Service Configuration Enhancements

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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
Support added for DNN List	2021.02.3
First introduced	2020.01.0

Feature Description

cnSGW-C supports Subscriber Map and Operator Policy configurations.

SGW profile represents SGW-service or node. The operator policy is decided based on subscriber policy association.

Feature Configuration

Configuring this feature involves the following steps:

- SGW profile. For more information, see Configuring the SGW Profile, on page 2.
- Subscriber policy. For more information, see Configuring the Subscriber Policy, on page 3.
- Operator policy. For more information, see Configuring the Operator Policy, on page 4.
- Policy DNN. For more information, see Configuring the Policy DNN, on page 4.

Configuring the SGW Profile

To configure this feature, use the following configuration:

```
config
   profile sgw sgw_name
      locality locality_code
      fqdn dnn_name
      subscriber-policy policy_name
      end
```

NOTES:

- **locality** *locality_code*—Specify the locality code. Must be a string.
- **fqdn** *dnn_name*—Specify the cnSGW-C FQDN.
- **subscriber-policy** *policy_name*—Specify the subscriber policy name. Must be a string.

Configuration Example

The following is an example configuration.

```
config
   profile sgw sgw-data
      locality LOC1
      fqdn 209.165.200.254
      subscriber-policy subpol1
      end
```

Configuration Verification

To verify the configuration:

```
show running-config profile sgw
profile sgw sgw-data
locality LOC1
fqdn 209.165.200.254
subscriber-policy subpol1
```

Configuring the Subscriber Policy

Note The maximum number of supported subscriber map profiles is 64.

To configure this feature, use the following configuration:

```
config
   policy subscriber subscriber_name
      precedence precedence_value
         imsi
            mcc mcc_value
            mnc mnc_value
            msin first_value last_value
         serving-plmn
            mcc mcc_value
            mnc mnc_value
         imsi-start-range range_value
         imsi-stop-range range_value
         supi-start-range range_value
         supi-stop-range range_value
         operator-policy policy_name
         end
```

Note All parameters are optional.

NOTES:

- **precedence** *precedence_value*—Specify the precedence for entry. Must be an integer in the range of 1-2048.
- **mcc** *mcc_value*—Specify the Mobile Country Code (MCC). Must be a three digit integer.
- **mnc** *mnc_value*—Specify the Mobile Network code (MNC). Must be a two or three digit integer.
- **msin** *first_value last_value*—Specify the mobile subscriber identification number (MSIN) range.

  first_value—Specify starting value of the MSIN range. Must be an integer in the range of 1-9999999999.

  last_value—Specify the ending value of the MSIN range. Must be an integer in the range of 1-9999999999.
- **operator-policy** *policy_name*—Specify the operator policy name. Must be a string.
- **imsi-start-range** *range_value*—Specify the IMSI start range. Must be an integer in the range of 100000000000000-9999999999999999.
- **imsi-stop-range** *range_value*—Specify the IMSI stop range. Must be an integer in the range of 100000000000000-9999999999999999.
- **supi-start-range** *range_value*—Specify the SUPI start range. Must be an integer in the range of 100000000000000-999999999999999.

- **supi-stop-range** *range_value*—Specify the SUPI stop range. Must be an integer in the range of 100000000000000-999999999999999.

Configuration Example

The following is an example configuration.

```
config
   policy subscriber sub1
      precedence 2
         imsi mcc 123 mnc 456
         imsi msin first 99 last 100
      serving-plmn mcc 404 mnc 678
      supi-start-range 100000000000001
      supi-stop-range  199999999999999
      imsi-start-range 200000000000001
      imsi-stop-range  299999999999999
      operator-policy op1
      end
```

Configuring the Operator Policy

Note The maximum number of supported operator policy profiles is 1000.

To configure this feature, use the following configuration:

```
config
  policy operator operator_name
  policy dnn dnn_policy_name
  end
```

NOTES:

- **policy operator** *operator_name*—Specify the operator policy name. Must be a string.
- **policy dnn** *dnn_policy_name*—Specify the DNN policy name. Must be a string.

Configuration Example

The following is an example configuration.

```
config
   policy operator op1
   policy dnn pol1
   end
```

Configuring the Policy DNN

This section describes how to configure Policy DNN and adding it to cnSGW-C. The DNN support enables you to determine the exact APN profile as per the APN name, APN network-identifier and APN operator-identifier.

Note The maximum number of supported DNN policies is 1000.

To configure this feature, use the following configuration:

```
config
    policy dnn dnn_policy_name
        dnn dnn_name
           dnn-list dnn_list
           profile profile_name
        dnn network-identifier network_identifier_name operator-identifier
operator_identifier_name profile profile_name
        dnn operator-identifier operator_identifier_name profile profile_name
        dnn operator-identifier profile profile_name
        end
```

NOTES:

- **dnn** *dnn_name*—Specify the DNN name.
- **network-identifier** *network_identifier_name*—Specify the network identifier. Must be a string.
- **profile** *profile_name*—Specify the profile name. Must be a string.
- **operator-identifier** *operator_identifier_name*—Specify the operator identifier. Must be a string.
- **profile** *default_dnn_profile*—Specify the default DNN profile name.
- **dnn-list** *dnn_list*—Specify the DNN list for selecting a DNN profile. It helps in minimizing the entries needed for pointing multiple DNN to a single profile.

Note With present evaluation criteria, following is the matching order to select the associated profile:

- DNN/DNN List
- NI+OI
- NI
- OI
- Default

Don’t configure overlapping criteria.

Configuration Example

The following is an example configuration.

```
config
   policy dnn polsub1
      dnn network-identifier ims profile ims1
      dnn network-identifier ims operator-identifier ims.com profile ims
      dnn network-identifier voice operator-identifier volte profile voiceprofile
```

```
      dnn operator-identifier data profile data-profile
   profile default-dnn-profile
   end

config
   policy dnn polsub1
      dnn intershat dnn-list [ intershat1 intershat2 intershat3 ]
         profile profile_name
            dnn network-identifier ims operator-identifier ims.com profile ims
            dnn operator-identifier volte profile voiceprofile
            dnn operator-identifier data profile profile_name
            end
```

Configuration Modification Impact

This section describes the impact or behavior of configuration change on existing call, new PDN, or new subscriber.

Modification	cnSGW-C Existing Call	cnSGW-C New PDN or New subscriber
Define a new SGW-profile and delete the old profile (with or without the pod restart)	When the new transaction happens, the call gets loaded on cn-SGW-C from CDL. *Observation:* Change in the cnSGW-C profile configuration and termination of the call.	Rejects the new PDN and deletes the existing call. New subscriber uses new SGW profile.
Delete the subscriber map	No impact	Applies modified configuration for the following: • subscriber policy • operator policy • dnn policy • dnn profile
Modify the subscriber map in SGW-service	No impact	Applies modified configuration for the following: • subscriber policy • operator policy • dnn policy • dnn profile

Modification	cnSGW-C Existing Call	cnSGW-C New PDN or New subscriber
Delete the operator policy	No impact	Applies modified configuration for the following: • subscriber policy • operator policy • dnn policy • dnn profile
Add the deleted or new operator policy	No impact	Applies modified configuration for the following: • subscriber policy • operator policy • dnn policy • dnn profile
Modify the operator policy name in the subscriber map	No impact	Applies modified configuration for the following: • subscriber policy • operator policy • dnn policy • dnn profile

Troubleshooting Information

This section describes the troubleshooting information that enables you to resolve the service configuration issues.

Configuration Errors

This section describes the errors that cnSGW-C reports during the service configuration.

Subscriber Policy Configuration Errors

```
show config-error
ERROR
COMPONENT ERROR DESCRIPTION
------------------------------------------------------------------------
SGWProfile Subscriber policy name : polSubSgw in profile sgw1 is not configured
```

Operator Policy Configuration Errors

```
show config-error
ERROR COMPONENT ERROR DESCRIPTION
```

```
--------------------------------------------------------------------------
SubscriberPolicy Operator policy : op2 under subscriber policy polSubSgw is not configured
```

DNN Policy Configuration Errors

```
show config-error
ERROR COMPONENT ERROR DESCRIPTION
--------------------------------------------------------------------------
OperatorPolicy Dnn policy name : dnn_1 in operator policy op1 is not configured
```