

User Plane Selection based on TAC Range

- Revision History, on page 1
- Feature Description, on page 1
- How It Works, on page 1
- Configuring User Plane Selection based on TAC Range, on page 3
- Configuring Tracking Area Code Profile, on page 4
- Configuring Routing Area Code Profile, on page 5

Revision History

Note Revision history details are not provided for features introduced before release 21.24.

Revision Details	Release
With this release, support is added for TAC/RAC profile configuration.	21.25
First introduced	Pre 21.24

Feature Description

With this feature, User Plane group can be selected based on Access Point Name (APN). The ability to configure Tracking Area Code (TAC) range, in rule combinations in virtual APN selection, helps in giving more flexible network design for location-based User Plane selection for edge computing and other services.

With 21.25 and later releases, support is added to configure TAC and Routing Area Code (RAC) profile in the Control Plane node. Using this feature, it is now possible to select APN based on discrete values of TAC/RAC profile instead of range.

How It Works

In non-CUPS architecture, Virtual APN selection is based on the following parameters:

- Subscriber IP
- Access-gw-address
- Bearer-access
- cc-behavior
- cc-profile
- domain
- mcc
- msisdn-range
- pdp-type
- rat-type
- roaming-mode
- serv-gw-plmnid

In CUPS architecture, Virtual APN selection is based on Tracking Area Code range with other options, such as cc-profile or mcc/mnc.

To support this feature:

- A new CLI keyword is introduced to accommodate new parameter.
- During call processing, incoming tracking area code is compared with the configured tracking area code range to determine the Virtual APN.

The Tracking Area Code based Virtual APN selection:

- Supports at least 30 tracking-area-code-range configured for Virtual APN.
- Supports overlapping ranges (subset or superset). Duplicate of tracking-area-code-range is not allowed for different priority.
- Selects a Virtual APN based on CLI configuration and User Plane is selected based on Virtual APN for a new call based on the tracking-area-code for that UE.
- Supports a combination of tracking-area-code-range and cc-profile in same priority.

Virtual APN functionality includes storing all the Virtual APN selection rules per real/Gn APN. Every rule has multiple criteria. Rule is identified by preference number. The list of APNs are stored and within APN a rule is identified using preference number.

New parameter has been introduced to pass Tracking Area Code, received in CSReq (TAI).

Limitations

Following are the known limitations and restriction of this feature.

- New configuration with multiple selection criteria in Virtual APN selection does not work with older builds/releases. User should have separate copies of the configuration for older builds/releases.

- Modify operation on the Virtual APN rule is not supported. User should delete the existing rule and add new rule to achieve modify operation.
- If same option is provided multiple times in the same rule, then the value of later option is considered for selection.
- Total number of Virtual APN rules added across all APNs is limited to 2048. This limitation exists in non-CUPS architecture.
- Upto 1000 TAC/RAC profiles can be configured. Memory usage is based on the number of profiles configured.
- The maximum number of TAC/RAC discrete values supported in a profile are 100. Memory usage is fixed per profile.
- TAC/RAC range or discrete values can overlap between profiles to support maintenance activities like split existing profile or others.
- This is Day-0 and Day-1 configuration.
- Multiple profiles can be associated with an APN.
- There are no changes in existing IP pool functionality.
- There is no specific impact on ICSR or Multi-Sx configurations.
- There is no Service Area Code (SAC) support.
- Pure-S calls aren't supported.
- UP selection requirements are handled in multi-UP group support features.

Configuring User Plane Selection based on TAC Range

This section provides information about CLI commands available in support of this feature.

Configuring Tracking Area Code Range

Use the following CLI commands to configure APN for Tracking Area Code range in Control Plane node.

```
configure
  context context_name
    apn apn_name
     virtual-apn preference preference apn apn_name tracking-area-code-range
 tac_range
       end
```

NOTES:

- **tracking-area-code-range** *tac_range*: Configures APN for Tracking Area Code range. The *tac_range* is an integer value ranging from 0 to 65535.

Verifying the Tracking Area Code Range Configuration

Use the following CLI commands to verify if the feature is enabled and the range that is configured for Tracking Area Code.

- **show configuration apn** *apn_name*
- **show apn name** *apn_name*

Configuring Tracking Area Code Profile

From 21.25 and later releases, Tracking Area Code profile can be configured in the Control Plane node. Using this feature, it is now possible to select APN based on discrete values of TAC instead of only range.

The following CLI commands are used to configure Tracking Area Code profile with discrete values and range.

```
configure
   context context_name
      tac-profile tac_profile_name
         tac range X to Y
         tac value
```

NOTES:

- **tac-profile** *tac_profile*: Configures APN for Tracking Area Code profile. The *tac_profile* is any range or discrete integer value ranging from 0 to 65535.
- The number of discrete TAC values supported per CLI command is 16.

Associating TAC Profile with APN

Use the following configuration to associate TAC profile with APN:

```
configure
   context context_name
      apn apn_name
         virtual-apn preference preference apn apn_name tac-profile tac_profile
         end
```

Verifying the Tracking Area Code Profile Configuration

Use the following CLI commands to verify if the feature is enabled and the range that is configured for Tracking Area Code profile.

- **show configuration apn** *apn_name*
- **show apn name** *apn_name*
- **show rule definition** *tac_profile*

Configuring Routing Area Code Profile

From 21.25 and later releases, Routing Area Code profile can be configured in the Control Plane node. Using this feature, it is now possible to select APN based on discrete values of RAC profile instead of range.

The following CLI commands are used to configure Routing Area Code profile with discrete values.

```
configure
   context context_name
      rac-profile rac_profile_name
         rac range X to Y
         rac value
```

NOTES:

- **routing-area-code-profile** *rac_profile*: Configures APN for Routing Area Code profile. The *rac_profile* is any range or discrete integer value ranging from 0 to 255.
- The number of RAC profile values supported is upto 16.

Associating RAC Profile with APN

Use the following configuration to associate TAC profile with APN:

```
configure
   context context_name
      apn apn_name
         virtual-apn preference preference apn apn_name
routing-area-code-profile rac_profile
         end
```

Verifying the Routing Area Code Profile Configuration

Use the following CLI commands to verify if the feature is enabled and the range that is configured for Routing Area Code profile.

- **show configuration apn** *apn_name*
- **show apn name** *apn_name*
- **show rule definition** *rac_profile*