

20 Slicing

Slicing is to divide a physical network into multiple logical networks for multiple purposes. Different slices can meet differentiated SLA, isolation, security, and independent operation requirements, effectively solving network congestion problems.

[20.1 Slicing Solution Change Description](#)

This section describes the changes in each version.

[20.2 Slicing Solution Overview](#)

This section describes the background, principle architecture, and typical application scenarios of the slicing solution.

[20.3 Slice Lifecycle Management](#)

On an actual network, slices are dynamically created and changed based on user requirements.

[20.4 Slice Deployment and Configuration](#)

This section describes the common slice deployment and configuration procedures and examples.

[20.5 Reference](#)

20.1 Slicing Solution Change Description

This section describes the changes in each version.

Release	Description
V100R023C11&C12	Optimized 20.4.1.2 Example of Hard-Isolated Dedicated Network Slice Deployment (CLI) and added the procedure for adding an upstream port to a VLAN.
V100R023C11&C12	Added key technology HDBA .

Release	Description
V100R023C00	- Optimized 20.4.1.2 Example of Hard-Isolated Dedicated Network Slice Deployment (CLI) and added examples of configuring dedicate network slices by ONT and ONT port. - Optimized section <i>Prerequisites</i> and some section titles.
V100R021C10S PC300	Added the function of configuring MAC addresses for dedicated network slices. Added the link to P2MP dedicated network slicing.
V100R021C10	Added the function of dedicated network slicing.
V100R021C00	First release that supports service slicing.

For details about specifications and changes in each version, see [Specifications Query Tool](#).

20.2 Slicing Solution Overview

This section describes the background, principle architecture, and typical application scenarios of the slicing solution.

20.2.1 Background of Slicing

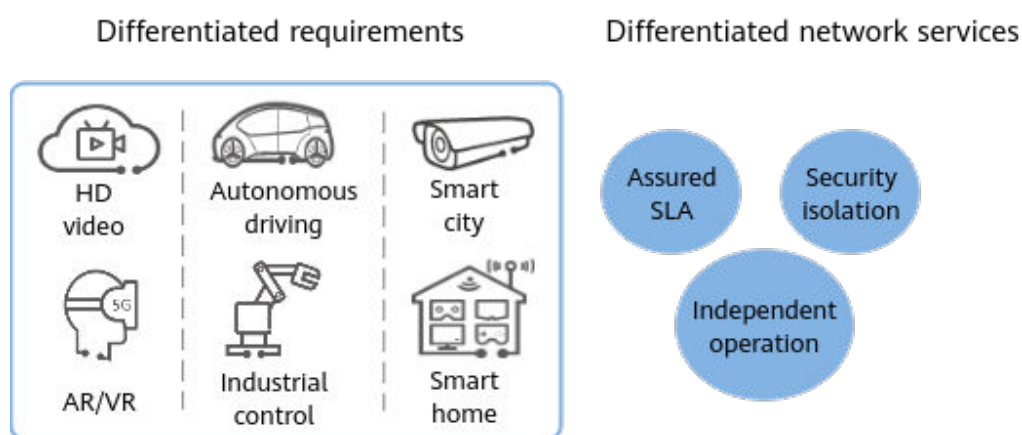
With the improvement of living standards, users' network requirements become more and more diversified, and the requirement for fast construction of dedicated networks becomes a trend.

Diversified User Services and Differentiated User Experience

With the development of science and technology and the improvement in living standards, home and enterprise users have higher requirements on network quality. They are no longer satisfied with mere improvement in broadband rates, and are calling for more diversified experience. Communication is changing from connections between people to connections between people, between people and things, and between things. Internet of everything (IoE) has become a trend.

In the era of IoE, massive devices need to access the network, and each device may carry multiple services. These devices and services belong to different industries and have different characteristics, posing different requirements on network security, latency, reliability, and bandwidth. For example:

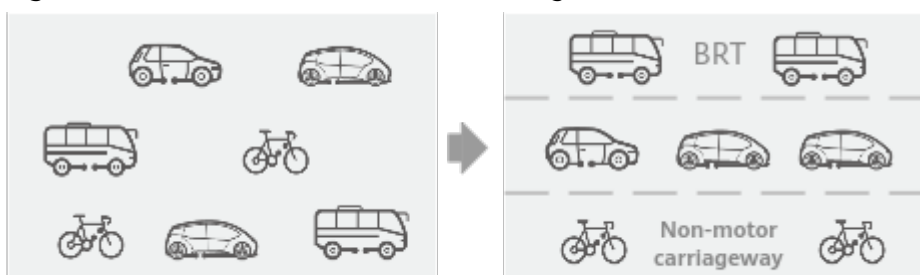
- Entertainment services such as HD video and AR/VR require high-bandwidth network connections.
- Autonomous driving and industrial control require low-latency and high-reliability network connections.
- Smart cities and smart homes require a large number of device connections and frequent transmission of small data packets.



Differentiated Network Service Assurance by Operators

A communications network is like a transportation system. Data packets are "vehicles", and the network provides "roads". Before cars became popular, the main consideration was to make roads wider and flatter to meet the needs of motorcycles and bicycles. As the number of vehicle types increases, the requirements for roads are also changing. It is not reasonable to use the same road and network mechanism to support bicycles and sports cars. To solve the problem of traffic jams during rush hours in the morning, it is not economical to only expand roads. The transportation department also controls traffic based on vehicle priorities and operation modes. For example, the bus rapid transit (BRT) lane and non-motor lane are set to improve the traffic efficiency.

Figure 20-1 Road traffic distribution management



Similarly, when network services are relatively simple and bandwidth is the main indicator, operators only need to consider how to improve the network speed and stability. In the era of IoE, numerous devices and applications are connected to the network. Home users and industry users have different and customized requirements. One network or the same set of policies cannot meet the requirements of new services and scenarios. Independent network construction for each service scenario is costly, time-consuming, and uneconomical.

- In multi-service unified bearing scenarios, for example, in home broadband, one home terminal may access multiple applications (such as online courses, online games, live broadcast, online shopping, and online chat) at the same time. These services have different network assurance requirements and priorities. Operators need to provide differentiated assurance for different services.

- In multi-tenant independent operation scenarios, if an independent hardware infrastructure network is provided for each network service provider (NSP)/ Internet service provider (ISP), the cost is high and device usage is low. If physical network resources can be shared by multiple tenants, the investment will be significantly reduced, and the device usage will be higher.

Slicing Solution

Based on the current software defined networking (SDN) technology, Huawei has developed a technology to divide one hardware infrastructure network into multiple independent virtual networks, for which resources can be flexibly combined and assigned on demand to meet different service requirements. If the live network cannot meet a new service requirement, an operator can create a new virtual network without affecting the live network. In this way, the new service can be provisioned as soon as possible.

The slicing solution helps operators and ISPs build networks more efficiently and agilely and provide differentiated and isolated network services for users.

- It helps operators provide differentiated service experience for home broadband users and provide isolated and secure logical dedicated networks for industry users.
- It also enables ISPs to obtain isolated access network resources economically and carry out independent service deployment and O&M.

20.2.2 Benefits of the Slicing Solution

Network slicing provides resource isolation, differentiated service level agreements (SLA), high reliability, flexible topology customization, and automatic slice management capabilities, helping enterprises achieve digital transformation.

Network slicing enables operators to build multiple dedicated, virtual, isolated, and on-demand logical networks on one physical network to meet network capability requirements (such as latency, bandwidth, and number of connections) from different industry customers.

- **Differentiated SLAs for diversified services.** Customized slices based on service requirements enable networks to have good service adaptability and meet differentiated service requirements such as latency, jitter, reliability, and security. Therefore, the slicing technology can help operators enter the massive vertical industry markets.
- **Dynamic resource assignment and flexible networking.** Through network slice life cycle management, the service, function, capacity, service quality, and connection relationship of a network slice can be customized based on different service requirements, implementing dynamic assignment and efficient use of network resources.
- **One network for multiple purposes, reducing costs.** Compared with independent networks, network slicing enables a unified infrastructure network to meet multi-service requirements, avoids the need to build a dedicated physical network for each service, reduces network construction investment, improves the network operation efficiency, and reduces operators' CAPEX and OPEX.

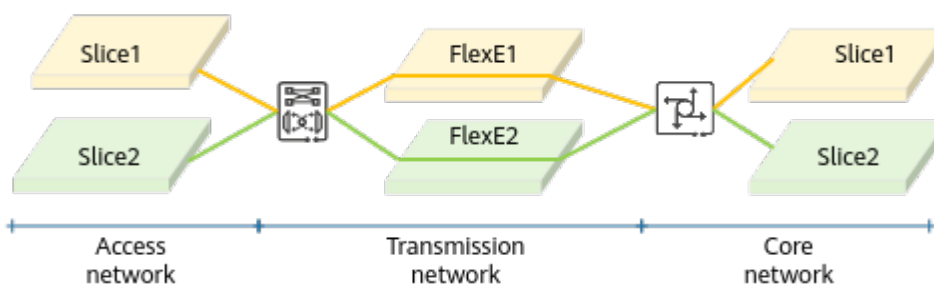
- **Simplified configuration.** ONU services can be automatically configured in batches without the need for onsite software debugging, improving device deployment and service provisioning efficiency.
- **Visualized O&M.** The network management system (NMS) visualizes slice resources and slice SLAs, and monitors network-wide status in real time, so that users can view the real-time running status of the entire network clearly.

20.2.3 Architecture of the Slicing Solution

The network slicing solution is an end-to-end solution that flexibly assigns resources and combines network capabilities based on service requirements from the access network, transmission network, to the core network. The network slice management system is used to implement unified network management.

E2E Slicing

To implement end-to-end network slicing, each network segment must support network slicing and identify network slices in an end-to-end manner, as shown in the following figure.



The basic slice information of each NE is as follows:

Access network

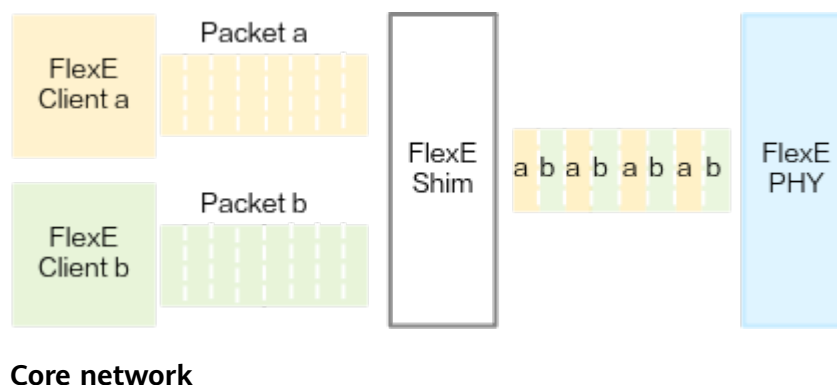
Slicing object: port, ONU, and transmission bandwidth

Slicing mode: service-based soft slicing and port-based hard slicing

Transmission network

Slicing object: transmission bandwidth

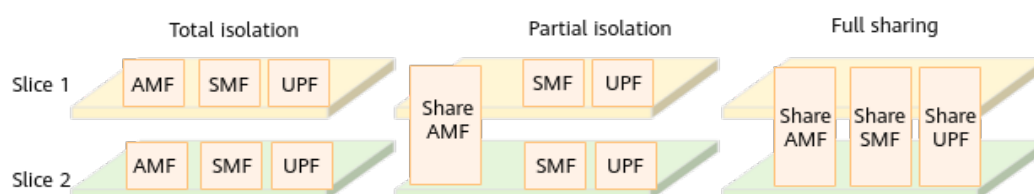
Slicing mode: differentiated hard pipe isolation using FlexE



Slicing object: virtualized network function (VNF)

Slicing mode: VNF sharing planned based on the SLA requirements of services. Different VNF sharing policies lead to different network isolation, service performance, and networking complexity.

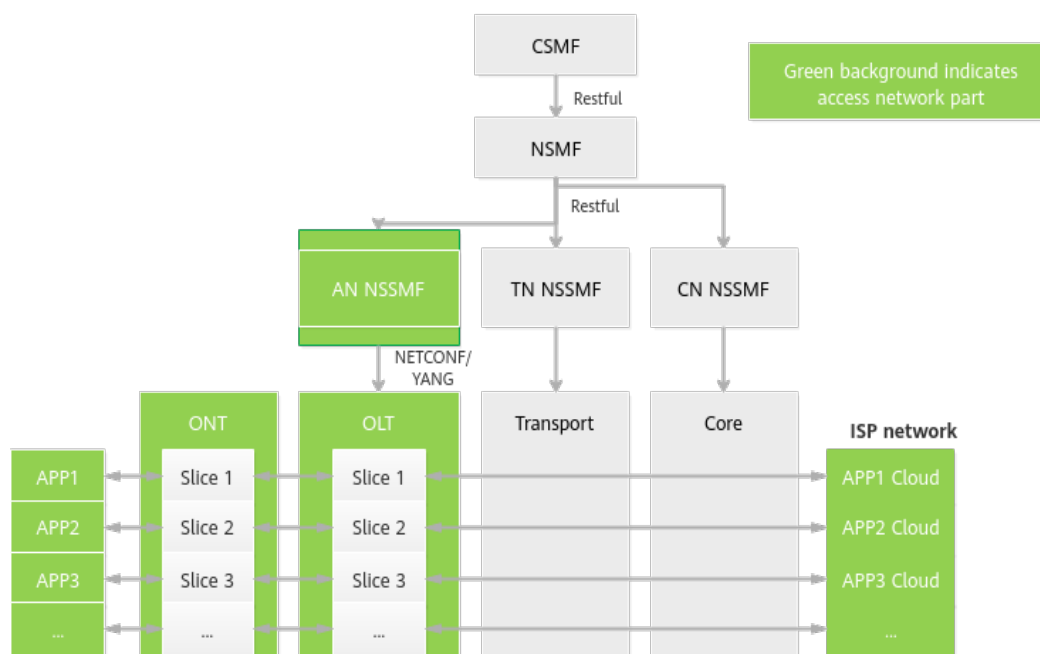
- VNF that can be shared by all network slices: network slice selection function (NSSF), network repository function (NRF), and network exposure function (NEF).
- VNF that can be shared by some network slices: access and mobility management function (AMF), unified data management (UDM), and policy control function (PCF).
- VNF that can be exclusively used by a network slice: session management function (SMF) and user plane function (UPF).



Architecture of the Slicing Solution

Figure 20-2 shows the architecture of the network slicing solution and protocols used by main interfaces.

Figure 20-2 Architecture of the network slicing solution



The communication service management function (**CSMF**) converts service requirements into network requirements. The CSMF provides a slice mall. After a user subscribes to a slice service in the mall, the CSMF converts the service

requirements of the user into requirements on the network side and transfers the requirements to the NSMF for network design. Generally, the CSMF is provided by the business support system (BSS) of an operator.

The network slice management function (**NSMF**) manages and orchestrates end-to-end network slices. After receiving end-to-end network slice requirements, the NSMF converts the requirements into slice instances, decomposes and combines services based on the capabilities of each subdomain/subnet (including the access network, transmission network, and core network), and transfers the deployment requirements on subdomains/subnets to the NSSMF.

The NSMF is generally provided by a cross-domain slice manager.

The network slice subnet management function (NSSMF) manages and orchestrates network slice subnet instances (NSSIs), including slice life cycle management (such as deployment, activation, and deactivation) and O&M (such as slice subnet performance monitoring and alarms). It focuses on a single subnet, such as the access network.

Communication Interfaces

As shown in [Figure 20-2](#), the communications interfaces between components in the slicing solution are as follows:

CSMF and NSMF: RESTful protocol

NSMF and NSSMF: RESTful protocol

NSSMF and access NEs: NETCONF/YANG

NOTE

This document describes the implementation, application, and configuration of the access network in detail. For details about the transmission network and core network, see the corresponding product documentation.

20.2.4 Implementation Principles of Access Network Slicing

Access network slices can be classified into dedicated network slices and service slices.

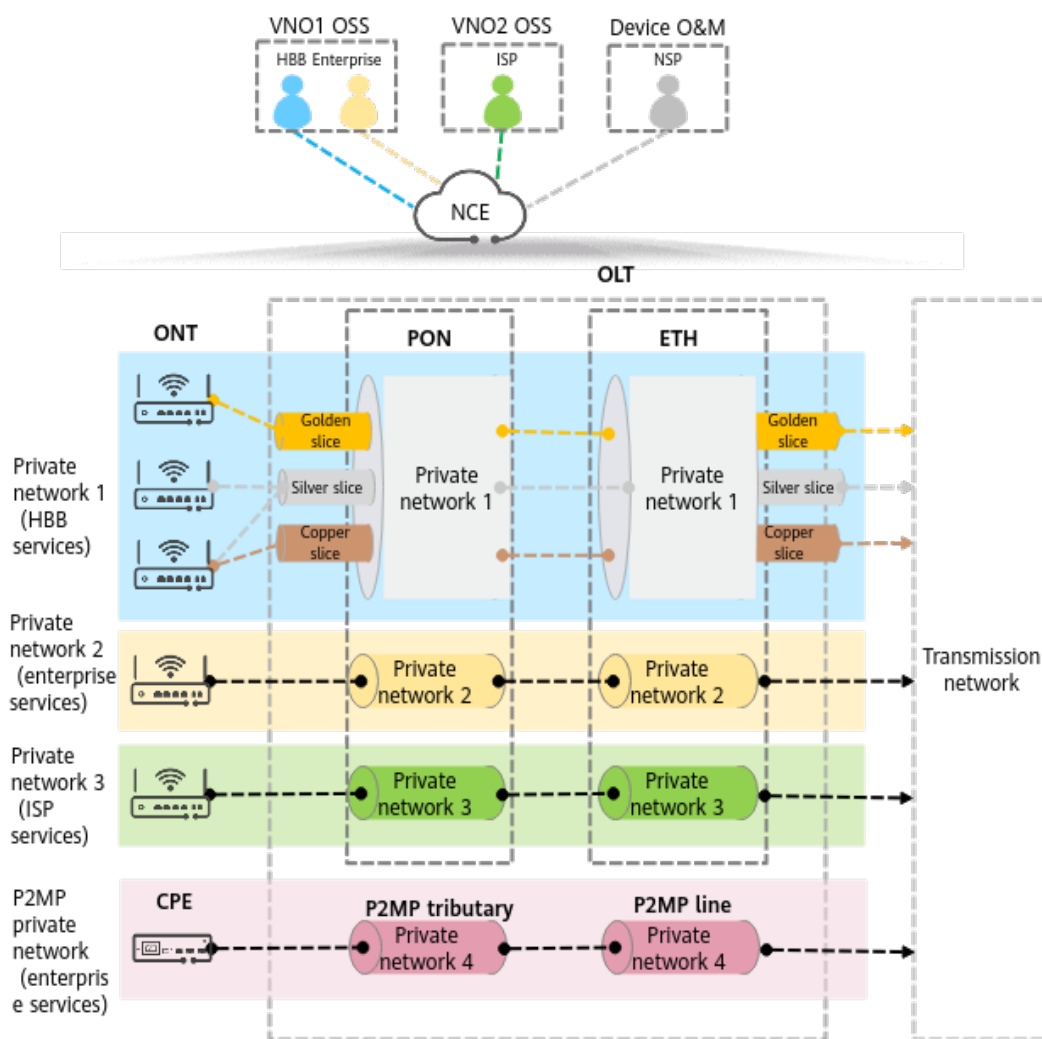
dedicated network slice: Divides software and hardware resources of a network into multiple independent slices. Each slice forms a hard isolated dedicated network. Different virtual network operators (VNOs) perform independent and isolated O&M management on dedicated network resources. It also enables a campus network to carry multiple subnet services in a secure manner.

Service slice: Divides a traditional access network or dedicated network into service channels of different SLAs. Different network slice instances (NSIs) are deployed in service channels to meet differentiated network requirements of different users or services.

Table 20-1 Comparison between the two slicing modes

Item	Dedicated Network Slice	Service Slice
Object	Deterministic services	General services
Slicing granularity	Networking level	Service level
Slice level classification	Not classified	3 classes: golden, silver, and copper
Application scenario	Enterprises requiring private lines or ISP leasing, enterprise campus networks, and power distribution networks	Differentiated SLAs for multiple services on one network (for example, multiple services in home broadband or enterprise scenarios)
Service deployment modes	On-demand deployment	Pre-deployment
O&M and management	Isolated	Unified NMS and independent slice view

Figure 20-3 Access network slicing principle



Dedicated Network Slice

An NSP uses the NCE controller to slice OLT resources into multiple dedicated networks. Resources and services of the dedicated networks are isolated from each other. The NSP can lease network slices to ISPs. Each ISP performs isolated O&M through an independent VNO interface. The logical topology, route selection, and O&M of each VNO are independent of those of other VNOs.

- **NSP multi-tenant management:** The NSP uses the NMS to manage tenants in a visualized and unified manner and assign network resources.
- **Resource and service isolation between ISP tenants:** By slicing resources at the NCE layer, an NSP can assign the port, VLAN, and other resources of an OLT to ISPs so that the ISPs can share the OLT and fiber resources. The rights control on the tenant interface enables independent management of resources between ISPs and improves the reliability of private line services.
- **Independent service provisioning and O&M by ISPs:** NCE provides different service package profiles for tenants to implement differentiated services between ISPs and meet different service requirements. The one-click troubleshooting function provided by NCE helps ISPs quickly diagnose faults.

dedicated network slicing includes two solutions.

- Physically dividing the PON board resources of an OLT
- Building E2E P2MP dedicated networks using P2MP boards

Service Slices

Network service experience requirements are classified into the following types:

- Golden services: services that require assured bandwidth and latency
- Silver services: services that require assured bandwidth
- Copper service: regular services

Based on network service experience requirements, access network service slices are classified into golden slices, silver slices, and copper slices. The characteristics of resource assignment are as follows:

- Golden slice: fixed reserved bandwidth which cannot be preempted even when idle
- Silver slice: assured bandwidth which can be preempted when idle
- Copper slice: best-effort bandwidth, allowing overselling

In each type of golden, silver, and copper slices, multiple specific service slices with different network parameters can be set. For example, in the golden slice type, a VR service slice, an HD video service slice, and a live broadcast service slice can be set.

Figure 20-4 Bandwidth usage supported by golden, silver, and copper slices

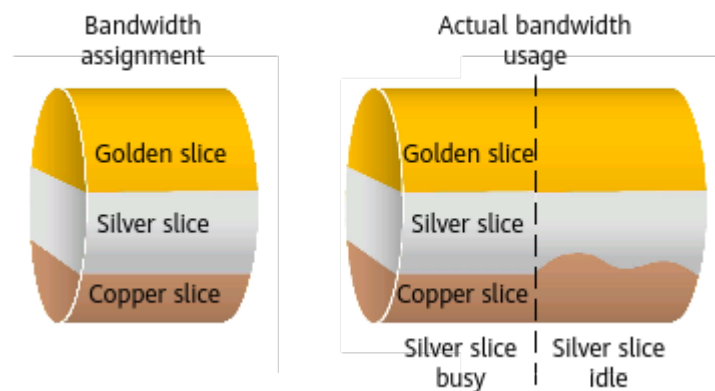


Table 20-2 Comparison of golden, silver, and copper slice resources

Slice Category	Direction	ONT	
		Wi-Fi Side	WAN Side
Golden slice	Upstream	• Exclusive RU resources • Dynamic assignment	• Application identification • Virtualization into multiple WAN ports that correspond to different slices
	Downstream		
Silver slice	Upstream	• RU resource sharing • Scheduling with priority higher than copper slices	
	Downstream		
Copper slice	Upstream	RU resource sharing	
	Downstream		

Slice Category	Direction	OLT	
		PON	Uplink
Golden slice	Upstream	- DBA fix: fixed bandwidth that cannot be preempted even when idle - T-CONT timeslot isolation	- Highest-priority HQoS scheduling - Fixed bandwidth that cannot be preempted even when idle - Independent slice queues and configurable packet buffer size
	Downstream	- Highest-priority HQoS scheduling, and fixed bandwidth that cannot be preempted even when idle - Independent slice queues and configurable packet buffer size	/

Slice Category	Direction	OLT	
		PON	Uplink
Silver slice	Upstream	- DBA assure: assured bandwidth that can be preempted when idle - T-CONT timeslot isolation	- Medium-priority HQoS scheduling - Assured bandwidth that can be preempted when idle - Independent slice queues and configurable packet buffer size
	Downstream	- Medium-priority HQoS scheduling, and assured bandwidth that can be preempted when idle - Independent slice queues and configurable packet buffer size	/
Copper slice	Upstream	- DBA Max: maximum bandwidth - T-CONT timeslot isolation	- Low-priority HQoS scheduling - Bandwidth overselling allowed, best effort

Slice Category	Direction	MAN
Golden slice	Upstream	OTN+ preferred VXLAN and VLAN supported
	Downstream	
Silver slice	Upstream	VXLAN preferred OTN+ and VLAN supported
	Downstream	
Copper slice	Upstream	VLAN preferred OTN+ and VXLAN supported

20.2.5 Key Technologies

20.2.5.1 HDBA

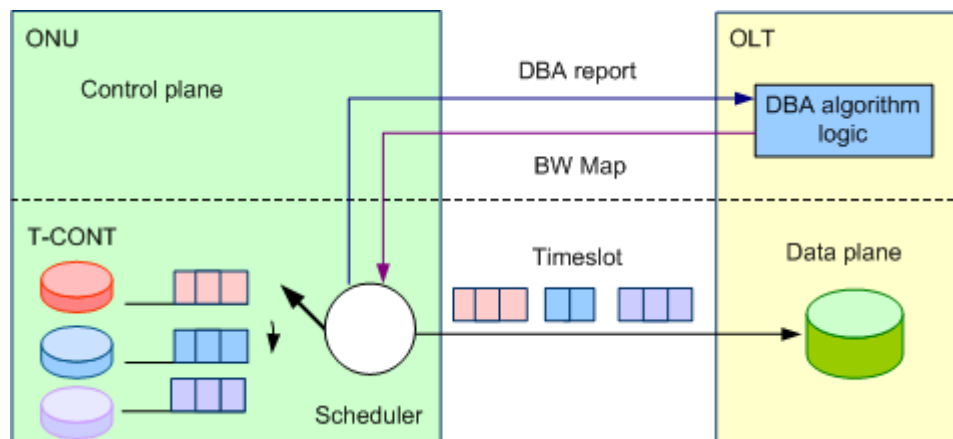
DBA Principles

DBA is short for dynamic bandwidth assignment. An OLT uses DBA to dynamically adjust the upstream bandwidth assigned to different ONUs to process the burst

traffic from ONUs, meeting the ONU upstream bandwidth requirements and improving the utilization of the PON upstream bandwidth.

Figure 20-5 shows the DBA principles.

Figure 20-5 DBA principles



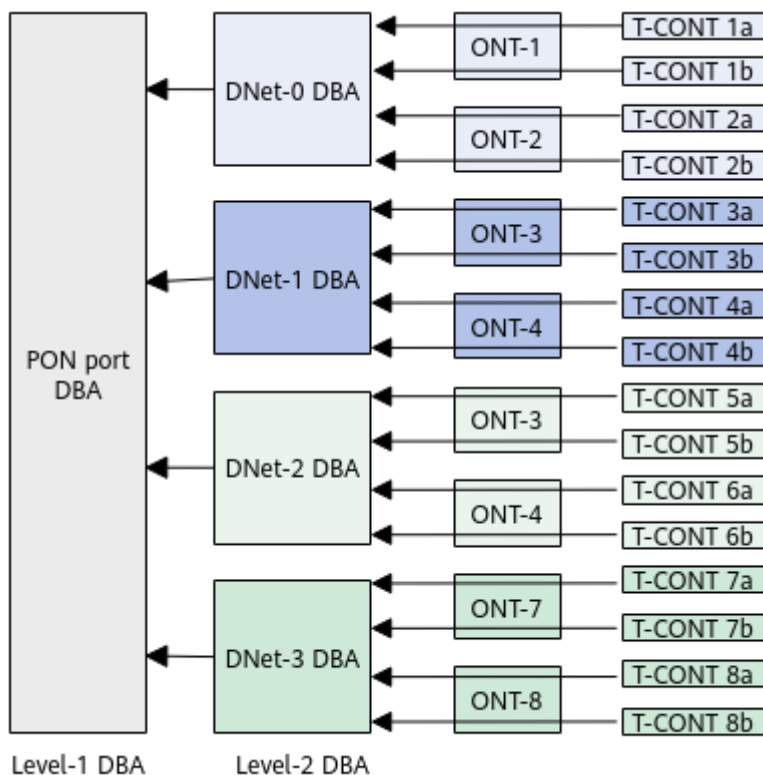
DBA implementation process:

- The DBA module in an OLT consistently collects DBA reports and uses a DBA algorithm to calculate the upstream bandwidth assigned to each ONU.
- The OLT sends the calculated result to each ONU using a bandwidth (BW) map.
- Each ONU transmits upstream data in burst mode in permitted timeslots defined in the BW map.

HDBA Principles

When multiple operators share an ODN, users connected to the same PON port can select service packages provided by different operators. A unique dedicated network (DNet) can be assigned to each operator, so that each operator can provision services and perform O&M separately. When dynamically assigning bandwidth, an OLT uses the hierarchical DBA (HDBA) technology to add the DNet group attribute to a PON port and performs 2-level DBA scheduling to implement bandwidth sharing on the PON port.

HDBA refers to two-level DBA scheduling by adding a DNet group attribute to a PON port. During dynamic bandwidth assignment, the bandwidth scheduling on a PON port is changed from T-CONT-based scheduling to two-level scheduling from DNet groups to T-CONTs. **Figure 20-6** shows the HDBA principles.

Figure 20-6 HDBA Principles

20.2.6 Typical Application Scenarios of the Slicing Solution

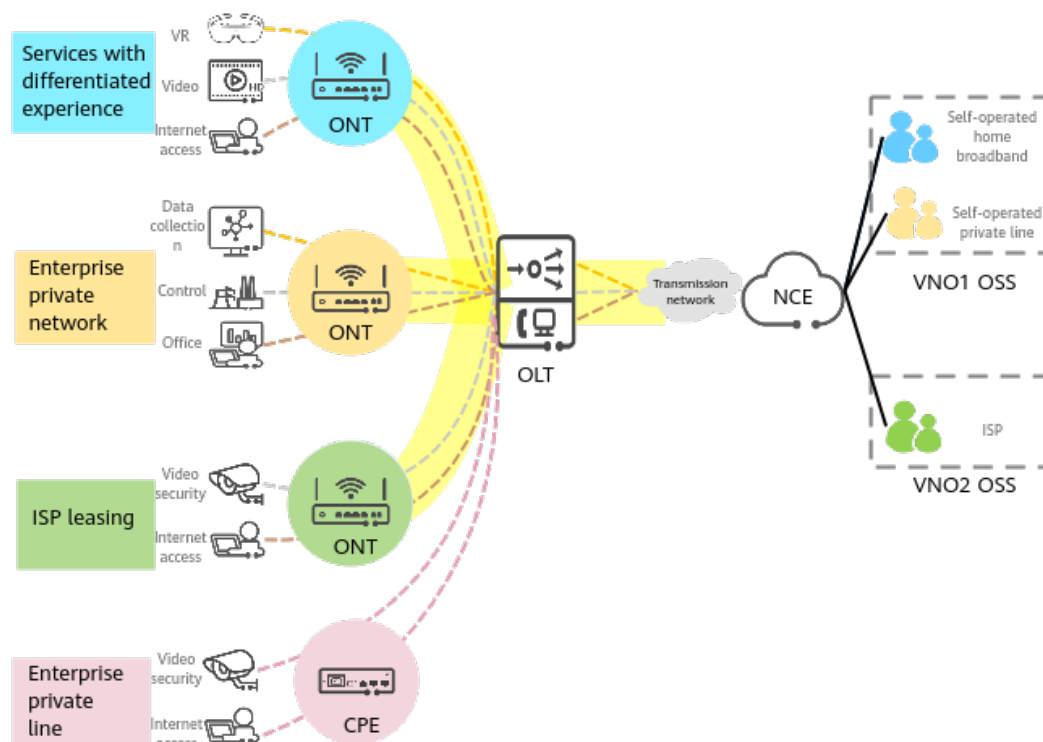
Network slicing enables traditional physical network resources to be flexibly and precisely divided, and slices are isolated from each other. It provides differentiated service experience for home and enterprise users, and provides ISPs with more flexible and economic physical networks.

20.2.6.1 Application Networking of the Slicing Solution

The access network slicing solution can provide differentiated services on the same FTTH network. It can also be used to build dedicated networks for enterprises with high requirements or lease the network resources to ISP users.

Figure 20-7 shows the usage of the two slicing modes on the access network.

- Service slice: applies to home broadband scenarios or enterprise scenarios where different services require differentiated network services. For example, differentiated management can be implemented for VR, video, and common Internet access services in home broadband, or for data collection, industrial control, and office services in enterprises.
- dedicated network slice: Applies to independent O&M of multiple VNOs, such as enterprise private lines or ISP dedicated networks, and the scenario of one campus network carrying multiple subnet services in a secure manner.

Figure 20-7 Slice application networking

20.2.6.2 Customized Network Services for Dedicated Network Slices

dedicated network slices apply to scenarios such as independent O&M by multiple VNOs and enterprise private lines.

Generally, for customers such as government departments, enterprises, and healthcare, finance, energy, and electricity industry customers, there are multiple service networks on their local area networks (LANs), including office and production networks on the intranet, Internet access, Wi-Fi, Internet of Things (IoT), and device networks (security, video, and access control). These services are isolated through dedicated network slicing to meet user requirements for high security.

Campus Scenarios

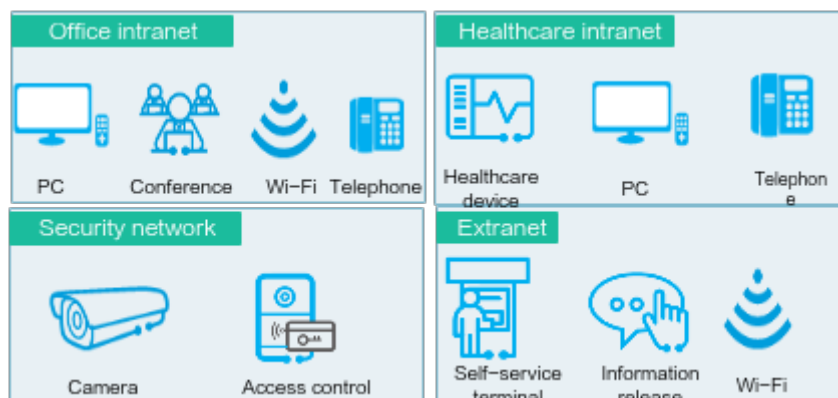
Enterprise campuses can use dedicated network slicing to isolate different services.

- Industrial campuses can use dedicated network slicing to isolate their production, office, and security networks.



- On a hospital campus, there are usually three networks — the intranet, device network, and extranet. Some hospitals further divide their intranets into office

and healthcare intranets. Hospital campuses can use dedicated network slicing to isolate the preceding networks.

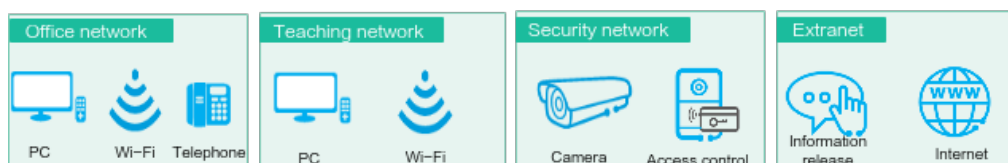


The **hospital intranet** is a dedicated medical information network that is open only to internal staff. It is the core working network of a hospital. The hospital intranet carries smart healthcare data and most smart management services, such as the hospital information system (HIS), electronic medical record (EMR), laboratory information system (LIS), picture archiving and communication system (PACS), and hospital resource planning (HRP) system. As the core network, the hospital intranet is also used for Wi-Fi access and medical IoT, and covers the consultation areas and wards of each clinical department, medical technology department, office area, cashiers, pharmacies, outpatient, emergency halls, and public areas.

The **hospital device network** is used to connect security cameras, environment monitoring devices, and access control systems. As safety incidents occur due to medical disputes from time to time, a reliable and economical security system is increasingly significant for hospitals, especially in key areas of smart hospitals.

The **hospital extranet** is used for Internet and external Wi-Fi access in scenarios such as offices and public areas. It also provides services such as appointment and treatment, online follow-up consultation, information release, result check, and telemedicine. With the development of "Internet + healthcare", hospitals are providing smart services on the Internet as well, such as online reservation, consultation, and payment.

- School campuses can use dedicated network slicing to isolate their office, teaching, and security networks, and extranet.



Electricity Scenarios

On electricity transmission/distribution networks, there are control services and data collection service that need to be isolated from each other.



ISP Scenarios

Dedicated network slices can be used when multiple ISPs share resources of one physical network.



Table 20-3 Network requirements of different services

Service Type	Safe City	Finance	Energy	ISP Self-Operation
Network requirements	High isolation High reliability High bandwidth Regular latency Massive connections	High isolation High reliability High bandwidth Lower latency	High isolation High reliability Lower latency	Customized requirements

20.2.6.3 Differentiated Service Experience of Service Slices

Service slices apply to home broadband scenarios or enterprise scenarios where different services have differentiated network requirements.

Home Broadband Scenario

Services such as VR, video call, office, and web browsing in home broadband have different network requirements, and differentiated SLA management can be provided.

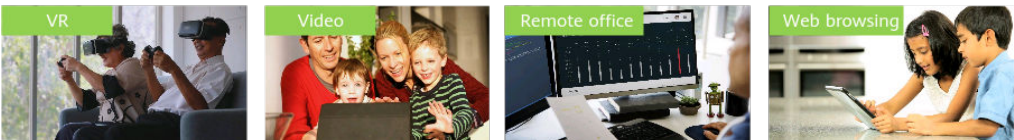


Table 20-4 Network requirements and slice recommendation for different services

Service Type	VR	Video and Remote Office	Web Browsing
Network requirements	Strong interactivity Bandwidth: high Latency: low Jitter: small Packet loss: low	Real-time Bandwidth: average Latency: relatively low Jitter: relatively small Packet loss: relatively low	Regular network requirements
Recommended slice	Golden slice	Silver slice	Copper slice

Enterprise Scenario

An enterprise campus network is divided into different areas or data groups with different network requirements. For example, production data collection, industrial control, online training, and office require differentiated management.



Table 20-5 Network requirements and slice recommendation for different services

Service Type	Production Center	Training	R&D Office/ Administrative Office
Network requirements	Large data volume and high reliability requirements Bandwidth: high Latency: low Jitter: small Packet loss: few	Strong interactivity Bandwidth: average Latency: relatively low Jitter: relatively small Packet loss: relatively low	Regular network requirements
Recommended slice	Golden slice	Silver slice	Copper slice

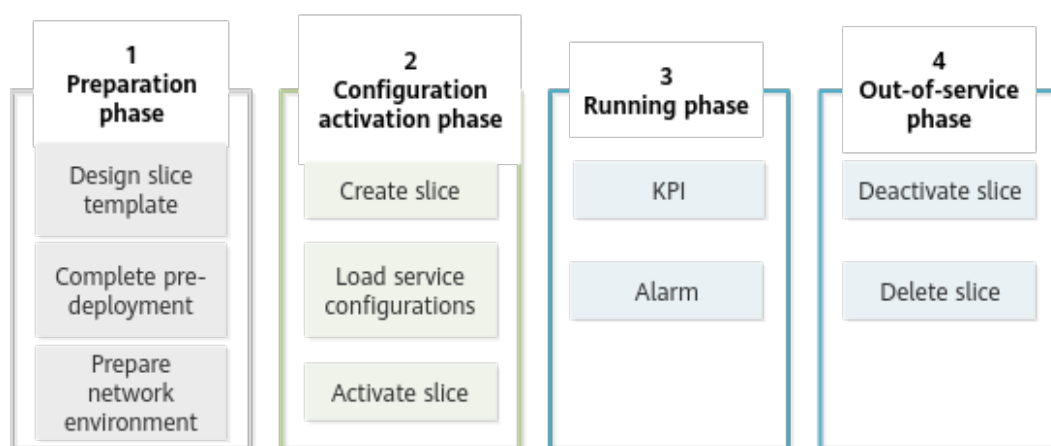
20.3 Slice Lifecycle Management

On an actual network, slices are dynamically created and changed based on user requirements.

When a user dynamically creates a network slice based on a network slice template, the network slice has a specific network capability of supporting a type of service, that is, the network slice becomes activated and alive.

Slice Life Cycle

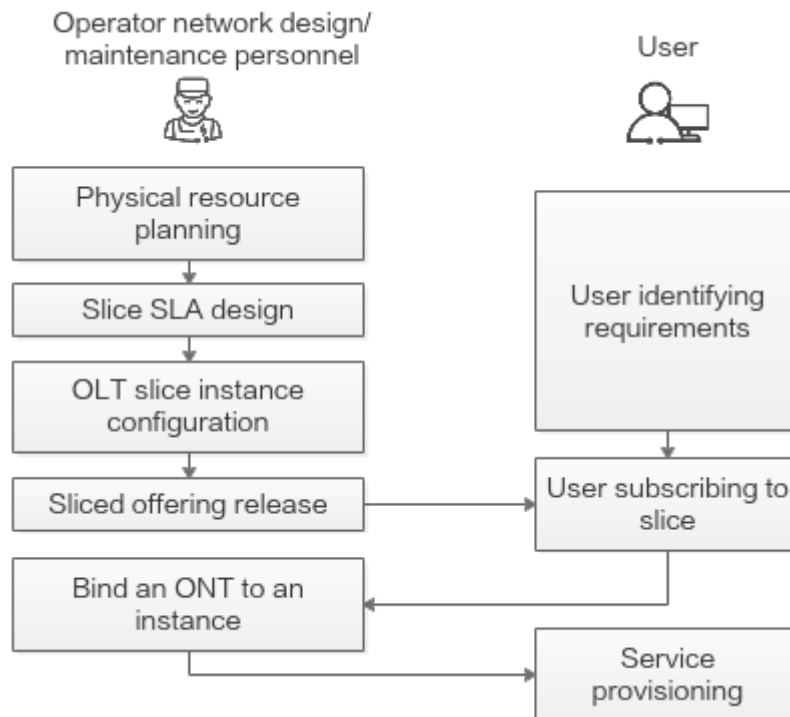
The life cycle of a network slice is divided into four phases to provide more flexible services to tenants.



- **Preparation phase:** Design the slice template based on actual service requirements and complete pre-deployment to prepare the network environment.
- **Configuration activation phase:** Create slices, load service configurations, and activate slices based on users' subscription status to provide differentiated SLAs for users.
- **Running phase:** Monitor and manage resource usage and clear alarms during slice running.
- **Out-of-service phase:** Deactivate and delete a slice after a user unsubscribes from the slice or the slice plan is changed.

Slice Management Process

The following figure shows the overall slice provisioning process based on a service or application.



20.4 Slice Deployment and Configuration

This section describes the common slice deployment and configuration procedures and examples.

20.4.1 Dedicated Network Slice Deployment

To implement independent operation and management of dedicated networks, tenants need to be configured, independent physical resources need to be configured for the tenants, and then the tenants can configure services on their own network management pages.

20.4.1.1 Example of Hard-Isolated Dedicated Network Slice Deployment (NCE)

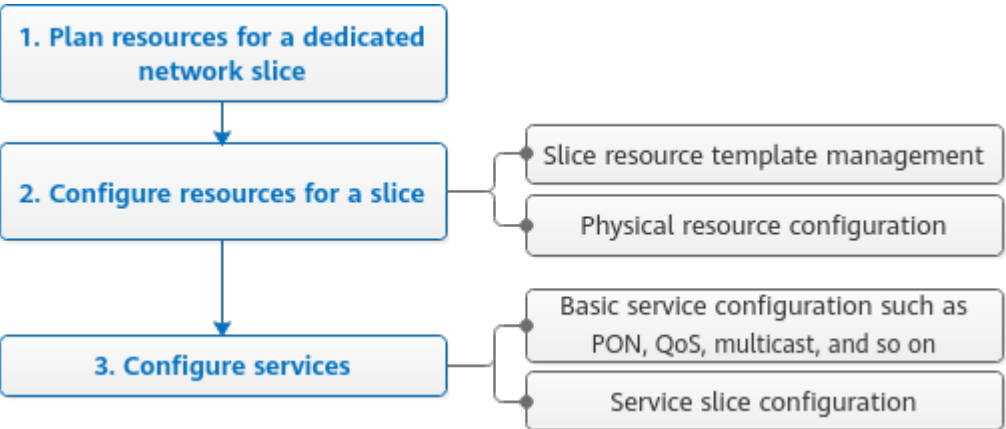
This section describes how to deploy dedicated network slices on NCE-FAN.

Prerequisites

- OLT model: MA5800-X17, X15, X7, and X2
- OLT version: V100R021C10 or later
- NCE-FAN version: V100R021C10 or later
- NEs have gone online, and the management channel for NEs has been established.

- You have the permission to perform **network slice management**.

Dedicated Network Division and Configuration Process



Configuration Procedure

The GUI varies with the NMS version. For details about the operations in each version, see the configuration guide of the corresponding version.

Enterprise customers: [iMaster NCE-FAN Product Documentation](#).

Carrier users: [iMaster NCE-FAN Product Documentation](#)

Data Planning Example in the iMaster NCE-FAN Product Documentation

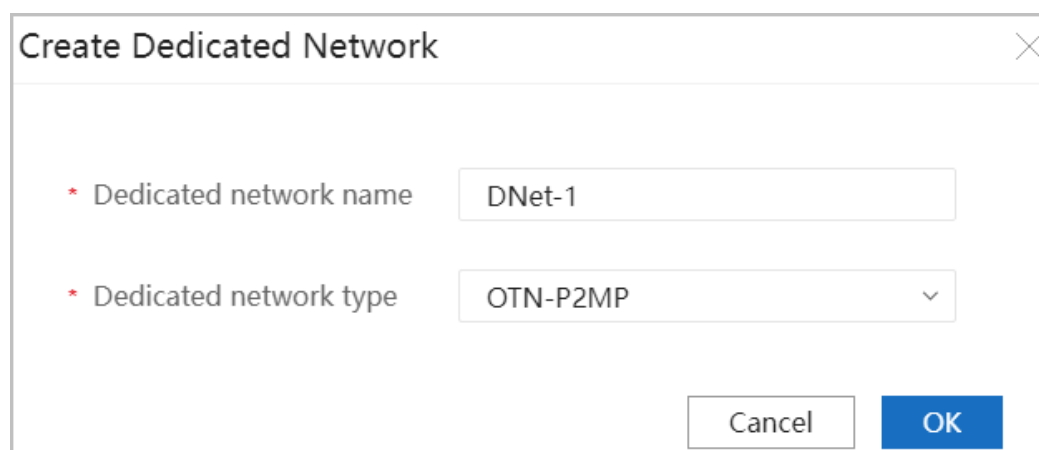
Table 20-6 Key data planning

Parameter	Description	Example Value
Dedicated network ID	Indicates the ID of a dedicated network, which is automatically assigned by the OLT.	1
Dedicated network name	Indicates the name of a dedicated network	DNet-1
Upstream port	Indicates the upstream port bound to a dedicated network slice.	0/8/0
Service port	Indicates a service port bound to a dedicated network slice.	0/2/0
Service port bandwidth	Indicates the bandwidth of a service port, which is configured on a non-combo board.	300Mbit/s
Uplink port bandwidth	Indicates the bandwidth of the uplink port.	300Mbit/s

Parameter	Description	Example Value
Channel 0 port bandwidth	Indicates the port bandwidth of channel 0. A combo board requires the channel parameter, whereas a non-combo board does not require the channel parameter.	300Mbit/s
Channel 1 port bandwidth	Indicates the port bandwidth of channel 1. A combo board requires the channel parameter, whereas a non-combo board does not require the channel parameter.	500Mbit/s

Procedure

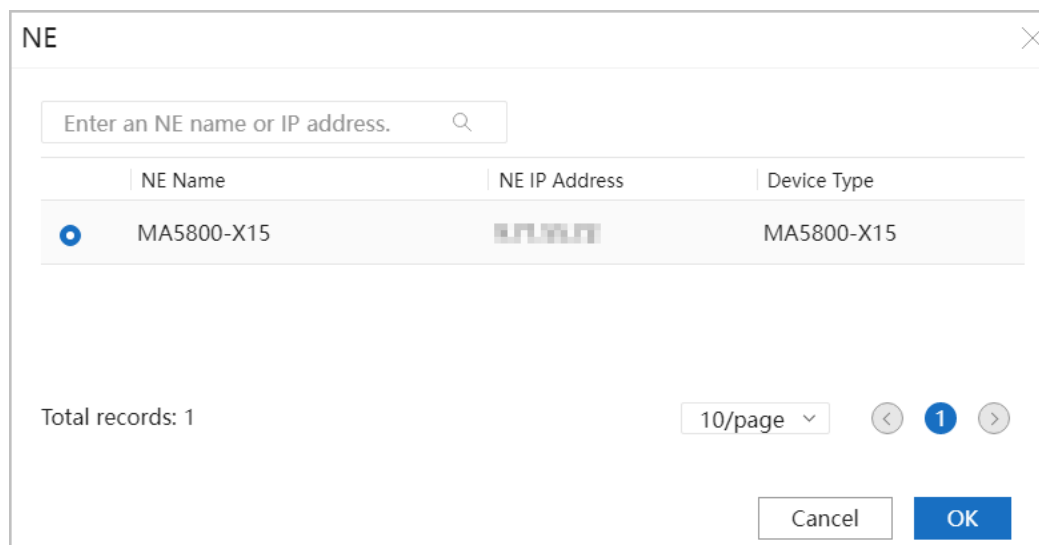
- Step 1** Open the **Access Controller** app and choose **Private Line > D-Net** from the main menu.
- Step 2** Click **Create**. In the dialog box that is displayed, set **Dedicated network name** and **Dedicated network type**, and click **OK**.

A screenshot of a 'Create Dedicated Network' dialog box. The dialog has a title bar with a close button (X). Inside, there are two required fields marked with red asterisks. The first field is 'Dedicated network name' with a text input containing 'DNet-1'. The second field is 'Dedicated network type' with a dropdown menu showing 'OTN-P2MP'. At the bottom right, there are two buttons: 'Cancel' and 'OK'.

- Step 3** Click  corresponding to the dedicated network slice to unfold the list of NEs bound to the slice.
- Step 4** Click **Add**. In the dialog box that is displayed, select an NE and click **OK**.

NOTE

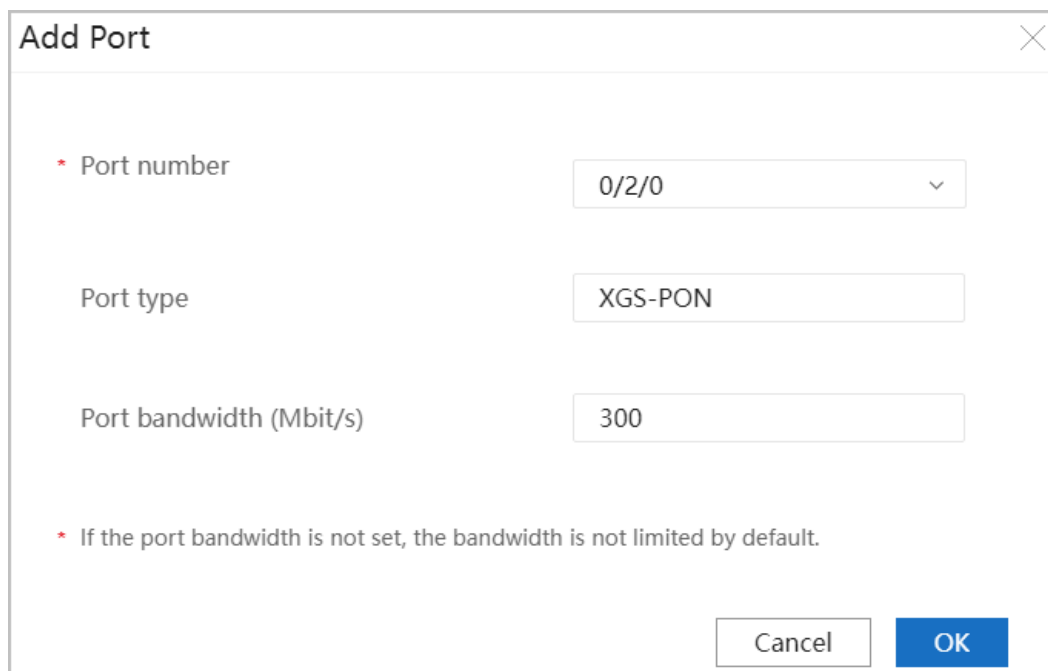
Each NE can be bound to a maximum of eight dedicated network slices, one of which is the default slice.



NE Name	NE IP Address	Device Type
MA5800-X15	192.168.1.1	MA5800-X15

Step 5 Click  in the **Operation** column of an NE. In the dialog box that is displayed, configure port resources. The following uses the GPON port and upstream ETH port as examples.

- Configuring a PON port
 - a. On the **GPON Port** tab page, click **Add**.
 - b. In the dialog box that appears, set the parameters such as the port number and bandwidth.



Add Port

* Port number: 0/2/0

Port type: XGS-PON

Port bandwidth (Mbit/s): 300

* If the port bandwidth is not set, the bandwidth is not limited by default.

 NOTE

If the PON port is a Combo port, you need to configure the channel port bandwidth.

- c. Click **OK**.

- Configuring an upstream port.
 - a. On the **Uplink Ethernet Port** tab page, click **Add**.
 - b. In the dialog box that appears, set the parameters such as the port number and bandwidth.

Add Port

* Port number

0/8/0

Port type

ETH

Port bandwidth (Mbit/s)

300

* If the port bandwidth is not set, the bandwidth is not limited by default.

Cancel

OK

- c. Click **OK**.

Step 6 After the configuration is complete, you can view the configured resource information.

Dedicated Network Name	Dedicated Network Type	Bound NEs	Operation				
DNNet-1	OTN-P2MP	1					
NE List							
Enter an NE name or IP address.			Add				
NE Name	NE IP Address	Device Type	Configured GPON Ports	Configured EPON Ports	Configured Uplink Ethernet Ports	Configured Uplink Virtual Ports	Operation
MA5800-X15		MA5800-X15	1	0	1	0	

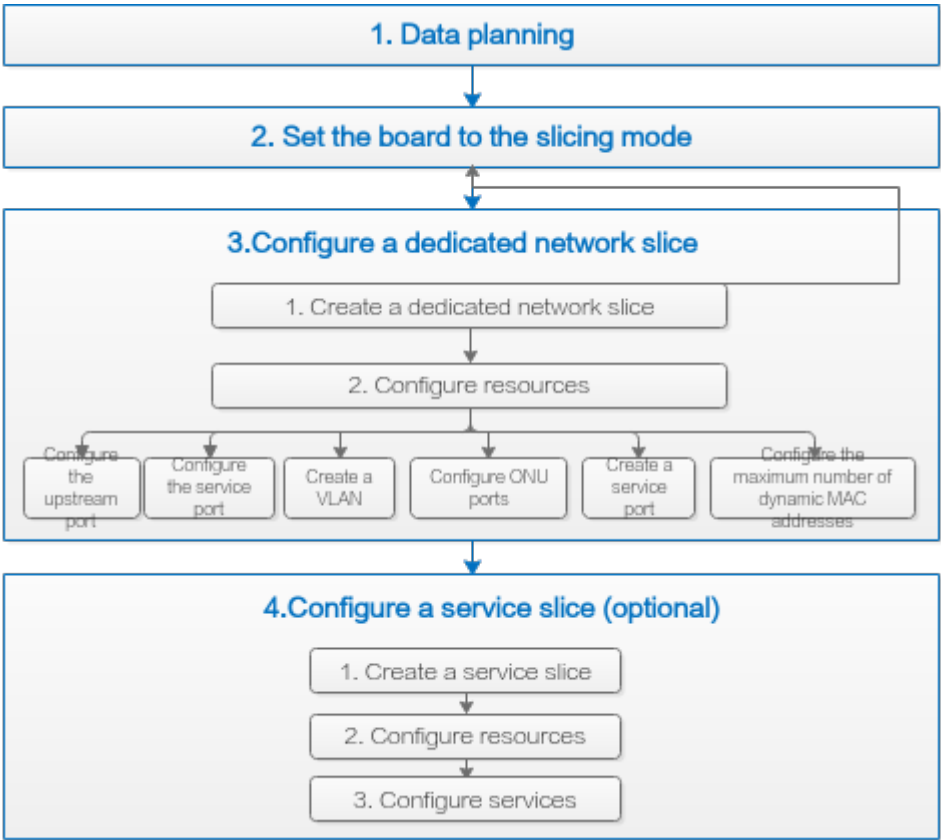
----End

20.4.1.2 Example of Hard-Isolated Dedicated Network Slice Deployment (CLI)

Prerequisites

- OLT model: MA5800-X17, X15, X7, and X2
- OLT version: V100R021C10 or later
- NEs have gone online, and the management channel for NEs has been established.

Configuration Procedure



Data Planning Example

Table 20-7 Data planning for dedicated network slices

Parameter	Description	Example Value
Dedicated network ID	/	1, 2
Dedicated network name	/	DNet-1 DNet-2
DNet-1 resource	OLT upstream port	0/9/0
	OLT service port	0/3/0
	PON port bandwidth channel 0 (A combo board needs to be configured with a channel, and a non-combo board does not need to be configured with a channel.)	700M

Parameter	Description	Example Value
	PON port bandwidth channel 1 (A combo board needs to be configured with a channel, and a non-combo board does not need to be configured with a channel.)	7000M
	ONU resources	All ports of ONU 0 and ports 1–2 of ONU 1 connected to port 0/3/0
	VLAN	100
	DNet-1 GEM port index	1
	DNet-1 mapping index	0
DNet-2 resource	OLT upstream port	0/9/1
	OLT service port	0/3/0
	PON port bandwidth channel 0 (A combo board needs to be configured with a channel, and a non-combo board does not need to be configured with a channel.)	300M
	PON port bandwidth channel 1 (A combo board needs to be configured with a channel, and a non-combo board does not need to be configured with a channel.)	3000M
	ONU resources	Ports 3–4 of ONU 1 connected to port 0/3/0
	VLAN	100
	DNet-2 GEM port index	2
	DNet-2 mapping index	0

Table 20-8 Data planning for service slices

Parameter	Description	Example Value
Slice ID	/	1
Slice name	/	slice-1
Slice priority	0-7	5

Parameter	Description	Example Value
Queue buffer level	/	13
Bound VLAN	/	100
Number of MAC addresses	Indicates the maximum number of dynamic MAC addresses that can be learned by a dedicated network.	100
User port	/	0/3/0
Upstream port	/	0/9/1
Bandwidth of the user port in the slice instance	/	2048kbit/s
Bandwidth of the upstream port in the slice instance	/	2048kbit/s
Traffic profile	/	index 100

Procedure

- Step 1 (Optional)** Run the **slice mode { van | fans }** command to set the system to the FANS mode.

 NOTE

By default, the FANS mode is used. You need to perform this step in non-FANS mode.

- Step 2** Enter the board and run the **hqos mode** command to set the HQoS mode of the board to slice. You can run the **display hqos mode** command to query whether the HQoS mode of a board is slice.

```
huawei(config)#interface gpon 0/3
huawei(config-if-gpon-0/3)#hqos mode slice
huawei(config-if-gpon-0/3)#display hqos mode
huawei(config-if-gpon-0/3)#quit
huawei(config)#interface mpu 0/9
huawei(config-if-mpu-0/9)#hqos mode slice
huawei(config-if-mpu-0/9)#display hqos mode
huawei(config-if-mpu-0/9)#quit
```

- Step 3** Configure a dedicated network slice.

- Run the **dedicated-net** command to create a dedicated network slice.

```
huawei(config)#dedicated-net dedicated-net-id 1 dedicated-net-name DNet-1
huawei(config)#dedicated-net dedicated-net-id 2 dedicated-net-name DNet-2
```
- Run the **dedicated-net-binding** command to add port resources for the dedicated network slice. The ports are bound to the dedicated network slice and the upstream port uses an exclusive bandwidth. PON port bandwidths are configured according to the service plan.
 - Configure resources for DNet-1.

```
huawei(config-dnet-1)#dedicated-net-binding port 0/9 0 // Add upstream port resources.
Number of ports bound successfully: 1
Number of ports bound failed : 0
```

- ```
huawei(config-dnet-1)#dedicated-net-binding port 0/3 0 channel assure-bandwidth 700
7000 // Add service port resources and assign bandwidths.
Number of ports bound successfully: 1
Number of ports bound failed : 0
```
- Configure resources for DNet-2.

```
huawei(config-dnet-2)#dedicated-net-binding port 0/9 1 // Add upstream port resources.
Number of ports bound successfully: 1
Number of ports bound failed : 0

huawei(config-dnet-2)#dedicated-net-binding port 0/3 0 channel assure-bandwidth 300
3000 // Add service port resources and assign bandwidths.
Number of ports bound successfully: 1
Number of ports bound failed : 0
```
3. Run the **vlan** command to create a VLAN for the dedicated network slice.

```
huawei(config)#vlan 100 dedicated-net-id 1 // Create a VLAN for DNet-1.
huawei(config)#vlan 100 dedicated-net-id 2 // Create a VLAN for DNet-2.
```
  4. Add the upstream port to a VLAN.

```
huawei(config)#port vlan 100 dedicated-net-id 1 0/9 0
huawei(config)#port vlan 100 dedicated-net-id 2 0/9 1
```
  5. Configure a service profile and line profile.
    - Configure a DBA profile.

```
huawei(config)#dba-profile add profile-id 31 profile-name DBA_kongzhi type3 assure
1024000 max 10000000
huawei(config)#dba-profile add profile-id 32 profile-name DBA_jiankong type4 max
10000000
```
    - Configure a service profile.

```
huawei(config)#ont-srvprofile gpon profile-id 10
huawei(config-gpon-srvprofile-10)#ont-port eth adaptive 8
huawei(config-gpon-srvprofile-10)#port vlan eth 1 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 2 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 3 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 4 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 5 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 6 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 7 transparent
huawei(config-gpon-srvprofile-10)#port vlan eth 8 transparent
huawei(config-gpon-srvprofile-10)#commit
```
    - Configure a line profile (by ONU).

```
huawei(config)#ont-lineprofile gpon profile-id 10
huawei(config-gpon-lineprofile-10)#omcc encrypt on
huawei(config-gpon-lineprofile-10)#tcont 1 dba-profile-id 31
huawei(config-gpon-lineprofile-10)#gem add 1 eth tcont 1 encrypt on
huawei(config-gpon-lineprofile-10)#gem mapping 1 0 vlan 100
huawei(config-gpon-lineprofile-10)#commit
huawei(config-gpon-lineprofile-10)#quit
```
    - Configure a line profile (by ONU Ethernet port).

```
huawei(config)#ont-lineprofile gpon profile-id 20
huawei(config-gpon-lineprofile-20)#omcc encrypt on
huawei(config-gpon-lineprofile-20)#mapping-mode port
huawei(config-gpon-lineprofile-20)#tcont 1 dba-profile-id 31
huawei(config-gpon-lineprofile-20)#tcont 2 dba-profile-id 32
huawei(config-gpon-lineprofile-20)#port-bundle eth 1 port 1,2
huawei(config-gpon-lineprofile-20)#port-bundle eth 2 port 3,4
huawei(config-gpon-lineprofile-20)#gem add 1 eth tcont 1 encrypt on
huawei(config-gpon-lineprofile-20)#gem add 2 eth tcont 2 encrypt on
huawei(config-gpon-lineprofile-20)#gem mapping 1 0 eth-bundle 1
huawei(config-gpon-lineprofile-20)#gem mapping 2 0 eth-bundle 2
huawei(config-gpon-lineprofile-20)#commit
huawei(config-gpon-lineprofile-20)#quit
```
  6. Add an ONU.
    - Add ONU 0 and bind the ONU-level profile to it.

```

huawei(config)#interface gpon 0/3
huawei(config-if-gpon-0/3)#ont add 0 0 sn-auth "485754432Dxxxxxx" omci ont-lineprofile-id 10 ont-srvprofile-id 10 ont-type 10g/10g
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 1 vlan 100 // Configure a default VLAN for ONT Ethernet ports
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 2 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 3 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 4 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 5 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 6 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 7 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 0 eth 8 vlan 100

```

- Add ONU 1 and bind the ONU Ethernet port granularity profile to ONU 1.

```

huawei(config-if-gpon-0/3)#ont add 0 1 sn-auth "485754432Dyyyyyy" omci ont-lineprofile-id 20 ont-srvprofile-id 10 ont-type 10g/10g
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 1 vlan 100 // Configure a default VLAN for ONT Ethernet ports
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 2 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 3 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 4 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 5 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 6 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 7 vlan 100
huawei(config-if-gpon-0/3)#ont port native-vlan 0 1 eth 8 vlan 100

```

7. Run the **service-port** command to create a service port for the dedicated network.

#### NOTE

This step is mandatory when only dedicated network slices are configured. Skip this step if service slices need to be configured for a dedicated network slice.

- Configure ONT-based service ports for DNet-1.  

```

huawei(config)#service-port 1000 vlan 100 dedicated-net-id 1 gpon 0/3/0 ont 0 gemport 1 multi-service user-vlan 100 // Add an ONU 0 service port and bind it to DNet-1.
huawei(config)#service-port 1001 vlan 100 dedicated-net-id 1 gpon 0/3/0 ont 1 gemport 1 multi-service user-vlan 100 // Add a service port for ports 1-2 of ONU 1 and bind it to DNet-1.

```
- Configure ONT-based service ports for DNet-2.  

```

huawei(config)#service-port 1002 vlan 100 dedicated-net-id 2 gpon 0/3/0 ont 1 gemport 2 multi-service user-vlan 100 // Add a service port for ports 3-4 of ONU 1 and bind it to DNet-2.

```

8. Configure the maximum number of learnable dynamic MAC addresses for the dedicated network.

```

huawei(config)#dedicated-net dedicated-net-id 1
huawei(config-dnet-1)#mac-address max-mac-count 100 // Configure the maximum number of learnable MAC addresses for DNet-1.

```

```

huawei(config)#dedicated-net dedicated-net-id 2
huawei(config-dnet-2)#mac-address max-mac-count 100 // Configure the maximum number of learnable MAC addresses for DNet-2.

```

9. View all created dedicated network slices.

```

huawei(config)#display dedicated-net all
{ <cr>||<K> }:
```

Command:  
display dedicated-net all

```

D-Net ID Slice ID

```

```

0 -
1 -
2 -

```

Total : 3

## 10. View details about a specified dedicated network slice.

```
huawei(config)#display dedicated-net dedicated-net-id 1 // View details about DNet-1.
{ <cr>||<K> }:
```

```
Command:
 display dedicated-net dedicated-net-id 1
D-Net ID : 1
D-Net name : DNet-1
Slice ID : -
VLAN list : 1,100
Description:
Available dyn-mac number : 100
Queue buffer class : 6

F/ S/ P Bandwidth(Mbps) Ingress Egress

0/ 9/ 0 - - -

Network port number : 1

F/ S/ P Bandwidth(Mbps) Ingress Egress Channel ID

0/ 3/ 0 700 - - 0
0/ 3/ 0 7000 - - 1

User port number : 2
Network vport number : 0
```

```
huawei(config)#display dedicated-net dedicated-net-id 2 // View details about DNet-2.
{ <cr>||<K> }:
```

```
Command:
 display dedicated-net dedicated-net-id 2
D-Net ID : 2
D-Net name : DNet-2
Slice ID : -
VLAN list : 1,100
Description:
Available dyn-mac number : 100
Queue buffer class : 6

F/ S/ P Bandwidth(Mbps) Ingress Egress

0/ 9/ 1 - - -

Network port number : 1

F/ S/ P Bandwidth(Mbps) Ingress Egress Channel ID

0/ 3/ 0 300 - - 0
0/ 3/ 0 3000 - - 1

User port number : 2
Network vport number : 0
```

**Step 4 Create a service slice in the dedicated network slice.**

## 1. Create a service slice under the dedicated network.

```
huawei (config) # network slice-instance slice-id 1 dedicated-net-id 1 priority 5 //Create a service slice in DNet-1.
huawei(config-slice-instance-1)#queue-buffer-class 13
```

## 2. Add resources to the service slice.

```
huawei(config-slice-instance-1)#nsi-binding vlan 100
huawei(config-slice-instance-1)#nsi-binding port 0/3 0 bandwidth 1024
huawei(config-slice-instance-1)#nsi-binding port 0/9 1 bandwidth 1024
huawei(config)#service-port 100 vlan 100 dedicated-net-id 1 gpon 0/3/0 ont 0 gemport 0 multi-
service user-vlan 100 tag-transform translate inbound traffic-table index 100 outbound traffic-
table index 100
```

3. Query the service slice configuration result.  
huawei(config)#display network slice-instance slice-id 1  
{ <cr>||<K> }:

```
Command:
display network slice-instance slice-id 1
Slice ID : 3
Slice name : slice-3
D-Net ID : 1
Priority : 3
Service Type : any
Queue buffer class : 13
VLAN list : 100
VXLAN VNI list : -

F/ S/ P Bandwidth(Mbps) Convergence ratio

0/ 9/ 1 1024 1.0

Network port number : 1

F/ S/ P Bandwidth(Mbps) Convergence ratio Channel ID

0/ 3/ 0 1024 1.0 -

User port number : 1
Network vport number : 0
```

----End

## 20.4.2 Service Slice Deployment

This section uses the HD video golden slice as an example to describe how to create a slice instance and provision services.

### 20.4.2.1 Service Slice Deployment Example (NCE)

#### Prerequisites

- OLT model: MA5800-X17, X15, X7, and X2
- OLT version: V100R021C00 or later
- NCE-FAN version: V100R021C00 or later
- To use this feature, you need to purchase and install the *Access Network Auto Configuration Package License* and *Access Service Slice License*.

#### NOTE

For details about how to load a license, see **NCE-FAN Application Operation and Maintenance > Basic Applications > System Settings > License Management** in the **iMaster NCE-FAN Product Documentation**.

Carrier link: [License Management](#)

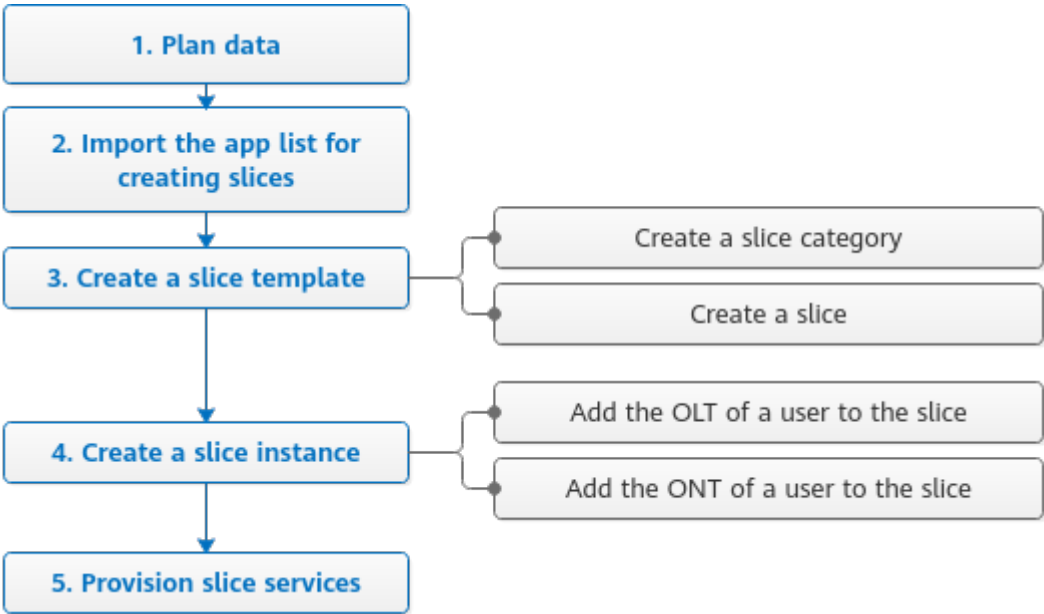
Enterprise network link: [License Management](#)

- The NEs and NMS have been installed and are running properly. The network is running properly. A management channel has been established.
- The app to be guaranteed and the corresponding server IP address list are available.
- Slice instance parameters have been planned.

 NOTE

- When adding slices in the reconstruction scenario, ensure that:
- A GEM port has been specified for the service port configured on the ONT. If the GEM port is not specified, contact Huawei engineers to modify the configuration.
  - The ONT type is not auto.

Slice Configuration Process



Data Planning Example

Table 20-9 Key parameter planning for slicing

| Category       | Parameter                                                    | Description                  | Example Value |
|----------------|--------------------------------------------------------------|------------------------------|---------------|
| Slice template | Create Slice Category                                        | Customized                   | Video         |
|                | Slice Name                                                   | Customized                   | SliceName1    |
|                | SLA template (different templates have different parameters) | Preset and directly selected | Video HD      |
|                | Network-side Settings                                        | Preset and directly selected | VLAN          |
|                | Outer VLAN ID                                                | Customized                   | 100           |
|                | User-side Settings                                           | Preset and directly selected | VLAN          |
|                | Outer VLAN ID                                                | Customized                   | 1001          |

| Category                      | Parameter          | Description | Example Value    |
|-------------------------------|--------------------|-------------|------------------|
| Slice instance NE information | Slice Name         | Customized  | OLT              |
|                               | NE IP Address      | Customized  | 10.xxxxxx        |
|                               | Uplink Port        | Customized  | 0/9/0            |
|                               | Uplink Bandwidth   | Customized  | 1000Mbit/s       |
|                               | PON Port           | Customized  | 0/3/0            |
|                               | Downlink Bandwidth | Customized  | 1000Mbit/s       |
|                               | ONT SN             | Customized  | 48575443ACC14071 |

## Procedure

**Step 1 Import the app and the corresponding server IP address list into NCE for binding a slice instance.**

- On the NCE home page, click the **Access Controller** app and choose **Network Slice** from the main menu.

**Figure 20-8** Home page

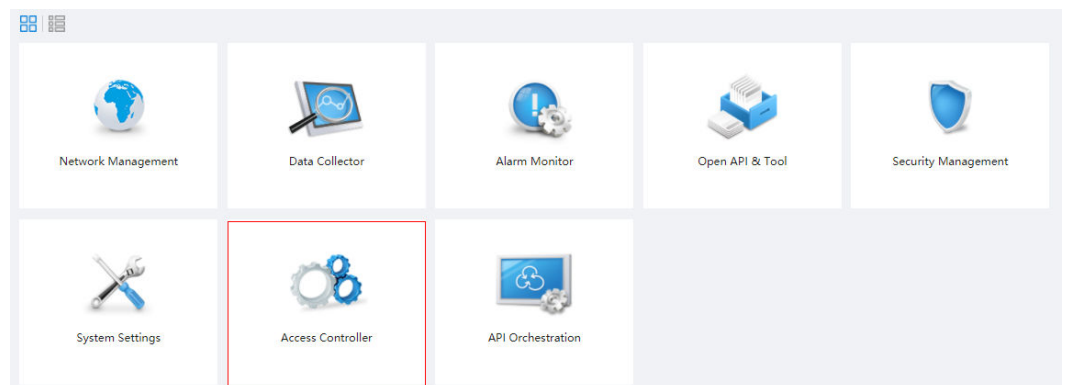
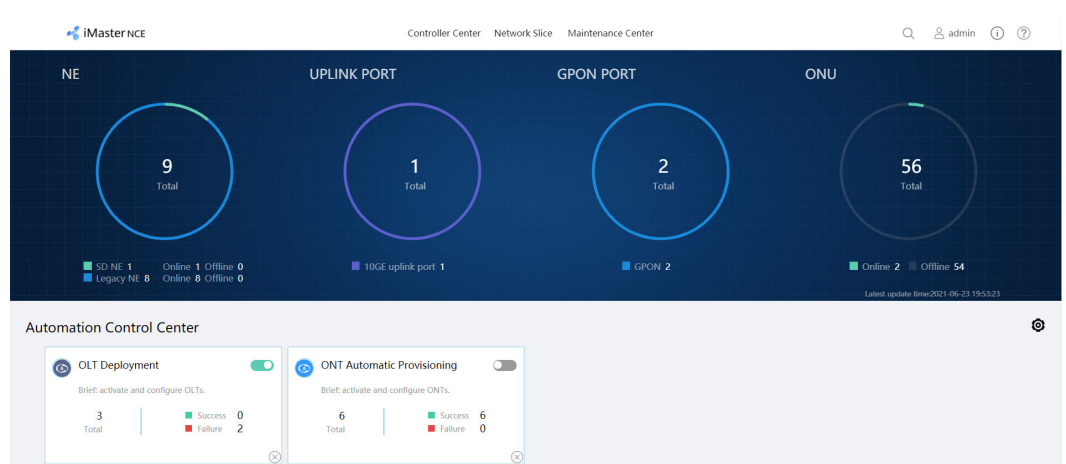
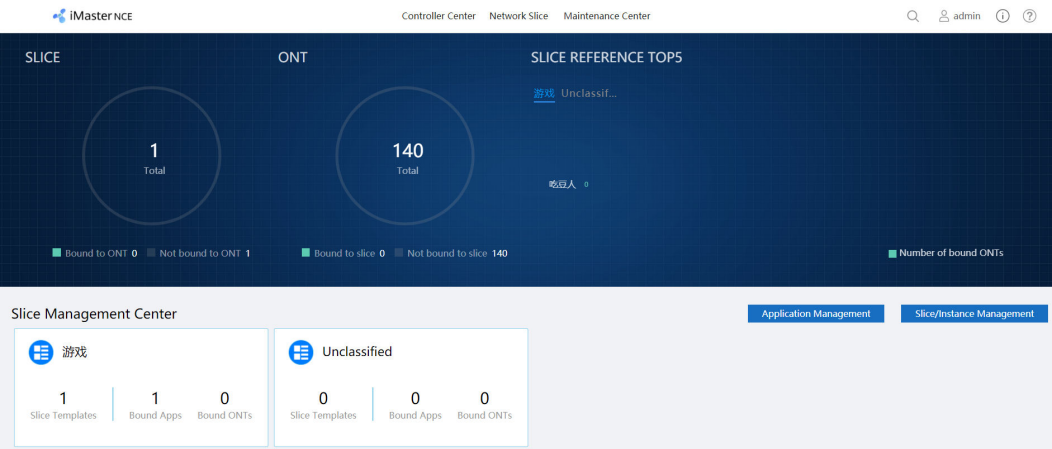


**Figure 20-9** Access Controller page



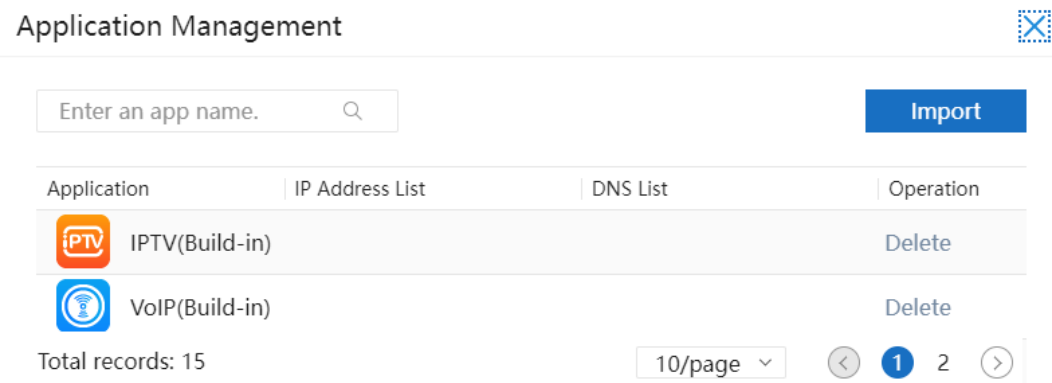
2. In the **Slice Management Center** area, click **Application Management**.

Figure 20-10 Network slice/slice management center



3. Click **Import**. In the displayed dialog box, download a template. Enter application information on the local PC and upload the application template file (JSON file) and application icon package (ZIP package) to NCE.

Figure 20-11 Importing an app



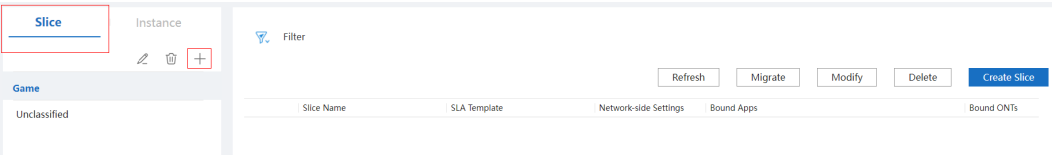
NOTE

For details about the requirements on the JSON file and ZIP package, see the online help on the NCE import page.

Step 2 Create a slice category.

1. In the **Slice Management Center** area, click **Slice/Instance Management**.
2. On the **Slice** tab page, click . In the dialog box that is displayed, enter the slice category name and click **OK**.

Figure 20-12 Slice/instance management page



## Create Slice Category

Enter a slice category name

Cancel

OK

| Slice   | Instance                                     |
|---------|----------------------------------------------|
| 1-Video | <div><div></div><div></div><div></div></div> |

 NOTE

NCE supports a maximum of eight slice categories.

**Step 3 Create a slice.**

1. Select a created slice category and click **Create Slice** in the right pane.
2. In the **Create Slice** dialog box, set related parameters, select the app to be bound, and click **OK**.

Create Slice

Slice Name:

Test

SLA Template:

Video HD

Network-side Settings

VLAN

VxLAN

Outer VLAN:

100

Inner VLAN:

User-side Settings

VLAN

Outer VLAN:

100

Inner VLAN:

Selected apps: 1

Delete

Add

Cancel

OK

切片

实例

1-视频类切片

刷新

迁移

修改

删除

创建切片

| 切片名称                                          | SLA模板    | 网络侧配置 | 已绑定应用                             | 绑定ONT数量 |
|-----------------------------------------------|----------|-------|-----------------------------------|---------|
| > <div><div></div><div>SliceName1</div></div> | Video HD | VLAN  | <div><div></div><div></div></div> | 0       |

NOTE

- NCE supports a maximum of 1024 slices.
- One slice can be bound to a maximum of 16 apps.
- After selecting an SLA template, you can click  to view the parameter values of the template.
- For common services, such as the Internet access service, a VLAN can be configured on the network side to use the VLAN tunnel.
- For services that have high requirements on bandwidth and latency, such as education services, VXLAN can be configured on the network side to use the VXLAN tunnel.

Step 4 Create a slice instance.

1. **Add an OLT to the slice instance.** Click the **Instance** tab, select a slice category on the left, and click **Create Instance** on the right. In the **Create Instance** dialog box that is displayed, select the slice and OLT, and click **OK**.

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Create Instance

Select slice: Test

Enter an OLT name or IP address.

|                                  | NE Name    | NE IP Address | Device Type |
|----------------------------------|------------|---------------|-------------|
| <input checked="" type="radio"/> | MA5800-X15 | 192.168.1.1   | MA5800-X15  |
| <input type="radio"/>            | PON_Zhou   | 192.168.1.2   | MA5800-X17  |

2. **Configure detailed OLT parameters for the slice instance.** Click **Configure Port** in the **Operation** column. In the dialog box that is displayed, configure the uplink port and PON port.
  - a. On the **Uplink Port** tab page, click **Add**, configure the uplink port and uplink bandwidth, and click **OK**.
  - b. On the **PON Port** tab page, click **Add**, configure the PON port and downlink bandwidth, and click **OK**.

Configure Port

Uplink Port

PON Port

Enter a frame/slot/port.

Add

| Uplink Port | Bandwidth (Mbit/s) | Operation      |
|-------------|--------------------|----------------|
| 0/10/0      | 1000               | Confirm Cancel |

## Step 5 Bind an ONT and provision the slice service.

1. Click **Configure ONT** in the **Operation** column. In the dialog box that is displayed, select an ONT.

Configure ONT

Enter an ONT alias or SN.

Refresh

Delete

Add

| SN | ONT Alias | Frame/Slot/Port | ONT ID | Authentication Mode |
|----|-----------|-----------------|--------|---------------------|
|    |           |                 |        |                     |

2. Click **Add**. In the dialog box that is displayed, select an ONT and click **Next**.

Add

Select ONT

Select Authentication Mode

Enter an ONT alias or SN.

|                       | SN               | ONT Alias | Frame/Slot/Port | ONT ID |
|-----------------------|------------------|-----------|-----------------|--------|
| <input type="radio"/> | 48575443608747A3 | --        | 0/1/3           | 0      |
| <input type="radio"/> | 48575443ACC14971 | --        | 0/1/3           | 1      |

Total records: 2

10/page

<

1

>

Previous

Next

OK

- a. Select the ONT authentication mode and click **OK**.
- b. After the ONT passes the authentication, NCE delivers slice configurations to the ONT.

**Step 6 View the configuration result.** In the Slice Management Center, view information about the added slices, bound applications, and ONTs in different slices.

**Step 7 A subscriber uses services or apps in the slice.**

----End

20.4.2.2 Service Slice Deployment Example (CLI)

Prerequisites

- OLT model: MA5800-X17, X15, X7, and X2
- OLT version: V100R021C00 or later
- The NEs have been installed and are running properly. The network is running properly. A management channel has been established.

- An app and its server IP address list have been imported into to NCE. For details, see [20.4.2.1 Service Slice Deployment Example \(NCE\)](#) > [Step 1](#).
- Slice instance parameters have been planned.
- A traffic profile with the same CIR and PIR has been configured.

## Data Planning Example

**Table 20-10** Key data planning

| Parameter                                          | Example Value |
|----------------------------------------------------|---------------|
| Slice ID                                           | 3             |
| Slice name                                         | slice-3       |
| Slice priority                                     | 3             |
| Queue buffer level                                 | 13            |
| Bound VLAN                                         | 100           |
| User port                                          | 0/3/0         |
| Uplink port                                        | 0/9/1         |
| Bandwidth of the user port in the slice instance   | 2048kbit/s    |
| Bandwidth of the uplink port in the slice instance | 2048kbit/s    |
| Traffic profile                                    | index 100     |

## Procedure

**Step 1 (Optional) Set the system to the FANS mode.** Run the **slice mode { van | fans }** command to set the system to the FANS mode.

 **NOTE**

By default, the FANS mode is used. You need to perform this step in non-FANS mode.

**Step 2 Create a slice instance.** Run the **network slice-instance** command to create a slice and set a priority.

 **NOTE**

The priority determines whether the slice bandwidth can be preempted. The value 0 indicates a copper slice (the default priority is 0 and no slice needs to be created), values 1 to 5 indicate silver slices, and values 6 to 7 indicate golden slices. Golden slices have the highest priority.

```
huawei(config)#network slice-instance slice-id 3 slice-name slice-3 priority 3 service-type any
```

**Step 3 Configure slice instance parameters.**

1. Run the **queue-buffer-class** command to set the buffer level of a slice queue.  

```
huawei(config-slice-instance-3)#queue-buffer-class 13
```

2. Run the **nsi-binding vlan** command to bind a VLAN to a slice instance.  
huawei(config-slice-instance-3)#**nsi-binding vlan 100**
3. Enter the board and run the **hqos mode** command to set the HQoS mode of the board to slice. You can run the **display hqos mode** command to query whether the HQoS mode of a board is slice.  
huawei(config)#**interface gpon 0/3**  
huawei(config-if-gpon-0/3)#**hqos mode slice**  
huawei(config)#**interface mpu 0/9**  
huawei(config-if-mpu-0/9)#**hqos mode slice**
4. Run the **nsi-binding port** command to bind a user port and uplink port to the slice instance and set their bandwidths in the current slice instance.  
huawei(config-slice-instance-3)#**nsi-binding port 0/3 0 bandwidth 1024**  
huawei(config-slice-instance-3)#**nsi-binding port 0/9 1 bandwidth 1024**
5. Run the **service-port** command to configure a service port.  
huawei(config)#**service-port 100 vlan 100 gpon 0/3/0 ont 0 gemport 0 multi-service user-vlan 100 tag-transform translate inbound traffic-table index 100 outbound traffic-table index 100**

#### Step 4 Query the configuration results.

```
huawei(config)#display network slice-instance all
{ <cr>||<K> }:
Command:
 display network slice-instance all

Slice ID Priority Queue buffer class Service type

 3 3 13 any

Total : 1
huawei(config)#display network slice-instance slice-id 3
{ <cr>||<K> }:

Command:
 display network slice-instance slice-id 3
Slice ID : 3
Slice name : slice-3
Priority : 3
Service Type : any
Queue buffer class : 13
VLAN list : 100
VXLAN VNI list : -

F/ S/ P Bandwidth(Mbps) Convergence ratio

0/ 9/ 1 1024 1.0

Network port number : 1

F/ S/ P Bandwidth(Mbps) Convergence ratio Channel ID

0/ 3/ 0 1024 1.0 -

User port number : 1
Network vport number : 0
```

----End

## 20.5 Reference

## 20.5.1 Parameter Reference for a Service Slice SLA Template

| Template Name               | Parameter                | Value          |
|-----------------------------|--------------------------|----------------|
| HD education live broadcast | Uplink bandwidth         | 20000000bit/s  |
|                             | Downlink bandwidth       | 20000000bit/s  |
|                             | Maximum latency          | 60ms           |
|                             | Maximum jitter           | 10ms           |
|                             | Maximum packet loss rate | 0.01%          |
| 4K education live broadcast | Uplink bandwidth         | 50000000bit/s  |
|                             | Downlink bandwidth       | 50000000bit/s  |
|                             | Maximum latency          | 60ms           |
|                             | Maximum jitter           | 10ms           |
|                             | Maximum packet loss rate | 0.01%          |
| 8K education live broadcast | Uplink bandwidth         | 200000000bit/s |
|                             | Downlink bandwidth       | 200000000bit/s |
|                             | Maximum latency          | 60ms           |
|                             | Maximum jitter           | 10ms           |
|                             | Maximum packet loss rate | 0.01%          |
| HD video                    | Uplink bandwidth         | 20000000bit/s  |
|                             | Downlink bandwidth       | 20000000bit/s  |
|                             | Maximum latency          | 60ms           |
|                             | Maximum jitter           | 10ms           |
|                             | Maximum packet loss rate | 0.01%          |
| 4K video                    | Uplink bandwidth         | 50000000bit/s  |
|                             | Downlink bandwidth       | 50000000bit/s  |
|                             | Maximum latency          | 60ms           |
|                             | Maximum jitter           | 10ms           |
|                             | Maximum packet loss rate | 0.01%          |
| 8K video                    | Uplink bandwidth         | 200000000bit/s |
|                             | Downlink bandwidth       | 200000000bit/s |
|                             | Maximum latency          | 60ms           |
|                             | Maximum jitter           | 10ms           |

| Template Name         | Parameter                | Value          |
|-----------------------|--------------------------|----------------|
| Weak-interaction VR   | Maximum packet loss rate | 0.01%          |
|                       | Uplink bandwidth         | 1024bit/s      |
|                       | Downlink bandwidth       | 1024bit/s      |
|                       | Maximum latency          | 10ms           |
|                       | Maximum jitter           | 4ms            |
|                       | Maximum packet loss rate | 0.01%          |
| Strong-interaction VR | Uplink bandwidth         | 200000000bit/s |
|                       | Downlink bandwidth       | 200000000bit/s |
|                       | Maximum latency          | 10ms           |
|                       | Maximum jitter           | 4ms            |
|                       | Maximum packet loss rate | 0.01%          |
| PC games              | Uplink bandwidth         | 20000000bit/s  |
|                       | Downlink bandwidth       | 20000000bit/s  |
|                       | Maximum latency          | 10ms           |
|                       | Maximum jitter           | 5ms            |
|                       | Maximum packet loss rate | 0.01%          |
| HD cloud gaming       | Uplink bandwidth         | 20000000bit/s  |
|                       | Downlink bandwidth       | 20000000bit/s  |
|                       | Maximum latency          | 10ms           |
|                       | Maximum jitter           | 4ms            |
|                       | Maximum packet loss rate | 0.01%          |
| 4K cloud gaming       | Uplink bandwidth         | 50000000bit/s  |
|                       | Downlink bandwidth       | 50000000bit/s  |
|                       | Maximum latency          | 10ms           |
|                       | Maximum jitter           | 4ms            |
|                       | Maximum packet loss rate | 0.01%          |
| 8K cloud gaming       | Uplink bandwidth         | 200000000bit/s |
|                       | Downlink bandwidth       | 200000000bit/s |
|                       | Maximum latency          | 10ms           |
|                       | Maximum jitter           | 4ms            |

| Template Name                | Parameter                | Value     |
|------------------------------|--------------------------|-----------|
| Multi-party voice conference | Maximum packet loss rate | 0.01%     |
|                              | Uplink bandwidth         | 2048bit/s |
|                              | Downlink bandwidth       | 2048bit/s |
|                              | Maximum latency          | 20ms      |
|                              | Maximum jitter           | 6ms       |
|                              | Maximum packet loss rate | 0.01%     |

### 20.5.2 Acronyms, Abbreviations, and Basic Concepts

| Abbreviation | Full Spelling                             |
|--------------|-------------------------------------------|
| MANO         | Management and Orchestration              |
| NF           | Network Function                          |
| NFV          | Network Functions Virtualisation          |
| NSI          | Network Slice Instance                    |
| NSMF         | Network Slice Management Function         |
| NST          | Network Slice Template                    |
| NSST         | Network Slice Subnet Template             |
| NSSI         | Network Slice Subnet Instance             |
| NSSMF        | Network Slice Subnet Management Function  |
| CSMF         | Communication Service Management Function |
| VNF          | Virtualized Network Function              |
| NCE          | Network Cloud Engine                      |
| OLT          | Optical line terminal                     |
| FTTH         | Fiber to the home                         |
| SST          | Servcie and slice type                    |
| NSI          | Network slice instance                    |
| FAN          | Fixed Access network                      |
| GPON         | Gigabit-capable Passive Optical Networks  |
| VAN          | Virtual access node                       |

| Abbreviation | Full Spelling             |
|--------------|---------------------------|
| VXLAN        | Virtual Extensible LAN    |
| OSS          | Operations support system |
| CP           | Content provider          |
| BNG          | Broadband network gateway |
| SR           | Service router            |
| D-NET        | Dedicate Network          |
| ISP          | Internet Service Provider |
| VNO          | Virtual Network Operator  |

### 20.5.3 Reference Standards and Protocols for Slicing

| Number | Description                  |
|--------|------------------------------|
| TR370  | Fixed Access Network Sharing |