ASR 5500 Series Default Policy Is Not Handed Out When PCRF Is Down

Document ID: 119201

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Jul 23, 2015

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Introduction

This document describes how to handle the default local policy in the Cisco Aggregation Services Router (ASR) 5500 chassis, in the event of PCRF (Policy Control and Rule Function) failure, when the local default policy is not configured.

Problem

The ASR PGW (Packet Data Gateway) failed to handle the default policy for subscribers when PCRF was down. In the PCRF upgrade phase, issues were observed on the PCRF. However, the ASR PGW failed to handle the default policy for subscribers which caused many sessions to be dropped.

Wireshark traces indicate that all CCA−I (Credit Control Answer Initial) packets are sent from PCRF with the Diameter Result−Code "DIAMETER_UNKNOWN_SESSION_ID (5002)" during the incident.

A sample packet is shown here:

```
2014−10−01 06:20:00.009092    107.72.199.142  172.18.232.142  DIAMETER 286
 [TCP Retransmission] cmd=Credit−ControlAnswer(272) flags=−P−− appl=3GPP
 Gx(16777238) h2h=70409850 e2e=4a67829
AVP: CC−Request−Type(416) l=12 f=−M− val=INITIAL_REQUEST (1)
  AVP: Result−Code(268) l=12 f=−M− val=DIAMETER_UNKNOWN_SESSION_ID (5002)
```

From configuration, the ASR does not have the Local Policy fallback configured to 5002 (or 5xxx) codes in order to perform Failure Handling (FH) for such codes:

```
failure−handling−template FHtemplate
  msg−type credit−control−initial failure−type diameter result−code 3000 to 3999
 action continue local−fallback
  msg−type credit−control−initial failure−type tx−expiry action continue local−fallback
  msg−type credit−control−initial failure−type resp−timeout action continue
 local−fallback
  msg−type credit−control−initial failure−type diabase−error action continue
 local−fallback
  msg−type credit−control−update failure−type diameter result−code 3000 to 3999 action
 continue local−fallback
  msg−type credit−control−update failure−type tx−expiry action continue local−fallback
```

```
 msg-type credit-control-update failure-type resp-timeout action continue local-fallback
 msg-type credit-control-update failure-type diabase-error action continue
local-fallback
 msg-type credit-control-terminate failure-type any action retry-and-terminate
 msg-type credit-control-terminate failure-type diameter result-code 3001 to 3005 action
retry-and-terminate
 msg-type credit-control-terminate failure-type diameter result-code any-error action
terminate
 #exit
```

The 5002 result code is a permanent failure (see RFC 3588). Per RFC 3588, section 7.1.5. Permanent Failures, "Errors that fall within the permanent failures category, are used to inform the peer that the request failed, and should not be attempted again."

DIAMETER_UNKNOWN_SESSION_ID 5002
The request contained an unknown Session−Id. When there is not a matching FH configuration in the template for permanent failure − 5xxx result code, the session gets terminated. Thus with the current FH template, the ASR handles the scenario (CCA−I) with Diameter Result−Code "DIAMETER_UNKNOWN_SESSION_ID (5002)" from PCRF as expected.

Solution

With the current FH template, the ASR handles the scenario (CCA−I) with Diameter Result−Code "DIAMETER_UNKNOWN_SESSION_ID (5002)" from PCRF as expected. You can decide how you want the ASR to handle this scenario (that is, when it receives CCA−I with the "DIAMETER_UNKNOWN_SESSION_ID (5002)" code from the PCRF) and you can change the FH template if necessary. You can make changes on the PCRF side in order to resolve the issue without the need to change (and thus keep the current design) the FH template on the PGW side.

The 5xxx codes are permanent failure codes. However, if you want to perform FH for such 5xxx error codes after receipt from the PCRF, the configuration could be added for expected 5xxx result codes to fallback, as in this example:

```
failure-handling-template FH template msg-type credit-control-initial failure-type
 diameter result-code 5001 to 500x action continue local-fallback.
```

Related Information

- ***ASR5500 System Administration Guide − Cisco Systems***
- ***Technical Support & Documentation − Cisco Systems***

Updated: Jul 23, 2015 Document ID: 119201