Bulkstats for GTP-C Messages by ARP Value

This chapter describes StarOS support for the Bulkstats for GTP-C Messages by ARP Value feature on the P-GW, SAE-GW, and S-GW.

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Feature Description

To comply with the "Long Term Evolution (LTE) Access Network Government Industry Requirements (GIR) for National Security/Emergency Preparedness (NS/EP) Next Generation Network (NGN) Priority" to support emergency calls over Voice over LTE (VoLTE), several Key Performance Indicators (KPIs) have been introduced with this feature. This feature is utilized to collect statistics for total number of GTP-C messages received for Enhanced Multimedia Priority Service (eMPS) session for specified interval (in minutes). The list of GTP-C messages are defined in accordance with the GIR document. As part of this feature:

- The S-GW will generate peg counts of the total number of received GTP-C messages containing an Allocation and Retention Priority (ARP), chosen from the set of values allocated for NS/EP NGN-PS use, for a specified interval (in minutes). This peg count is administered at the S-GW level.
- The P-GW will generate peg counts of the total number of received GTP-C messages containing an ARP, chosen from the set of values allocated for NS/EP NGN-PS use, for a specified interval (in minutes). This peg count is administered at the specific P-GW level.
- The peg counts for GTP-C messages are broken down by message type similar to existing GTP-C message counters. The bulkstats are broken down by applicable S-GW and P-GW service and S5, S8, S11, and S4 interfaces.

Bulkstats are added for eMPS session/message.

Piggy-back Message

For piggy-back messages, if either of the messages have matching ARP or result into converting non-eMPS session to eMPS session, then both messages are counted as eMPS message and corresponding statistics for both messages are incremented.

If Modify Bearer Request is piggy-backed with Create Bearer Response on S11 interface of S-GW and Create Bearer Response result into converting non-eMPS session into eMPS session, then Modify Bearer Response statistics will not increment for this Modify Bearer Request.

Bulkstats Collection and Reset

Bulkstats are added under eGTP-C Schema and pgw-egtpc-s5s8 Schema. These eMPS bulkstats in eGTP-C Schema and pgw-egtpc-s5s8 Schema holds value only for a bulkstat interval, that is, value of these bulkstats shows number of eMPS messages exchanged during the bulkstat interval.

Limitations

This section identifies the known limitations of the feature:

- Peer level and APN level statistics are not collected.
- MPS statistics recovery is not supported.
- MPS statistics are not collected for CSReq, DDNReq, and change notification messages rejected by demux with ARP for eMPS sessions.
- MPS statistics are not collected for retried/re-transmitted messages.

Licensing

Important Bulkstats for GTP-C Messages by ARP Value feature requires that a valid license key be installed. Contact your Cisco Account or Support representative for information on how to obtain a license.

Performance Indicator Changes

S-GW Ingress S4 Interface

The following CLI commands are modified to display the eMPS session related GTP-C message statistics for S4 interface of S-GW Ingress:

- **show egtpc statistics interface sgw-ingress interface-type s4**
  - **interface-type**: Displays interface level GTP-C message statistics
  - **s4**: Displays interface level GTP-C message statistics for S4 interface
- **show egtpc statistics egtp-service** *sgw_egtpc_service_name* **interface-type s4**
  - **s4**: Interface type S4 for S-GW eGTP-C interface

The output of the above CLI commands displays the following new parameters:

- **Total eMPS Statistics**: Cumulative GTP-C message statistics for messages received/transmitted on eMPS Sessions.
- **Current interval eMPS Statistics**: GTP-C message statistics for messages received/transmitted on eMPS Sessions for current statistics collection interval. Statistics collection interval will be same as

bulkstats collection interval. If bulk stats collection is not configured, then Current MPS Statistics will be same as Total MPS Statistics.

- **Create Session Request (Total RX)**: This counter will be incremented by S-GW when it receives Create session request message on S4 interface containing an ARP value configured in MPS Profile.
- **Create Session Response (Total TX)**: This counter will be incremented by S-GW when it transmits Create session response message on S4 interface containing an ARP value configured in MPS Profile.

S-GW Ingress S11 Interface

The following CLI commands are modified to display the eMPS session related GTP-C message statistics for S11 interface of S-GW Ingress:

- **show egtpc statistics interface sgw-ingress interface-type s11**
  - **interface-type**: Displays interface level GTP-C message statistics
  - **s11**: Displays interface level GTP-C message statistics for S11 interface
- **show egtpc statistics egtp-service** *sgw_egtpc_service_name* **interface-type s11**
  - **s11**: Interface type S11 for S-GW eGTP-C interface

The output of the above CLI commands displays the following new parameters:

- **Total eMPS Statistics**: Cumulative GTP-C message statistics for messages received/transmitted on eMPS Sessions.
- **Current interval eMPS Statistics**: GTP-C message statistics for messages received/transmitted on eMPS Sessions for current statistics collection interval. Statistics collection interval will be same as bulkstats collection interval. If bulk stats collection is not configured, then Current MPS Statistics will be same as Total MPS Statistics.
- **Create Session Request (Total RX)**: This counter will be incremented by S-GW when it receives Create session request message on S11 interface containing an ARP value configured in MPS Profile.
- **Create Session Response (Total TX)**: This counter will be incremented by S-GW when it transmits Create session response message on S11 interface containing an ARP value configured in MPS Profile.
- **Modify Bearer Request (Total RX)**: This counter will be incremented by S-GW when it receives Modify Bearer request message on S11 interface containing an ARP value configured in MPS Profile.
- **Modify Bearer Response (Total TX)**: This counter will be incremented by S-GW when it transmits Modify Bearer response message on S11 interface containing an ARP value configured in MPS Profile.
- **Create Bearer Request (Total TX)**: This counter will be incremented by S-GW when it transmits Create Bearer request message on S11 interface containing an ARP value configured in MPS Profile.
- **Create Bearer Response (Total RX)**: This counter will be incremented by S-GW when it receives Create Bearer response message on S11 interface containing an ARP value configured in MPS Profile.
- **Downlink Data Notification (Total TX)**: This counter will be incremented by S-GW when it transmits Downlink Data Notification message on S11 interface containing an ARP value configured in MPS Profile.

- **Downlink Data Notification Ack (Total RX)**: This counter will be incremented by S-GW when it receives Downlink Data Notification Ack message on S11 interface containing an ARP value configured in MPS Profile.
- **Update Bearer Request (Total TX)**: This counter will be incremented by S-GW when it transmits Update Bearer request message on S11 interface containing an ARP value configured in MPS Profile.
- **Update Bearer Response (Total RX)**: This counter will be incremented by S-GW when it receives Update Bearer response message on S11 interface containing an ARP value configured in MPS Profile.

S-GW Egress GTP-based S5/S8 Interface

The following CLI commands are modified to display the eMPS session related GTP-C message statistics for S5/S8 interface of S-GW Egress:

- **show egtpc statistics interface sgw-egress interface-type s5s8**
  - **interface-type**: Displays interface level GTP-C message statistics
  - **s5s8**: Displays interface level GTP-C message statistics for S5/S8 interface
- **show egtpc statistics egtp-service** *sgw_egtpc_service_name* **interface-type sgw-s5s8**
  - **sgw-s5s8**: Interface type S5/S8 for S-GW eGTP-C interface

The output of the above CLI commands displays the following new parameters:

- **Total eMPS Statistics**: Cumulative GTP-C message statistics for messages received/transmitted on eMPS Sessions.
- **Current interval eMPS Statistics**: GTP-C message statistics for messages received/transmitted on eMPS Sessions for current statistics collection interval. Statistics collection interval will be same as bulkstats collection interval. If bulk stats collection is not configured, then Current MPS Statistics will be same as Total MPS Statistics.
- **Create Session Request (Total TX)**: This counter will be incremented by S-GW when it transmits Create session request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Create Session Response (Total RX)**: This counter will be incremented by S-GW when it receives Create session response message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Modify Bearer Request (Total TX)**: This counter will be incremented by S-GW when it transmits Modify Bearer request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Modify Bearer Response (Total RX)**: This counter will be incremented by S-GW when it receives Modify Bearer response message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Create Bearer Request (Total RX)**: This counter will be incremented by S-GW when it receives Create Bearer request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Create Bearer Response (Total TX)**: This counter will be incremented by S-GW when it transmits Create Bearer response message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Update Bearer Request (Total RX)**: This counter will be incremented by S-GW when it receives Update Bearer request message on S5/S8 interface containing an ARP value configured in MPS Profile.

- **Update Bearer Response (Total TX)**: This counter will be incremented by S-GW when it transmits Update Bearer response message on S5/S8 interface containing an ARP value configured in MPS Profile.

P-GW Ingress GTP-based S5/S8 Interface

The following CLI commands are modified to display the eMPS session related GTP-C message statistics for S5/S8 interface of P-GW Ingress:

- **show egtpc statistics interface pgw-ingress interface-type s5s8**
- **show egtpc statistics egtp-service** *pgw_egtpc_service_name* **interface-type s5s8**
  - **s5s8**: Interface type S5/S8 for P-GW eGTP-C interface.

The output of the above CLI commands displays the following new parameters:

- **Total eMPS Statistics**: Cumulative GTP-C message statistics for messages received/transmitted on eMPS Sessions.
- **Current interval eMPS Statistics**: GTP-C message statistics for messages received/transmitted on eMPS Sessions for current statistics collection interval. Statistics collection interval will be same as bulkstats collection interval. If bulk stats collection is not configured, then Current MPS Statistics will be same as Total MPS Statistics.
- **Create Session Request (Total RX)**: This counter will be incremented by P-GW when it receives Create session request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Create Session Response (Total TX)**: This counter will be incremented by P-GW when it transmits Create session response message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Modify Bearer Request (Total RX)**: This counter will be incremented by P-GW when it receives Modify Bearer request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Modify Bearer Response (Total TX)**: This counter will be incremented by P-GW when it transmits Modify Bearer response message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Create Bearer Request (Total TX)**: This counter will be incremented by P-GW when it receives Create Bearer request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Create Bearer Response (Total RX)**: This counter will be incremented by P-GW when it receives Create Bearer response message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Update Bearer Request (Total TX)**: This counter will be incremented by P-GW when it transmits Update Bearer request message on S5/S8 interface containing an ARP value configured in MPS Profile.
- **Update Bearer Response (Total RX)**: This counter will be incremented by P-GW when it receives Update Bearer response message on S5/S8 interface containing an ARP value configured in MPS Profile.

clear egtpc

The following CLI commands are modified to clear eMPS statistics at interface level and eGTP-C service level:

- **clear egtpc statistics interface-type interface-pgw-ingress interface s5s8**: Clears interface statistics along with eMPS statistics for all eGTP-C services of P-GW Ingress type and S5/S8 interface.
- **clear egtpc statistics interface-type [interface-sgw-ingress | interface-sgw-egress] interface [s4 | s11 | sgw-s5s8]**: Clears interface statistics along with eMPS statistics for all eGTP-C services of S-GW Ingress type and S4 or S11 interface/S-GW Egress type and S5/S8 interface.
- **clear egtpc statistics egtp-service** *pgw_egtpc_service_name* **interface [s5s8]**: Clears interface statistics along with eMPS statistics for all P-GW eGTP-C services and S5/S8 interface.
- **clear egtpc statistics egtp-service** *sgw_egptc_service_name* **interface [s11 | s4 | sgw-s5s8]**: Clears interface statistics along with eMPS statistics for all S-GW eGTP-C services and S4 or S11 or S5/S8 interface.

P-GW eGTP-C S5/S8 Schema

The following new bulk statistics variables are added to the P-GW eGTP-C S5/S8 schema in support of this feature:

- tun-recv-cresessreq-emps – The total number of tunnel - create session request - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-cresessresp-emps – The total number of tunnel - create session response - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-modbearerreq-emps – The total number of tunnel - modify bearer request - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-modbearerresp-emps – The total number of tunnel - modify bearer response - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-crebearerreq-emps – The total number of tunnel - create bearer request - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-crebearerresp-emps – The total number of tunnel - create bearer response - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-updbearerreq-emps – The total number of tunnel - update bearer request - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-updbearerresp-emps – The total number of tunnel - update bearer response - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.

eGTP-C Schema

The following new bulk statistics variables are added to the eGTP-C schema in support of this feature:

- s11-tun-recv-cresessreq-emps – The total number of tunnel - create session request - messages received by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-sent-cresessresp-emps – The total number of tunnel - create session response - messages sent by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.

- s11-tun-recv-modbearerreq-emps – The total number of tunnel - modify bearer request - messages received by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-sent-modbearerresp-emps – The total number of tunnel - modify bearer response - messages sent by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-sent-crebearerreq-emps – The total number of tunnel - create bearer request - messages sent by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-recv-crebearerresp-emps – The total number of tunnel - create bearer response - messages received by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-sent-updbearerreq-emps – The total number of tunnel - update bearer request - messages sent by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-recv-updbearerresp-emps – The total number of tunnel - update bearer response - messages received by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-sent-ddnreq-emps – The total number of downlink data notification - messages sent by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s11-tun-recv-ddnack-emps – The total number of downlink data notificatino acknowledge - messages received by the system for eMPS subscriber on interface s11. This stat is for current bulkstat interval only.
- s4-tun-recv-cresessreq-emps – The total number of tunnel - create session request - messages received by the system for eMPS subscriber on interface s4. This stat is for current bulkstat interval only.
- s4-tun-sent-cresessresp-emps – The total number of tunnel - create session response - messages sent by the system for eMPS subscriber on interface s4. This stat is for current bulkstat interval only.
- tun-sent-cresessreq-emps – The total number of tunnel - create session request - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-cresessresp-emps – The total number of tunnel - create session response - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-modbearerreq-emps – The total number of tunnel - modify bearer request - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-modbearerresp-emps – The total number of tunnel - modify bearer response - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-crebearerreq-emps – The total number of tunnel - create bearer request - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-crebearerresp-emps – The total number of tunnel - create bearer response - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-recv-updbearerreq-emps – The total number of tunnel - update bearer request - messages received by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.
- tun-sent-updbearerresp-emps – The total number of tunnel - update bearer response - messages sent by the system for eMPS subscriber on interface s5s8. This stat is for current bulkstat interval only.