Change Notification Request Handling

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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.	2021.02.0

Feature Description

A change notification message is initiated in cnSGW-C to indicate modifications for the User Location Information (ULI) and User CSG Information (UCI) updates. If these updates are valid, the cnSGW-C CDR is initiated. The change notifications may contain the secondary RAT usage IE which is specific to the

cnSGW-C and the ISGW. The cnSGW-C saves the RAT usage information and transmits the usage information in the subsequent CDR message.

Standards Compliance

This feature complies with the following standards specifications:

- *3GPP TS 29.274 "3GPP Evolved Packet System (EPS); Evolved General Packet Radio Service (GPRS) Tunnelling Protocol for Control plane (GTPv2-C); Stage 3"*

How it Works

This section describes how this feature works.

The cnSGW-C network function handles the change notification request using the following approach:

- If the ULI or the UCI changes are valid in the connection request (CNREQ), the associated packet data network (PDN) is updated.
- cnSGW-C initiates a Query URR to get the latest usage information and generates cnSGW-C CDR when:
  - ULI is modified.
  - Charging and ULI trigger is enabled.

For information on configuring charging, see SGW Charging Support chapter.

Call Flows

This section describes the key call flow for this feature.

Change Notification Request Call Flow

This section describes the change notification request and the response call flow.

Figure 1: Change Notification Request Call Flow

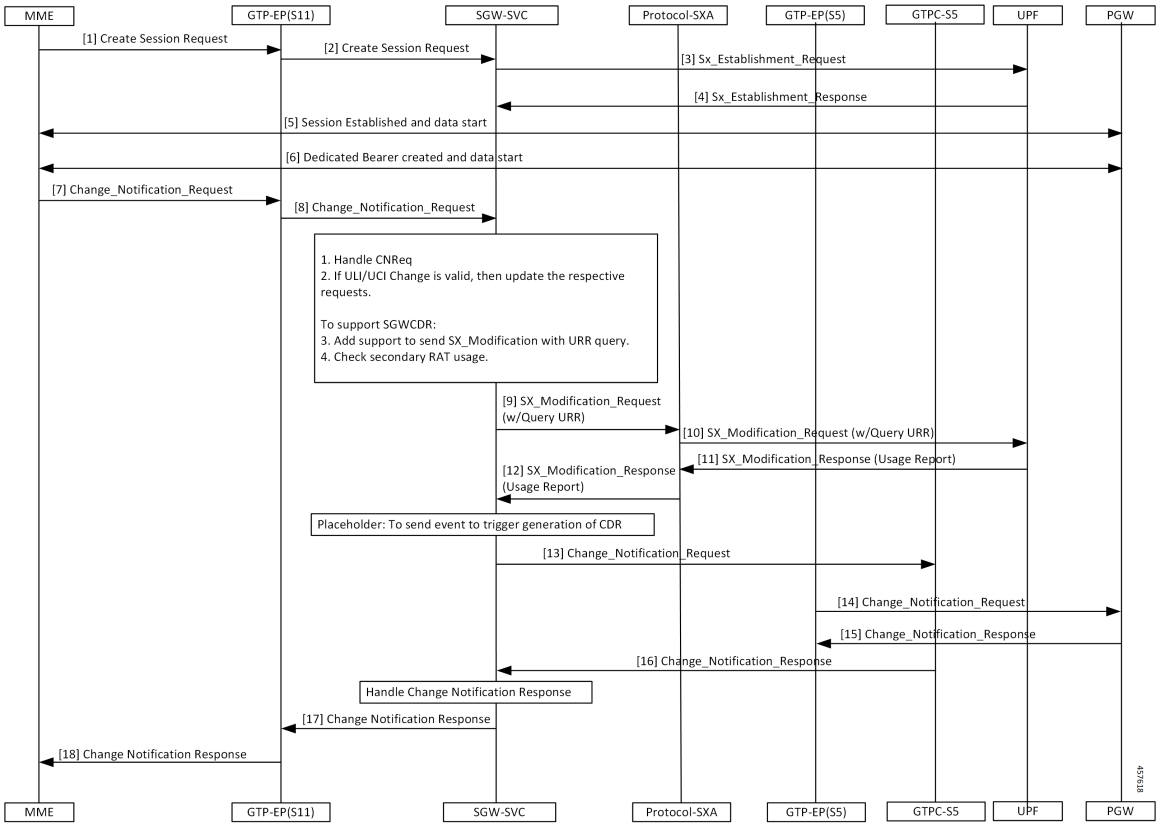

Table 3: Change Notification Request Call Flow Description

Step	Description
1	The MME sends a Create Session Request towards GTP-EP(S11).
2	The GTP-EP(S11) forwards the Create Session Request to the SGW-SVC.
3	The SGW-SVC sends the Sx Establishment Request to the UPF.
4	The UPF responds to the request with the SX Establishment Response directed towards the SGW-SVC.
5	The MME and the PGW establish the sessions and start exchanging data.
6	The MME and the PGW create the dedicated bearer and start exchanging data.
7	The MME sends the Change Notification Request to the GTP-EP.
8	The GTP-EP forwards the Change Notification Request to the SGW-SVC. If ULI or UCI changes are valid in the connection request (CNREQ), the PDN is updated. The GTP-EP sends the Sx Modification Request with the URR query after checking the secondary RAT usage.

Step	Description
9	The SGW-SVC sends the Sx Modification Request with the URR query to the Proto-SXA.
10	The Proto-SXA forwards the Sx Modification Request with the URR query to the UPF.
11	The UPF responds to the request with the Sx Modification Response, with the usage report to the Proto-SXA.
12	The Proto-SXA forwards the Sx Modification Response with the usage report to the SGW-SVC.
13	The SGW-SVC sends the Change Notification Request to the GTPC-S5.
14	The GTPC-S5 forwards the Change Notification Request to the PGW.
15	The PGW responds with the Change Notification Response to the GTPC-S5.
16	The GTPC-S5 forwards the Change Notification Response to the SGW-SVC.
17	The SGW-SVC sends the Change Notification Response to the GTP-EP(S11).
18	The GTP-EP(S11) forwards the Change Notification Response to the MME.

OAM Support

This section describes operations, administration, and maintenance information for this feature.

Bulk Statistics Support

The change notification filter displays the status of the change requests for which the notification is invoked. The following are the sample statistics and are provided for reference purposes only.

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_egress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="change_notification",status="attempted",sub_fail_reason=""}
1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_egress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="change_notification",status="success",sub_fail_reason=""} 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_egress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="initial_attach",status="attempted",sub_fail_reason=""} 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_egress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="initial_attach",status="success",sub_fail_reason=""} 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_ingress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="change_notification",status="attempted",sub_fail_reason=""}
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```

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sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_ingress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="change_notification",status="success",sub_fail_reason=""} 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_ingress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="initial_attach",status="attempted",sub_fail_reason=""} 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_ingress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="initial_attach",status="success",sub_fail_reason=""} 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_ingress",reject_cause="",service_name="sgw-service",
sgw_procedure_type="modify_bearer_req_initial_attach",status="attempted",sub_fail_reason=""}
 1
```

```
sgw_service_stats{app_name="smf",cluster="Local",data_center="DC",fail_reason="",
instance_id="0",interface="interface_sgw_ingress",reject_cause="",service_name="sgw-service"
,sgw_procedure_type="modify_bearer_req_initial_attach",status="success",sub_fail_reason=""}
 1
```