



# Network Slicing

**Table 1: Feature History**

Feature Name	Release Information	Description
Cellular Network Slicing	Cisco IOS XE Catalyst SD-WAN Release 17.16.1a Cisco Catalyst SD-WAN Manager Release 20.16.1	This feature allows multiple networks to exist on the same physical network to optimize the network for different traffic types.

- [Information about Network Slicing, on page 1](#)
- [Restrictions for Network Slicing, on page 2](#)
- [Configure Network Slicing, on page 2](#)
- [Configure Cellular Network Slicing Using CLI, on page 4](#)
- [Verify Cellular Network Slicing Configuration, on page 5](#)

## Information about Network Slicing

Network slicing refers to partitioning a physical network into multiple virtual parts, called slices. The network slicing solution allows service providers to partition a 5G physical network into multiple virtual network slices. Using this feature, a host platform can set up multiple simultaneous network connections, each with its own IP address, using slice types that are suited to each of the host requirements. This approach allows service providers to allocate dedicated resources for different types of services for 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 the expected behavior of a network slice in terms of 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.

## Restrictions for Network Slicing

- You can enable network slicing for cellular profile only on P-5GS6-R16SA-GL module in 5G standalone mode.
- Configuring network slicing parameters on profile one or the default profile for the carrier is not allowed.

## Configure Network Slicing

### Before You Begin

Create a configuration group for Cisco Catalyst Cellular Gateways using **Workflows > Create Cellular Gateway Group**. On the **Configuration Groups** page, the resulting configuration group is labelled cellular gateway in the **Device Solution** column.

For information about creating configuration groups and applying them to devices, see the [Using Configuration Groups](#) section of *Cisco Catalyst SD-WAN Configuration Groups, Cisco IOS XE Catalyst SD-WAN Release 17.x*.

1. From the Cisco SD-WAN Manager menu, choose **Configuration > Configuration Groups**.
2. Create a [Configuration Group](#). A new configuration group is created.
3. In the configuration group, click **Add Profile**.
4. Choose **Transport & Management Profile** from the drop-down list.
5. Click **Edit** to add features to the Transport and Management profile.
6. Click **Add New Feature**.
7. Choose **Cellular Controller** from the **Add Feature** drop-down list.
8. Choose **Cellular Profile** from the **Add Feature** drop-down list.

**Table 2: Cellular Settings**

Field	Description
<b>Primary Slot</b>	Choose a SIM slot to designate it as primary. Range: 0, 1 Default: 0
<b>SIM SLOT 0 Cellular Profile</b>	
<b>Profile Id</b>	Profile ID. You can click <b>Add</b> to add multiple profiles.
<b>Access Point Name</b>	Access point name, from your service provider.

Field	Description
<b>Authentication Method</b>	Authentication method ( <b>none</b> , <b>pap</b> , <b>chap</b> , <b>pap_or_chap</b> ) indicated by your service provider.
<b>Username</b>	Username for authentication, as indicated by your service provider.
<b>Password</b>	Password for authentication, as indicated by your service provider.
<b>Packet Data Network Type</b>	Packet data network type ( <b>IPv4</b> , <b>IPv6</b> , <b>IPv4v6</b> ), as indicated by your service provider.
<b>Attach Profile</b>	Choose a attach profile from the defined profiles.
<b>Data Profile</b>	Choose a data profile from the defined profiles. You can use the same profile for the attach profile and data profile.
<b>SIM SLOT 1 Cellular Profile</b>	
See the fields described for SIM slot 0.	

9. For the configured **Cellular Controller**, choose the **Cellular Profile** or click **Add New** to add a new cellular profile.
10. Configure **Cellular Profile** using the following table.

**Table 3: Cellular Profile Settings**

Field	Description
<b>Type</b>	Choose a feature from the drop-down list.
<b>Feature Name</b>	Enter a name for the feature. The name can be up to 128 characters and can contain only alphanumeric characters.
<b>Description</b>	Enter a description of the feature. The description can be up to 2048 characters and can contain only alphanumeric characters.
<b>Profile ID</b>	Enter the identification number of the profile to use on the router. Range: 1 through 15
<b>Access Point Name</b>	Enter the name of the gateway between the service provider network and the public internet. It can be up to 32 characters long.
<b>Authentication</b>	Choose the authentication method used for the connection to the cellular network. It can be <b>none</b> , <b>pap</b> , <b>chap</b> , or <b>pap_chap</b> .
<b>Profile Username</b>	Enter the username to use when making cellular connections for web services. It can be 1 to 32 characters. It can contain any alphanumeric characters, including spaces.

Field	Description
<b>Profile Password</b>	Enter the user password to use when making cellular connections for web services. The password is case-sensitive and can be clear text, or an AES-encrypted key.  From Cisco Catalyst SD-WAN Manager Release 20.15.1, when you enter the password as clear text, Cisco SD-WAN Manager encrypts the password. When you view the configuration preview, the password appears in its encrypted form.
<b>Packet Data Network Type</b>	Choose the packet data network (PDN) type of the cellular network. It can be IPv4, IPv6, or IPv4v6.
<b>No Overwrite</b>	Enable this option to overwrite the profile on the cellular modem. By default, this option is disabled.
<b>Slice Type</b>	Choose the network slice type (SST) for the profile. The options are: <ul style="list-style-type: none"> <li>• eMBB: Enhanced Mobile Broadband, used for high data throughput.</li> <li>• URLLC: Ultra-Reliable Low Latency Communication, used for high reliability and low latency transmission.</li> <li>• MIoT: Massive IoT, used for many devices transmitting small quantities of data.</li> </ul>
<b>Slice Differentiator</b>	Enter the slice differentiator (SD) for the profile. This is an optional value that enables the user equipment (UE) to use multiple slice instances of the same SST.  Range: 0 through 16777214
<b>Slot</b>	Enter the associated SIM slot for the profile.

## Configure Cellular Network Slicing Using CLI

The following example shows how to configure a cellular network slicing using a CLI.

```
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" will 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

The following is a sample output from the **show cellular** command that displays network slicing configuration and slice type details:

```
Device# show cellular profile 6

Profile 6 = INACTIVE
-----
PDP Type = IPv6
Access Point Name (APN) = TestNSSAI6_URLLC1
Authentication = None
S-NSSAI Slice Type is URLLC
S-NSSAI Slice Differentiator = 1
```

