

Cellular Network Slicing

This document outlines the architectural framework and operational parameters required to deploy cellular network slicing effectively.

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Cellular network slicing

Network slicing refers to partitioning of a physical network into multiple virtual segments known as slices. This solution lets service providers divide a 5G physical network into several distinct virtual slices. A host platform can set up multiple simultaneous network connections, each with its own IP address. It uses slice types that match each host's requirements. This method enables service providers to allocate dedicated resources for different service types, ensuring optimal performance and efficiency.

5G network slicing is supported only on 5G standalone networks. It is not available on 5G non-standalone (NSA) networks. The slice or service types have a specific set of network functions and resources defined by the network provider. Service type defines how a network slice is expected to behave, based on its features and services. These service types are supported in network slicing:

- Enhanced Mobile Broadband (eMBB): for high-bandwidth and low-latency applications.
- Ultra-reliable low latency communications (URLLC): for high reliability and low latency transmission requirements.
- Massive Internet of Things (MIoT): for sending small quantities of data.

Table 1: Feature History Table

Feature name	Release information	Feature description
Cellular Network Slicing	Release 17.18.2	This feature enables service providers to divide a 5G physical network into several distinct virtual slices.

Restrictions for cellular network slicing

These restrictions apply when configuring cellular network slicing.

- You can enable network slicing for the cellular profile only on the P-5GS6-R16SA-GL module when using 5G standalone mode.
- You cannot configure network slicing parameters on profile one or the default profile for the carrier.

Configure cellular network slicing

Follow these steps to configure cellular network slicing.

Procedure

Step 1 Use **config terminal** command to enter the global configuration mode.

Example:

```
Router# configure terminal
```

Step 2 Use the **controller cellular** <*slot*> command to enter the cellular controller configuration mode.

Example:

```
Router(config)# controller cellular x/x/x
```

Step 3 Use the **profile id** *number* **apn** *name* **authentication** *type* **pdn-type** *type* command to associate the profile with the PDN.

Example:

```
Router(config-controller)# profile id 3 apn apn-ns authentication none pdn-type ipv4
```

Step 4 Use the **profile id** *number* **apn** *name* **authentication** *type* **pdn-type** *type* **slice-type** *type* to associate the profile with the slice type.

Example:

```
Router(config-controller)# profile id 3 apn apn-ns authentication none pdn-type ipv4 slice- type miot
```

<1-3> slice type *number*: 1(eMBB), 2(URLLC), 3(MioT)

Step 5 Use the **profile id** *number* **apn** *name* **authentication** *type* **pdn-type** *type***slice-type** *type* **slice-differentiator** *number* to associate tslice differentiator with the slice type.

Example:

```
Router(config-controller)# profile id 3 apn apn-ns authentication none pdn-type ipv4 slice- type miot
 slice-differentiator 6
```

slice differentiator *number*: 0-16777214

If slice differentiator is bypassed, then "FF FF FF" is used internally as the slice differentiator to indicate that there is no slice differentiator associated with this slice type.

Example for configuring cellular network slicing

This example shows how to configure a cellular network slicing.

```
Device(config-controller)# profile id 3 apn apn-ns authentication none pdn-type ipv4
        no-overwrite
        slot            Associated sim slot
        slice-type Associated network slice type(SST)

        Device(config-controller)# profile id 3 apn apn-ns authentication none pdn-type
ipv4 slice-type
        <1-3>  Slice type number: 1(eMBB), 2(URLLC), 3(MioT)
        Device(config-controller)# profile id 3 apn apn-ns authentication none pdn-type
ipv4 slice- type embb
        slice-differentiator Associated Slice Differentiator(SD)  <--- if SD is bypassed
here,"FF FF FF" wll be used internally as the SD to indicate that there is no SD associated
 with this SST.
        slot                            Associated sim slot

        Device(config-controller)# profile id 3 apn apn-ns authentication none pdn-type
ipv4 slice-type
        embb slice-differentiator
        <0-16777214>  Slice Differentiator
        Device(config-controller)#
        Device(config-controller)#$ pdn ipv6  slice-type miot slice-differentiator 6
        slot  Associated sim slot
```

Verify cellular network slicing configuration

This is a sample output from the **show cellular** command that displays network slicing configuration and slice type details.

```
Device# show cellular profile 3

                Profile 3 = ACTIVE
                --------
                PDP Type = IPv6
                Access Point Name (APN) = TestNSSAI6_MIOT1
                Authentication = None
                S-NSSAI Slice Type is MIOT
                S-NSSAI Slice Differentiator = 6
```