

# Troubleshoot Diameter Message Drops Due to Max-Outstanding-CCRU Threshold Hit

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## Introduction

This document describes the details of the StarOS Cisco Packet Data Network Gateway (PGW)/Policy and Charging Enforcement Function (PCEF) Syslog error message related to Diameter message drops and suggests methods in order to address the problem.

## Problem Syslog Message

Here are few sample Syslog messages that are generated by StarOS when the maximum number of outstanding Credit Control Update Request messages are reached for a given subscriber.

```
Nov 18 08:01:44 evlogd: [local-60sec44.282] [ims-authorizatn 98916 error] [1/0/6046 <sessmgr:78>
imsa_sgx.c:1493] [callid 17100da1] [software internal user syslog] [IMSI: 123456789012341,
MSISDN :1234567890] Pending CCR-U equal to Max Outstanding threshold. CCR-U Dropped for :
USAGE_REPORT
```

```
Nov 21 07:02:07 evlogd: [local-60sec7.271] [ims-authorizatn 98916 error] [1/1/5983 <sessmgr:31>
imsa_sgx.c:1493] [callid 090fe704] [software internal user syslog] [IMSI: 123456789012342,
MSISDN :1234567891] Pending CCR-U equal to Max Outstanding threshold. CCR-U Dropped for :
USAGE_REPORT
```

```
Nov 24 15:17:52 evlogd: [local-60sec52.471] [ims-authorizatn 98916 error] [1/1/5185
<sessmgr:271> imsa_sgx.c:1493] [callid 46f53fd5] [software internal user syslog] [IMSI:
123456789012343, MSISDN :1234567892] Pending CCR-U equal to Max Outstanding threshold. CCR-U
Dropped for : USAGE_REPORT
```

```
Nov 22 21:05:58 evlogd: [local-60sec58.422] [ims-authorizatn 98916 error] [3/1/5966 <sessmgr:10>
imsa_sgx.c:1493] [callid 02ce20d8] [software internal user syslog] [IMSI: 123456789012344,
MSISDN :6789012344] Pending CCR-U equal to Max Outstanding threshold. CCR-U Dropped for :
USAGE_REPORT
```

## Problem Cause

The error message appears when StarOS PGW/PCEF diameter IP Multimedia Subsystem (IMS)-Authorization-Service reaches the limit of **max-outstanding-ccr-u** diameter messages towards Policy and Charging Rules Function (PCRF) for a given session. Once that maximum limit is reached, StarOS starts dropping subsequent Credit Control Request (CCR)-U messages towards PCRF for that session until the outstanding messages reduce to a number below the configured

limit. The outstanding messages are reduced either by receiving a response to a previously outstanding message or upon the timeout expiry of these outstanding messages.

## Troubleshoot

This error log is usually an indication of the change in call-model requiring configuration optimization due to an increase in the outstanding CCR-U messages for a given Gx session. When this happens, syslog has the IMSI printed in the log. If possible, retrieve the historical packet capture of that subscriber to find out why the subscriber session attempted to initiate more than configured outstanding CCR-U. Additionally, look for the number of unique IMSIs that are printed in order to get an idea of the scope of the problem. To address the issue from StarOS end, go to the StarOS configuration and update the configuration for "max-outstanding-ccr-u" under that IMS Authorization Service bases on the new subscriber behavior or new call-model. Along with making this change on the StarOS, ensure the peer Diameter Routing Agent (DRA)/PCRF supports such a number of outstanding messages per session and also has the TPS capacity to handle the incline in the number of messages that may cause due to the call-model and configuration change. When there are multiple outstanding CCR-U messages, StarOS has the capability to handle out of order responses to these messages.

Here is a snippet from the output of a Show Support Details (SSD) file that shows the number of CCR-U drops due to the threshold for max-outstanding-ccru:

```
***** show ims-authorization policy-control statistics debug-info *****
callid_mismatch      : 0
capi_session_init    : 236157394
capi_session_add      : 236157394
capi_session_update  : 1657200358
capi_session_del     : 235071716
capi_session_gone    : 235067742
capi_session_checkpoint : 0
capi_session_recover : 0
capi_config          : 22902
dapi_message_received : 2492716060
dapi_message_sent    : 2492723514
asr_err              : 0
ccru_dropped_max_outstanding: 433034
```

This StarOS show command can be used to find out the configured value of max-outstanding CCR-U messages that shows 4 outstanding CCR-U messages allowed per session.

```
# show ims-authorization service name <Your GX service name>
Context: SAMPLE-CONTEXT
IMS Authorization Service name: sampleGx
Service State: Enabled
<snip> Failure Handling: Retry and Terminate Max-Outstanding-CCRU: 4
Local Policy Service: NA
Host Selection: Table: 1 Algorithm: Round-Robin
```

This snippet shows the portion of StarOS config, where this value is defined.

```
config
 context SAMPLE-CONTEXT
   ims-auth-service sample-gx
   policy-control
   diameter origin endpoint sample-pcrf-ep
```

```
diameter dictionary dpca-custom11
diameter request-timeout 60 deciseconds msg-type any
endpoint-peer-select on-host-select-failure
no event-report-indication
custom-reauth-trigger none
diameter host-select table 1 algorithm round-robin
max-outstanding-ccr-u 4
```

## Related Information

- [StarOS CLI Reference Guide](#)
- [Technical Support & Documentation - Cisco Systems](#)