# VoLTE Call Prioritization



# 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

cnSGW-C provides:

- CLI support to mark QCI as IMS media.
- CLI support to display whether session/bearer is VoLTE or not in `show subscriber` output.
- Counter support to identify number of VoLTE subscribers in the system.
- Sx message priority configuration based on VoLTE marked session.

# How it Works

This section describes how this feature works.

- SGW profile represents SGW service.
- SGW profile has associated subscriber policy, which helps to select the Operator Policy.
- Operator Policy has DNN policy associated with it.
- DNN policy has DNN profile associated with it which has the QCI mark for marking VoLTE subscriber for priority.

Based on the QCI marking as IMS, *volteBearer* and *volteSession* flags are set internally when you execute `show subscriber` command.

- *volteBearer* is a bearer level flag. If bearer QCI is present in marked QCI list, *volteBearer* flag is set as true and the bearer is considered as **volteBearer**.
- *volteSession* is a session level flag. This flag is set as **true** if there's a VoLTE bearer present in any PDN of that subscriber.

# Feature Configuration

Configuring this feature involves the following steps:

- Configure the call priority. For more information, refer to Configuring the Priority, on page 2.
- Configure the message priority. For more information, refer to Sx Message Priority, on page 5.

## Configuring the Priority

This section describes how to configure the priority.

CLI is used to mark the QCI level as VoLTE media under dnn profile. If requested QCI in the call matches with the marked QCI, SGW sets the *volteSession* and *volteBearer* flags. If a subscriber session has **volteSession**, then that subscriber has the highest priority compared to other subscribers.

```
config
  profile dnn profile_name ims mark qci qci_value
```

**NOTES:**

- **profile dnn** *profile_name*—Specify the DNN profile name.

- **mark**—For marking standard QCI value as IMS media.
- **qci** *qci_value*—Specify the QCI value. The following QoS Class Identifiers are supported:

  **Standard:** 1-9

## Configuration Example

The following is an example configuration.

```
config
   profile dnn dnn1 ims mark qci [ 2 3 4 ]
   end
```

## Configuration Verification

To verify the configuration

```
show full-configuration profile dnn dnn1
profile dnn dnn1
 ims mark qci [ 2 3 4 ]
```

Based on the QCI marking as IMS, *volteSession* and *volteBearer* flags are set internally when you execute `show subscriber` command.

This section provides sample output.

```
show subscriber namespace sgw imsi 123456789012348
subscriber-details
{
  "subResponses": [
    {
      "status": true,
      "genericInfo": {
        "imsi": "imsi-123456789012348",
        "mei": "imei-123456786666660",
        "msisdn": "msisdn-223310101010101",
        "accessType": "EUTRAN",
        "plmnId": {
          "mcc": "123",
          "mnc": "456"
        },
        "sgwProfileName": "sgw1",
        "unAuthenticatedImsi": "No"
      },
      "s11cInterfaceInfo": {
        "sgwTeid": "[0x12000147] 301990215",
        "sgwIPv4Address": "209.165.201.19",
        "mmeTeid": "[0x62b5] 25269",
        "mmeIPv4Address": "209.165.201.20"
      },
      "pdnInfoList": {
        "totalPdn": 1,
        "pdnInfo": [
          {
            "pdnId": "PDN-1",
            "apn": "intershat",
            "attachType": "Initial Attach",
            "sgwRelocState": "N/A",
            "operatorPolicyName": "N/A",
            "dnnProfileName": "N/A",
            "defaultEbi": 5,
            "pdnType": "IPv4",
```

```
                "allocatedIPv4": "209.165.201.26",
                "apnSelectionMode": "Subscribed",
                "ambrUplink": "10 Kbps",
                "ambrDownlink": "20 Kbps",
                "s5cInterfaceInfo": {
                  "sgwTeid": "[0x52000147] 1375732039",
                  "sgwIPv4Address": "209.165.201.19",
                  "pgwTeid": "[0x339a] 13210",
                  "pgwIPv4Address": "209.165.201.18"
                },
                "sxaInterfaceInfo": {
                  "selectedUP": "209.165.201.20",
                  "upEpKey": "209.165.201.20:209.165.201.19",
                  "cpSeid": "[0x1200014752000147] 1297038098512740679",
                  "upSeid": "[0x2712] 10002"
                },
                "bearerInfoList": {
                  "totalBearer": 1,
                  "bearerInfo": [
                    {
                      "bearerId": "Bearer-1",
                      "state": "Connected",
                      "ebi": 5,
                      "isDefaultBearer": true,
                      "qosInfo": {
                        "qci": 6,
                        "arp": 113
                      },
                      "s1uInterfaceInfo": {
                        "sgwTeid": "[0x62b7] 25271",
                        "sgwIPv4Address": "209.165.200.226",
                        "eNodeBTeid": "[0x62b8] 25272",
                        "eNodeBIPv4Address": "209.165.201.20"
                      },
                      "s5uInterfaceInfo": {
                        "sgwTeid": "[0x62b6] 25270",
                        "sgwIPv4Address": "209.165.201.1",
                        "pgwTeid": "[0x339b] 13211",
                        "pgwIPv4Address": "209.165.201.18"
                      },
                      "chargingId": 303174163
                    }
                  ]
                },
                "uli": {
                  "mcc": "123",
                  "mnc": "456",
                  "tac": "0x92a",
                  "eci": "0x12d687"
                },
                "uetimeZone": {
                  "timeZone": "+0:15",
                  "dayLightSavingTime": "+1 hour"
                },
                "plmnType": "VISITOR"
              }
            ]
          }
        }
      ]
    }
```

## Sx Message Priority

This section describes the Sx message priority.

Based on the VoLTE flags (volteSession and volteBearer), SGW sets the message priority in Sx request messages (Sx-Est, Sx-Mod, and so on) while processing the received requests/responses (for example, S5-CBReq, S11CBResp, S11-UBRes, S5DBReq, and so on).

Sx Message Priority is set when the session is marked for volteSession (or it has VoLTE QCI).

In Sx Req (Establishment or Modification) Message Header:

```
"HEADERS": {
      "length": 30,
      "msg_type": 52,
      "priority": 2,        <<< VOLTE Session priority value
      "priority_flag": 1,   <<< Priority flag is true i.e 1
      "retransmit": 0,
      "seid": 10002,
      "seid_flag": 1,
      "seq_number": 22,
      "version": 1
    },
```

# OAM Support

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

## Bulk Statistics

sgw_voltesession_counter is added based on the *volteSession* flag. This counter indicates how many VoLTE sessions are present in the system at a particular moment.

If *volteSession* flag is true, counter gets incremented.

If *volteSession* flag isn't present (no VoLTE bearer is present in any PDN), the counter gets decremented.

Counter Name: sgw_voltesession_counter

Description: Current active VoLTE sessions present in the system.

Label:

- LABEL_STAT: VolteSession

**Sample Counter Output:**

You can check the counter from the pod:

```
curl http://209.165.201.20:8080/metrics | grep "volte"

% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0#
HELP sgw_voltesession_counter Current Active Volte Session
# TYPE sgw_voltesession_counter gauge
sgw_voltesession_counter{app_name="smf",cluster="cn",data_center="cn",instance_id="0",
service_name="sgw-service",state="VolteSession"} 1
100  246k    0  246k    0     0  16.0M      0 --:--:-- --:--:-- --:--:-- 17.1M
root@sgw-service-n0-0:/opt/workspace#
```