



Update Bearer Request and Response

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	cnSGW-C
Applicable Platform(s)	SMI
Feature Default Setting	Enabled - Always-on
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2020.04

Feature Description

In this release, cnSGW-C supports only relay of update bearer request (which can contain TFT change, QCI change or APB – AMBR change) from PGW towards MME. When MME sends response to cnSGW-C, it relays update bearer response towards PGW.

This release doesnt support signaling towards User Plane.

Standards Compliance

The Update Bearer Request and Response Support feature complies with the following standards:

- *3GPP TS 23.401*
- *3GPP TS 23.214*
- *3GPP TS 29.274*
- *3GPP TS 29.244*

How it Works

This section describes how this feature works.

Call Flows

This section describes the key call flow of Update Bearer Request and Response feature.

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sequenceDiagram
    participant MME
    participant S11 as S11-GTP-EP
    participant S5 as S5-SGW-EGRESS-GTP-EP
    participant SGW as Service-POD (SGW)
    participant NodeMgr as Node-Mgr
    participant CDLEndpoint as CDL-Endpoint
    participant PFCPEP as PFCP-EP

    Note over MME: [1] CreateSessionReq(TEID=0)
    MME->>S11: [1] CreateSessionReq(TEID=0)
    Note over S11: Started New Transaction E-T1  
Route this CSReq to any available Svc pod
    S11->>SGW: [2] Create Session Request
    Note over SGW: Started New Transaction S-T2. Validate CSREQ
    SGW->>NodeMgr: [3] Allocate Id
    NodeMgr->>SGW: [4] Allocate Id Rsp
    Note over SGW: [5] Read UPF Cache
    Note over SGW: UPF Cache is updated by Node-Mgr when Association is performed. SGW service read same cache and perform UP selection. Phase 1 is single UP support
    SGW->>PFCPEP: [6] Sx Est Req
    Note over PFCPEP: Started New Transaction P-T3
    PFCPEP->>SGW: [7] Sx Est Rsp
    Note over PFCPEP: P-T3 Transaction is complete
    SGW->>S5: [8] Create Session Req
    Note over S5: Started New Transaction E-T4
    S5->>SGW: [9] Create Session Rsp
    Note over S5: Transaction E-T4 is complete
    SGW->>NodeMgr: [10] Sx Mod Req
    Note over NodeMgr: Started New Transaction P-T5
    NodeMgr->>SGW: [11] Sx Mod Rsp
    Note over NodeMgr: P-T5 Transaction is complete
    Note over SGW: Transaction S-T2 which was started at Step 2 is complete
    SGW->>S11: [12] Create Session Rsp
    Note over S11: Transaction E-T1 which was started at Step 1 is now complete
    S11->>MME: [13] Create Session Rsp
    MME->>S11: [15] Modify Bearer Request (TEID)
    Note over S11: Route MBRReq with TEID to correct Service Pod  
Start New Transaction E-T1
    S11->>SGW: [16] Modify Bearer Request
    Note over SGW: Service POD starts new transaction S-T2
    SGW->>NodeMgr: [17] Sx Mod Req
    Note over NodeMgr: Started New Transaction P-T3
    NodeMgr->>SGW: [18] Sx Mod Rsp
    Note over NodeMgr: P-T3 Transaction is complete
    SGW->>S11: [19] Modify Bearer Response
    Note over SGW: Transaction S-T2 which was started at Step 16 is complete
    S11->>SGW: [20] Update Bearer Request (TFTs/APN AMBR)
    Note over SGW: New transaction S-T3 is started. Session is loaded from CDL
    SGW->>CDLEndpoint: [20] Update Session to CDL
    CDLEndpoint->>SGW: [18] Sx Mod Rsp
    Note over CDLEndpoint: P-T3 Transaction is complete
    SGW->>S11: [22] Update Bearer Request
    Note over S11: [23] Update Bearer Request
    S11->>MME: [23] Update Bearer Request
    MME->>S11: [24] Update Bearer Response
    S11->>SGW: [25] Update Bearer Response
    Note over SGW: In Phase 1 SGW is not doing any UP communication. Only update to CDL (APN AMBR/QCI/ULI/Timezone parameters)
    SGW->>S5: [26] Update Bearer Response
    Note over S5: [25] Update Bearer Response
    S5->>SGW: [27] Update Session to CDL
    Note over SGW: [27] Update Session to CDL
    SGW->>CDLEndpoint: [27] Update Session to CDL
    Note over CDLEndpoint: [27] Update Session to CDL
    
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Table 3: Bearer Request/Response without UP Signaling Call Flow Description

Step	Description
1	MME sends Create Session Req to S11-GTP-EP with TEID value as zero.
2	Transaction E-T1 started. S11-GTP-EP sends Create Session Req to SGW-Service POD.
3, 4	Transaction S-T2 started. SGW-Service POD sends Allocate ID to Node-Mgr and receives response from it.
5, 6, 7	SGW-Service POD reads Node-Mgr updated UPF cache and performs UPF selection. SGW-Service POD sends Sx Est Req to PFCP-EP. Transaction P-T3 started. SGW-Service POD receives Sx Est Rsp from PFCP-EP.
8, 9	Transaction P-T3 completed. SGW-Service POD sends Create Session Req to S5-SGW-EGRESS-GTP-EP. Transaction E-T4 started. SGW-Service POD receives Create Session Rsp from S5-SGW-EGRESS-GTP-EP.
10, 11, 12	Transaction E-T4 completed. SGW-Service POD sends Sx Mod Req to PFCP-EP. Transaction P-T5 started. SGW-Service POD receives Sx Mod Rsp from PFCP-EP.
12	Transaction S-T2 and P-T5 completed. SGW-Service POD sends Create Session Rsp to S11-GTP-EP.
13	Transaction E-T1 completed. S11-GTP-EP sends Create Session Rsp to MME.
14	SGW-Service POD sends Create Session to DB.
15	MME sends Modify Bearer Req with TEID value to S11-GTP-EP.
16	S11-GTP-EP routes MBReq with TEID to the exact SGW-Service POD. S11-GTP-EP sends Modify Bearer Request SGW-Service POD.
17	Transaction S-T2 completed. SGW-Service POD sends Sx Mod Req to PFCP-EP.
18	Transaction P-T3 started. SGW-Service POD receives Sx Mod Rsp from PFCP-EP.

Step	Description
19	Transaction P-T3 completed. SGW-Service POD sends Sx Mod Rsp to S11-GTP-EP.
20	Transaction S-T2 completed. SGW-Service POD sends Update Session to CDL.
21	S5-SGW-EGRESS-GTP-EP sends Update Bearer request with TFTs and APN AMBR to SGW-Service POD.
22, 23	Transaction S-T3 completed. SGW-Service POD sends Update Bearer Request to S11-GTP-EP. S11-GTP-EP forwards Update Bearer Request to MME.
24, 25	MME sends Update Bearer Rsp to S11-GTP-EP. S11-GTP-EP forwards Update Bearer Rsp to SGW-Service POD.
26	SGW-Service POD forwards Update Bearer Rsp to S5-SGW-EGRESS-GTP-EP.
27	SGW-Service POD sends Update Session to CDL.

