## Web 3.0 Node Engine Service (NES)

## **User Guide**

 Issue
 01

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Web3 Node Engine Service (NES) is a blockchain node engine platform developed by Huawei Cloud. It simplifies blockchain network management, resource management, and authentication, while also providing developers with the ability to connect to mainstream blockchains like Ethereum. NES offers a stable, efficient, and secure infrastructure for Web3 services.

On the page of the **dedicated edition** of NES, there are **Dashboard**, **Network Management**, and **Authentication Credential** functions.

On the page of the **shared edition** of NES, there are **Dashboard**, **Package Management**, and **DApp Project Management** functions.

**NOTE** 

Currently, only the AP-Singapore region is supported.

## **2** Permissions Management

## 2.1 Creating a User and Granting NES Permissions

This topic describes how to use **Identity and Access Management (IAM)** to implement fine-grained permissions control for your NES resources. With IAM, you can:

- Create IAM users for employees based on your organizational structure. Each IAM user will have their own security credentials for accessing NES resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust a Huawei Cloud account or cloud service to perform efficient O&M on your NES resources.

If your Huawei Cloud account does not require individual IAM users, skip this topic.

This section describes the procedure for granting user permissions. **Figure 2-1** shows the process flow.

#### Prerequisites

Learn about the permissions (see **Permissions Management**) supported by NES and choose policies or roles according to your requirements. For the system permissions of other services, see **System-defined Permissions**.

#### Process



Figure 2-1 Process for granting NES permissions

#### 1. Create a user group and assign permissions.

Create a user group on the IAM console, and assign the BCS Administrator policy to the group.

#### **NOTE**

- If you select BCS Administrator, you also need to select the following dependent permissions: Tenant Guest, Server Administrator, ELB Administrator, SFS Administrator, SWR Admin, APM FullAccess, AOM FullAccess, CCE Administrator, VPC Administrator, EVS Administrator, and CCE Cluster Admin.
- Contact the account administrator to obtain the operation permissions on other services.

#### 2. Create a user and add them to the user group.

Create a user on the IAM console and add the user to the user group created in **1**.

3. Log in and verify permissions.

Log in to the console as the created user, and verify that the user has the NES operating permissions.

## 2.2 Custom Policies

Custom policies can be created to supplement the system-defined policies of NES.

You can create custom policies in either of the following ways:

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Create a policy in the JSON format from scratch or based on an existing policy.

For details, see **Creating a Custom Policy**. The following section contains examples of common NES custom policies.

- Step 1 On the management console homepage, click Identity and Access Management.
- **Step 2** In the navigation pane, choose **Permissions** > **Policies/Roles** and click **Create Custom Policy**.
- **Step 3** On the **Create Custom Policy** page, set the policy name, view, content, and description, then click **OK**.
  - **Policy Name**: Enter a custom policy name, for example, partial NES permissions.
  - **Policy View**: Select **JSON**.
  - **Policy Content**: Enter the policy content based on the template.

For example, to create a node, query a single node, and obtain node monitoring information, copy the following content:

"Version": "1.1", "Statement": [ {
"Action": [
"bcs:nesNode:create",
"bcs:nesNode:get",
"bcs:nesNode:getMetric"
],
"Effect": "Allow"
}
-

Table 2-1	Policy	content	parameters
-----------	--------	---------	------------

Parameter	Description	Value
Version	Policy version	Fixed to <b>1.1</b> .

Parameter		Description	Value	
Statemen t	Effect	Whether the actions are allowed- Allow Deny		
	Action	Operations to be performed on NES	Each action name is in the format of <i>Service</i> <i>name:Resource</i> <i>type:Operation</i> and cannot be customized. <b>Table 2-2</b> lists the fine-grained permissions supported by NES. After you set any action, the permissions for the action will be granted to the IAM user.	

#### Table 2-2 Action description

Action	Action Description
bcs:nes:getSummary	Obtaining the Overview Information
bcs:nes:listNetwork	Obtaining the Network Types
bcs:nes:listNetworkFlavor	Obtaining Available Specifications
bcs:nesNode:listFlavor	Obtaining Available Specifications for Node Scaling
bcs:nesNode:list	Obtaining All Nodes on a Specified Network
bcs:nesNode:create	Creating a Node
bcs:nesNode:get	Querying a Node
bcs:nesNode:delete	Deleting a Node
bcs:nesNode:update	Updating a Node
bcs:nesNode:getMetric	Obtaining the Node Monitoring Information
bcs:nesNode:getStatistic	Obtaining the API Calling Information of a Node in a Specified Period
bcs:nesNode:getStatus	Obtaining the Status of a Staking Node in a Specified Period
bcs:nesNode:downloadCert	Downloading Certificates
bcs:nesAPIKey:create	Creating an API Key

Action	Action Description
bcs:nesAPIKey:list	Obtaining All API Keys of a User
bcs:nesAPIKey:delete	Deleting an API Key
bcs:nesAPIKey:update	Updating an API Key
bcs:nesNode:validateRelays	Verifying the Address of Relays
bcs:nesNode:updateRelays	Updating the Address of Relays

----End

# **3** Dedicated Edition

## 3.1 Dashboard

The Quick Start process and My Resources are shown on this page.

#### Procedure

- **Step 1** Log in to the NES console.
- **Step 2** In the navigation pane on the left, choose **Dedicated** > **Dashboard**.
- Step 3 Check Quick Start, My Resources, and Feature Updates.

Figure	3-1	Dashboard	
Figure	3-I	Dasnboard	

	Jashboard			
	(1) Select Public Biocichain Select your public blockchain and configure nodes.	(2) Access Public Blockchain     Call node APIs or integrate node RPC addres     validator nodes and MEV-Boost.	(3) Perform O&M sees to your DApps to interconnect nodes to your Manage nodes	including node statuses, alarms, and specifications.
	My Resources			
	Public Blockchains (Mainnets & 2	Nodes 5	Full Nodes/Full Nodes (Staking) 1/4	API Calls 218,204,585
¢	Service Overview			
	Service Overview	Quick Links	Full Nodes	Staking Nodes
	Quick Links			
	Ethereum Node Engine Hosting for full nodes on Ethereum(traditional RPC)	Ethereum Staking Node Engine Staking, validator client, restaking powered by DVT, and so on	TRON Node Engine Hosting for full nodes on Tron	Polygon PoS Node Engine Hosting for full nodes on Polygon PoS
	BNB Smart Chain Node Engine Hosting for full nodes on BNB Smart Chain (BSC)	Arbitrum Node Engine Hosting for full nodes on Arbitrum		

----End

#### **Quick Start**

**Step 1** Select a public blockchain.

Select your public blockchain and configure nodes.

**Step 2** Access a public blockchain network.

Call node APIs or integrate node RPC addresses to your DApps to interconnect nodes to your validator nodes and MEV-Boost.

Step 3 Perform O&M.

Manage nodes, including node statuses, alarms, and specifications.

----End

#### **My Resources**

Public Blockchains (Mainnets & Testnets), Nodes, Full Nodes/Full Nodes (Staking), and API Calls are shown.

- Public Blockchains (Mainnets & Testnets): the number of created public blockchains
- Nodes: the number of nodes under your account
- Full Nodes/Full Nodes (Staking): the numbers of full nodes and staking nodes
- API Calls: the total number of API calls under your account

### 3.2 Network Management

Nodes of different public blockchains can be configured and managed on this page.

#### 3.2.1 Node Creation

To create a node, you need to configure the **Public Blockchain**, **Mainnet & Testnet**, **Node Type**, **Node Specifications**, and **Nodes**.

#### Prerequisites

You have registered with Huawei Cloud.

#### Procedure

- **Step 1** Log in to the NES console.
- **Step 2** Choose **Dedicated > Network Management** and click **Join Public Blockchain**.
- **Step 3** Configure parameters.

	BNB Smart Chain	🔶 Ethereum	Polygon PoS	🍞 Tron
★ Mainnet & Testnet	Aproof-of-stake (PoS) mainnet for real transactions.	Sepolia A proof-of-stake (PoS) testnet with a smill amount of data and fast node startup speed.	Holesky The first-ever Ethereum testnet launched on the top of the proof- of-stake (PoS) consensus, serving as a staking, infrastructure, and protocol- developer testnet.	
* Enterprise Project 🧿	default	✓ Q Create Enterpris	e Project 🖸	
* Node Type	Full node	~		
* Consensus Client 🕜	Prysm	of a diockchain.		
* Execution Client ⑦	Geth			
	Node Instance Flavor		vCPUs   Memory	
* Node Specifications	Sull and (Etherson 2010)	C Stable	8vCPUs   32GiB RAM	
* Node Specifications	<ul> <li>Full hode(Ethereum)803.</li> </ul>			
★ Node Specifications	Full node(Ethereum)16U	34G Robust	16vCPUs   64GiB RAM	

Figure 3-2 Joining a public blockchain

Node: 0.768 USD/Hour + storage: 0.12 USD/GB/Month + API calls: 4.81 USD/Million calls  $\odot$ 

Table 3-1 Node parameters

Parameter	Description
Public Blockchain	There are <b>BNB Smart Chain</b> , <b>Ethereum</b> , <b>Polygon PoS</b> , and <b>TRON</b> .
	• <b>BNB Smart Chain</b> : an EVM-compatible blockchain. It contains consensus layers and hubs to multiple blockchains. As a leading blockchain, BNB Smart Chain serves as an essential infrastructure, offers low-cost transactions and fast processing, and prioritizes privacy.
	• <b>Ethereum</b> : an open-source, blockchain-based computing platform featuring smart contract functionality
	• <b>Polygon PoS</b> : an L2 solution or a side chain, with its PoS Chains interconnected and communicating with the Ethereum mainnet
	• <b>TRON</b> : a blockchain-based, decentralized operating system

Parameter	Description
Mainnet &	For BNB Smart Chain, there are <b>Mainnet</b> and <b>Chapel</b> .
Testnet	• <b>Mainnet</b> : an EVM-compatible, Proof of Staked Authority (PoSA) mainnet, with shorter block time and lower fees.
	<b>NOTE</b> This function will be available soon.
	• <b>Chapel</b> : a replica of mainnet. Chapel allows you to develop, test, and deploy your DApps.
	For Ethereum, there are <b>Mainnet</b> , <b>Sepolia</b> , <b>Goerli</b> , and <b>Holesky</b> .
	• <b>Mainnet</b> : a proof-of-stake (PoS) mainnet for real transactions
	• <b>Sepolia</b> : a PoS testnet with a small amount of data and fast node startup speed
	• <b>Goerli</b> : a PoS testnet with a large amount of data for complex services
	• <b>Holesky</b> : The first-ever Ethereum testnet launched on the top of the PoS consensus, serving as a staking, infrastructure, and protocol-developer testnet.
	For Polygon PoS, there are <b>Mainnet</b> and <b>Mumbai</b> .
	• <b>Mainnet</b> : The PoS mechanism and compatibility with EVMs make mainnet the preferred choice for fast transactions and low costs.
	<ul> <li>Mumbai: a replica of mainnet. Mumbai allows you to develop, test, and deploy your DApps.</li> </ul>
	For TRON, there are <b>Mainnet</b> and <b>Nile</b> .
	• <b>Mainnet</b> : a dedicated proof-of-stake (DPoS) mainnet for real transactions
	• <b>Nile</b> : a DPoS testnet with a small amount of data and fast node startup speed
Enterprise	Select an existing enterprise project, for example, <b>default</b> .
Project	If the Enterprise Management service is not enabled, this parameter is unavailable.
Node Type	For Ethereum, there are <b>Full node</b> and <b>Full node (Staking supported)</b>
	• <b>Full node</b> : It stores blockchain ledger data and status data and is suitable for DApp development and on-chain data requests.
	• Full node (Staking supported)

Parameter	Description
Consensus Client	It implements the proof-of-stake consensus algorithm, which enables the network to achieve agreement based on validated data from the execution client.
	• If the <b>Public Blockchain</b> is <b>Ethereum</b> and the <b>Node Type</b> is <b>Full node</b> , you can set <b>Prysm</b> as the consensus client.
	<ul> <li>If the Public Blockchain is Ethereum and the Node Type is Full node (Staking supported), you can set Prysm (default) or Lighthouse as the consensus client.</li> </ul>
	• If the <b>Public Blockchain</b> is <b>Polygon PoS</b> and the <b>Node Type</b> is <b>Full node</b> , you can set <b>Heimdall</b> as the consensus client.
	<b>NOTE</b> Prysm 5.0.2 is provided for you to use Prysm validators of version 5.0.0 and later.
	Lighthouse 5.2.0 is provided for you to use Lighthouse validators of version 5.0.0 and later.
	Heimdall 1.1.0 is provided for you.
Execution Client	It listens to new transactions broadcasted in the network, executes them in EVM, and holds the latest state and database of all current data on the Ethereum network.
Node Specification s	• If the <b>Public Blockchain</b> is <b>BNB Smart Chain</b> and the <b>Node</b> <b>Type</b> is <b>Full node</b> , the <b>2U8G</b> and <b>16U64G (Robust)</b> flavor is supported.
	<ul> <li>If the Public Blockchain is Ethereum and the Node Type is Full node, the following flavors are supported: 4U16G (Recommended), 8U32G (Stable), and 16U64G (Robust).</li> </ul>
	• If the <b>Public Blockchain</b> is <b>TRON</b> and the <b>Node Type</b> is <b>Full node</b> , the <b>16U32G (Stable)</b> flavor is supported.
	<ul> <li>If the Node Type is Full node (Staking supported), the 8U32G (Stable) flavor is supported.</li> </ul>
	• If the <b>Public Blockchain</b> is <b>Polygon PoS</b> , the following flavors are supported: <b>8U32G (Stable)</b> and <b>16U64G (Robust)</b> .
Nodes	You can create multiple nodes at the same time as required.

Parameter	Description
Connect to MEV-Boost Relays	This is displayed if the <b>Node Type</b> is <b>Full node (Staking</b> <b>supported)</b> , and is enabled by default. Click <b>Edit</b> to use the default MEV-Boost relays or add new ones.
	The following mainstream MEV-Boost relays are connected by default.
	<ul> <li>https:// 0xa15b52576bcbf1072f4a011c0f99f9fb6c66f3e1ff321f11f461d 15e31b1cb359caa092c71bbded0bae5b5ea401aab7e@aestus.li ve</li> </ul>
	<ul> <li>https:// 0xa7ab7a996c8584251c8f925da3170bdfd6ebc75d50f5ddc405 0a6fdc77f2a3b5fce2cc750d0865e05d7228af97d69561@agnost ic-relay.net</li> </ul>
	<ul> <li>https:// 0x8b5d2e73e2a3a55c6c87b8b6eb92e0149a125c852751db142 2fa951e42a09b82c142c3ea98d0d9930b056a3bc9896b8f@blox route.max-profit.blxrbdn.com</li> </ul>
	<ul> <li>https:// 0xb0b07cd0abef743db4260b0ed50619cf6ad4d82064cb4fbec9 d3ec530f7c5e6793d9f286c4e082c0244ffb9f2658fe88@bloxrou te.regulated.blxrbdn.com</li> </ul>
	<ul> <li>https:// 0xb3ee7afcf27f1f1259ac1787876318c6584ee353097a50ed84f 51a1f21a323b3736f271a895c7ce918c038e4265918be@relay.e dennetwork.io</li> </ul>
	<ul> <li>https:// 0xac6e77dfe25ecd6110b8e780608cce0dab71fdd5ebea22a16c0 205200f2f8e2e3ad3b71d3499c54ad14d6c21b41a37ae@boost- relay.flashbots.net</li> </ul>
	<ul> <li>https:// 0x98650451ba02064f7b000f5768cf0cf4d4e492317d82871bdc8 7ef841a0743f69f0f1eea11168503240ac35d101c9135@mainne t-relay.securerpc.com</li> </ul>
	<ul> <li>https:// 0xa1559ace749633b997cb3fdacffb890aeebdb0f5a3b6aaa7eee af1a38af0a8fe88b9e4b1f61f236d2e64d95733327a62@relay.ult rasound.money</li> </ul>
	<ul> <li>https:// 0x8c7d33605ecef85403f8b7289c8058f440cbb6bf72b055dfe2f3 e2c6695b6a1ea5a9cd0eb3a7982927a463feb4c3dae2@relay.we nmerge.com</li> </ul>
	Add MEV-Boost Relay Address Click to add relays in the following format:
	http:// <i>{Protocol prefix}{Public key}</i> @ <i>{Relay domain name}</i> or https:// <i>{Protocol prefix}{Public key}</i> @ <i>{Relay domain name}</i>

Parameter	Description
	Click <sup>Delete</sup> in the <b>Operation</b> column to delete unnecessary relays. <b>NOTE</b> Invalid relays can be added but will not be used in transactions.
Display APIs for Full	Disabled by default. For details about common APIs for full nodes, see <b>Common Ethereum APIs</b> .
Node	Displaying these APIs will trigger the traffic control policy for your full nodes (staking supported) and might affect the validator efficiency. It is recommended to use full nodes to view these APIs.
VPC Endpoint (VPCEP)	If it is enabled, NES will create interface VPC endpoints for your staking nodes. After your staking nodes are connected, traffic from these nodes and validator staking will be forwarded through a private network.

#### Step 4 Click Create.

Step 5 Select I have read and agree to the HUAWEI CLOUD User Agreement and Disclaimer. and click Submit.

#### Figure 3-3 Node information

	Mainnet &	Enterpris	Node Specifications		Client		Nodes	Billing Mo	Pricing	
Ethereum	Mainnet	default	Node Type Node Instance Flavor	Full node 8vCPUs   32GIB RAM	Consensus Client Execution Client	Prysm Geth	1	Pay-per-use	Node: Storage: API Calls:	\$0.768 USD / Hour \$0.12 USD / GB/Month \$4.81 USD / Million calls
✓ I have read	and agree to the	HUAWEI CLOUE	User Agreement and D	isclaimer.						

#### **NOTE**

It takes about 5 to 8 seconds to complete the process.

```
----End
```

## 3.2.2 Node Checking

#### 3.2.2.1 Checking a Full Node

#### Procedure

- **Step 1** Log in to the NES console.
- **Step 2** Choose **Dedicated** > **Network Management**.
- Step 3 Click a node ID.

#### Figure 3-4 Checking a full node

Q Select a property or enter a keyword.								00
Node ID 😔	Status 😔	Node Type 😔	Client 🕀	Specifications 😔	AZ 🕀	Enterpr 😔	Created 😔	Operatio
2b936cf8-451b-4187-8f36-0dd0242e355a	• Available	Full node (Staking supported)	Consensus layer: Pr Execution layer: Ge	8vCPUs   32GiB	AZ3	default	Apr 28, 202	Scale C
aead902d-f8c3-450e-bda3-6971cbb2df42	• Available	Full node (Staking supported)	Consensus layer: Pr Execution layer: Ge	8vCPUs   32GIB	AZ3	default	Apr 28, 202	Scale C
44be1527-f5c4-4cae-a9f3-b6107ee07776	• Available	Full node	Consensus layer: Pr Execution layer: Ge	8vCPUs   32GiB	AZ3	default	Apr 28, 202	Scale D

**Step 4** Check the node details, including the data of **Basic Settings**, **Monitoring**, **APIs**, and **Alarms**.

#### Figure 3-5 Node details

C cb9+192-6454-4316-4996-24553cd84 0 Avalues									
1 A full node must be used with its API key. FAQs 🎦			×						
Node Info	Nede Info								
Basic Info									
Node ID	Status	Public Blockchain	Mainnet & Testnet						
cb9e1192-5a5d-431d-a99d-2a553cd84283	Available	Ethereum	Mainnet						
Enterprise Project	AZ	Node Type	Instance Flavor						
default 🕑	AZ5	Full node	Full node(Ethereum)8U32G						
Created	HTTP Endpoint ③	WebSocket Endpoint ③							
Nov 26, 2024 09:28:14 GMT+08:00									
Client Info									
Execution Client	Execution Cilent Version	Consensus Client	Consensus Client Version						
Geth	v1.13.15	Prysm	v5.1.0						
antering APIs Alarms									
			Last 30 minutes Last 1 hour Last 1 day Q						
CPU Usage Unit: % 18		Physical Memory Usage Unit % 70							
15	· · · · · · · · · · · · · · · · · · ·								

----End

#### **Node Information**

Here shows the node ID, public blockchain name, node status, mainnet and testnet types, node type, HTTP endpoint, WebSocket endpoint, blockchain instance flavor, creation time, availability zone (AZ), execution client, execution client version, consensus client, and consensus client version.

#### Figure 3-6 Basic settings

Node Info			
Basic Info			
Node ID	Status	Public Blockchain	Mainnet & Testnet
cb9e1f92-5e5d-431d-e99d-2e553cd84283	Available	Ethereum	Mainnet
Enterprise Project	AZ	Node Type	Instance Flavor
default 🖸	AZ5	Full node	Full node(Ethereum)8U32G
Created	HTTP Endpoint ①	WebSocket Endpoint (*)	
Nov 26, 2024 09:28:14 GMT+08:00			
Client Info			
Execution Client	Execution Client Version	Consensus Client	Consensus Client Version
Geth	v1.13.15	Prysm	v5.1.0

#### **NOTE**

An AZ is a physical region where resources use independent power supplies and networks. Your public blockchain nodes are automatically allocated to different AZs. To ensure application availability when deleting nodes, it is recommended to avoid leaving the remaining nodes in the same AZ. Currently, **AZ1** and **AZ3** are supported.

#### Monitoring

Here shows the CPU usage, physical memory usage, network traffic, and disk usage.



#### Figure 3-7 Monitoring

#### APIs

Here shows the total number of API calls and the top 5 most called APIs.

#### Figure 3-8 APIs

AFI Calis Units Times 1 0 0 0 0 0 0 0 0 0 0 0 0 0

#### Alarms

Here shows the active and history alarms of the current node.

#### Figure 3-9 Alarms

Monitoring APIs	Alarms						Last 30 🗸		
Active History									
Q Select a property or enter a	keyword.						Q (0		
Alarm Θ	Severity O	Provider 😣	Resource Type (6)	Resource Name 😔	Alarm Details 😣	Reported O	Duration 😔		
				N 1 7					
	No data available.								
			No al	larms on current node.					
Alarm O	Sevenity O	Provider 🥹	Resource Type 0	Resource Name 创	Alarm Details 🤤	Reported O	Duration Ø		

#### 3.2.2.2 Checking a Staking Node

#### Procedure

**Step 1** Log in to the NES console.

**Step 2** Choose **Dedicated** > **Network Management**.

**Step 3** Click a node ID.

#### Figure 3-10 Checking a staking node

Mainnet Sepolia Holesky								
Q Select a property or enter a keyword.								0
Node ID \ominus	Status 🔶	Node Type \ominus	Client 🔶	Specificati \ominus	AZ ⇔	Enterprise	Created \ominus	Operation
cb9e1f92-5a5d-431d-a99d-2a553cd84283	O Available	Full node	Consensus layer: Execution layer:	8vCPUs   32GiB	AZ5	default	Nov 26, 2024 0	Scale Delete
9ab16f45-a1fd-4e71-be4a-4b7b94950fa6	O Available	Full node (Stak	Consensus layer: Execution layer:	8vCPUs   32GiB	AZ5	default	Nov 26, 2024 0	Scale Delete
Total Records: 2							10	<ul><li>✓&lt;1&gt;</li></ul>

Step 4 Check the node details, including the data of Basic Settings, Monitoring, Node Status, and Alarms.

#### Figure 3-11 Node details

Node Engine Service (NES) / Network Management / Node Details	Note Expine Service (NES) / Network Management / Kede Details						
Sabitito-4110-46/1-D643-4D/D94950136 See 20	19						
A full node that supports staking must be used with its certificate and API key. F	x0: (?			×			
Node Info							
Basic Info							
Node ID	Status	Public Blockchain	Mainnet & Testnet				
9ab16f45-a1fd-4e71-be4a-4b7b94950fa6	Available	Ethereum	Mainnet				
Enterprise Project	AZ	Node Type	Instance Flavor				
🔁 flusteb	A25	Full node (Staking supported)	Full node(Ethereum)8U32G				
Created	Display APIs for Full Node	gRPC Endpoint (for Validators)	HTTP Endpoint (for Validators)				
Nov 25, 2024 09:23:04 GMT+08:00		0	đ				
Node TLS Certificate	'C Endpoint (VPCEP)						
Download	ð						
Client Info							
Execution Client	Execution Client Version	Consensus Client	Consensus Client Version				
Geth	v1.13.15	Prysm	v5.1.0				
Staking Performance Node Status Alarms							
Check statistics for up to 800 validators since the Staking Performance function	became available. Buy new nodes to analyze more validators. Learn more 🕑			×			
Statistics (All time)							
				0			
0	0 %	0 %	0 %				
Active Validators 💿	Avg. Staking Effectiveness 💿	Avg. Participation Rate 🕥	Avg. Accuracy 🕥				
Find							
EIIU							

#### Node Information

Here shows the node ID, public blockchain name, node status, mainnet and testnet types, node type, gRPC endpoint, node TLS certificate, blockchain instance flavor, creation time, AZ, APIs for full nodes, WebSocket endpoint, HTTP endpoint (for validators), gRPC endpoint (for validators), execution client, execution client version, consensus client, and consensus client version. If **Display APIs for Full Node** is enabled, HTTP and WebSocket endpoints are displayed. If **VPC Endpoint** (**VPCEP**) is enabled, the VPC endpoint is displayed.



Node Info			
Basic Info			
Node ID	Status	Public Blockchain	Mainnet & Testnet
cb9e1f92-5a5d-431d-a99d-2a553cd84283	Available	Ethereum	Mainnet
Enterprise Project	AZ	Node Type	Instance Flavor
default 🗹	A25	Full node	Full node(Ethereum)8U32G
Created	HTTP Endpoint ③	WebSocket Endpoint (3)	
Nov 26, 2024 09:28:14 GMT+08:00			
Client Info			
Execution Client	Execution Client Version	Consensus Client	Consensus Client Version
Geth	v1.13.15	Prysm	v6.1.0

#### D NOTE

- **Connect to MEV-Boost Relays** is displayed only if you enabled this function when creating staking nodes.
- An AZ is a physical region where resources use independent power supplies and networks. Your public blockchain nodes are automatically allocated to different AZs. To ensure application availability when deleting nodes, it is recommended to avoid leaving the remaining nodes in the same AZ. Currently, **AZ1** and **AZ3** are supported.

#### **Staking Performance**

You can check statistics for up to 800 validators since the **Staking Performance** function became available. Buy new nodes to analyze more validators. This function helps you analyze the validator performance, including their online status, effectiveness, participation, and accuracy.

Figure 3	-13	Staking	performance
----------	-----	---------	-------------

Statung Performance Node Status Adams			
Check statistics for up to 800 validators since the Staking Performance function bec	ame available. Buy new nodes to analyze more validators. Learn more 🕑		×
Statistics (All time)			۵
800 Active Validators: (3)	96.92 % Avg. Staking Effectiveness ③	99.87 % Avg. Participation Rate (3)	96.35 % Avg. Accuracy (3)
Details (Epochs) Attestation ①		Avg. Staking Effectiveness	Last 1 day Last 7 days Last 30 days
Total/Missed Dufes 170400 / 238     Ø     Missed Source Dufes     Missed Head Dufes 15894     Inclusion Delay 1.97	863 @ Missed Terget Duties 783	Unit: %	
Block Proposal ③		80	
Sync Committee ③		40	
A Totalifused Duries 4600 / 279		20 0 20, 20, 2024 15:12:00 GMT+08:00 Nev 25, 2024	225024 GMT+0800 Nov 26, 2024 082848 GMT+0880

**Statistics (All Time)** shows the overall staking performance and **Details (by Epoch)** shows details.

#### • Statistics (All Time)

The following data is displayed.

#### a. Active Validators

The number of active validators in the current network.

#### b. Avg. Staking Effectiveness

Validators performance in their attestation, block proposal, and sync committee duties.

- 84.4% of validators' rewards come from attestations (attestation\_effectiveness), greatly affecting the staking performance. Formula: attestation\_effectiveness = actual\_reward/ ideal\_reward
- 12.5% of validators' rewards come from block proposals (proposer\_effectiveness). If the validator did not propose any block, the effectiveness is 1. Formula:

proposer\_effectiveness = proposed\_blocks/total\_blocks

 3.1% of validators' rewards come from sync committee duties (sync\_effectiveness). Formula:

sync\_effectiveness = executed\_sync/(scheduled\_sync - missed\_blocks)

**Avg. Staking Effectiveness** is the weighted average of attestation\_effectiveness, proposer\_effectiveness, and sync\_effectiveness. Formula: effectiveness = 54/64 x attestation\_effectiveness x 8/64 x proposer\_effectiveness + 2/64 x sync\_effectiveness

Effectiveness calculation excludes tasks in which the validators did not participate. The following lists some possible scenarios.

Participating only in attestation duties:

effectiveness = 1 x attestation\_effectiveness

Participating in attestation and proposal duties:

effectiveness = ((56/64 x attestation\_effectiveness) + (8/64 x proposer\_effectiveness))

 Participating in attestation and sync committee duties: effectiveness = ((62/64 x attestation\_effectiveness) + (2/64 x sync\_effectiveness))

#### c. Avg. Participation Rate

The number of epochs a validator's attestation was included on the blockchain. Formula:

participation\_rate = included\_attestations/active\_epochs

d. Avg. Accuracy

This measures the correctness of attestations submitted by validators, including source votes, target votes, and head votes. Formula:

correctness\_rate = (source\_vote\_correctness + target\_vote\_correctness + head\_vote\_correctness)/3

#### • Details (by Epoch)

You can filter data by specifying the time range, for example, last day, last 7 days, or last 30 days. Detailed data of attestation, block proposal, and sync committee duties are shown in graphs and tables to help you evaluate the validator performance by day, week, or month.

a. **Attestations**: An active validator is expected to create, sign, and broadcast an attestation every epoch.

#### Figure 3-14 Attestations

ttestati	on 🕐						
o/o	Total/Missed Duties	163200 / <mark>236</mark>	Missed Source Duties	942	Ċ	Missed Target Duties	693
HEAD	Missed Head Duties	15204	Inclusion Delay 1.06				

- Total: the total attestations submitted by validators
- Missed Duties: the total attestations that were failed or incorrectly submitted
- Missed Source Duties
- Missed Target Duties
- Missed Head Duties
- Inclusion Delay: the difference between the time when the validator's attestation is actually included in the blockchain and the expected time. The lower the inclusion delay, the greater the validator's contributions to the network's consensus and stability. The optimal inclusion delay is 1.
- b. **Block Proposal**: New blocks are proposed, created, and broadcast by random validators in their respective slots.

Figure 3-15 Block proposal



c. **Sync Committee**: A group of validators (randomly chosen every 27 hours) that sign valid block headers. This group enables light clients to trace the blockchain status and keep the blockchain synchronized without accessing the entire set of validators.

#### Figure 3-16 Sync committee



d. **Avg. Staking Effectiveness**: Trends in the last 1 day, 7 days, and 30 days are displayed to help you evaluate the validator performance.

#### Figure 3-17 Avg. staking effectiveness



#### **Node Status**

Here shows the trends of the peer quantity and block height.

#### Figure 3-18 Node status



#### Alarms

Here shows the active and history alarms of the current node.

Figure 3-19 Alarms

Monitoring Node Status	Alarms							Last 30 V
Active History								
Q Select a property or enter a keyw	ord.							0
Alarm 🖯	Severity 🖯	Provider 🖯	Resource Type \ominus	Resource Name 😔	Alarm Details 😔	Reported O	Duration 🖯	
				2 L 4				
			No d	ata available.				
			No alarr	ns on current node.				
Total Research: 0	• • •							

## 3.2.3 Other Operations

#### Searching for a Node

**Step 1** Log in to the NES console.

#### **Step 2** Choose **Dedicated** > **Network Management**.

**Step 3** In the search box, select a property or enter a keyword, and press **Enter** to search for a node.

#### Figure 3-20 Searching for a node

Nod Property	Status 😔	Node Type \ominus	Client \ominus	Specifications 😔	AZ ⊖	Enterpr 😔	Created 😔	Operatio
Node ID 2b9: Status	O Available	Full node (Staking supported)	Consensus layer: Pr Execution layer: Ge	8vCPUs   32GIB	AZ3	default	Apr 28, 202	Scale
Node Type Bear Client	O Available	Full node (Staking supported)	Consensus layer: Pr Execution layer: Ge	8vCPUs   32GIB	AZ3	default	Apr 28, 202	Scale [
44bi Enterprise Project	<ul> <li>Available</li> </ul>	Full node	Consensus layer: Pr Execution layer: Ge	8vCPUs   32GiB	AZ3	default	Apr 28, 202	Scale (

----End

#### Scaling a Node

- **Step 1** Log in to the NES console.
- **Step 2** Choose **Dedicated** > **Network Management**.
- **Step 3** Click **Scale** in the **Operation** column of a node.
- **Step 4** Select a target flavor and click **OK**.

#### Figure 3-21 Scaling a node

Scale Nod	e	×
You can scale	e in or out nodes as required.	
* Target Flavor	16vCPUs   64GiB	~ )
		Cancel OK
End		
Deleting a Node		
Step 1 Log in to the NE	S console.	

- Step 2 Choose Dedicated > Network Management.
- Step 3 Click Delete in the Operation column of a node.
- **Step 4** Enter **DELETE** to confirm the deletion.

#### Figure 3-22 Deleting a node

Delete Node			>
Node ID to be deleted: cb0f0412 Deleted nodes cannot be recover	-0416-447f-a9be-21215fd93852 red. You can create another one.		
Node ID	Status	Node Type	Specifications
cb0f0412-	O Available	Full node	8vCPUs   32GiB
To confirm deletion, enter "DELE	TE" below. Auto Enter		
			Cancel

----End

## 3.3 Authentication Credential

Authentication credentials are used for security authentication and key operations on public blockchain nodes.

For full nodes: Each credential can be attached to the end of the node address as a request parameter for quick interconnection. This is recommended for node interconnection tests. For actual business, use Huawei Cloud tokens.

For staking nodes: Credentials are the parameter values used to start staking nodes.

## 3.3.1 API Key Creation

#### Prerequisites

You have created a public blockchain node.

#### Procedure

- **Step 1** Log in to the NES console.
- Step 2 Choose Dedicated > API Keys, then click Create API Key.
- Step 3 Describe the API key and set the access policy.

#### Figure 3-23 Creating an API key

ach API key can be attach commended for node inte ily once. Change the API	hed to the end of the node address as a request parameter for quick interconnection. This is erconnection tests. For actual business, use Huawei Cloud tokens. Each API key can be downloade key periodically for security.
Enterprise Project	Select an enterprise project.
Description	Enter a description.
	0/1,000,
Access Policy	^
Target Nodes	2b936cf8-451b-4187-8f36-0dd0242e355a × V ③
Access Policy Type	Disabled Whitelist Blacklist
Access Policy Type	Disabled Whitelist Blacklist Your DApp can only send requests to or receive requests from the whitelist. Note: Set one access policy type for each API key.
Access Policy Type Whitelist	Disabled     Whitelist     Blacklist       Your DApp can only send requests to or receive requests from the whitelist.     Note: Set one access policy type for each API key.       Whitelist     Access Control By ③     Operation

#### **NOTE**

Access policies are not applicable to staking nodes.

Table	3-2	Parameter	description
-------	-----	-----------	-------------

lte m	Paramet er	Description
-	Enterpris e Project	Select an existing enterprise project, for example, <b>default</b> . If the Enterprise Management service is not enabled, this parameter is unavailable.
-	Descripti on	The description of an API key, which can contain up to 1000 characters
Acc ess Poli cy	Target Nodes	Nodes to be authenticated. By default, no node is selected, and the credentials take effect on all nodes of the tenant. If you select some nodes, the credentials and access policies take effect only on selected nodes.

lte m	Paramet er	Description
	Access	Options:
	Policy	• <b>Disabled</b> (default): The access policy is disabled.
	iype	• Whitelist: Your DApp can only send requests to or receive requests from the whitelist.
		Click <sup>( Add Whitelist</sup> and configure whitelist information as prompted.
		Options of Access Control By:
		<ul> <li>Blockchain Address: Your DApp can only send query requests to the whitelisted addresses.</li> </ul>
		<ul> <li>User-Agent: Your DApp can only receive requests sent by the whitelisted user-agents.</li> </ul>
		<ul> <li>IP Address: Your DApp can only receive requests sent by the whitelisted IP addresses.</li> </ul>
		<ul> <li>HTTP Origin: Your DApp can only receive requests sent by the whitelisted URLs.</li> </ul>
		Content:
		<ul> <li>Blockchain Address: Enter an account or contract address. For example:</li> </ul>
		mobileDapp
		<ul> <li>IP Address: Enter an IP address. For example: 123.123.123.123</li> </ul>
		<ul> <li>HTTP Origin: Enter a URL. For example: https:// www.huawei.com/en/</li> </ul>
		• <b>Blacklist</b> : Your DApp cannot send requests to or receive requests from the blacklist.
		Click <sup>O Add Blacklist</sup> and configure blacklist information as prompted.
		Options of Access Control By:
		<ul> <li>Blockchain Address: Your DApp cannot send query requests to the blacklisted addresses.</li> </ul>
		<ul> <li>User-Agent: Your DApp cannot receive requests sent by the blacklisted user-agents.</li> </ul>
		<ul> <li>IP Address: Your DApp cannot receive requests sent by the blacklisted IP addresses.</li> </ul>
		<ul> <li>HTTP Origin: Your DApp cannot receive requests sent by the blacklisted URLs.</li> </ul>
		Content:
		<ul> <li>Blockchain Address: Enter an account or contract address. For example: 0xed10421561cc4ee07e3a9b32ce6829b7ac902490</li> </ul>

lte m	Paramet er	Description
		<ul> <li>User-Agent: Enter user-agent information. For example: mobileDapp</li> </ul>
		<ul> <li>IP Address: Enter an IP address. For example: 123.123.123.123</li> </ul>
		<ul> <li>HTTP Origin: Enter a URL. For example: https:// www.huawei.com/en/</li> </ul>
		NOTE Set one access policy type for each API key.

**Step 4** Click **OK**. The API key is created and then automatically downloaded as a ZIP package.

는 credential (4).zip - WinRAR					×
File Commands Tools Favgrites Options Help					
Add Extract To Test Vew Delete Field Witzerd Info					
😰 📄 credential (4).zip - ZIP archive, unpacked size 94 bytes					~
Name	Size	Packed Type	Modified	CRC	:32
Q≟ credential.csv	94	94 Microsoft Exc	el	F5AI	8F2BF
La le tart de la companya de					

#### **NOTE**

Each API key can be downloaded only once. Change the API key periodically for security.

**Step 5** Decompress the package and open the **credential.csv** file to obtain the API key.

F17	$\cdot$ : $\times \checkmark f_x$		
	A	В	С
1 ID		Credential	
2 e5b23	068-f9e4-11ed-9237-0255ac100036	QNyaAcXGqQR	
3			
4			
5			
6			

----End

### 3.3.2 Other Operations

#### **Checking an API Key**

- **Step 1** Log in to the NES console.
- **Step 2** In the navigation pane, choose **Dedicated** > **API Keys**.
- **Step 3** Check the credentials.

#### Figure 3-24 Credentials

Keys 💿					Create API K
Q. Select a property or enter a keyword.					0
API Key ID \ominus	Enterprise Project	Description \ominus	Used $\Theta$	Created \varTheta	Operation
3164564a-9539-471e-ae66-8f7ff14f3f3d	default		Apr 29, 2024 15:55:36 GMT+08:00	Apr 28, 2024 23:09:48 GMT+08:00	Edit Delete
23a07d93-77fc-4973-b3c5-e6fc456dff4d	default		Apr 28, 2024 22:33:01 GMT+08:00	Apr 28, 2024 22:33:01 GMT+08:00	Edit Delete
6e2633b1-ce02-46d2-a118-361cee70bc85	default		Apr 28, 2024 15:18:51 GMT+08:00	Apr 28, 2024 15:17:56 GMT+08:00	Edit Delete
7bb4e196-d220-4d93-b718-b804bf9e00f8	default		Apr 26, 2024 11:00:01 GMT+08:00	Apr 25, 2024 22:50:38 GMT+08:00	Edit Delete
a4fe8b7c-f97a-4028-9811-088db440a5ca	default		Apr 25, 2024 18:43:00 GMT+08:00	Apr 25, 2024 18:43:00 GMT+08:00	Edit Delete
11c3c68-11bd-4366-b01f-64f3f3772341	default		Apr 17, 2024 11:28:17 GMT+08:00	Apr 17, 2024 11:27:40 GMT+08:00	Edit Delete
1195b135-9901-4189-911e-b7e8c6cfa4f7	default		Apr 15, 2024 19:46:37 GMT+08:00	Apr 15, 2024 19:46:37 GMT+08:00	Edit Delete
laa021a6-bc19-400f-8cfa-9b8fb9449d67	default		Apr 10, 2024 14:27:28 GMT+08:00	Apr 10, 2024 11:33:58 GMT+08:00	Edit Delete
4d485132-cb7b-453b-bedd-6820c74cc1cc	default		Apr 11, 2024 21:01:26 GMT+08:00	Apr 10, 2024 09:53:50 GMT+08:00	Edit Delete
16c980c1-1ad4-4b04-8282-99f4f8da3591	default		Apr 02, 2024 21:19:31 GMT+08:00	Apr 02, 2024 21:19:31 GMT+08:00	Edit Delete

Table 3-3 API key information

Parameter	Description
API Key ID	ID of an API key, which is automatically generated
Enterprise Project	The selected enterprise project
Description	The description of an API key
Used	Last time when an API key was used
Created	Time when an API key is created
Operation	Click <b>Edit</b> to add a description and configure an access policy. You can click <b>Delete</b> to delete an API key.

#### ----End

#### Searching for an API Key

- **Step 1** In the navigation pane, choose **Dedicated** > **API Keys**.
- **Step 2** In the search box, select a property or enter a keyword, and press **Enter** to search for an API key.

#### Figure 3-25 Searching for an API key

Select a property or enter a keyword.					]Q
PI Property	Enterprise Project \ominus	Description 😝	Used $\ominus$	Created 🖯	Operation
6. API Key ID	default		Apr 29, 2024 15:55:36 GMT+08:00	Apr 28, 2024 23:09:48 GMT+08:00	Edit Delete
Enterprise Project lai Description	default		Apr 28, 2024 22:33:01 GMT+08:00	Apr 28, 2024 22:33:01 GMT+08:00	Edit Delete
121 Used	i default		Apr 28, 2024 15:18:51 GMT+08:00	Apr 28, 2024 15:17:56 GMT+08:00	Edit Delete
Created ,	default		Apr 26, 2024 11:00:01 GMT+08:00	Apr 25, 2024 22:50:38 GMT+08:00	Edit Delete
lfe8b7c-197a-4028-9611-088db440a5ca	default		Apr 25, 2024 18:43:00 GMT+08:00	Apr 25, 2024 18:43:00 GMT+08:00	Edit Delete
1c3c58-11bd-4366-b01f-64f3f3772341	default		Apr 17 2024 11:28:17 GMT+08:00	Apr 17 2024 11:27:40 GMT+08:00	Edit Delete

Cancel

ОК

#### **Editing an API Key**

- **Step 1** In the navigation pane, choose **Dedicated** > **API Keys**.
- Step 2 Click Edit in the Operation column of an API key.
- **Step 3** Edit the API key information. For details about the parameters, see **Table 3-2**.

ecommended for node inte nly once. Change the API	ned to the end of the node address erconnection tests. For actual busin key periodically for security.	as a request parameter for ess, use Huawei Cloud tok	r quick interconnection. This is kens. Each API key can be downloade
* Enterprise Project	default	~	O Create Enterprise Project []
Description	trident-test-jarvis		
		19/1,000;	
Access Policy	^		
Target Nodes			~ Ø

Step 4 Click OK.

----End

#### **Deleting an API Key**

- **Step 1** In the navigation pane, choose **Dedicated** > **API Keys**.
- **Step 2** Click **Delete** in the **Operation** column of an API key.
- Step 3 Click OK.

#### Figure 3-26 Deleting an API key

Delete API Key		)
API Key ID to be deleted: 45bel If you delete this, you will have	845b-9f93-49ff-b384-eecd6314cd9c to create a new API key to maintain the node connec	tion.
API Key ID	Description	Used
45b	)c	Jul 03, 2024 19:42:09 GMT+08:00
To confirm deletion, enter "DEL	ETE" below. Auto Enter	
		Cancel

----End

## **4** Shared Edition

## 4.1 Dashboard

The Quick Start process, My Resources, and Uptime are shown on this page.

#### Viewing the Dashboard

**Step 1** Log in to the NES console.

Figure 4-1 Dashboard

- **Step 2** In the navigation pane, choose **Shared** > **Dashboard**.
- Step 3 Check Quick Start, My Resources, and Uptime.

#### Dashboard 🕼 Quick Link Create a DApp project by blockchain, and network. Call node A DApps and My Resources 8 🥃 API Calls 15.32 Million 🔃 Total Used CUs 53.69 Million Specifications Basic Edition (Monthly) Projects Uptime ③ Ethereum Mainnet ✓ Mar 2024 – May 2024 Ethereum Mainnet (\*\*\* 100% uptime 100% uptime 100% uptin Mar 2024 Apr 2024 May 2024 tage 📕 Ma utage 📕 Majoi Fri Sat Tues Wed Thur Fri Wed Thur Fri 2 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

----End

#### **Getting Started**

**Step 1** Select a package.

Buy a package to provision the shared NES resources.

**Step 2** Create a project.

Create a DApp project by configuring its name, description, blockchain, and network.

**Step 3** Call APIs.

Call node APIs or integrate node RPC addresses to your DApps to interconnect nodes to your validator nodes and MEV-Boost.

**Step 4** Monitor the project.

View API statistics and monitor the DApp project.

----End

#### Viewing My Resources

The package specifications and numbers of projects and API calls are shown.

- **Specifications**: The edition of your package, which can be the basic edition (monthly), professional edition (monthly), enterprise edition (monthly), or enterprise edition (yearly).
- **Projects**: the total number of the created DApp projects under your account
- API Calls: the total number of API calls under your account
- **Total Used CUs**: the total number of compute units (CUs) used by DApps under your account

#### **Checking Service Uptime**

Here displays the network availability.



## 4.2 Package Management

Here you can view package details and check DApp statistics in a specified period.

#### Viewing Package Usage

• **Current**: Here displays the package name, status, renew time, purchase time, and expiration time.

Sur	ent Historical			
	Package Name	Basic Edition (Monthly)	Effective Time	Apr 29, 2024 00 00 00 GMT+08 00
	Renew Time	Misy 28, 2024 23 59 59 GMT+08:00	Expires	May 28, 2024 23:59:59 UMI +08:00

• Historical: The latest 50 invalid packages are displayed.

urrent Historical						Buy Package
The latest 50 invalid packages are d	displayed. ayword.					
Package Name ⊖	Specifications		Invitation Status	Purchased 🖯	Effective Time 🖯	Expires ()
Basic Edition (Monthly)	Projects Compute Units/Month/Million Compute Units/Second	10 450 400	O Invalid	Mar 28, 2024 09:01:21 GMT+08:00	Mar 28, 2024 09:01:21 GMT+08:00	Apr 28, 2024 23:59:59 GMT+08:00
Basic Edition (Monthly)	Projects Compute Units/Month/Million	10 450	O Invalid	Feb 20, 2024 09:39:06 GMT+08:00	Feb 28, 2024 00:00:00 GMT+08:00	Mar 27, 2024 23:59:59 GMT+08:00

• Here shows the **CUs Used This Month** and **CUs Available This Month**.

CUs Used This Month 2,176,598	•	CUs Available This Month 447,823,402	

#### **Viewing DApp Statistics**

Here shows the usage statistics of all DApps. You can filter the charts with specified DApp name and time.

DApp Statistics	× ° √ Apr 09, 2024 – May 09, 2024 – ⊞) Q
Unit: Compute Units 150	1 Unit: Compute Units 120
120	80
60	40
0, 2024 16:2:2:0 M/T+08:0 Apr 22, 2024 16:2:2:0 M/T+08:0 May 05, 2024 16:2:2:0 M/T+08:00	20 0 +

#### **NOTE**

The statistics of a maximum of four DApps are shown.

#### **Buying a Package**

- **Step 1** Log in to the NES console.
- **Step 2** Choose **Shared** > **Package Management** and click **Buy Package**.
- **Step 3** Configure parameters.

#### Figure 4-2 Buying a package

	s			3104
* Edition	Basic Edition (Monthly)	Professional Edition (Monthly)	Enterprise Edition (Monthly)	Enterprise Edition (Yearly)
	\$0.00 USD / month	\$49.00 USD / month	\$289.00 USD / month	\$2,388.00 USD /yea
	Projects 10	Projects 20	Projects 40	Projects 40
	Compute Units/Month/Million 450	Compute Units/Month/Million 600	Compute Units/Month/Million 2,200	Compute Units/Month/Million 2,200
	Compute Units/Second 400	Compute Units/Second 990	Compute Units/Second 5,000	Compute Units/Second 5,000
		Excess: USD1.2/million CUs	Excess: USD1.0/million CUs	Excess: USD1.0/million CUs
Effective Time	Upon expiration Immediately This package will be effective after your curren	t package expires. Current package: Basic Ed	ition (Monthly). Expiration date: May 28, 2024(R	emaining
	days: 22)			
otes				
	d a package, its fees cannot be refunded and the	CUs in it will become invalid after it expires or	it is replaced.	
you have purchased				
you have purchased				

#### Table 4-1 Package parameters

Parameter	Description
Billing Mode	Packages can be billed in the Yearly/Monthly mode.

Parameter	Description
Edition	<ul> <li>Basic Edition (Monthly) Number of projects: 10 CUs per month: 450 million CUs per second: 400</li> <li>Professional Edition (Monthly) Number of projects: 20 CUs per month: 600 million CUs per second: 990 NOTE Excess: USD1.2/million CUs</li> <li>Enterprise Edition (Monthly) Number of projects: 40 CUs per month: 2.2 billion CUs per second: 5,000 NOTE Excess: USD1.0/million CUs</li> <li>Enterprise Edition (Yearly) Number of projects: 40 CUs per month: 2.2 billion CUs per month: 2.2 billion CUs per month: 2.2 billion CUs per month: 2.2 billion CUs per month: 2.2 billion</li> </ul>
	Excess: USD1.0/million CUs
Duration	Select whether to buy the package for months or for a year. <b>NOTE</b> The basic edition can be used free of charge for one month. After it expires, you can buy it again or buy other packages.
Effective Time	Time when the package takes effect, which can be <b>Upon</b> expiration or Immediately.
	• <b>Upon expiration</b> : The package will be effective after your current package expires.
	• Immediately: The package will be effective immediately.

#### **NOTE**

If you have purchased a package, its fees cannot be refunded and the CUs in it will become invalid after it expires or it is replaced.

**Step 4** Click **Next**. Confirm the configurations, confirm that you have read and agree to the agreement and disclaimer, and click **Submit**.

----End

## 4.3 DApp Project Management

## 4.3.1 DApp Project Creation

You need to create a DApp project by selecting a specified network and setting a whitelist.

#### Prerequisites

- You have registered with Huawei Cloud.
- You have purchased a package.

#### Procedure

- **Step 1** Log in to the NES console.
- Step 2 Choose Shared > DApp Project Management and click Create DApp Project.
- **Step 3** Configure parameters.

#### Figure 4-3 Creating a DApp project

Enter a project name.			
Ethereum	🍞 Tron	Polygon PoS	
n Arbitrum	BNB Smart Chain		
Mainnet     A proof-of-stake (PoS) mainnet     for real transactions.	Sepolia A proof-of-stake (PoS) testnet with a small amount of data and fast node startup speed.		
Enter a description.	0/3002		
Add Whitelist			
Content 🕀	Access Control By	÷	Operation
	Enter a project name.    Enter a project name.    Arbitrum   Mainnet  A proof-of-stake (PoS) mainnet for real transactions.   Enter a description.   Add Whitelist  Add Whitelist  Content $\hat{\Theta}$	Enter a project name.	Enter a project name.

#### Table 4-2 DApp parameters

Parameter	Description
DApp Name	Enter 1 to 10 letters and digits.

Parameter	Description
Public Blockchain	There are <b>Ethereum</b> , <b>TRON</b> , <b>Polygon PoS</b> , <b>Arbitrum</b> , and <b>BNB</b> Smart Chain.
	• Ethereum: an open-source, blockchain-based computing platform featuring smart contract functionality
	• <b>TRON</b> : a blockchain-based, decentralized operating system
	• <b>Polygon PoS</b> : an L2 solution or a side chain, with its PoS Chains interconnected and communicating with the Ethereum mainnet
	• <b>Arbitrum</b> : a layer 2 scaling solution for the Ethereum blockchain. It aims to enhance scalability and reduce network congestion and transaction fees while maintaining the compatibility and security of the Ethereum Virtual Machine (EVM).
	• <b>BNB Smart Chain</b> : an EVM-compatible blockchain. It contains consensus layers and hubs to multiple blockchains. As a leading blockchain, BNB Smart Chain serves as an essential infrastructure, offers low-cost transactions and fast processing, and prioritizes privacy.
Mainnet &	For Ethereum, there are <b>Mainnet</b> and <b>Sepolia</b> .
Testnet	Mainnet: a PoS mainnet for real transactions
	<ul> <li>Sepolia: a PoS testnet with a small amount of data and fast node startup speed</li> </ul>
	For TRON, there are <b>Mainnet</b> and <b>Nile</b> .
	Mainnet: a DPoS mainnet for real transactions
	<ul> <li>Nile: a DPoS testnet with a small amount of data and fast node startup speed</li> </ul>
	For Polygon PoS, there are <b>Mainnet</b> and <b>Mumbai</b> .
	• <b>Mainnet</b> : The PoS mechanism and compatibility with EVMs make mainnet the preferred choice for fast transactions and low costs.
	<ul> <li>Mumbai: a replica of mainnet. Mumbai allows you to develop, test, and deploy your DApps.</li> </ul>
	For Arbitrum, there are <b>One</b> and <b>Goerli</b> .
	<ul> <li>One: an optimistic rollup chain that supports EVMs and lets you efficiently perform transactions at low costs</li> </ul>
	<ul> <li>Goerli: a replica of mainnet. Goerli allows you to develop, test, and deploy your DApps</li> </ul>
	For BNB Smart Chain, there are <b>Mainnet</b> and <b>Chapel</b> .
	<ul> <li>Mainnet: an EVM-compatible, PoSA mainnet, with shorter block time and lower fees.</li> </ul>
	• <b>Chapel</b> : a replica of mainnet. Chapel allows you to develop, test, and deploy your DApps.
Description	Describe your project in 300 characters.

Parameter	Description
Advanced	You can set whitelists to restrict access to your DApp.
Settings	Click • Add Whitelist and configure whitelist information as prompted.
	<ul> <li>Options of Access Control By: Blockchain Address: Your DApp can only send query requests to the whitelisted addresses.</li> </ul>
	<b>User-Agent</b> : Your DApp can only receive requests sent by the whitelisted user-agents.
	<b>IP Address</b> : Your DApp can only receive requests sent by the whitelisted IP addresses.
	<b>JSON Web Token (JWT)</b> : A JWT is an Internet standard (RFC 7519) that defines a process for secure data exchange between two parties. Your DApp can only receive requests that include the whitelisted JWTs.
	<b>HTTP Origin</b> : Your DApp can only receive requests sent by the whitelisted domain names and URLs.
	Content:
	<ol> <li>Blockchain Address: Enter an account or contract address. For example: 0xed10421561cc4ee07e3a9b32ce6829b7ac902490</li> </ol>
	<ol> <li>User-Agent: Enter user-agent information. For example: mobileDapp</li> </ol>
	<ol> <li>IP Address: Enter an IP address. For example: 123.123.123.123</li> </ol>
	<ol> <li>JSON Web Token (JWT): Enter a public key. For example: BEGIN PUBLIC KEY</li> </ol>
	END PUBLIC KEY
	<ol> <li>HTTP Origin: Enter a URL. For example: https:// www.huawei.com/en/</li> </ol>

Step 4 Click Create.

----End

## 4.3.2 DApp Project Viewing

#### Procedure

- **Step 1** Log in to the NES console.
- **Step 2** In the navigation pane, choose **Shared** > **DApp Project Management**.
- **Step 3** Click a DApp to view its details.

Figure 4-4 Viewing a DApp project

Select a property	or enter a keyword.						0
App Name \ominus	Mainnet & Testnet 😔	API Key		HTTPS ⊖	WebSocket 😣	Created 🕀	Operation
	Ethereum Mainnet		0	https://ethereum-mainnet.shared-fullnode.bcs	wss://ethereum-mainnet.shared-fullnode.bcs.a	Apr 25, 2024 18:48:14 GMT+08:00	Delete
	BNB Smart Chain Mai		0	https://bsc-mainnet.shared-fullnode.bcs.ap-so	wss://bsc-mainnet.shared-fullnode.bcs.ap-sout	Jan 31, 2024 11:16:07 GMT+08:00	Delete
	Tron Nile	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	۵	https://tron-nile.shared-fullnode.bcs.ap-southe	-	Jan 31, 2024 11:15:24 GMT+08:00	Delete
	Tron Mainnet		0	https://tron-mainnet.shared-fullnode.bcs.ap-so	-	Jan 31, 2024 11:14:57 GMT+08:00	Delete
	Ethereum Sepolia		0	https://ethereum-sepolia.shared-fullnode.bcs.a	wss://ethereum-sepolia.shared-fullnode.bcs.ap	Jan 31, 2024 11:14:35 GMT+08:00	Delete
	Ethereum Goerli		-	https://ethereum-goerli.shared-fullnode.bcs.ap	wss://ethereum-goerli.shared-fullnode.bcs.ap	Jan 31, 2024 11:14:16 GMT+08:00	Delete
	Ethereum Mainnet		0	https://ethereum-mainnet.shared-fullnode.bcs	wss://ethereum-mainnet.shared-fullnode.bcs.a	Jan 31, 2024 11:13:20 GMT+08:00	Delete
	Ethereum Mainnet		∞	https://ethereum-mainnet.shared-fulinode.bcs	wss://ethereum-mainnet.shared-fulinode.bcs.a	Dec 20, 2023 11:23:27 GMT+08:00	Delete

Step 4 Check the information of Basic Settings, APIs, and Whitelists.

Figure 4-5 Project details

Basic Settings						
API Key			DApp ID	85fac3d704eb0005910b7374504c8ae 🗇		
Latest Block Height	19814865		WebSocket		đ	
Total Calls	6		HTTPS		10	
Created	Apr 25, 2024 18:48:14 GMT+08:00		Public Blockchain	Ethereum		
Mainnet & Testnet	Ethereum Mainnet		Description	-		
APIs Access Policies						
_						
					La	ist hour 🗸 🖸
Median Personne Tim			Max Perponse Tim			
Unit: Millisecond			Unit: Millisecond	•		
1			1			
0.8			0.8			
0.6			0.6			
0.4			0.4			
0.2			0.2			
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	8.00 May 07, 2024 08;64:05 GMT+08:00	May 07, 2024 09:10:05 GMT+08:00	y 07, 2024 08:18:05 GMT	+0800 May 07, 2024 08,44.05 GMT+08.00 M	ay 07, 2024 09:10:05 GMT+08:00	, ,

----End

<

#### **Checking Basic Settings**

Here shows the API key, DApp ID, latest block height, WebSocket, total calls, HTTPS, creation time, public blockchain name, mainnet and testnet types, and description.

#### Figure 4-6 Basic Settings

Basic Settings				
API Key	& S	DApp ID	37ac1965c53209a946dtc2d2d8864dbc 🗇	
Latest Block Height	19068096	WebSocket		3
Total Calls	0	HTTPS		٥
Created	Jan 19, 2024 17:05:57 GMT+08:00	Public Blockchain	Ethereum	
Mainnet & Testnet	Ethereum Mainnet	Description		

#### **Checking APIs**

Here shows the medium and maximum response time and statistical distribution of API calls, and the most called APIs.

#### Figure 4-7 APIs

APIs Access Policies		
		Last m v Q
Median Response Time Ubit Milliseand	Max. Response Time Unit: Millisecond	
0.8	8	
0.6	6	
02	2	
r 07, 2024 09:20:08 GMT+08:00 Apr 20, 2024 09:20:08 GMT+08:00 May 03, 2024 09:20:08 GMT+08:00	r 07, 2024 09:20:08 GMT+08:00	pr 20, 2024 09:20:08 GMT+08:00 May 03, 2024 09:20:08 GMT+08:00
Call Statistics	Most Called APIs	
Times	Method 😌	Total Calls \ominus
6	eth_blockNumber	2
5	eth_chainId	2
4	eth_getBlockByNumber	2
3		

#### **Access Policies**

You can add or delete whitelists here.

#### Figure 4-8 Whitelists

APIs Access Policies			
Add Whitelist			
O. Select a property or enter a keyword.			00
Content 🕀	Access Control By	Operation	
	User-Agent	Delete	
	IP Address	Delete	
Total Records: 2 10 V (1)			

## 4.3.3 Other Operations

#### Searching for a DApp Project

- **Step 1** Log in to the NES console.
- **Step 2** In the navigation pane, choose **Shared** > **DApp Project Management**.
- **Step 3** In the search box, select a property or enter a keyword, and press **Enter** to search for a DApp project.

#### Figure 4-9 Searching for a project

DApp Name         Intro //top Name         Intro //top Name         Intro //top Name         Arr 25, 2024 118 48 14 0007-108 00           Name 13 Tested         Ann Mail         Intro // top Name         Intro // top Name         Ann Mail         Ann M	Delete Delete Delete
Marked & Entered         Main Mail         Integr/loc mained transf Mindels bics ap-soll.         Visit / Non-mained transf Mindels bics ap-soll.         Jan 31, 2024 111:60 / GMT-68:00           HTTPS         Main Mail         Impor/loc mained transf Mindels bics ap-soll.         -         Jan 31, 2024 111:60 / GMT-68:00           VietScholt         Impor/loc mained transf Mindels bics ap-soll.         -         Jan 31, 2024 111:52 / GMT-68:00           Created         Impor/loc mained transf Mindels bics ap-soll.         -         Jan 31, 2024 111:52 / GMT-68:00           Etherson Sepola         Impor/loc mained transf Mindels bics ap-soll.         -         Jan 31, 2024 111:45 / GMT-68:00	Delete
WebSocket         Integration with a sharef-billingde box ap-souther         -         Jan 31, 2024 111524 0007-08.00           Created         Integration with the of billingde box ap-souther         -         Jan 31, 2024 111525 0007-08.00           Etherem Sepola         Integration with the of billingde box ap-souther         -         Jan 31, 2024 111457 0007-08.00           Etherem Sepola         Integration with the of billingde box ap-souther         -         Jan 31, 2024 111457 0007-08.00	Delete
Created	
Ethereum Sepolia 🗰 https://ethereum-sepolia.shared-fulmode.bcs.a wss://ethereum-sepolia.shared-fulmode.bcs.ap	Delete
	Delete
Ethereum Goeri  https://ethereum-goeri.shared-fullnode.bcs.ap wss://ethereum-goeri.shared-fullnode.bcs.ap Jan 31, 2024 11:14:16 GMT-08:00	Delete
Ethereum Mainnet 🐘 👘 https://ethereum-mainnet.shareof-tulinode.bcs vss://ethereum-mainnet.shareof-tulinode.bcs Jan 31, 2024 11:13:20 GMT=08:00	Delete
Ethereum Mainnet ***********************************	Delete
al Records: 8 10 V < 1 >	

#### **Deleting a DApp Project**

- **Step 1** Log in to the NES console.
- **Step 2** In the navigation pane, choose **Shared** > **DApp Project Management**.
- **Step 3** Click **Delete** in the **Operation** column of a project.
- **Step 4** Enter **DELETE** to confirm the deletion.

#### Figure 4-10 Deleting a project

Delete DApp Project		X
DApp to be deleted: Deleted DApps cannot be restored	d or be accessed by API keys.	
DApp Name	Mainnet & Testnet	Created
	Ethereum Mainnet	Jul 03, 2024 19:23:08 GMT+08:00
To confirm deletion, enter "DELET	TE" below. Auto Enter	
		Cancel OK

----End