec data in Hex format [highlighted in bold].

### Failure Case: (Engine Logs)

```
HOSTNAME-qnsXX [yyyy-mm-dd 15:33:02,529] =====
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: 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(0x646f776e6c696e6b0d0a616e737765720d0a6d3d617564696f203336363032205254502f4156502039372039360d0a613d7274706d61703a393720414d522f383030302f310d0a613d666d74703a3937206d6f64652d7365743d302c322c342c373b206d6f64652d6368616e67652d706572696f643d323b206d6f64652d6368616e67652d6361706162696c6974793d323b206d6f64652d6368616e67652d6e65696768626f723d313b206d61782d7265643d300d0a613d7274706d61703a39362074656c6570686f66e652d6576656e742f383030300d0a613d666d74703a393620302d31350d0a613d637572723a716f73206c6f63616c2073656e64726563760d0a613d637572723a716f732072656d6f7465206e6f66e650d0a613d6465733a716f73206d616e6461746f7279206c6f63616c2073656e64726563760d0a613d6465733a716f73206d616e6461746f72792072656d6f74652073656e64726563760d0a613d636f6663a716f732072656d6f74652073656e64726563760d0a613d6d6178707)

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)
```

## Success Case: (Engine Logs)

For success case, no Hex data is seen in both uplink and downlink codec and no difference in AAR in both success and failure cases.

For success case, you can refer to **INFO : (core) Successful load by key: imsiFramedIpKey:1111111111111111:172.16.xx.yy** under **DEBUG MSG** which was not present in the failure scenario.

```
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 50008 RTP/AVP 116 107 118
96 111 110\r\na=rtpmap:116 AMR-WB/16000/1\r\na=fmtp:116 mode-change-capabil
ity=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-
diameter.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.imsgr0up1-111-
1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgr0up1-111-1111111
    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-
diameter.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.imsgr0up1-111-
1111111.aaa.sbc.bbb.com;316160;1;5.2551556468.2;pcsf-stdn.imsgr0up1-111-1111111
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)

```

From the consolidated-qns logs also it seems that binding of Gx with Rx session does not happen. This can be seen in the consolidated-qns logs by an exception shown here.

```
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)
```

## Solution

The full DB scan throttle is enabled and is set to **5**. It is observed that the number of Rx AARs increases and goes beyond 110 (5\*22), and at the same time, Rx AAA responses 5012 are observed.

This because the throttle is set to 5 and there are 22 QNS VMs and the full DB scan only allows 110 requests.

All other requests are being dropped with the error response. All the AAR requests do a full DB scan as they have not yet configured IMSIandframedIP key in lookaside keys.

This is the procedure to resolve the issue:

Step 1. Add **imsiFramedIpKey** under PB – cluster – lookaside key prefixes.

Step 2. Wait until publish successfully (wait 5 min after publish).

Step 3. Go back to the “Cluster Manager” terminal and restart qns process using **restartall.sh** script.

Step 4. Once restart operation is completed run **diagnostics.sh** script to verify CPS is up and running.

Step 5. Login to the one of the QNS OSGI console using telnet command:

```
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(DiameterRxTGPPDeviceMgr.java:1104)

at

com.broadhop.diameter2.policy.rx.tgpp.DiameterRxTGPPDeviceMgr.filterEvent(DiameterRxTGPPDeviceMgr.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\_\_e4BawWmREeKEu46lGH\_XOQ\_\_0.consequence(Unknown Source)