

# **ICSR Checkpointing**

This appendix lists and describes macro- and micro-checkpoints employed by the Interchassis Session Recovery framework. Checkpoints are exchanged between the active and standby ICSR chassis via the Service Redundancy Protocol (SRP).

The following topics are discussed:

- Overview of Checkpointing, page 1
- Macro-checkpoints, page 1
- Micro-checkpoints, page 3

# **Overview of Checkpointing**

Interchassis Session Recovery (ICSR) provides a framework for sessing instance-level checkpointing within an ICSR framework. A checkpoint is a snapshot of the status of an application. Checkpointing can be used by sessing to push instance level information to the peer chassis.

Instance-level checkpointing sends messages to specific sessmgr instances. Each application, such as GGSN, PDSN, P-GW, S-GW or SGSN, is responsibility for encoding and decoding the checkpoint message. The ICSR framework provides the APIs for transport of the instance-level checkpoint information and associated statistics.

Macro-checkpoints contain full session information and micro-checkpoints contain only a few variables. Macro-checkpoints are sent initially from the active chassis to the standby chassis on power up and reload, and periodically thereafter. When a standby chassis receives macro-checkpoints, it clears any existing CRR (Call Recovery Record) or CLP (Call Line Pointer) related to that session, and creates a new CRR or CLP. Macro-checkpoints are also known as full checkpoints (FCs).

To conserve processing cycles and memory, dynamic and periodic updates from an active chassis to a standby chassis are done using micro-checkpoints.

The output of the Exec mode **show srp info** command displays a complete list of SRP checkpoints.

# **Macro-checkpoints**

This section lists and briefly describes ICSR macro-checkpoints.

# **GGSN\_APN ID MAPPING**

This macro-checkpoint is sent from the active to the standby chassis to map APN names on the standby chassis.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs whenever a TCP connection is established between the sessmgrs and they move to READY\_STATE.

• Accounting: No

• Delta/Cumulative: N/A

• Related CLI command: show session subsystem facility sessmgr instance <instance no> debug-info and show srp micro-checkpoint statistics

### INSTANCE LEVEL CHECKPOINT

This macro-checkpoint is generated by ECS (Enhanced Charging System) to send new rules to the standby chassis. It is also used by ECS to delete or modify a rule on the standby chassis.

· Time based: Yes

• Frequency: 30 minutes

Event based: YesEvents: Occurs:

- 1 When a new rule is added or deleted on the active chassis.
- 2 Every 30 minutes if the ECS is registered for periodic micro-checkpointing.
- · Accounting: —
- Delta/Cumulative: —
- Related CLI command: show session subsystem facility sessing instance <instance no> debug-info and show srp micro-checkpoint statistics

# **SERVICE ID MAPPING**

This macro-checkpoint is sent from the active to the standby chassis to map Service IDs on the standby chassis.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs whenever a TCP connection is established between the sessmgrs and they move to READY\_STATE.

• Accounting: No

• Delta/Cumulative: N/A

• Related CLI command: show session subsystem facility sessmgr instance < instance no > debug-info

# VPNMGR\_ID MAPPING

This macro-checkpoint is sent from the active to the standby chassis to map VPNs on the standby chassis.

Time based: NoFrequency: N/A

• Event based: Yes

- Events: Occurs whenever a TCP connection is established between the sessmgrs and they move to READY\_STATE.
- Accounting: No
- Delta/Cumulative: N/A
- Related CLI command: show session subsystem facility sessmgr instance < instance no > debug-info

# **Micro-checkpoints**

This section lists and briefly describes the characteristics of micro-checkpoints by application category. Micro-checkpoints are listed in alphabetical order under the following categories:

- Uncategorized, on page 4
- DCCA Category, on page 5
- ECS Category, on page 5
- ePDG Category, on page 9
- Firewall/ECS Category, on page 11
- GGSN Category, on page 12
- Gx Interface Category, on page 14
- NAT Category, on page 14
- P-GW Category, on page 17
- Rf Interface Category, on page 19
- S6b Interface Category, on page 21
- SaMOG Category, on page 21

# **Uncategorized**

#### SESS\_UCHKPT\_CMD\_INVALIDATE\_CRR

This micro-checkpoint is sent to the standby chassis to clear a deleted call. It carries the Call ID and other information that must be deleted on the standby chassis.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs when a call is deleted on the active chassis.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 1

• Related CLI command: None

### SESS\_UCKKPT\_CMD\_UPDATE\_CLPSTATS

This micro-checkpoint sends VoLTE data statistics.

Time based: YesFrequency: —

• Event based: Yes

• Events: Occurs during ICSR background checkpointing. A chassis switchover triggers the sending of VoLTE data stats.

· Accounting: —

• Delta/Cumulative: —

• CMD-ID: 4

• Related CLI command: None

# SESS\_UCHKPT\_CMD\_UPDATE\_IDLESECS

This micro-checkpoint sends remaining number of seconds before idle timeout.

Time based: Yes

• Frequency: —

• Event based: No

• Events: Occurs during ICSR background checkpointing.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 2

• Related CLI command: None

# **DCCA Category**

#### SESS\_UCHKPT\_CMD\_DCCA\_SESS\_INFO

This micro-checkpoint sends Credit Control (CC) related information.

• Time based: Yes

• Frequency: 18 seconds for GR micro-checkpoint

• Event based: Yes

• Events: Sent along with the macro-checkpoint/CCA/Assume-positive-state-transitions.

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 19

• Related CLI command: None

# **ECS Category**

# ${\tt SESS\_UCHKPT\_CMD\_ACS\_CALL\_INFO}$

This micro-checkpoint sends critical ECS call level data.

• Time based: Yes

• Frequency: —

• Event based: Yes

• Events: Occurs whenever ECS call level information is created or modified.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 179

#### SESS UCHKPT CMD ACS GX LI INFO

This micro-checkpoint sources lawful intercept (LI) related information maintained by ECS.

- Time based: Yes
- Frequency: —
- Event based: Yes
- Events: Occurs whenever LI information is created or modified.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 75
- Related CLI command: None

#### SESS\_UCHKPT\_CMD\_ACS\_SESS\_INFO

This micro-checkpoint sends ECS-level bearer-related data

- Time based: Yes
- Frequency: —
- Event based: Yes
- Events: Occurs whenever ECS bearer information is created or modified.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 33
- Related CLI command: None

#### SESS UCHKPT CMD DEL ACS CALL INFO

This micro-checkpoint notifies that a Release Call event has occurred.

- Time based: No
- Frequency: N/A
- Event based: Yes
- Events: Occurs whenever an ECS Release Call message is processed.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 188
- Related CLI command: —

#### SESS\_UCHKPT\_CMD\_DEL\_ACS\_SESS\_INFO

This micro-checkpoint notifies that a Release Bearer event has occurred.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs whenever an ECS Release Bearer message is processed.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 187

• Related CLI command: None

#### SESS UCHKPT CMD DYNAMIC CHRG CA INFO

This micro-checkpoint sends dynamic charging action information maintained by ECS.

Time based: YesFrequency: —Event based: Yes

• Events: Occurs whenever dynamic charging action information is created or modified.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 141

• Related CLI command: None

# SESS\_UCHKPT\_CMD\_DYNAMIC\_CHRG\_DEL\_CA\_INFO

This micro-checkpoint notifies that a dynamic charging action has been deleted.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs whenever a dynamic charging action has been deleted.

• Accounting: No

• Delta/Cumulative: N/A

• **CMD-ID:** 183

#### SESS UCHKPT CMD DYNAMIC CHRG DEL QG INFO

This micro-checkpoint notifies that a dynamic QoS group has been deleted.

Time based: NoFrequency: N/A

• Event based: Yes

• Events: Occurs whenever a dynamic QoS group has been deleted.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 182

• Related CLI command: None

#### SESS UCHKPT CMD DYNAMIC CHRG QG INFO

This micro-checkpoint sends dynamic QoS group related information maintained by ECS.

• Time based: Yes

• Frequency: —

• Event based: Yes

• Events: Occurs whenever dynamic QoS group information is created or modified.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 140

• Related CLI command: None

# SESS\_UCHKPT\_CMD\_DYNAMIC\_RULE\_DEL\_INFO

This micro-checkpoint notifies that a dynamic rule has been deleted.

• Time based: No

• Frequency: —

• Event based: Yes

• Events: Occurs whenever a dynamic rule has been deleted.

Accounting: No

• Delta/Cumulative: N/A

• **CMD-ID:** 178

#### SESS\_UCHKPT\_CMD\_DYNAMIC\_RULE\_INFO

This micro-checkpoint sources predefined and dynamic rule related information maintained by ECS.

• Time based: Yes

• Frequency: —

• Event based: Yes

• Events: Occurs whenever a dynamic rule is created or modified.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 43

• Related CLI command: None

# **ePDG** Category

#### SESS\_UCHKPT\_CMD\_DELETE\_EPDG\_BEARER

This micro-checkpoint synchronizes deleted ePDG bearers between the active and standby chassis.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 110

• Related CLI command: show srp micro-checkpoint statistics debug-info

# SESS\_UCHKPT\_CMD\_UPDATE\_EPDG\_BEARER

This micro-checkpoint synchronizes ePDG bearers between the active and standby chassis.

• Time based: No

• Frequency: N/A

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 110

• Related CLI command: show srp micro-checkpoint statistics debug-info

### SESS\_UCHKPT\_CMD\_UPDATE\_EPDG\_PEER\_ADDR

This micro-checkpoint synchronizes ePDG peer addresses between the active and standby chassis.

Time based: NoFrequency: N/AEvent based: Yes

• Events: —

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 110

• Related CLI command: show srp micro-checkpoint statistics debug-info

#### SESS\_UCHKPT\_CMD\_UPDATE\_EPDG\_REKEY

This micro-checkpoint synchronizes ePDG rekey statistics between the active and standby chassis.

• Time based: Yes

• Frequency: 30 seconds

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 110

• Related CLI command: show srp micro-checkpoint statistics debug-info

# SESS\_UCHKPT\_CMD\_UPDATE\_EPDG\_STATS

This micro-checkpoint synchronizes session statistics between the active and standby chassis.

• Time based: Yes

• Frequency: 30 seconds

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 110

• Related CLI command: show srp micro-checkpoint statistics debug-info

# Firewall/ECS Category

#### SESS\_UCHKPT\_CMD\_SFW\_DEL\_RULE\_INFO

This micro-checkpoint is sent when a ruledef is deleted for a bearer.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs whenever PCRF sends a command to disable the predefined stateful firewall access rules.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 186

• Related CLI command: None

### SESS\_UCHKPT\_CMD\_SFW\_RULE\_INFO

This micro-checkpoint notifies the addition of dynamically enabled stateful firewall (SFW) access rules.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs whenever PCRF sends a command to enable the predefined SFW access rules.

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 185

# **GGSN Category**

#### SESS\_UCHKPT\_CMD\_GGSN\_DELETE\_SUB\_SESS

This micro-checkpoint sends an update when a secondary bearer is deleted.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs upon secondary bearer deletion

· Accounting: —

• Delta/Cumulative: —

• CMD-ID: 117

• Related CLI command: None

#### SESS\_UCHKPT\_CMD\_GGSN\_UPDATE\_RPR

If RPR (Resilient Packet Ring) is configured in the GGSN service, an RPR timer is started during secondary bearer creation. This checkpoint is sent upon expiry of this timer.

• Time based: Yes

• Frequency: RPR timer

• Event based: Yes

• Events: Occurs when the secondary bearer creation RPR timer expires.

· Accounting: —

• Delta/Cumulative: —

• CMD-ID: 118

• Related CLI command: —

# SESS\_UCHKPT\_CMD\_GGSN\_UPDATE\_SESSION

This micro-checkpoint is sent in a Network or UE initiated update procedure except for updates that result in the following scenarios:

- Creation or deletion of the beare
- TFT change or inter-RAT handovers
- Gn-Gp handoff

Parameters associated with this micro-checkpoint are shown below.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs for a network initiated or UE initiated update.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 171

• Related CLI command: show srp checkpoint statistics active verbose, and show session subsystem facility sessmgr instance <instance\_number> debug-info.

#### SESS\_UCHKPT\_CMD\_GGSN\_UPDATE\_STATS

This micro-checkpoint periodically sends session statistics.

• Time based: Yes

• Frequency: Every five minutes

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 116

• Related CLI command: None

#### SESS\_UCHKPT\_CMD\_UPDATE\_COA\_PARAMS

This micro-checkpoint updates input and output ACL parameters.

• Time based: —

• Frequency: —

• Event based: Yes

• Events: COA (Change of Authorization) response

· Accounting: —

• Delta/Cumulative: —

• CMD-ID: 83

# **Gx Interface Category**

#### SESS\_UCHKPT\_CMD\_ACS\_VOLUME\_USAGE

This micro-checkpoint sends volume usage over Gx accounting buckets.

- Time based: Yes
- Frequency: 4 seconds for aamgr micro-checkpoint and 18 seconds for GR micro-checkpoint
- Event based: No
- Events: Send along with macro-checkpoint
- Accounting: Yes
- Delta/Cumulative: Cumulative
- CMD-ID: 79
- Related CLI command: —None

#### SESS\_UCHKPT\_CMD\_UPDATE\_SGX\_INFO

This micro-checkpoint sends Gx session-related information.

- Time based: No
- Frequency: N/A
- Event based: Yes
- Events: Triggered on receiving CCA-I/U or RAR from PCRF.
- Accounting: Yes
- Delta/Cumulative: Cumulative
- CMD-ID: 137
- Related CLI command: None

# **NAT Category**

### SESS\_UCHKPT\_CMD\_GR\_UPDATE\_NAT\_REALM\_PORT\_INFO1

This micro-checkpoint is sent when a port chunk is allocated or deallocated for a subscriber sharing a NAT IP address with other subscribers. The port chunk is allocated or deallocated while data is being received for that subscriber.

- Time based: No
- Frequency: N/A

• Event based: Yes

• Events: Triggered when a new NAT port chunk is allocated or deleted.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 105

• Related CLI command: None

#### SESS\_UCHKPT\_CMD\_GR\_UPDATE\_NAT\_REALMS

This micro-checkpoint is sent when a NAT IP address is allocated to or deallocated from a subscriber.

For an on-demand case, it is triggered when the first packet matching a particular NAT realm is received and the NAT IP address is allocated to the subscriber.

If this is not an on-demand case, the NAT IP address is allocated during call setup and this micro-checkpoint is sent.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Triggered when a NAT IP address is allocated to or deallocated from a subscriber.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 45

• Related CLI command: None

# SESS\_UCHKPT\_CMD\_NAT\_SIP\_ALG\_CALL\_INFO

This micro-checkpoint is sent when a new SIP flow is created or deleted for a subscriber (while SIP data is being passed via the subscriber).

Time based: NoFrequency: N/AEvent based: Yes

• Events: Triggered when a new SIP flow is created or deleted.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 98

#### SESS\_UCHKPT\_CMD\_NAT\_SIP\_ALG\_CONTACT\_PH\_INFO

This micro-checkpoint is sent when a received SIP packet is analyzed and pinholes are created in the NAT firewall.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Triggered when a SIP packet creates pinholes in the NAT firewall.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 97

• Related CLI command: None

#### SESS UCHKPT CMD UPDATE DSK FLOW CHKPT INFO

This micro-checkpoint is sent when a new NAT flow is created or deleted for a subscriber (while data is being passed via the subscriber).

This checkpoint is sent from a timer but it is not timer based. The timer is used to pace (10 micro-checkpoints) whenever the timer fires (granularity = 2 sec). This only occurs if there are new flows that need to be micro-checkpointed. Otherwise, no micro-micro-checkpoints are sent.

• Time based: No

• Frequency: See explanation above.

• Event based: Yes

• Events: Triggered when a new NAT flow is created or deleted.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 96

• Related CLI command: None

### SESS\_UCHKPT\_CMD\_UPDATE\_NAT\_BYPASS\_FLOW\_INFO

This micro-checkpoint is sent when NAT is enabled for a subscriber but bypass-nat (no NATing) is configured for this flow (based on a rule-match), and a new bypass flow is created.

This checkpoint is sent when the flow is both added and deleted.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Triggered when a new flow with bypass-nat enabled is created or deleted.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 60

• Related CLI command: None

# **P-GW Category**

#### SESS\_UCHKPT\_CMD\_PGW\_DELETE\_SUB\_SESS

Reserved for future use.

#### SESS\_UCHKPT\_CMD\_PGW\_OVRCHRG\_PRTCTN\_INFO

This micro-checkpoint indicates that the S-GW has set the Overcharging Protection bit in the MBR.

Time based: NoFrequency: N/A

• Event based: Yes

• Events: Triggered when the S-GW sets the Over Charging Protection Bit.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 159

• Related CLI command: None

# SESS\_UCHKPT\_CMD\_PGW\_SGWRESTORATION\_INFO

This micro-checkpoint indicates the interval that a call will remain up when the S-GW is down.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Triggered when the S-GW goes into Restoration mode.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 158

#### SESS\_UCHKPT\_CMD\_PGW\_UBR\_MBR\_INFO

This micro-checkpoint is sent at the end of a UBR (Update Bearer Request ) or MBR (Modify Bearer Request ) except when the UBR /MBR procedure results in the following scenarios:

- TFT change
- Bearer updat or modification for a collapsed call
- Pure P to collapsed or collapsed to Pure P change
- Inter-technology handoff, for example, WiFi to LTE

Parameters associated with this micro-checkpoint are show below.

- Time based: NoFrequency: N/AEvent based: yes
- Events: Occurs as a result of a UBR or MBR procedure.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 193
- Related CLI command: show srp checkpoint statistics active verbose and show session subsystem facility sessmgr instance <instance\_number> debug-info.

#### SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_APN\_AMBR

Reserved for future use.

#### SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_INFO

Reserved for future use.

# SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_LI\_PARAM

This micro-checkpoint indicates the state of Lawful Intercept (LI) for this call.

- Time based: NoFrequency: N/AEvent based: Yes
- Events: Triggered when there is a change in the LI state for this call.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 151

• Related CLI command: None

#### SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_PDN\_COMMON\_PARAM

Reserved for future use.

#### SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_QOS

Reserved for future use.

#### SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_SGW\_CHANGE

Reserved for future use.

### SESS\_UCHKPT\_CMD\_PGW\_UPDATE\_STATS

This micro-checkpoint periodically sends session statistics.

• Time based: Yes

• Frequency: Every five minutes

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 65

• Related CLI command: None

# **Rf Interface Category**

#### SESS\_UCHKPT\_CMD\_ACS\_ACCOUNTING\_TYPE\_QCI\_RF

This micro-checkpoint indicates a change in the SDF+QCI-based Rf accounting buckets.

• Time based: Yes

• Frequency: 4 seconds for aamgr checkpoint and 18 seconds for GR checkpoint

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 126

• Related CLI command: None

#### SESS\_UCHKPT\_CMD\_ACS\_ACCOUNTING\_TYPE\_QCI\_RF\_WITH\_FC

This micro-checkpoint indicates complete SDF+QCI-based Rf accounting buckets.

• Time based: Yes

• Frequency: 4 seconds for aamgr checkpoint and 18 seconds for GR checkpoint

• Event based: No

• Events: Sent along with macro-checkpoint.

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 164

• Related CLI command: None

#### SESS\_UCHKPT\_CMD\_ACS\_ACCOUNTING\_TYPE\_RATING\_GROUP\_RF

This micro-checkpoint indicates a change in the SDF-based Rf accounting buckets.

• Time based: Yes

• Frequency: 4 seconds for aamgr checkpoint and 18 seconds for GR checkpoint

• Event based: No

• Events: N/A

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 125

• Related CLI command: None

# SESS\_UCHKPT\_CMD\_ACS\_ACCOUNTING\_TYPE\_RATING\_GROUP\_RF\_WITH\_FC

This micro-checkpoint indicates complete SDF-based Rf accounting buckets.

• Time based: Yes

• Frequency: 4 seconds for aamgr checkpoint and 18 seconds for GR checkpoint;

• Event based: No

• Events: Sent along with macro-checkpoint.

• Accounting: Yes

• Delta/Cumulative: Cumulative

• CMD-ID: 163

• Related CLI command: None

# **S6b Interface Category**

### SESS\_UCHKPT\_CMD\_S6B\_INFO

This micro-checkpoint sends the Restoration Priority Indicator when reauthorization occurs over the S6b interface.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs when an Sb6 reauthorization results in a change in value of the Restoration Priority Indicator.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 202

• Related CLI command: None

# SaMOG Category

### SESS\_UCHKPT\_CMD\_CGW\_DELETE\_BEARER

Reserved for future use.

# SESS\_UCHKPT\_CMD\_CGW\_DELETE\_PDN

This micro-checkpoint indicates a PDN connection has been deleted.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs whenever SaMOG sends a Delete-Session-Req or upon receiving a Delete-Bearer-Request.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 169

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_CGW\_UPDATE\_BEARER\_QOS

This micro-checkpoint indicates a QoS update for the bearer.

Time based: NoFrequency: N/AEvent based: Yes

- Events: Occurs when a change in Bearer QoS is received from the P-GW due to a reauthorization (AAR Received from AAA Server) or Update-Bearer-Request.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 167
- Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_CGW\_UPDATE\_PDN

This micro-checkpoint indicates a PDN update for a change in APN-AMBR.

Time based: NoFrequency: N/AEvent based: Yes

- Events: Occurs when a change in APN-AMBR is received from the P-GW due to a reauthorization (AAR Received from AAA Server) or Update-Bearer-Request.
- Accounting: No
- Delta/Cumulative: N/A
- CMD-ID: 168
- Related CLI command: show subscriber samog-only full

# SESS\_UCHKPT\_CMD\_CGW\_UPDATE\_STATS

Reserved for future use.

# SESS\_UCHKPT\_CMD\_CGW\_UPDATE\_UE\_PARAM

Reserved for future use.

# SESS\_UCHKPT\_CMD\_SAMOG\_ACCT\_INTERIM\_INFO

This micro-checkpoint is sent for a SaMOG session on receipt of an Accounting Req (INTERIM-UPDATE) from the WLC

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs on receipt of an Accounting Req (INTERIM-UPDATE) from the WLC.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 177

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_SAMOG\_ACCT\_START\_INFO

This micro-checkpoint is sent for a SaMOG session on receipt of an Accounting Req (START) from the WLC (Wireless LAN Controller).

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs when a Account Req (START) request is received from the WLC.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 174

• Related CLI command: show subscriber samog-only full

### SESS\_UCHKPT\_CMD\_SAMOG\_EOGRE\_TUNNEL\_INFO

This micro-checkpoint is sent for an Inter-RG handoff for EoGRE subscriber sessions. This checkpoint updates the VMAC Address and WLC EoGRE tunnel end-point address.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs whenever a DHCP-Discover message is received over a different EoGRE tunnel.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 201

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_SAMOG\_GTPV1\_UPDATE\_PDN\_INFO

This micro-checkpoint is sent for a SaMOG session upon receipt of an Update-PDP-Context-Req from the GGSN to update the PDN information.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs after successful SaMOG processing of an Update-PDP-Context-Req from the GGSN.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 191

• Related CLI command: show subscriber samog-only full

#### SESS UCHKPT CMD SAMOG HANDOFF AUTHEN INFO

This micro-checkpoint is sent for a SaMOG session that is Re-authenticating the subscriber while the subscriber session is in Handoff state.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs on completion of Re-Authentication for an existing SaMOG subscriber session currently in Handoff state.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 176

· Related CLI command: show subscriber samog-only full

# SESS\_UCHKPT\_CMD\_SAMOG\_HANDOFF\_INIT\_INFO

This micro-checkpoint is sent for a SaMOG session on receipt of an Accounting Req (STOP) from the WLC (Wireless LAN Controller).

SaMOG will delay handoff as it expects an Accounting Req (START) from the subscriber.

Time based: NoFrequency: N/AEvent based: Yes

• Events: Occurs when a Account Req (STOP) request is received from the WLC.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 175

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_SAMOG\_LI\_PROV\_INFO

This micro-checkpoint is sent for a SaMOG session that is on lawful intercept (LI) Active-Camp-on mode.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs after an LI trigger is received after SaMOG session has been created.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 189

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_SAMOG\_MIPV6\_TIMER\_INFO

This micro-checkpoint updates the Binding Cache Life timer and MIPv6 biding status for a SaMOG session.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs whenever a PMIPv6 PBU is received with a lifetime of zero from the WLC.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 190

• Related CLI command: show subscriber samog-only full

### SESS\_UCHKPT\_CMD\_SAMOG\_MULTI\_ROUND\_AUTHEN\_INFO

This micro-checkpoint is sent for a SaMOG session when SaMOG is waiting on the UE after sending an Access-Challenge while Re-authenticating the subscriber session.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs after SaMOG sends an Access-Challenge for an existing SaMOG subscriber session during Re-authentication.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 184

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_SAMOG\_REAUTHEN\_INFO

This micro-checkpoint is sent for a SaMOG session when subscriber Re-authentication is completed.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs on completion of Re-Authentication for an existing SaMOG subscriber session.

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 172

• Related CLI command: show subscriber samog-only full

#### SESS\_UCHKPT\_CMD\_SAMOG\_REAUTHOR\_INFO

This micro-checkpoint is sent for a SaMOG session when subscriber Re-authorization is completed.

• Time based: No

• Frequency: N/A

• Event based: Yes

• Events: Occurs on receiving and successfully processing AAR from the AAA Server to re-authorize the subscriber

• Accounting: No

• Delta/Cumulative: N/A

• CMD-ID: 173

• Related CLI command: show subscriber samog-only full