

Huawei HiLens

FAQs

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1 FAQs

1.1 HiLens Kit Devices

1.1.1 Device Introduction

1.1.1.1 What Are the Differences Between HiLens Kit and Atlas 500?

HiLens Kit devices are intended for indoor use, while Atlas 500 is designed for industrial use. The latter is more reliable for outdoor use with high and low temperature resistance, water and dust resistance.

1.1.1.2 What Are the Differences Between HiLens Kit and Atlas 200 DK?

There are two main differences between HiLens Kit and Atlas 200 DK:

- Atlas 200 DK focuses on the bottom-layer and offline development. Developers must understand and comply with the requirements for HiAi Engine workflow orchestration and think about API interconnection, and the code is more complex.
- HiLens Kit is used with the HiLens Framework for application development. It features highly encapsulated APIs that are simple and easy for developers to use. The code is simple, and more peripheral interfaces are provided. As a part of Huawei HiLens, HiLens Kit can be seamlessly integrated with the Huawei HiLens console on the cloud.

1.1.1.3 What Is HiLens Kit?

HiLens Kit is a multimedia device with AI inference capabilities. It packs powerful computing, HD camera access, and multiple ports into a compact kit. Its hardware has an integrated Atlas 200 AI Accelerator Module (Atlas 200 for short) for quick access to the network and maximized computing power of the Ascend 310 AI processor. The HiLens Kit device is perfect for AI developers in pre-research and development as well as video surveillance domains. Its built-in HiLens Framework provides abundant APIs for running skills. For detailed parameters, see [Table 1-1](#). For details about HiLens Kit, see "HiLens Kit User Guide > Product Description".

Table 1-1 HiLens Kit parameters

Chip	CPU	Micro SD	Camera	Microphone	Network Port	USB	HDMI	Audio out	OS	Wi-Fi
Ascend 310 (8 GB RAM)	Hi3559A (4 GB)	1	2-megapixel, 720p	2	1	2	1	1	Linux	Supported

- HiLens Kit is now available on the website, where you can purchase it. If you want to purchase many HiLens Kit devices at once, contact the local office or call the HUAWEI CLOUD pre-sales hotline.
- HiLens Kit devices support system file configuration. You can connect a HiLens Kit device to a PC and log in to the HiLens Kit device using SSH. HiLens Kit device systems cannot be ported to other operating systems.
- Each HiLens Kit device has a built-in camera. It can also connect to external Internet protocol cameras (IPCs) with a resolution of 4K or lower.

Reference Documents

When you obtain the documents for the first time, create a new account and [register your product](#) in the enterprise technical support website (Support-E website). Enter the product serial number (SN) of the HiLens Kit device to complete product registration. For details, see [Enhance My Account Privilege](#).

The SN is at the bottom of the HiLens Kit device and is a string of 20 characters, for example, **21023XXXXXXXXXXXXXXXXXX**.

After the product registration request is submitted, if the system displays a message indicating that the product registration is successful, go to the next step. If the system displays a message indicating that the product is to be reviewed, wait until the product is successfully reviewed and then go to the next step. The product will be reviewed within one workday.

- [HiLens Kit User Guide](#)
This document describes the appearance, logical structure, and specifications of the Atlas 200 HiLens Kit and provides guidance for users to install, connect, power on, power off, and configure the Atlas 200 HiLens Kit.
- [Atlas 200 HiLens Kit Intelligent Edge System User Guide](#)
This document describes the system architecture of the Huawei HiLens intelligent edge system and provides guidance for users to manage and maintain the Huawei Atlas 200 HiLens Kit using this system.

1.1.1.4 What Is the Focal Length of a HiLens Kit Camera? Can It be Adjusted?

HiLens Kit cameras have a fixed focal length of 2.8 mm, a wide angle of 120 degrees, and a surveillance distance of 0 to 4 meters. Its focal length cannot be adjusted.

1.1.1.5 What Cameras Can Be Connected to HiLens Kit?

A HiLens Kit device has a built-in camera and can connect to and manage multiple IP cameras (the number of cameras cannot be greater than the total number of channels supported by the skills installed on the device).

HiLens Kit can connect to 4K or lower IP cameras, UVC cameras (USB video class) that can run on Linux without drivers, and mainstream RTSP cameras. It cannot connect to thermographic cameras.

On the Huawei HiLens console, you can add a camera and configure the camera information. For details, see "User Guide > Configuring Cameras".

1.1.1.6 Can I Develop HiLens Kit Skills Using Compute Architecture for Neural Networks (CANN)?

Symptom

The hardware structure of HiLens Kit devices is similar to that of Atlas 500. Can I develop HiLens Kit skills using CANN, just like how I would develop skills for Atlas 500?

Solution

No. Currently, HiLens Kit skills can only be developed using the HiLens Framework.

HiLens Framework encapsulates bottom-layer APIs to implement common management functions and provides APIs for Python and C++, enabling you to easily develop skills on the Huawei HiLens console.

- [HiLens Framework \(C++\)](#)
- [HiLens Framework \(Python\)](#)

1.1.2 Device Hardware Operations

1.1.2.1 What Storage Devices Can Be Mounted to the USB Port of a HiLens Kit Device?

HiLens Kit supports SD cards, USB flash drives, and removable hard disks. The maximum storage capacity can be 2 TB and the disk format is ext4.

The HiLens Kit USB port currently supports only USB driver-free cameras that comply with the Linux UVC protocol. External keyboards and mouse devices are not supported.

1.1.2.2 What Does the Red Indicator of a HiLens Kit Device Mean?

Figure 1-1 Indicator positions

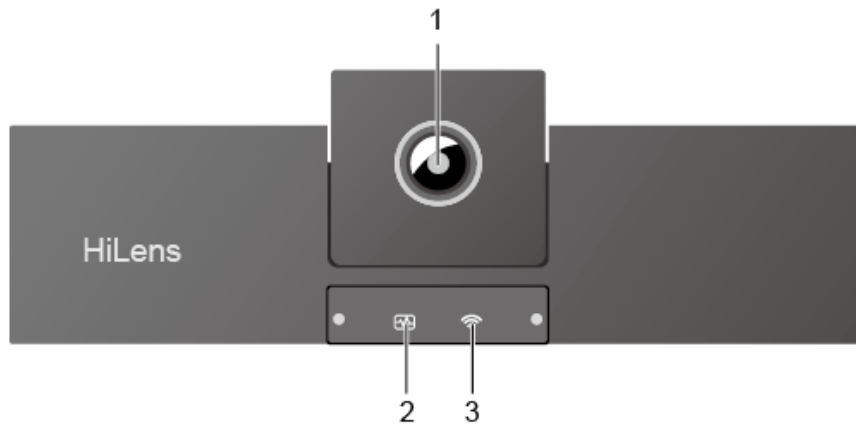


Table 1-2 Indicators on the front panel

No.	Indicator Description
1	1080p camera The current Atlas 200 HiLens Kit software supports a resolution of 720p only.
2	Health indicator
3	Wi-Fi connection status indicator

Description of indicator statuses:

- Blinking red: An alarm has been generated.
- Blinking red and green alternatively: The active and standby partitions of the system storage medium are abnormal.
- Red (on for 2 to 3 seconds and then off): The system is being restarted by pressing the power button.

1.1.2.3 How Do I Restore HiLens Kit Devices to Factory Settings?

If the system of a HiLens Kit device is damaged and cannot be restored, you need to restore its factory settings.

There are two ways to restore factory settings:

- If the device does not automatically start after being connected to a power supply, perform the steps in [Restoring Factory Settings by Pressing the RST Button plus the Power Button](#) to restore its default settings.
- If the device can automatically start after being connected to a power supply, perform the steps in [Restoring the Factory Settings of an Auto-Start Device](#) to restore its default settings.

 NOTE

Before restoring factory settings, ensure that the device is powered off.

Restoring Factory Settings by Pressing the RST Button plus the Power Button

1. Wear an ESD wrist strap.
2. Connect the 12 V DC power adapter to the power socket on the rear panel of the Atlas 200 HiLens Kit.
3. Press and hold the RST button for 2 to 3 seconds. During this process, press and then quickly release the power button. When the health indicator on the panel turns to steady orange, the factory settings are being restored. Release the RST button.

Restoring the Factory Settings of an Auto-Start Device

1. Wear an ESD wrist strap.
2. Connect the 12 V DC power adapter to the power socket on the rear panel of the Atlas 200 HiLens Kit.
3. Press the RST button to power on the device. When the health indicator on the panel turns to steady orange, the factory settings are being restored. Release the RST button.

1.1.2.4 Can HiLens Kit Connect to Multiple USB Cameras?

HiLens Kit supports only one camera. Although both USB ports can be used, the device can only read the first connected camera due to bandwidth restrictions.

1.1.2.5 Do I Need to Use Other Devices Together with HiLens Kit Devices?

You can determine whether to use other devices as required.

For example, to implement the access control function, you need to control the door status with the corresponding embedded device. The HiLens Kit device processes the information about visitors and returns it to the third-party device, which determines whether to open or close the door.

1.1.2.6 How Do I Quickly Switch a HiLens Kit Device to the Wireless Network Configuration Mode?

When the HiLens Kit device is working properly, press and hold the **RST** button on the rear panel of the device for 3 to 5 seconds to switch to the wireless network (Wi-Fi) configuration mode.

Figure 1-2 Port on the rear panel



1.1.2.7 Does HiLens Kit Support Infrared Interfaces?

No.

1.1.3 Device System Operations

1.1.3.1 How Do I Log In to a Device Using SSH?

This section uses a HiLens Kit camera as an example to show you how to log in to a device using SSH. The procedure is as follows:

1. [Connecting a HiLens Kit Device to a PC Using a Network Cable](#)
2. [Connecting the Network Between Your PC and the HiLens Kit Device](#)
3. [Remotely Connecting to HiLens Kit Cameras Using SSH](#)

Connecting a HiLens Kit Device to a PC Using a Network Cable

[Figure 1-3](#) and [Table 1-3](#) show the ports on the rear panel of the HiLens Kit device.

Figure 1-3 Ports on the rear panel





Table 1-3 Description of ports on the rear panel

Port	Description
1	Power button
2	Power socket
3	Management network port

1. Connect a 12 V DC power adapter to the power socket on the rear panel of the HiLens Kit device.
2. Press and hold the power button for 1 to 2 seconds to power on the HiLens Kit device.
3. Connect one end of the network cable to the management network port of the device and the other end to an Ethernet port of the PC.

Connecting the Network Between Your PC and the HiLens Kit Device

Set an IP address and a subnet mask or route for the PC so that the PC can properly communicate with the device.

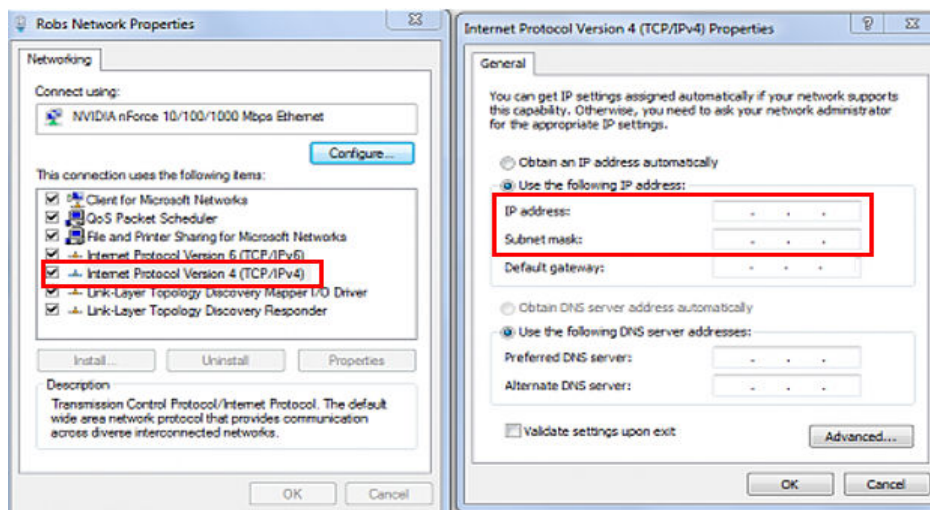
1. Click the network icon  in the lower right corner of the PC and click **Network & Internet settings**.
2. On the **Network & Internet settings** page, click **Change adapter options** to enter the **Network Connections** page.
3. After the HiLens Kit device is connected to the PC using a network cable, a connection icon  is displayed on the **Network Connections** page of the PC. Right-click the connection (usually named **Local Area Connection**) and choose **Properties** from the shortcut menu. The **Local Area Connection Properties** dialog box is displayed.
4. Double-click **Internet Protocol Version 4** and select **Use the following IP address**. Then, enter an IP address that is in the **same network segment** as the device IP address and click the **Subnet mask** text box to automatically generate a subnet mask. Click **OK**.

For details about the initial IP address of the device, see the **Default Value of Initial IP address of the management network port** in [HiLens Kit User Guide > Default Credentials](#).

NOTE

- You can connect to the HiLens Kit device from the PC using SSH only when the IP address in **Local Area Connection Properties > Internet Protocol Version 4 Properties** is in the same network segment as the IP address of the HiLens Kit device. **The same network segment** means that the first three octets of the local connection IP address are the same as those of the device IP address. For example, if the device IP address is 192.168.2.111, the IP address (in the same network segment as the device IP address) configured in **Local Area Connection Properties > Internet Protocol Version 4 Properties** can be 192.168.2.x, where x is an integer from 2 to 255 with the exception of 111.
- If the device IP address has been changed, configure the IP address in **Local Area Connection Properties > Internet Protocol Version 4 Properties** to an IP address in the same network segment as the new device IP address. .

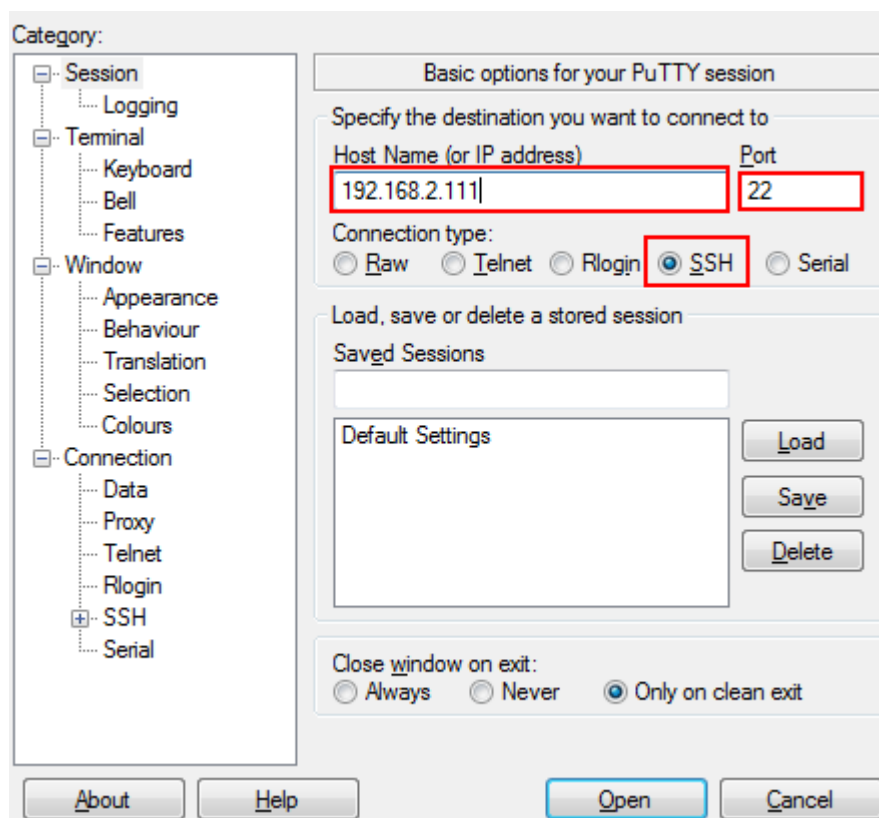
Figure 1-4 Modify network properties (6)



Remotely Connecting to HiLens Kit Cameras Using SSH

1. Use SSH to remotely connect to the HiLens Kit device.
 - a. Start PuTTY, click **Session**, enter the device IP address in the **Host Name (or IP address)** text box, and enter the port number in the **Port** text box. Assume that the device IP address is 192.168.2.111 and the port number is 22. [Figure 1-5](#) shows the page.

Figure 1-5 Using PuTTY to log in to the HiLens Kit device



- b. Click **Open**.
Log in to the device.
2. Use SSH to remotely connect to the device system.
After the **admin@192.168.2.111's password** prompt, enter the **admin** password. For details about the preset password for the first login, see .
3. Use SSH to remotely log in to the developer CLI.
 - a. After the **IES:/->** prompt, run the **develop** command.
 - b. After the **Password** prompt, enter the **root** password. For details about the preset password for the first login, see .

Figure 1-6 Connecting to the device using SSH

```
login as: admin
Pre-authentication banner message from server:
|
| Authorized users only. All activities may be monitored and reported.
| End of banner message from server
admin@192.168.2.111's password:
Authorized users only. All activities may be monitored and reported.
Last login: Thu Oct 17 08:40:47 2019 from 192.168.2.55
Tips:This admin password is an initial password . Change it for security purpose
s.
IES:/->develop
Tips:The root password is an initial password. Change it for security purposes.
input root passwd
Password:
Last login: Thu Oct 17 01:52:25 UTC 2019 on pts/0
Euler:~ #
```

4. Use SSH to remotely modify the device time.
 - a. Run the following command to change the time zone to that of :
timedatectl set-timezone
 - b. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:
date -s "2019-10-17 19:19:19"
hwclock -w
reboot
Restarts the device.

1.1.3.2 After I Change the Password for a Huawei HiLens Device, Why Can't I Use PuTTY to Log In to the Device Even Though I Can Use the New Password to Log in to Huawei HiLens IES?

First, make sure PuTTY is running properly. To do that, use the CLI or another tool (such as SSH) to try to log in for confirmation.

If PuTTY is working properly, log in to the Huawei HiLens Intelligent Edge System and change the user name and password.

1. Log in to the Huawei HiLens IES using a browser on the local PC. Enter the address of the Huawei HiLens IES in the address box. The address format is "**https://Huawei HiLens IES IP address**". The default IP address is **192.168.2.111**. If the default IP address has been changed, use the new IP address to log in to HiLens IES.

For details, see [Logging In to HiLens IES](#).

2. In the dialog box displayed for you to change the password, enter the new username, old password, new password, and confirm password, and click **OK**.

NOTE

- The username can contain 1 to 16 characters, including digits, uppercase letters, and lowercase letters.
- The password must meet the following requirements:
 - Contains 8 to 20 characters.
 - Contains at least one space or one of the following special characters:
`~!@#\$%^&*()-_+=\|[]{};:"',<.>/?
 - Contains at least two types of the following characters:
Lowercase letters, uppercase letters, and digits
 - Cannot be the same as the user name or the user name in reverse order.
 - The new password must be different from the previous five passwords you used.

1.1.3.3 How Do I Perform Bottom-Layer Operations on the HiLens Kit System?

The HiLens Kit device comes pre-installed with the Euler operating system developed by Huawei. You do not need to install one. To modify configurations such as system files of a HiLens Kit device, you can log in to the device from your local PC using SSH and run the Linux commands needed.

Connecting a HiLens Kit Device to a PC Using a Network Cable

[Figure 1-7](#) and [Table 1-4](#) show the ports on the rear panel of the HiLens Kit device.

Figure 1-7 Ports on the rear panel



Table 1-4 Description of ports on the rear panel



Port	Description
1	Power button
2	Power socket

Port	Description
3	Management network port

1. Connect a 12 V DC power adapter to the power socket on the rear panel of the HiLens Kit device.
2. Press and hold the power button for 1 to 2 seconds to power on the HiLens Kit device.
3. Connect one end of the network cable to the management network port of the device and the other end to an Ethernet port of the PC.

Connecting the Network Between Your PC and the HiLens Kit Device

Set an IP address and a subnet mask or route for the PC so that the PC can properly communicate with the device.

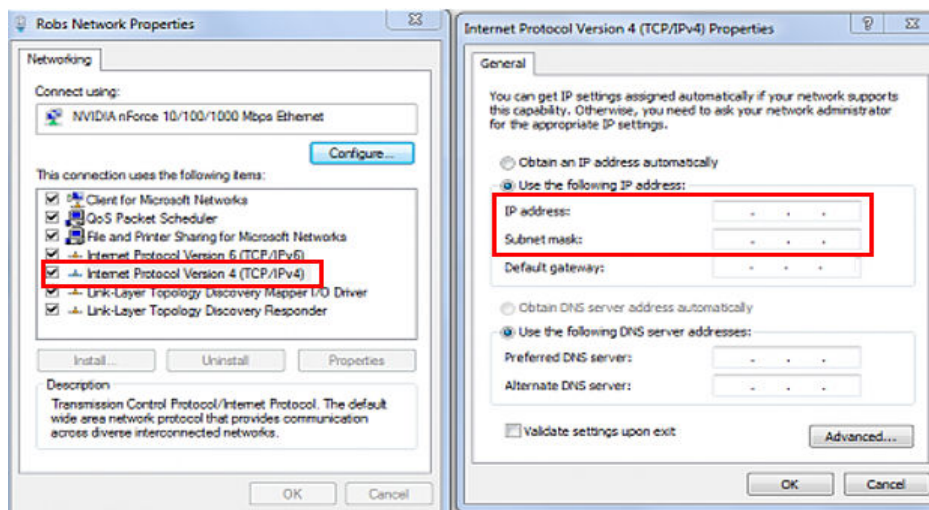
1. Click the network icon  in the lower right corner of the PC and click **Network & Internet settings**.
2. On the **Network & Internet settings** page, click **Change adapter options** to enter the **Network Connections** page.
3. After the HiLens Kit device is connected to the PC using a network cable, a connection icon  is displayed on the **Network Connections** page of the PC. Right-click the connection (usually named **Local Area Connection**) and choose **Properties** from the shortcut menu. The **Local Area Connection Properties** dialog box is displayed.
4. Double-click **Internet Protocol Version 4** and select **Use the following IP address**. Then, enter an IP address that is in the **same network segment** as the device IP address and click the **Subnet mask** text box to automatically generate a subnet mask. Click **OK**.

For details about the initial IP address of the device, see the **Default Value of Initial IP address of the management network port** in [HiLens Kit User Guide > Default Credentials](#).

NOTE

- You can connect to the HiLens Kit device from the PC using SSH only when the IP address in **Local Area Connection Properties > Internet Protocol Version 4 Properties** is in the same network segment as the IP address of the HiLens Kit device. **The same network segment** means that the first three octets of the local connection IP address are the same as those of the device IP address. For example, if the device IP address is 192.168.2.111, the IP address (in the same network segment as the device IP address) configured in **Local Area Connection Properties > Internet Protocol Version 4 Properties** can be 192.168.2.x, where x is an integer from 2 to 255 with the exception of 111.
- If the device IP address has been changed, configure the IP address in **Local Area Connection Properties > Internet Protocol Version 4 Properties** to an IP address in the same network segment as the new device IP address. .

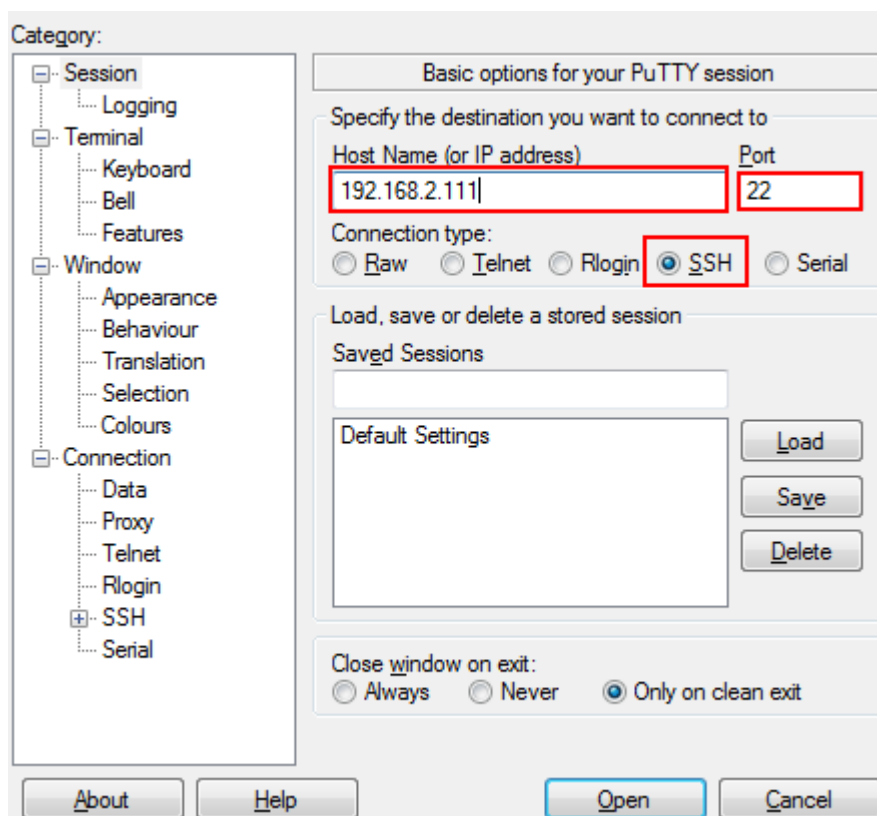
Figure 1-8 Modify network properties (6)



Remotely Connecting to HiLens Kit Cameras Using SSH

1. Use SSH to remotely connect to the HiLens Kit device.
 - a. Start PuTTY, click **Session**, enter the device IP address in the **Host Name (or IP address)** text box, and enter the port number in the **Port** text box. Assume that the device IP address is 192.168.2.111 and the port number is 22. [Figure 1-9](#) shows the page.

Figure 1-9 Using PuTTY to log in to the HiLens Kit device



- b. Click **Open**.
Log in to the device.
2. Use SSH to remotely connect to the device system.
After the **admin@192.168.2.111's password** prompt, enter the **admin** password. For details about the preset password for the first login, see .
3. Use SSH to remotely log in to the developer CLI.
 - a. After the **IES:/->** prompt, run the **develop** command.
 - b. After the **Password** prompt, enter the **root** password. For details about the preset password for the first login, see .

Figure 1-10 Connecting to the device using SSH

```
login as: admin
Pre-authentication banner message from server:
|
| Authorized users only. All activities may be monitored and reported.
| End of banner message from server
admin@192.168.2.111's password:
Authorized users only. All activities may be monitored and reported.
Last login: Thu Oct 17 08:40:47 2019 from 192.168.2.55
Tips:This admin password is an initial password . Change it for security purpose
s.
IES:/->develop
Tips:The root password is an initial password. Change it for security purposes.
input root passwd
Password:
Last login: Thu Oct 17 01:52:25 UTC 2019 on pts/0
Euler:~ #
```

4. Use SSH to remotely modify the device time.
 - a. Run the following command to change the time zone to that of :
timedatectl set-timezone
 - b. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:
date -s "2019-10-17 19:19:19"
hwclock -w
reboot
Restarts the device.

1.1.3.4 Can I Import a Custom Python Module to a HiLens Kit Device?

Yes. You can do that in the same way as you would in a common Python environment. If you want to use other Python packages, compile the source code of AArch64 software.

1.1.3.5 How Do I Install YUM on HiLens Kit Devices?

The EulerOS release 2.0 (SP8) installed on HiLens Kit devices is a tailored version. YUM is not installed by default. You need to log in to your HiLens Kit device and install common tools such as YUM.

Connecting a HiLens Kit Device to a PC Using a Network Cable

Figure 1-11 and **Table 1-5** show the ports on the rear panel of the HiLens Kit device.

Figure 1-11 Ports on the rear panel





Table 1-5 Description of ports on the rear panel

Port	Description
1	Power button
2	Power socket
3	Management network port

1. Connect a 12 V DC power adapter to the power socket on the rear panel of the HiLens Kit device.
2. Press and hold the power button for 1 to 2 seconds to power on the HiLens Kit device.
3. Connect one end of the network cable to the management network port of the device and the other end to an Ethernet port of the PC.

Interconnecting the Network Between the PC and the HiLens Kit Device

Set an IP address and a subnet mask or route for the PC so that the PC can properly communicate with the device.

1. Click the network icon  in the lower right corner of the PC and click **Network & Internet settings**.
2. On the **Network & Internet settings** page, click **Change adapter settings** to enter the **Network Connections** page.
3. After the HiLens Kit device is connected to the PC using a network cable, a corresponding connection  is displayed on the **Network Connections** page of the PC. Right-click the connection (generally named **Local Area Connection**) and choose **Properties** from the shortcut menu. The **Local Area Connection Properties** dialog box is displayed.

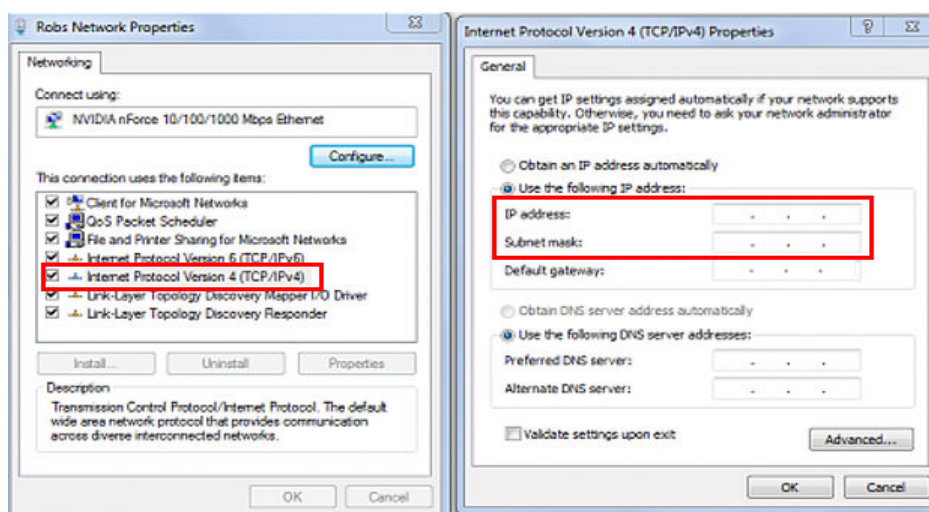
4. Double-click **Internet Protocol Version 4 (TCP/IPv4)** and select **Use the following IP address**. Then, enter an IP address that is in the **same network segment** as the device IP address and click the **Subnet mask** text box to automatically generate a subnet mask. Click **OK**.

For details about the initial IP address of the device, see the **Default Value of Initial IP address of the management network port in HiLens Kit User Guide > Default Credentials**.

NOTE

- You can connect to the HiLens Kit device using SSH from your local PC only when the IP address configured in **Local Area Connection Properties > Internet Protocol Version 4 (TCP/IPv4) > Properties** is in the same network segment as the device IP address. **The same network segment** means that the first three octets of the local connection IP address are the same as that of the device IP address. For example, if the device IP address is 192.168.2.111, the IP address (in the same network segment as the device IP address) configured in **Local Area Connection Properties > Internet Protocol Version 4 (TCP/IPv4) > Properties** can be 192.168.2.x, where x is an integer from 2 to 255 except 111.
- If the device IP address has been modified, configure the IP address in **Local Area Connection Properties > Internet Protocol Version 4 (TCP/IPv4) > Properties** to an IP address in the same network segment as the new device IP address.

Figure 1-12 Modifying network properties



Logging In to a HiLens Kit Device Using SSH

1. Use SSH to remotely connect to the HiLens Kit device.
 - a. Start PuTTY, click **Session**, enter the device IP address in the **Host Name (or IP address)** text box, and enter the port number in the **Port** text box. Assume that the device IP address is **192.168.2.111** and the port number is **22**. **Figure 1-13** shows the login window.

Figure 1-14 Connecting to the device using SSH

```
login as: admin
Pre-authentication banner message from server:
|
| Authorized users only. All activities may be monitored and reported.
| End of banner message from server
admin@192.168.2.111's password:
Authorized users only. All activities may be monitored and reported.
Last login: Thu Oct 17 08:40:47 2019 from 192.168.2.55
Tips:This admin password is an initial password . Change it for security purposes.
IES:~>develop
Tips:The root password is an initial password. Change it for security purposes.
input root passwd
Password:
Last login: Thu Oct 17 01:52:25 UTC 2019 on pts/0
Euler:~ #
```

Installing YUM

Go to the developer forum and download the YUM package. Upload the package to the **/tmp** directory of the HiLens Kit device, decompress the package, and run the **install.sh** script to install YUM in one-click.

The **install.sh** script performs the following operations:

1. Install YUM and configure the YUM source.
2. Use YUM to install python3-devel, OpenBLAS, BLAS, GCC-GFortran, libarchive-devel, CMake, GCC-C++, Automake, Autoconf, Libtool, and Make.
3. Configure the ld link **ln -s /usr/bin/ld.bfd /usr/bin/ld**.
4. Use a tool such as CMake by running **export LD_LIBRARY_PATH=/usr/lib64:\$LD_LIBRARY_PATH** (available in the script).

NOTE

1. You can modify the script to install libraries as required.
2. The dependent libraries of tools such as CMake may conflict with some libraries in **/home/hilens/skillframework**. To run a skill, you may need to run the **export LD_LIBRARY_PATH=/home/hilens/skillframework/lib/** command again, or close the current session and open a new window. Otherwise, errors may occur because some symbols cannot be found.

1.1.3.6 How Do I Manage Device Files?

Run the following command to delete the restriction on using SFTP:

```
rm -rf /etc/usr/sftp_disable
```

Open another SSH window. Then, you can save local files to **/tmp** or pull the folder from **/tmp** to the local PC.

 NOTE

- **/tmp** is a temporary folder and is cleared after a device is restarted. If you want to retain the file, move it to another folder.
- If a file with the same name exists in the **/tmp** directory, the file cannot be placed in the directory and will not be automatically overwritten.
- To copy a file in **/tmp**, run the **chmod a+r /tmp/file name** command to change the read permission of the file.

1.1.3.7 How Do I Install Software Packages on HiLens Kit Devices?

Currently, there are four ways to install software on HiLens Kit devices:

Note: Before your run any command, run `umask 022` first. If an installed package cannot be used after firmware is upgraded to 1.1.2 or later, uninstall the package, run `umask 022`, and install it again.

- Using pip: Run **python3 -m pip install** to install pip. You can also use other pip sources, such as:
python3 -m pip install requests -i http://pypi.douban.com/simple --trusted-host pypi.douban.com
- Compiling source code: Download a compiler for AArch64 software.
- Installing RPM packages: Download RPM packages and their dependencies from Huawei Images and use RPM and YUM to install the software packages.
- Configuring Python Dependencies for a skill: For details, see [How Do I Configure Python Dependencies for a Skill?](#)

1.1.3.8 How Do I Log In to a Device as Root User and Disable Connection Timeout?

There are three types of timeouts you can control: SSHD, CLP (15 minutes), and shell timeout (5 minutes). CLP timeout cannot currently be disabled. The connection times out after 15 minutes, regardless of whether there have been any operations in that time or not. SSHD and shell timeouts, however, can be disabled.

1. SSHD:

Log in to the system, using **admin** by default, and switch to the **develop** mode. Run **vi /etc/ssh/sshd_config** to find the statement **PermitRootLogin no**, and change it to **PermitRootLogin yes**.

Figure 1-15 Disabling SSHD timeouts

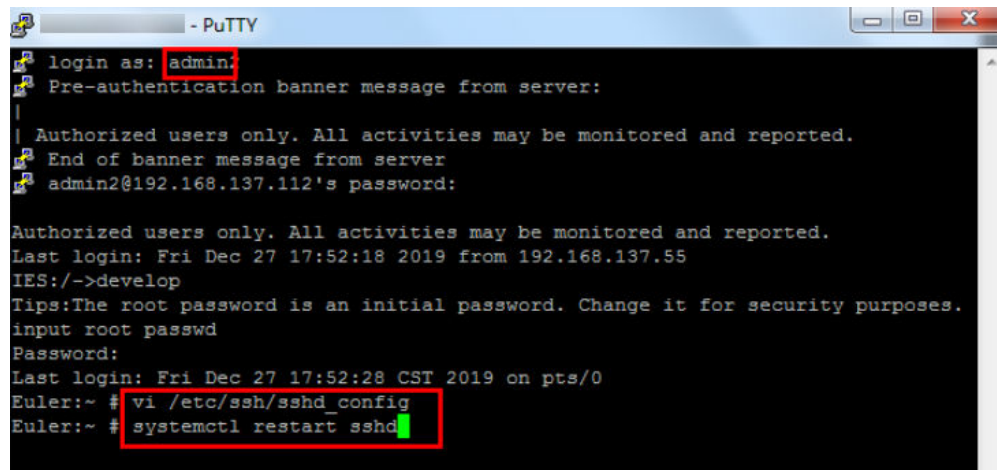
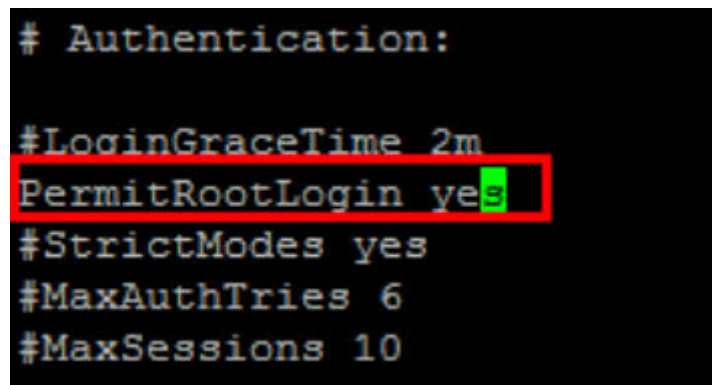


Figure 1-16 Disabling SSHD timeouts



(By default, the following statements are not commented out. You can comment them out to allow for login from **root**.)

#ClientAliveInterval 0

#ClientAliveCountMax 0

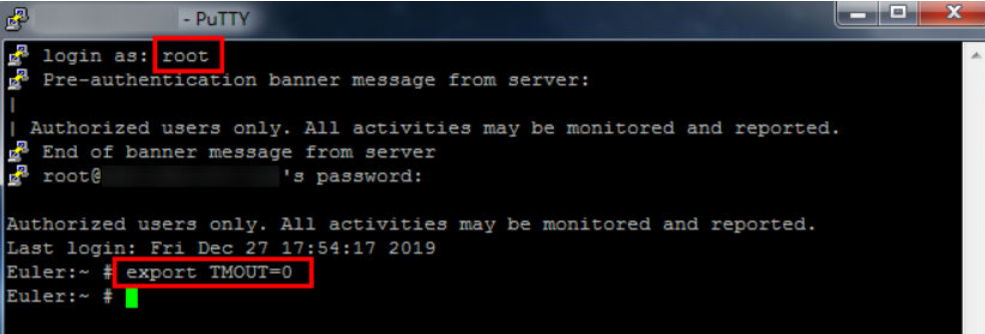
#DenyUsers root

#DenyGroups root

Figure 1-17 Disabling SSHD timeouts

```
HostbasedAuthentication no
PermitEmptyPasswords no
PermitUserEnvironment no
Ciphers aes128-ctr,aes192-ctr,aes256-ctr
#ClientAliveInterval 0
#ClientAliveCountMax 0
Banner /etc/issue.net
MACs hmac-sha2-256,hmac-sha2-512
StrictModes yes
AllowTcpForwarding no
AllowAgentForwarding no
GatewayPorts no
PermitTunnel no
KexAlgorithms ecdh-sha2-nistp256,ecdh-sha2-nistp3
al
LoginGraceTime 60
#DenyUsers root
#DenyGroups root
```

2. Shell:
Log in to the system as **root** and run **export TMOUT=0**.

Figure 1-18 Login as root

```
- PuTTY
login as: root
Pre-authentication banner message from server:
|
| Authorized users only. All activities may be monitored and reported.
| End of banner message from server
root@      's password:
Authorized users only. All activities may be monitored and reported.
Last login: Fri Dec 27 17:54:17 2019
Euler:~ # export TMOUT=0
Euler:~ #
```

1.1.3.9 Can Python-based OpenMV Devices Invoke HiLens Kit Skills by Calling APIs?

The recognition result of the skills run on a HiLens Kit device can be transferred through a POST request. You need to use an OpenMV device to compile code to receive requests and process the requests on the device to obtain the result.

1.1.3.10 Why a HiLens Kit Device Cannot Display Chinese Characters?

Symptom

The label of a skill is in Chinese. After the skill is installed on a HiLens Kit device, the Chinese label cannot be displayed while the skill is running.

Solution

To display Chinese characters, you need to install the **pillow** package. To do that, you need to modify the source code.

Go to the developer forum, download the corresponding ZIP package, and install the **pillow** package.

1.1.3.11 How Do I Clear Wi-Fi Information Saved on a HiLens Kit Device?

Symptom

The Wi-Fi information saved in IEF cannot be cleared and I have to manually connect to my HiLens Kit device. How do I use commands to reset the network configuration?

Solution

[Log in to a HiLens Kit device using SSH](#) and run the following command:

```
rm /home/data/wifi/wifi_cfg
```

1.1.3.12 How Do I Use SSH Commands to Connect a HiLens Kit Device to a Wi-Fi Network?

Symptom

How do I use SSH commands to connect a HiLens Kit device to a Wi-Fi network?

Solution

1. Remotely log in to the HiLens Kit device using SSH. For details, see [How Do I Log In to a Device Using SSH?](#)
2. Run the following command to view all Wi-Fi networks:

```
wifi_work -i 4
```
3. Run the following command to connect the device to the target Wi-Fi network:

```
wifi_work -s ssid -p password
```

id: ID of the target Wi-Fi network **password**: password of the target Wi-Fi network

1.1.3.13 How Do I Configure Permanent DNS on a HiLens Kit Device?

Symptom

Each time a HiLens Kit device is restarted, the DNS configuration is reset to the default one. How do I configure the permanent DNS?

Solution

1. Remotely log in to the HiLens Kit device using SSH. For details, see [How Do I Log In to a Device Using SSH?](#)

2. Run the following commands to add a 30-second delay for the Wi-Fi configuration after the execution of the automation script:

```
#!/bin/bash
sleep 30s
echo "nameserver:xxx.xxx.xxx.xxx" >>/etc/resolv.conf
echo "nameserver:xxx.xxx.xxx.xxx" >>/etc/resolv.conf
echo "nameserver:xxx.xxx.xxx.xxx" >>/etc/resolv.conf
```
3. Create the **user_init.sh** file in the **/home/data/user/** directory.
4. Run the following command to modify the permission of the **user_init.sh** file:

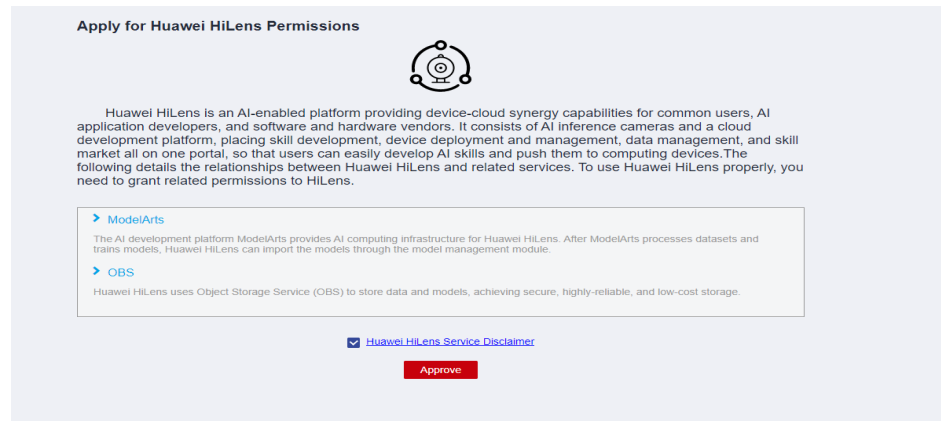
```
chmod 777 /home/data/user/user_init.sh
```

1.2 Device Registration

1.2.1 How Do I Handle Device Registration Failures with Different Causes Returned?

Possible Causes

- Identity authentication failed. Check whether the user name or password is correct.
The account you use to register a HiLens Kit device **must be a HUAWEI CLOUD account, rather than a HUAWEI ID**.
HUAWEI ID and HUAWEI CLOUD account are different. If you do not have an account, you are advised to register one and enable HUAWEI CLOUD services. For details, see [Registering a HUAWEI ID and Enabling HUAWEI CLOUD Services](#).
If your account is a HUAWEI ID, use this account to create a sub-account. For details, see [Creating an IAM User](#), and add the admin permissions to the sub-account.
The username, account name, and device name used for registering a HiLens Kit device can contain only letters, digits, and underscores (_). The names cannot start with a digit or contain digits only.
- If the message **The account is locked** or **Password: Authenticating the account** is displayed:
Check whether the HUAWEI CLOUD account and password are correct. If you enter incorrect passwords for five consecutive times, the account will be locked. The account will be automatically unlocked 15 minutes later.
- If the message **Role is op_restricted** is displayed:
 - The Huawei Cloud account is a restricted account. Check whether the account is in arrears.
 - Contact the IAM customer service to check whether IAM is disabled.
 - Check whether the account has been granted the HiLens permission. Log in to the HiLens console, select **Huawei HiLens Service Disclaimer**, and click **Approve**.

Figure 1-19 Applying for Huawei HiLens permissions

- If the message **Network is unreachable** is displayed:
Check whether the network configuration is correct. For details, see section "Configuring the Wireless Network" in the *User Guide*.
- If the message **Your device has been registered** is displayed:
If the previous user did not deregister the device, you will not be able to register it. Log in using the account that previously used the device and deregister the device. For details, see [Deregistering Devices](#).
- If the message **hdactl: command not found** is displayed when you use SSH to register a HiLens Kit device:
Log in to the HiLens Kit device using SSH and run the following commands:

```
cd /home/hilens
systemctl restart hdad
systemctl status hdad
```


If the message **hdad.service not found** is displayed during the restart, open the `/home/hilens/package_new/skillframework` file and run the following command:

```
./install.sh
```
- If the user account is in arrears, the registration cannot succeed.
- The device time is inconsistent with the current time. To synchronize time, see [Checking the Device Time](#).
- DNS configuration is incorrect. For details, see [Configuring DNS](#).
- System busy. Please try again later.
- If the fault persists, perform the steps in [Restoring Factory Settings](#) to restore the HiLens Kit device to its factory settings.

Checking the Device Time

- **Connecting to the device using SSH**
The procedure is as follows:
 - a. Use a network cable to connect the device to a PC, and use PuTTY to log in to the device over SSH. For details, see [Registering a Device Using SSH](#).
 - b. Run the **date** command on PuTTY to view the current device time.
 - The time displayed on PuTTY is Coordinated Universal Time (UTC), which is eight hours earlier than Beijing time.

- Add 8 hours to the UTC time to convert the UTC time to the Beijing time, and check whether it is the same as the current time.
- **Restarting the device**

If the device time is the same as the current time, perform the following operations to restart the device:

 - a. Use a network cable to connect the HiLens Kit device to a PC, and use PuTTY to log in to the device over SSH. For details, see [Registering a Device Using SSH](#).
 - b. Enter the **reboot** command on PuTTY and press **Enter** to restart the device.
- **Changing the device time**

If the device time is different from the current time, perform the following operations to change the device time:


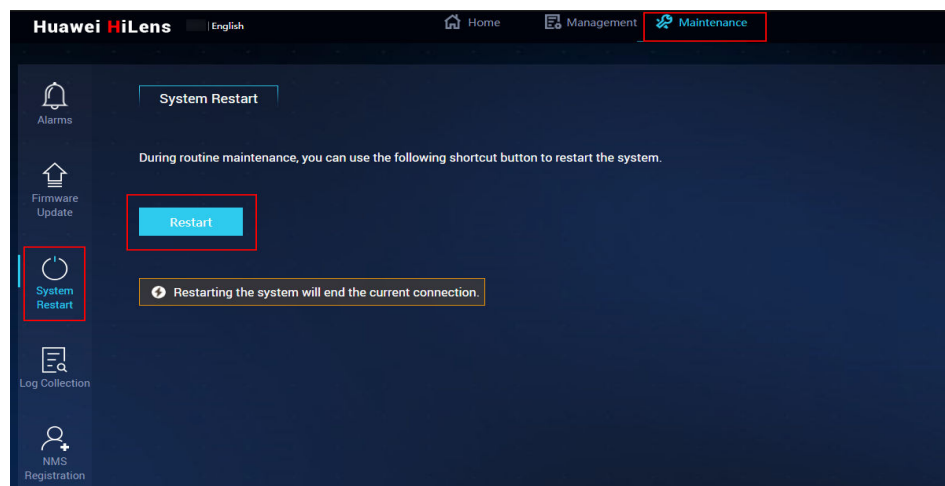
 - a. Use a network cable to connect the HiLens Kit device to a PC, and use PuTTY to log in to the device over SSH. For details, see [Registering a Device Using SSH](#).
 - b. Enter the following command on PuTTY:
timedatectl set-timezone Asia/Shanghai
Press **Enter**.
 - c. Enter the following command on PuTTY:
hwclock -w
Press **Enter**.
 - d. Enter **https://192.168.2.111** (example device IP address) in the address box of a browser, and enter the **username** and **password** to log in to the Huawei HiLens IES.
 - e. Click **Management** on the top of the page.
 - f. Click **Time**. On the **Time** page, select **Manually adjust the time** and click  to reconfigure the time.
 - g. Click **Maintenance** on the top of the page.
 - h. Click **System Restart**. On the **System Restart** page, click **Restart** to change the device time. See [Figure 1-20](#).

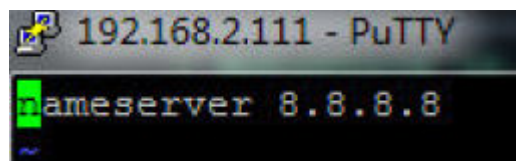
Figure 1-20 Restarting the system



Configuring DNS

1. Log in to the HiLens Kit device using SSH. For details, see [Registering a Device Using SSH](#).
2. Remotely configure DNS using SSH.
 - a. Run the following command on PuTTY to open the DNS file:
vi /etc/resolv.conf
 - b. Delete the original content and change the content to the following:
nameserver 8.8.8.8
Save the settings and exit. See [Figure 1-21](#). Perform the previous step again.

Figure 1-21 Configuring DNS



1.2.2 How Do I Check Whether a Huawei Cloud Account Is Bound to a Device?

A HiLens Kit device can only be registered under a single Huawei Cloud account.

You can check whether the device has been bound to a Huawei Cloud account only when you are registering the device. Currently, you cannot view the information about the Huawei Cloud account under which the device has been registered.

1.2.3 What Should I Do If I Can't Access the Huawei HiLens IES?

Symptom

The HiLens Kit device can access the Internet, but it cannot access the Huawei HiLens IES.

Solution

- Use the HTTPS protocol. Do not use HTTP.
- Check whether the IP address of the HiLens Kit device has been changed.
If you are not sure whether the IP address of the HiLens Kit device has been changed, restore the HiLens Kit device to its factory settings.

1.2.4 What Should I Do If There Is Not Enough Quota for Device Registration?

If a message is displayed showing insufficient quota when you try to register a device, as shown in [Figure 1-22](#), submit a service ticket to request a larger quota. For details, see [Quotas](#).

Figure 1-22 Insufficient quota

```
Password:
Your device has been registered. New registration will clear the previous data.
Are you sure you want to continue? [y/n]: y
Authenticating the account...
Sending a request to the HiLens console...
"The number of devices you have registered has exceeded the quota."
Registration failure: Request to the HiLens console failed.
Euler:~ #
```

1.2.5 Why Do HiLens Kit Devices Fail to Connect to Wi-Fi?

One possible cause is that the HiLens Kit devices do not support the current wireless network.

Currently, HiLens Kit devices support only 2.4 GHz wireless networks with general encryption types. In addition, the name of a wireless network consists of 8 to 63 characters but cannot contain English single quotation marks or double quotation marks.

- The 2.4 GHz wireless network complies with IEEE 802.11n, g, and b standards.
- Supported wireless network encryption types include WEP, WPA-PSK/WPA2-PSK, and AES.
- Wireless networks that need to be verified are not supported.
- TKIP encryption is not supported.
- The IP address of the router gateway cannot be set to **xxx.xxx.0.xxx**, for example, **192.168.0.1**. In addition, the router gateway and the HiLens Kit device cannot be in the same network segment. For example, if the device IP address is **192.168.2.111**, the IP address of the router gateway cannot be set to **192.168.2.xxx**.

1.2.6 How Do I View the IP address of a Wireless Network?

Checking the IP Address of a Wireless Network

After a wireless network is configured, you can obtain its IP address from the Huawei HiLens intelligent edge system.

1. Log in to the Huawei HiLens intelligent edge system using a browser on the local PC. Enter the address of the Huawei HiLens IES in the address box. The address format is "**https://Huawei HiLens IES IP address**". The default IP address is **192.168.2.111**. Press **Enter**.

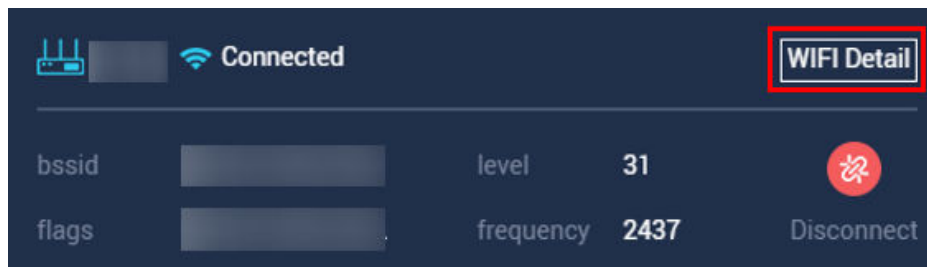
NOTE

If "There is a problem with this website's security certificate" is displayed, click **Continue to this website (not recommended)**.

2. On the login page, enter login information.
Enter the username and password.
For details about the username and password, see .
3. Choose **Management > Network > Wireless Network**.
The **Wireless Network** tab page is displayed.
4. In the upper right corner of the card of the wireless network you are connected to, click **WIFI Detail**.

The **WIFI detail** dialog box is displayed.
IP is the IP address of the wireless network.

Figure 1-23 Checking the IP address of a wireless network



1.2.7 What Do I Do If the System Displays a Message Indicating that Only Firmware 1.0.3 or Later Can Be Registered When I Use Register a Device with the Intelligent Edge System?

Before using the intelligent edge system to register a HiLens Kit device, you need to upgrade the HiLens Kit system firmware to version 2.2.200.011. After the HiLens Kit system firmware is upgraded twice, its version becomes 2.2.200.011, and the HiLens_Device_Agent firmware will also be upgraded to 1.0.6. If the HiLens Kit device is in use and the current HiLens_Device_Agent firmware version is later than 1.0.6, the latest HiLens_Device_Agent firmware version is retained.

Prerequisites

Use a network cable to connect a HiLens Kit device to a PC. For details, see .

Upgrade Procedure

If you have registered and used your HiLens Kit devices, carefully read Upgrade Risks before the upgrade.

Upgrade the system firmware version **twice**. The operations are as follows:

For details, see the [HiLens Kit Update Guide](#).

1. When you obtain the upgrade package for the first time, you need to register an account and [register products](#) with the enterprise technical support website (Support-E website), enhance your account privilege, and enter the product serial number (SN) of the HiLens Kit device to complete product registration. For details, see [Enhance My Account Privilege](#).

The SN is marked at the bottom of the HiLens Kit device and is a string of 20 characters, for example, **21023XXXXXXXXXXXXXXXXXX**.

After the product registration application is submitted, if the system displays a message indicating that the product registration is successful, go to the next step. If the system displays a message indicating that the product is to be reviewed, wait until the product is successfully reviewed and go to the next step. The product will be reviewed within one workday.

2. Log in to the [Huawei Enterprise website](#), choose **Technical Support > Product Support > Server - Intelligent Computing > Ascend Computing**. Under **Intelligent Edge Hardware**, click [A200-3000HiLens](#).

If an incorrect product is selected, the SN fails to pass the check and the upgrade cannot be performed.


3. Click **Software Download**. In the software version list, select **A200-3000HiLens-FWV2.2.200.011.hpm** and download it to the local PC.
4. Log in to the Huawei HiLens IES using a browser on the local PC. Enter the address of the Huawei HiLens IES in the address box. The address format is "**https://Huawei HiLens IES IP address**". The default IP address is **192.168.2.111**. Press **Enter**.

 **NOTE**

If "There is a problem with this website's security certificate" is displayed, click **Continue to this website (not recommended)**.

5. On the login page, enter login information.
Enter the username and password.
For details about the username and password, see .
6. On the main menu, choose **Maintenance > Firmware Update > System Firmware**.

The **System Firmware** page is displayed.

7. Click  on the right of **Update File**, and select a file, that is, the upgrade package downloaded in step 3.

The system displays a message indicating that the file has been added.

 **NOTE**

Do not close the current page or switch to another page during the upload process. Otherwise, the upload will fail.

8. Click **Upgrade**. In the confirmation box that is displayed, select **After the update is complete, the system restarts automatically**.

If you do not select this option, you need to manually restart the system for the update to take effect.

9. Click **OK**.

You can view the update package version and progress on the page.

10. Wait for about 10 minutes. The system displays a message indicating that the upgrade is successful.

If you perform the upgrade for the first time, log in to Huawei HiLens intelligent edge system again and **repeat** step 3 to step 8.

 **NOTE**

To ensure successful device registration, use the same upgrade package when performing the second upgrade.

If you have performed the upgrade twice, the HiLens Kit firmware has been upgraded.

1.2.8 What Are the Differences Between Using IES and SSH to Register a HiLens Kit Device?

Registering a Device Using SSH

This option allows you to register a HiLens Kit device by logging in to the HiLens Kit system over SSH, running Linux commands, and modifying system configuration files.

Figure 1-24 shows the registration procedure. Table 1-6 describes the procedure in detail.

Figure 1-24 Procedure for registering a device using SSH

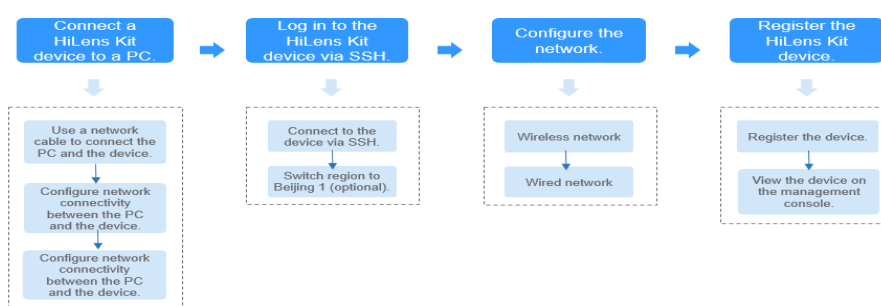


Table 1-6 Procedure description

Procedure	Description	Instructions
Connect a HiLens Kit device to your local PC.	The first thing you should do is to connect your HiLens Kit device to your PC and upgrade the system firmware to version 2.2.200.011.	Connecting a HiLens Kit Device to a PC
Configure the network.	Configure a wireless or wired network to connect the device to the router. You can only connect your device to a router through a wireless or wired network. If you use a wireless network, the default gateway will be automatically deleted. You need to reconfigure the default gateway when you plan to use a wired network for connection. It is recommended that you use a wireless network. In this way, you do not need to remember the device IP address.	"User Guide > Wireless Network Configuration" User Guide > Wired Network Configuration
Register the HiLens Kit device.	Register the device with the console and check the device status on the console.	Registering a Device Using SSH

1.2.9 What Do I Do If I Forgot the Password to the Huawei HiLens Intelligent Edge System?

If you forget the password to the Huawei HiLens intelligent edge system, you may choose to [restore the HiLens Kit device to factory settings](#).

After the HiLens Kit device is restored to factory settings, use the default username and password to log in to the Huawei HiLens intelligent edge system.

Restoring Factory Settings

Before restoring factory settings, ensure that the device is powered off.

There are two ways to restore factory settings:

- If the device does not automatically start after being connected to a power supply, you need to:
 - a. Wear an ESD wrist strap.
 - b. Connect the 12 V DC power adapter to the power socket on the rear panel of the Atlas 200 HiLens Kit.
 - c. Press and hold the RST button for 2 to 3 seconds. During this process, press and then quickly release the power button. When the health indicator on the panel turns to steady orange, the factory settings are being restored. Release the RST button.
- If the device can automatically start after being connected to a power supply, you need to:
 - a. Wear an ESD wrist strap.
 - b. Connect the 12 V DC power adapter to the power socket on the rear panel of the Atlas 200 HiLens Kit.
 - c. Press the RST button to power on the device. When the health indicator on the panel turns to steady orange, the factory settings are being restored. Release the RST button.

1.3 Managing Devices

1.3.1 What Should I Do If the Device Is Offline for More Than 5 Minutes After a Firmware Upgrade?

Restart the device. The procedure is as follows:

1. [Connecting a HiLens Kit Device to a PC Using a Network Cable](#)
2. [Connecting the Network Between Your PC and the HiLens Kit Device](#)
3. [Remotely Connecting to HiLens Kit Cameras Using SSH](#)

Connecting a HiLens Kit Device to a PC Using a Network Cable

Figure 1-25 and **Table 1-7** show the ports on the rear panel of the HiLens Kit device.

Figure 1-25 Ports on the rear panel





Table 1-7 Description of ports on the rear panel

Port	Description
1	Power button
2	Power socket
3	Management network port

1. Connect a 12 V DC power adapter to the power socket on the rear panel of the HiLens Kit device.
2. Press and hold the power button for 1 to 2 seconds to power on the HiLens Kit device.
3. Connect one end of the network cable to the management network port of the device and the other end to an Ethernet port of the PC.

Connecting the Network Between Your PC and the HiLens Kit Device

Set an IP address and a subnet mask or route for the PC so that the PC can properly communicate with the device.

1. Click the network icon  in the lower right corner of the PC and click **Network & Internet settings**.
2. On the **Network & Internet settings** page, click **Change adapter options** to enter the **Network Connections** page.
3. After the HiLens Kit device is connected to the PC using a network cable, a connection icon  is displayed on the **Network Connections** page of the PC. Right-click the connection (usually named **Local Area Connection**) and choose **Properties** from the shortcut menu. The **Local Area Connection Properties** dialog box is displayed.

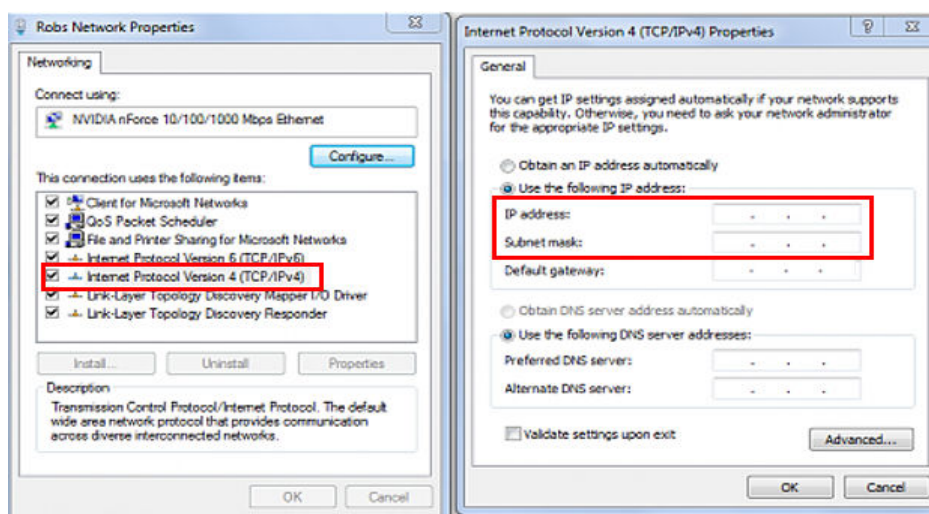
4. Double-click **Internet Protocol Version 4** and select **Use the following IP address**. Then, enter an IP address that is in the **same network segment** as the device IP address and click the **Subnet mask** text box to automatically generate a subnet mask. Click **OK**.

For details about the initial IP address of the device, see the **Default Value of Initial IP address of the management network port** in [HiLens Kit User Guide > Default Credentials](#).

NOTE

- You can connect to the HiLens Kit device from the PC using SSH only when the IP address in **Local Area Connection Properties > Internet Protocol Version 4 Properties** is in the same network segment as the IP address of the HiLens Kit device. **The same network segment** means that the first three octets of the local connection IP address are the same as those of the device IP address. For example, if the device IP address is 192.168.2.111, the IP address (in the same network segment as the device IP address) configured in **Local Area Connection Properties > Internet Protocol Version 4 Properties** can be 192.168.2.x, where x is an integer from 2 to 255 with the exception of 111.
- If the device IP address has been changed, configure the IP address in **Local Area Connection Properties > Internet Protocol Version 4 Properties** to an IP address in the same network segment as the new device IP address. .

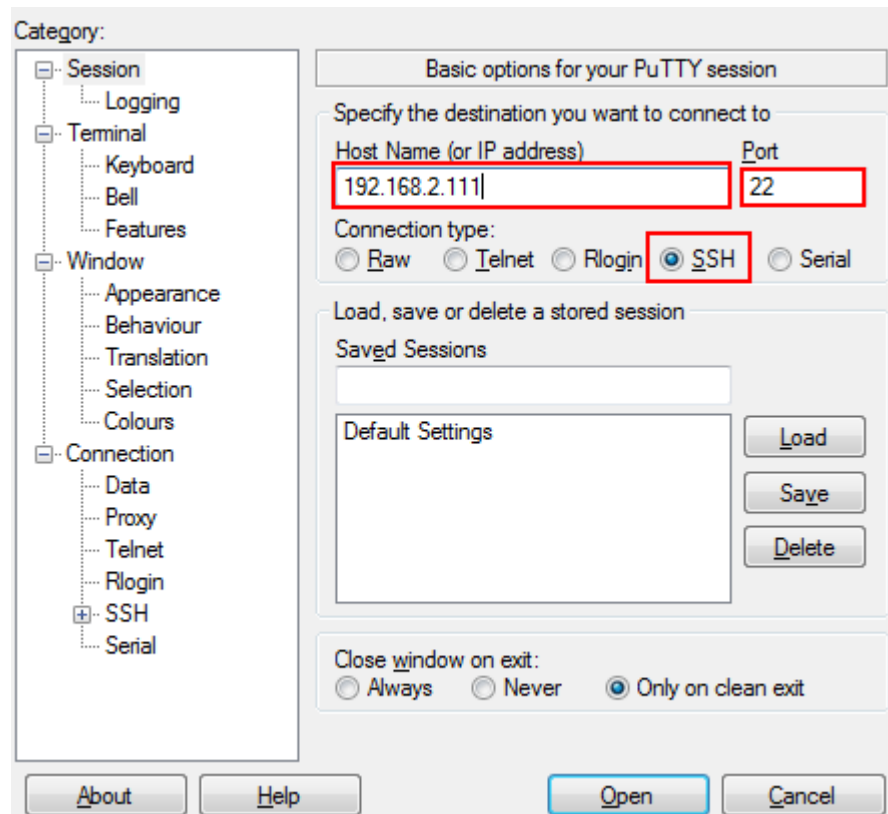
Figure 1-26 Modify network properties (6)



Remotely Connecting to HiLens Kit Cameras Using SSH

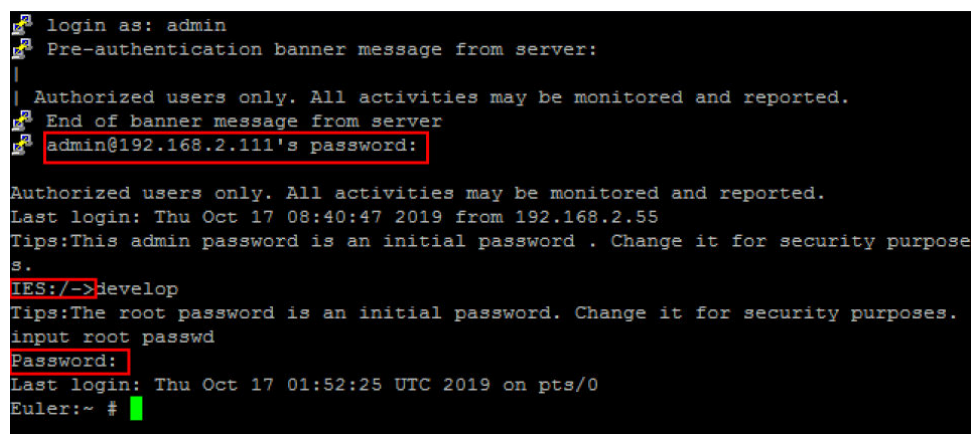
1. Use SSH to remotely connect to the HiLens Kit device.
 - a. Start PuTTY, click **Session**, enter the device IP address in the **Host Name (or IP address)** text box, and enter the port number in the **Port** text box. Assume that the device IP address is 192.168.2.111 and the port number is 22. [Figure 1-27](#) shows the page.

Figure 1-27 Using PuTTY to log in to the HiLens Kit device



- b. Click **Open**.
Log in to the device.
2. Use SSH to remotely connect to the device system.
After the **admin@192.168.2.111's password** prompt, enter the **admin** password. For details about the preset password for the first login, see .
3. Use SSH to remotely log in to the developer CLI.
 - a. After the **IES:/->** prompt, run the **develop** command.
 - b. After the **Password** prompt, enter the **root** password. For details about the preset password for the first login, see .

Figure 1-28 Connecting to the device using SSH



4. Use SSH to remotely modify the device time.
 - a. Run the following command to change the time zone to that of :
timedatectl set-timezone
 - b. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:
date -s "2019-10-17 19:19:19"
hwclock -w
reboot
Restarts the device.

1.3.2 Do I Need to Upgrade Firmware in Sequence?

The firmware can be directly upgraded to the latest version. If a device is online but the firmware upgrade and skill installation always fail, adjust the time zone information.

Run the **date** command in the SSH window to check whether the time is synchronized. If not, change the time.

1. Run the following command to change the time zone to that of :
timedatectl set-timezone
2. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:
date -s "2019-10-17 19:19:19"
hwclock -w
reboot

1.3.3 Why Does the Firmware Upgrade Fail When the Device Is Online?

- Check the device network, and check whether the device is really online.
- Run the **date** command in the SSH window to check whether the time is synchronized. If not, change the time.
 - a. Run the following command to change the time zone to that of :
timedatectl set-timezone
 - b. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:
date -s "2019-10-17 19:19:19"
hwclock -w
reboot

1.3.4 What Should I Do If the System Displays a Message Indicating That the Upgraded Version Must Be Later Than the Current Version During Firmware Upgrade?

- Check the device network, and check whether the device is really online.

- Run the **date** command in the SSH window to check whether the time is synchronized. If not, change the time.
 - a. Run the following command to change the time zone to that of :
timedatectl set-timezone
 - b. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:
date -s "2019-10-17 19:19:19"
hwclock -w
reboot

1.3.5 What Can I Do If a Device Alarm Is Reported Indicating That the Directory Space Is Full?

Log in to the HiLens Kit device using SSH and run the **cat /run/all_active_alarm df -h** command to view alarms in the P2 (**/dev/mmcbk0p2**, that is, the root directory).

You are advised to move the stored files to other partitions, such as the P8. Do not store a large number of data files in the root directory.

1.4 Skill Development

1.4.1 What Are the Causes of Skill Creation Failures?

Skill creation failures are mainly caused by:

1. Incorrect skill parameter settings. For example, the skill name is invalid or the entered OBS address does not exist.
2. Network delay or interruption. Ensure that the network is normal when you create a skill.
3. The Huawei Cloud account is in arrears or frozen.

1.4.2 What Models Does Huawei HiLens Support?

The imported models can be in **.om**, **.pb**, or **.caffemodel** format. Only models in **.om** format can run on HiLens Kit devices. If you **import (convert)** a model in **.pb** or **.caffemodel** format, the Huawei HiLens platform will automatically convert it into the **.om** format.

- Check whether the uploaded model file is correct.
Before importing a custom model, upload it to OBS. A non-om model package contains Caffe model files **.caffemodel** and **.prototxt** and configuration file **.cfg**, or TensorFlow model file **.pb** and configuration file **.cfg**.
- Check whether the model to be imported or converted uses the TensorFlow or Caffe operator boundaries supported by **.om** models.

Not all models can be successfully converted. Before importing and converting a model, check whether it uses the TensorFlow and Caffe operator boundaries

supported by **.om** models. For details, see [Caffe Operator Boundaries](#) and [TensorFlow Operator Boundaries](#).

Model Requirements

The models to be imported can be in **.om**, **.pb**, or **.caffemodel** format. Only models in **.om** format can run on HiLens Kit devices. If you import a model in **.pb** or **.caffemodel** format, the Huawei HiLens platform automatically converts it into the **.om** format.

Not all models can be successfully converted. Before importing and converting a model, check whether it uses the TensorFlow and Caffe operator boundaries supported by **.om** models. For details, see [Caffe Operator Boundaries](#) and [TensorFlow Operator Boundaries](#).

If the model does not use the TensorFlow or Caffe operator boundaries supported by **.om** models, select a model that uses such operator boundaries.

1.4.3 How Do I Upload Models to Huawei HiLens?

A skill can be abstractly understood as "algorithm model + logic code". The algorithm model handles AI inference, and the logic code handles inference result processing. Therefore, you need to import models to Huawei HiLens before developing skills.

Model Requirements

The models to be imported can be in **.om**, **.pb**, or **.caffemodel** format. Only models in **.om** format can run on HiLens Kit devices. If you import a model in **.pb** or **.caffemodel** format, the Huawei HiLens platform automatically converts it into the **.om** format.

Not all models can be successfully converted. Before importing and converting a model, check whether it uses the TensorFlow and Caffe operator boundaries supported by **.om** models. For details, see [Caffe Operator Boundaries](#) and [TensorFlow Operator Boundaries](#).

Prerequisites

You can train a model in ModelArts or locally.

- Importing a model trained locally

Before importing a custom model, upload it to OBS. A non-om model package contains Caffe model files **.caffemodel** and **.prototxt** and configuration file **.cfg**, or TensorFlow model file **.pb** and configuration file **.cfg**.

For details about how to upload model files to OBS, see [Object Storage Service Getting Started](#). The directory to which the model files are uploaded must meet certain specifications. For details, see [Model Input Directory Specifications](#).

Uploading files to OBS is charged. For details about the OBS pricing, see [Product Pricing Details](#).

When uploading files to OBS, ensure that the OBS bucket and Huawei HiLens are in the same region and the OBS folder name meets the following requirements:

- Cannot contain special characters: \:*?"<>|
- Cannot start or end with a period (.) or slash (/).
- The absolute path of the folder can contain a maximum of 1,023 characters.
- Cannot contain two or more adjacent slashes (/).

Importing (Converting) a Model

1. Log in to the Huawei HiLens console. In the navigation pane, choose **Skill Development > Models**. The **Models** page is displayed.
2. Click **Import (Convert) Model** in the upper right corner.
3. On the **Import Model** page, set parameters by referring to [Table 1-8](#), confirm the information, and click **OK**.

Figure 1-29 Importing a model

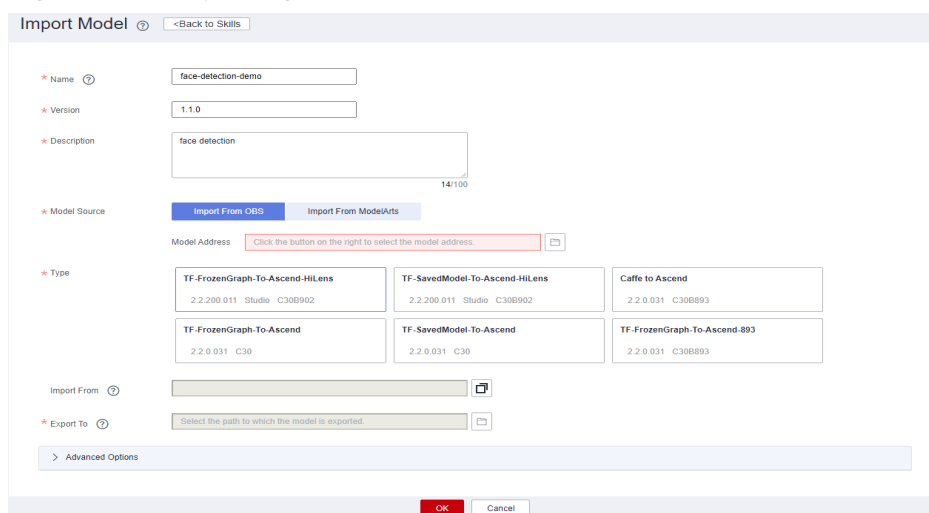



Table 1-8 Parameters for importing a custom model

Parameter	Description
Name	Name of the model to be imported. A model name contains 2 to 24 characters. Only lowercase letters, digits, and hyphens (-) are allowed. It must start with a lowercase letter and end with a lowercase letter or digit.
Version	Version of the model to be imported. The value is in the <i>number.number.number</i> format, for example, 2.1.3 . Each number ranges from 0 to 999 . When it has two or more digits, it cannot start with 0 .

Parameter	Description
Description	Description of the model to be imported. The value contains 1 to 100 characters. Special characters &!"'\<>= are not allowed.
Model Source	Select the source of the model to be imported. You can choose Import From OBS or Import From ModelArts . <ul style="list-style-type: none">• Importing a model from OBS Click Import From OBS, select the bucket and folder where the custom model is stored on OBS, and click OK.• Importing a model from ModelArts<ol style="list-style-type: none">1. Click Import From ModelArts and select a model framework from the drop-down list on the right, including TensorFlow, Caffe, and OM (obtained from the conversion task). After you import a TensorFlow or Caffe model, the Huawei HiLens platform converts it into the .om format and then imports it. The .om model is obtained from the previous conversion task.2. Select the model to be imported from the model list.

Parameter	Description
Type	<p>If you select a model (non-om model) whose format needs to be converted for Model Source, you need to select a model conversion template, which can be TF-FrozenGraph-To-Ascend-HiLens, TF-SavedModel-To-Ascend-HiLens, TF-FrozenGraph-To-Ascend, TF-SavedModel-To-Ascend or Caffe to Ascend.</p> <ul style="list-style-type: none"> • TF-FrozenGraph-To-Ascend-HiLens This template converts TensorFlow frozen_graph models into those run on Ascend chips. If the firmware version of your HiLens Kit system is 2.2.200.011, you are advised to use this template for model conversion. • TF-SavedModel-To-Ascend-HiLens This template converts TensorFlow saved_model models into those run on Ascend chips. If the firmware version of your HiLens Kit system is 2.2.200.011, you are advised to use this template for model conversion. • TF-FrozenGraph-To-Ascend This template converts TensorFlow frozen_graph models into those run on Ascend chips. If the firmware version of your HiLens Kit system is earlier than 2.2.200.011, you are advised to use this template for model conversion. • TF-SavedModel-To-Ascend This template converts TensorFlow saved_model models into those run on Ascend chips. If the firmware version of your HiLens Kit system is earlier than 2.2.200.011, you are advised to use this template for model conversion. • Caffe to Ascend Caffe models can be converted into models that can run on Ascend chips. • TF-FrozenGraph-To-Ascend-893 This template converts TensorFlow frozen_graph models into those run on Ascend chips. If the firmware version of your HiLens Kit system is earlier than 2.2.200.011, you are advised to use this template for model conversion.
Import From	<p>If you select a model (non-om model) that needs to be converted in Model Source, this parameter is automatically initialized based on the model source. The directory must contain the model file and configuration file required for conversion. For details about the input directory specifications of model files, see Model Input Directory Specifications.</p>
Export To	<p>If you select a model (non-om model) that needs to be converted in Model Source, click  to select the OBS directory to which the converted model is exported. Ensure that no .om model exists in the directory. For details about the output directory specifications, see Model Output Directory Specifications.</p>

Parameter	Description
Advanced Options	Includes the Input Tensor Shape and out_nodes parameters. For details, see Table 1-9 .

Table 1-9 Advanced Options

Parameter	Description
Input Tensor Shape	<p>If you select a model (non-OM model) whose format needs to be converted for Model Source and the conversion type is TF-FrozenGraph-To-Ascend-HiLens or TF-SavedModel-To-Ascend-HiLens, you must enter the tensor shape.</p> <p>Input Tensor Shape indicates the shape of the input data of the model. The input data format is NHWC, for example, input_name:1,224,224,3. input_name must be the node name in the network model before model conversion. This parameter is mandatory when the model has dynamic shape input. For example, in input_name1?:h,w,c, the question mark (?) indicates the batch size, that is, the number of images processed at a time. It is used to convert the original model with a dynamic shape into an offline model with a fixed shape.</p> <p>Use commas (,) to separate multiple inputs.</p>
out_nodes	<p>Specifies the output node, for example, node_name1:0;node_name1:1;node_name2:0. node_name must be the node name in the network model before model conversion. The digit after each colon (:) indicates the sequence number of the output. For example, node_name1:0 indicates the 0th output of node_name1.</p>
input_format	<p>The default input data format is NHWC. If the actual format is NCHW, you need to set this parameter to NCHW.</p>
net_format	<p>Specifies the preferred data format for network operators. Possible values are ND (N cannot be more than 4) and 5D. This parameter only takes effect if the input data of operators on the network supports both ND and 5D formats. ND indicates that operators in the model are converted into the NCHW format. 5D indicates that operators in the model are converted into the Huawei-developed 5D format. 5D is the default value.</p>

Parameter	Description
fp16_high_prec	<p>Specifies whether to generate a high-precision FP16 Davinci model.</p> <ul style="list-style-type: none"> The default value is 0, indicating that a common FP16 Davinci model is generated, which has better inference performance. The value 1 indicates that a high-precision FP16 Davinci model with better inference precision is generated.
output_type	<p>FP32 is the default value and is recommended for classification and detection networks. For image super-resolution networks, UINT8 is recommended for better inference performance.</p>

After the model is imported, the **Models** page is displayed. You can view the imported model in the list.

Viewing Details About a Model

- Log in to the Huawei HiLens console. In the navigation pane, choose **Skill Development > Models**. The **Models** page is displayed.
You can view the **Model Name**, **Version**, **Model Size**, **Import Time**, **Status**, **Description**, and **Operation** in the list. The model status can be **Converting**, **Conversion failed**, **Conversion succeeded**, **Import failed**, and **Import succeeded**.
- Click **Details** in the **Operation** column of a model. The **Model Details** page is displayed.

You can view the **Basic Information** and **Log Information** of the model, as shown in [Figure 1-30](#).

[Table 1-9](#) describes the **Basic Information** parameters.

For the model that needs to be converted, you can enter keywords in the upper right corner of the **Log Information** area to quickly locate key information in a log.

Figure 1-30 Model details

The screenshot displays the 'Model Details' page for a model named 'gesture-recognition0623'. It is divided into three main sections: Basic Information, Advanced Options, and Log Information.

- Basic Information:**
 - Model Name: gesture-recognition0623
 - Status: Import succeeded (indicated by a green checkmark)
 - Version: 1.0.0
 - Size: 45.19 MB
 - ID: 15041f7368b644cdae611d86491447b
 - Import Time: 2020-06-23 10:12:13 GMT+08:00
 - Model Path: https://modelarts-hilens.obs.myhuaweicloud.com/gesture/convert-output/convert-gesture0623.com
 - Type: -
 - Import From: -
 - Export To: -
 - Description: gesture-recognition
- Advanced Options:**
 - out_nodes: -
 - input_tensor_shape: -
 - input_format: NHWC
 - net_format: SD
 - fp16_high_prec: 0
 - output_type: FP32
- Log Information:**
 - A search bar with the placeholder text 'Search by keyword' and a magnifying glass icon.
 - Below the search bar, a message states: 'The model is directly imported without conversion. Therefore, no conversion log information is available.'

Reconverting a Model



If the imported model is not in the **.om** format and is in **Conversion failed** status, you can modify the model parameters and convert it again.

You can view the model status on the **Models** page of the Huawei HiLens console.

1. Log in to the Huawei HiLens console. In the navigation pane, choose **Skill Development > Models**. The **Models** page is displayed.
2. Click **Details** in the **Operation** column of a model. The **Model Details** page is displayed.

You can view the **Basic Information** and **Log Information** of the model.

For the model that needs to be converted, you can enter keywords in the upper right corner of the **Log Information** area to quickly locate key information in a log.

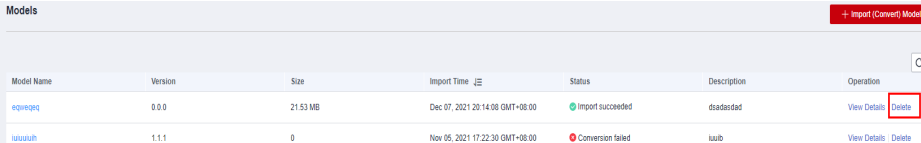
3. On the **Basic Information** tab page, click  to modify the **Type**, **Advanced Options**, **Import From**, **Export To**, and **Description** parameters. After the modification is complete, click  to save the modification. [Table 1-9](#) describes related parameters.
4. After modifying the model parameters, click **Reconvert** in the upper right corner to convert the model again.

Deleting a Model

You can delete imported (converted) models based on service requirements. Models in the **Converting** state cannot be deleted.

1. Log in to the Huawei HiLens console. In the navigation pane, choose **Skill Development > Models**. The **Models** page is displayed.
2. Locate a model and click **Delete** in the **Operation** column to delete it. You can also click **Details** in the **Operation** column and click **Delete Model** in the upper right corner of the model details page to delete the model.

Figure 1-31 Deleting a model



Model Name	Version	Size	Import Time	Status	Description	Operation
eprpqs	0.0.0	21.53 MB	Dec 07, 2021 20:14:00 GMT+08:00	Import succeeded	dsadasd	View Details Delete
luzqub	1.1.1	0	Nov 05, 2021 17:22:30 GMT+08:00	Conversion failed	luzb	View Details Delete

1.4.4 Can One Skill Use Multiple Models? How Do I Add Multiple Models When Developing a Skill?

Yes. One skill can use multiple models. You need to call the HiLens.Model APIs to initialize each model. For details, see [Developer Guide > Model Management Module](#).

To add multiple models, perform the following steps:

- Select multiple models under **Model** when configuring the skill content. For details, see [Creating Skills > Setting the Skill Content](#).
- When creating a skill, you need to pack multiple models and codes and upload them to OBS before configuring the skill content. Select **Upload from**

OBS for Code Entry Mode. For details, see [Creating Skills > Setting the Skill Content](#).

1.4.5 Why Does Skill Releasing Fail?

Possible causes are as follows:

- Check whether the HiLens Framework firmware version has been upgraded to 1.0.7 or later. For details, see *Huawei HiLens User Guide > Upgrading the HiLens Kit System Firmware Version*.
- Your skill to be released has the same name as an existing skill in the skill market. In this case, create another skill and ensure that its name is unique. Then, release the skill.
- Skills of the same version are repeatedly released. If the skill has been released but its code needs to be modified, log in to the management console, click **Skill Development**, locate the row containing the target skill, click **Edit** in the **Operation** column, and change the version to a later version under **Basic Information**. The release will succeed only when the new version number is later than the last version number. Then, upload the new code. When the skill is successfully modified, it can be released again.

1.4.6 Can Sockets Be Used During Skill Development?

Skills can write socket programs without special parameter settings. Check whether a firewall exists.

1.4.7 How Do I Handle a Model Conversion Failure?

You can view the model conversion logs to locate the failure cause and rectify the fault accordingly.

- [Viewing Model Conversion Logs](#): View the model conversion logs to locate the failure cause.
- [Resolving Model Conversion Failures](#): Common causes and solutions for model conversion failures.

Viewing Model Conversion Logs

1. Log in to the Huawei HiLens console. In the navigation pane, choose **Skill Development > Models**. The **Models** page is displayed.

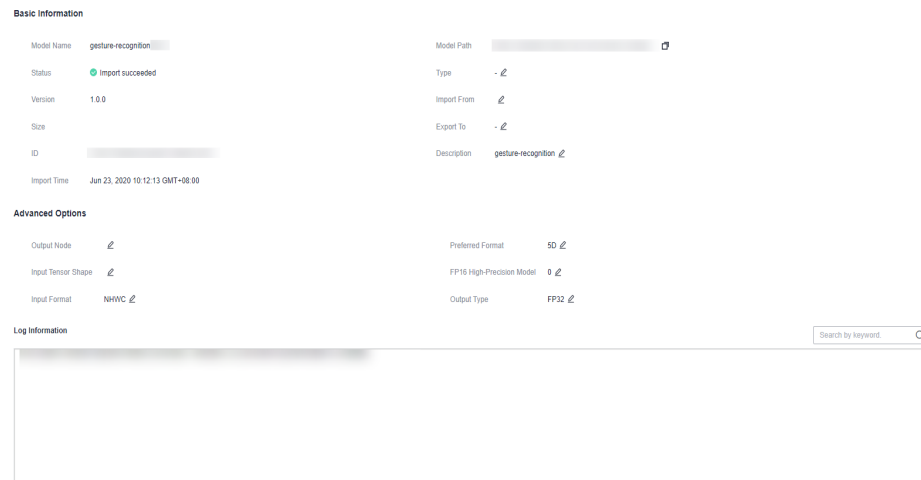
If the model fails to convert, you can view that the model status is **Conversion failed**.

2. Locate the failed model and click **Details** in the **Operation** column. The **Model Details** page is displayed.

You can view the **Basic Information** and **Log Information** of the model, as shown in [Figure 1-32](#).

You can enter a keyword about the failed model in the search box of the **Log Information** area to quickly locate the failure cause.

Figure 1-32 Model details



Resolving Model Conversion Failures

Solutions for common model conversion failures:

- Check whether the uploaded model file is correct.
Before importing a custom model, upload it to OBS. A non-om model package contains Caffe model files **.caffemodel** and **.prototxt** and configuration file **.cfg**, or TensorFlow model file **.pb** and configuration file **.cfg**.
- Check whether the model to be imported or converted uses the TensorFlow or Caffe operator boundaries supported by **.om** models.
Not all models can be successfully converted. Before importing and converting a model, check whether it uses the TensorFlow and Caffe operator boundaries supported by **.om** models. For details, see [Caffe Operator Boundaries](#) and [TensorFlow Operator Boundaries](#).
- Check whether the parameters are correctly set for model conversion.
For details about the parameters, see [Importing \(Converting\) Models](#). The parameters that may be incorrectly set are listed below.
 - **Input Tensor Shape**
Mandatory. The shape of the input data, in the format of NHWC, for example, *input_name:1,224,224,3*. *input_name* must be a node name in the network model before model conversion, which must be configured when the model has dynamic shape input. For example, in **input_name1:?,h,w,c**, the question mark (?) indicates the batch size, that is, the number of images processed at a time. It is used to convert the original model with a dynamic shape into an offline model with a fixed shape.
Use commas to separate multiple inputs.
 - **Type**
Select the correct model conversion type for the imported model.
 - TF-FrozenGraph-To-Ascend-HiLens
This template converts TensorFlow frozen_graph models into those run on Ascend chips. If the firmware version of your HiLens Kit

system is 2.2.200.011, you are advised to use this template for model conversion.

- **TF-SavedModel-To-Ascend-HiLens**

This template converts TensorFlow saved_model models into those run on Ascend chips. If the firmware version of your HiLens Kit system is 2.2.200.011, you are advised to use this template for model conversion.

- **TF-FrozenGraph-To-Ascend**

This template converts TensorFlow frozen_graph models into those run on Ascend chips. If the firmware version of your HiLens Kit system is earlier than 2.2.200.011, you are advised to use this template for model conversion.

- **TF-SavedModel-To-Ascend**

This template converts TensorFlow saved_model models into those run on Ascend chips. If the firmware version of your HiLens Kit system is earlier than 2.2.200.011, you are advised to use this template for model conversion.

- **Caffe to Ascend**

Caffe models can be converted into models that can run on Ascend chips.

- **TF-FrozenGraph-To-Ascend-893**

This template converts TensorFlow frozen_graph models into those run on Ascend chips. If the firmware version of your HiLens Kit system is earlier than 2.2.200.011, you are advised to use this template for model conversion.

- **Import From**

For Ascend chip-supported models developed locally or developed in ModelArts and converted on HiLens, set this parameter by referring to [Model Input Directory Specifications](#).

 **NOTE**

- The model input directory cannot contain multiple models.
- The directory must contain the model file. Other files are optional.

- **Export To**

For conversion tasks of models supported by Ascend chips, set this parameter by referring to [Model Output Directory Specifications](#).

1.4.8 To What Devices Does the HiLens Framework SDK Apply?

The HiLens Framework SDK can be used for skill development on HiLens Kit devices. You are not advised to use the HiLens Framework SDK on Atlas 500. For details, see [Huawei HiLens SDK Reference](#).

1.4.9 How Do I Determine the Input Tensor Shape During Model Conversion?

Mandatory. The shape of the input data, in the format of NHWC, for example, *input_name:1,224,224,3*. *input_name* must be a node name in the network model before model conversion, which must be configured when the model has dynamic shape input. For example, in *input_name1:?,h,w,c*, the question mark (?) indicates the batch size, that is, the number of images processed at a time. It is used to convert the original model with a dynamic shape into an offline model with a fixed shape.

Use commas to separate multiple inputs.

When a **pb** model is converted to an **om** model, the input tensor shape is the input node and shape of the **pb** model, for example, **images:1,224,224,3**.

1.4.10 Does Huawei HiLens Only Support Models Trained by ModelArts?

No. Locally trained models are also supported.

Model Requirements

The models to be imported can be in **.om**, **.pb**, or **.caffemodel** format. Only models in **.om** format can run on HiLens Kit devices. If you import a model in **.pb** or **.caffemodel** format, the Huawei HiLens platform automatically converts it into the **.om** format.

Not all models can be successfully converted. Before importing and converting a model, check whether it uses the TensorFlow and Caffe operator boundaries supported by **.om** models. For details, see [Caffe Operator Boundaries](#) and [TensorFlow Operator Boundaries](#).

Training Models on ModelArts

You can train your models on ModelArts and import them to Huawei HiLens.

NOTE

- Models developed by **ExeML** of ModelArts cannot be imported to Huawei HiLens.
- Only the model files instead of models trained on ModelArts can be imported to Huawei HiLens.

Training Models Locally

Before importing a custom model, you need to upload it to OBS. A non-om model package contains Caffe model files **.caffemodel** and **.prototxt** and configuration file **.cfg**, or TensorFlow model file **.pb** and configuration file **.cfg**.

For details about how to upload a model file to OBS, see [Object Storage Service > Getting Started](#). The directory to which the model files are uploaded must meet certain specifications. For details, see [Model Input Directory Specifications](#).

Fees will be incurred when you upload files to OBS. For details about OBS pricing, see [Product Pricing Details](#).

When uploading files to OBS, ensure that the OBS bucket and Huawei HiLens are in the same region and the OBS folder name meets the following requirements:

- The folder name cannot contain the following special characters: \:*?"<>|
- The folder name cannot start or end with a period (.) or slash (/).
- The absolute path of the folder can contain a maximum of 1,023 characters.
- The folder name cannot contain two or more adjacent slashes (/).

1.4.11 Can Skills Developed on Huawei HiLens Be Deployed on Edge Servers That Use P4 GPUs?

The skills developed on Huawei HiLens cannot be deployed on edge servers that use P4 GPUs. They can only be deployed on HiLens Kit devices.

1.5 Installing and Starting Skills

1.5.1 What Are the Possible Causes for Skill Installation Failures?

Do the following to locate the failure cause:

- Check whether the Huawei Cloud account is in arrears. Ensure that the account is not in arrears before installing skills.
- Check whether the network is connected. Run **ping 8.8.8.8** and **ping any website**, and check whether the destinations can be pinged.
- Check whether the required skills are stored in the OBS bucket. If they are not, check whether there are any permission restrictions on the OBS bucket.

If there are permission restrictions, you can remove the permission restrictions or create an OBS bucket without permission restrictions and reinstall the skills. For details about how to create an OBS bucket, see [Creating a Bucket](#).

- Check whether the time is synchronized.

Connect to the device over SSH and run the **date** command in the SSH CLI. Check whether the time is synchronized. If it is not, change the time.

- a. Run the following command to change the time zone to that of :

```
timedatectl set-timezone
```

- b. Modify the device time. Assume that the current time is 19:19:19 on October 17, 2019. Run the following commands:

```
date -s "2019-10-17 19:19:19"
```

```
hwclock -w
```

```
reboot
```

1.5.2 How Many Skills Can Run on a HiLens Kit Device Concurrently?

Currently, you can run up to five skills on the same HiLens Kit device concurrently.

1.5.3 Why Does a Skill Stop After Being Started?

View the failure cause on the console and rectify the fault accordingly.

Viewing the Failure Cause

In the skill list, you can view the failure cause of a skill.

Perform the following steps to view the failure cause:

1. Log in to the Huawei HiLens Console, and choose **Device Management > Devices** from the navigation pane.
2. Select your device and click **Manage Skill**.
3. On the **Manage Skill** tab page, view the skill list.

In the **Status** column, view the fault cause under **Faulty**.

You can also [view device logs](#) to further locate the fault.

Common Causes and Solutions

- If a skill fails to start or stop, and the displayed cause is that the device is offline but the console displays the online status, check whether the network and power cables are connected properly.
- If the error information shown in [Figure 1-33](#) is displayed, check whether the skill verification value is the same as that in the skill code. Ensure that they are the same. The skill verification value refers to the value you configured for **Skill Code Value** in the **Basic Information** area when [creating a skill](#) on the Huawei HiLens console. It is used for skill verification to prevent fake skills. Its value must be the same as that of the parameter of the initialization API `hilens.init` in skill code.

Figure 1-33 Error message

```
2020-01-15 11:39:57.396130394|ERROR|[SPM] RequestLicense: httpcode 400, response: {"request_id":"c6e48d15f064e7aa38f1bdcd99ab84","error_code":"HL_0061","error_msg":"Invalid skill hash."}
2020-01-15 11:39:57.396130404|ERROR|[SPM] failed to verify skill license! retrying... (1)
2020-01-15 11:39:57.397130394|ERROR|[SPM] license check channel test failed! reset count = 0.
Traceback (most recent call last):
  File "/home/hilens/nda/skill/et-hilens-20032034-01-hilens-test-license-8abfafa46fa3ae2f016fad32a7904b5/index.py", line 47, in <module>
```

Figure 1-34 Skill verification code

Basic Information

Template Create from scratch Select template

* Name

* Version

* Chip

* Verification Value

* Application Scenario

Icon

* OS Platform Linux Android iOS LiteOS Windows

Description

Figure 1-35 Skill code

```
if __name__ == '__main__':  
    # The parameter hello must be the same as the Verification Value.  
    hilens.init("test")  
    run()  
    hilens.terminate()
```

- Check whether the HiLens Framework firmware has been upgraded to version 1.0.7 or later..
- If error message **No such file or directory** is displayed, check the model path on the HiLens Kit device.

1.5.4 Can a HiLens Kit Device Run Skills Offline?

Huawei HiLens cannot work offline entirely. After a skill is started on the Huawei HiLens console, the license needs to be verified online before it can run. Once the verification is complete, the skill can run offline until the license expires.

1.5.5 What Can I Do If Skill A Is Successfully Started But Skill B Fails to Be Started When the Two Skills Purchased from the Skill Market Are Both Output by HDMI?

You cannot start two skills output by HDMI at the same time. To start skill B, stop skill A first. Select a skill to start as required.

1.6 Purchasing Skills

1.6.1 Why Does Skill Purchasing Fail?

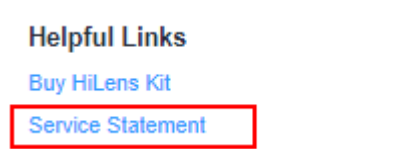
Possible causes are as follows:

- Parameters are set incorrectly.
Set parameters by referring to [Purchasing Skills](#).
- The network is abnormal.
- You did not agree to the HiLens service disclaimer.

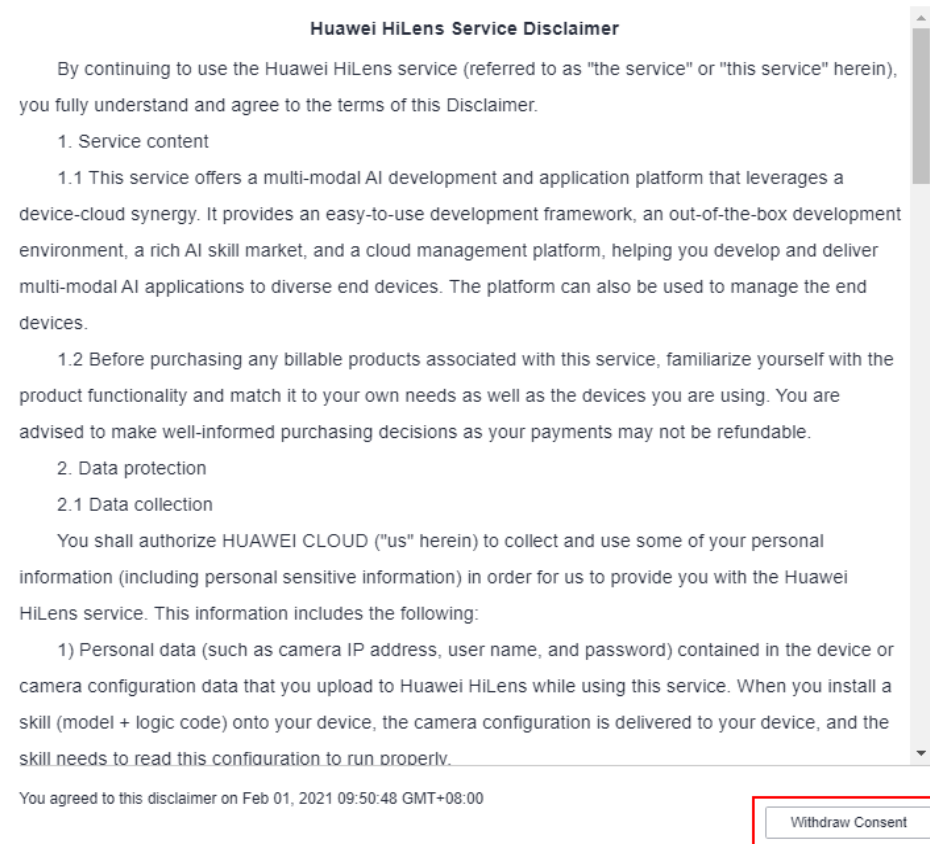
Withdraw your consent to the service disclaimer and approve the disclaimer again.

- a. Log in to the Huawei HiLens console and click **Service Statement** in the **Helpful Links** area.

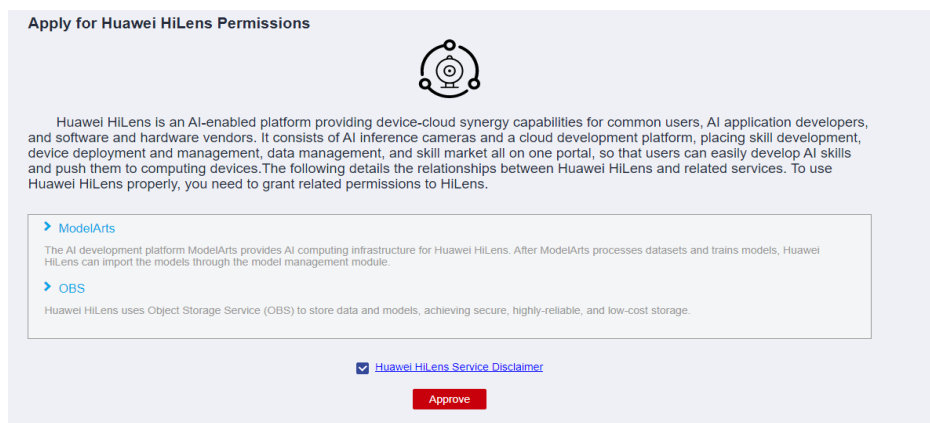
Figure 1-36 Service statement



- b. In the dialog box that is displayed, click **Withdraw Consent**, then click **OK**.

Figure 1-37 Withdrawing your consent to the HiLens service disclaimer

- c. Log out of the current account and relog in to the HiLens console with your account.
The **Apply for Huawei HiLens Permissions** page is displayed.
- d. Select **Huawei HiLens Service Disclaimer** and click **Approve**.

Figure 1-38 Applying for HiLens permissions

1.7 Managing Products

1.7.1 When Can I Select 3516CV500 When Creating a Product?

When creating a product, if the chip model is 3518EV300, 3516EV200, or 3516EV300, you can select **3516CV500**.

For details, see [Creating Products](#).

1.7.2 Can I Directly Distribute Skills to HiSilicon Hi35xx Series Chips?

- Skills oriented to HiSilicon 35xx series chips are different from those for HiLens Kit devices. You need to download the SDK of a specific skill by clicking **Download** in the **Operation** column on the **Skill Development > Skills** page of the console. For details, see "User Guide > Managing Orders". After downloading the SDK, manually integrate it into a specific firmware system. For details about how to use different skills, see the documents or header files in specific SDKs. Generally, the SDKs provide demo programs for reference.
- The function of automatically distributing skills to HiSilicon chips after configuring it on the web page is still under development.

1.7.3 How Do I Use the SDKs of Multiple Skills on HiSilicon Hi35xx Series Chips?

The SDKs of different skills are independent of each other and use different APIs. You can integrate one or more skills as required. For details about the integration method, you can create a service ticket for consulting.

1.8 Managing Data

1.8.1 Why Is There No HDMI Skill Data on the Data Management Page?

To view the HDMI skill data, output it to a display through the HDMI port of the device. The operations are as follows:

1. Use the HDMI video cable to connect the video output port (HDMI port) of the HiLens device to a display.
2. In the navigation pane, choose **Device Management > HiLens Kit**. The device list page is displayed.
3. Click **Manage Skill** of the registered device. The status of the deployed skill is **Stopped**. Click **Start** in the **Operation** column and click **OK** to start the skill on the device.

The skill status changes to **Running** after a short period of time, indicating that the skill is running properly on the device. Then, you can view the skill output data on the display.


[Table 1-10](#) lists the statuses of deployed skills.

Table 1-10 Skill deployment statuses

Status	Description
Stopped	The skill stops running on the device.
Running	The skill is successfully installed on the device and is running.

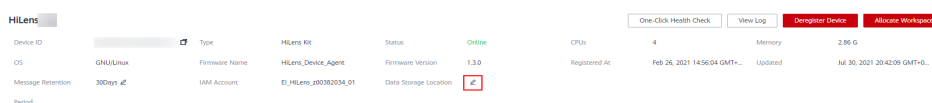
1.8.2 How Do I Configure the Data Storage Location (OBS Storage Path)?

Configuring the Data Storage Location (OBS Storage Path)

1. Log in to the Huawei HiLens console. In the navigation pane, choose **Device Management > Devices**. In the device list, click the name of the device to be managed to enter the device details page.
2. Click  on the right of **Data Storage Location**. In the dialog box that is displayed, select an OBS directory to store the video data of the current device.

NOTE

- Storing device data consumes storage resources of Huawei Cloud. Using OBS for storage will incur fees. For detailed operations and specifications, see the [Object Storage Service Console Operation Guide](#).
- When a URL is used to access a bucket, the bucket name is a part of the URL. According to DNS standards, a URL does not support uppercase letters and cannot be used to access a bucket whose name contains uppercase letters. Therefore, a bucket name can contain only lowercase letters, digits, hyphens (-), and periods (.). It cannot contain two consecutive periods (..) or contain a period (.) and a hyphen (-) adjacent to each other. For details about the naming rules, see [Creating a Bucket](#).

Figure 1-39 Configuring the data storage location

1.8.3 Why Does HDMI Black Screen Occur or HDMI Output Stop Working?

If multiple skills that generate output through HDMI are started, a black or frozen screen occurs.

The skill output by HDMI supports only one channel of video, and one channel of skill. Check whether multiple channels of video are ingested.

If multiple channels of video are ingested, specify only one channel of video to output in the code. In addition, when switching the skill output by HDMI, stop the running skill first, and then start another skill.

You can [check device logs](#) to further locate the cause.

1.8.4 Can I Record the Images Captured by a HiLens Kit Camera or the Skill Running Result for Storage?

Yes. You can use OpenCV VideoWriter. Note that the video must be in MJPG format. The reference code is as follows:

```
camera = hilens.VideoCapture()

fps = 20
size = (1280, 720)
format = cv2.VideoWriter_fourcc('M','J','P','G')
writer = cv2.VideoWriter("output.avi", format, fps, size)

count = 0
duration = 100 # Duration of the video
while True:
    input_nv21 = camera.read()

    input_bgr = cv2.cvtColor(input_nv21, cv2.COLOR_YUV2BGR_NV21)
    writer.write(input_bgr)

    if count >= fps * duration:
        break
    count += 1
writer.release()
```

1.8.5 Why Don't the Logs Contain Any Device Data?

Possible Causes

If the firmware version of the current device is 1.3.3 or later, you need to manually collect logs.

Manually Collecting Logs

1. Log in to the Huawei HiLens management console. In the navigation pane, choose **Data Management (Beta)**. The **Data Management** page is displayed.
2. Click the device that failed to upload logs and click **Save All Logs** in the upper right corner.
A dialog box for uploading logs is displayed.
3. Select the device logs you want to upload to OBS and click **OK**.
Wait for log collection.

NOTE

The system will collect the device logs you selected. This typically takes 5 minutes.

4. After the log collection is complete, on the **Data Management** page, click the device card to go to the corresponding folder and download the log file package to the local PC to view the logs.

1.9 Algorithm Issues

1.9.1 Why Is Error Code 17 Displayed During Model Inference?

Cause

The input data size is different from that required by the model. In this case, the **model.infer** API returns an error code, that is, the number 17 of the INT format.

Solution

Check whether the actual input matches the required model input, for example, the input format (YUV/RGB) and data type (float32/int8).

For the same image, the size of the YUV format is twice that of the RGB format. To convert an RGB image to a YUV image, call the **hilens.cvt_color** API. For details, see [Converting the Image Color Format](#).

1.9.2 How Do I Use and Program the SDK or License of a Skill?

Huawei HiLens provides an SDK function library. You can integrate HiLens functions into your system firmware to use skills and program them to chips or modules together with the system or execution files. A license contains the identity information for registration. You can obtain it from the **Device Management > Product Management** page of the Huawei HiLens console. Generally, the license is transferred to the skill initialization interface as an input parameter. Before using a skill, you need to distribute the skill to a device group on the **Device Management > Product Management** page and transfer the group license for registration in the SDK.

1.9.3 Can a Huawei HiLens Skill Run on an Android or Arm Platform?

No. HiLens skills cannot run on an Android or Arm platform.

1.9.4 What TensorFlow and Caffe Models Can Run on Huawei HiLens?

Only **.om** models can run on Huawei HiLens. The **Import (Convert) Model** function on the Huawei HiLens console can convert some TensorFlow and Caffe models into **.om** models.

For details about the supported TensorFlow/Caffe operators, see [TensorFlow Operator Boundaries](#) and [Caffe Operator Boundaries](#). More operators are being developed.

1.9.5 Does Huawei HiLens Support Self-Developed Operators?

You can develop operators based on the documentation of HiSilicon, but the process is complex. Huawei HiLens does not provide technical support for operator development. You are advised to use existing operators to develop skills.

1.9.6 What Language Does the Huawei HiLens Development Environment Support?

Skills can be developed using Python 3.7 and C++.

Huawei HiLens provides a development toolkit **HiLens Framework**, enabling you to easily develop skills on the Huawei HiLens console.

- [HiLens Framework \(C++\)](#)
- [HiLens Framework \(Python\)](#)

1.9.7 Does HiLens Kit Provide an Interface that Converts a Color Image to a Grayscale Image?

Currently, HiLens Kit does not provide such an interface. Only a color format conversion interface is available. For details, see [Converting the Image Color Format](#).

1.9.8 How Do I Configure Python Dependencies for a Skill?

Background

- Firmware 1.1.2 and later allow you to configure Python dependencies for skills. During skill development, you can configure Python dependencies for the skill as required.
Before configuration, check whether the firmware version is 1.1.2 or later. If the firmware is not updated, update it. For details, see [Upgrading HiLens Framework Firmware Version](#).
- During skill development, logic code can be stored in two modes: editing code online and uploading code from OBS.
 - If your code logic is simple, you are advised to compile the code online.
 - If your code structure is complex, you are advised to develop the code in a local integrated development environment (IDE) and upload it in **.zip** or **.tar.gz** format from OBS. For details about how to use OBS to upload files, see [Object Storage Service Getting Started](#). Fees will be incurred when you upload files to OBS. For details about OBS pricing, see [Product Pricing Details](#).

NOTE

- Before uploading a file, ensure that the OBS bucket is in the same region as your Huawei HiLens.
- If you upload code from OBS, compress all code files before uploading them. The uploaded files must be in **.zip** or **tar.gz** format, and the main file must be in the level-1 directory. As shown in the following example, the entry code (**main.py**) is in the level-1 directory. Other code needs to be designed as required. You can pack the model and code together to upload them.
- The file (for example, **main.py**) where the entry code is located is configured through the **Function Execution Entry** parameter, which will be described later.

The following is a code directory example:

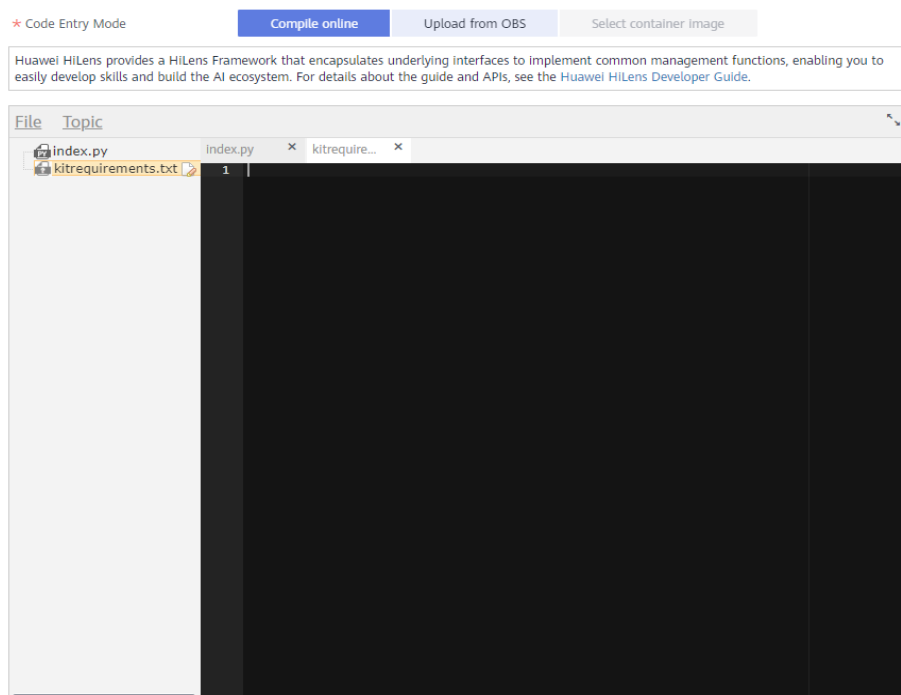
```
skill/
|--main.py    #Main file. The file name is the same as the value of parameter Code
```

```
Configuration of the new skill.  
|--depends/      #Optional, used to store the model file.  
|--workspace/   #Workspace, used to store data generated by the skill.  
|--data/        # Used to store runtime configurations.
```

Configuring Python Dependencies

Add the **kitrequirements.txt** file to the root directory of the skill logic code and write Python dependencies to be installed to the file.

Figure 1-40 Adding the kitrequirements.txt file



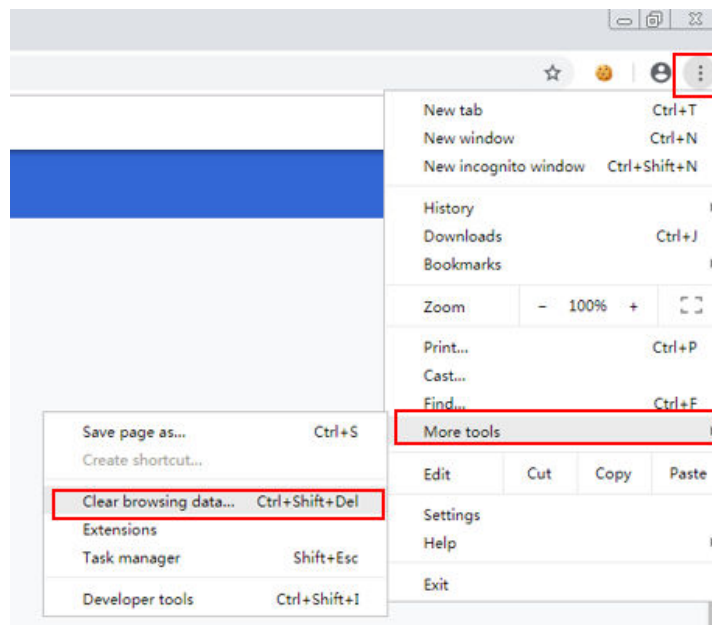
NOTE

The dependencies to be installed must be dependencies that can be successfully installed on HiLens Kit devices by running the **python3 -m pip** command. Use spaces to separate multiple dependencies.

1.10 Other

1.10.1 Why Does the Huawei HiLens Console Keep Reporting 404 Errors?

Check whether the network is normal, and then clear the browser cache and refresh the page. Take Google Chrome as an example. Click the Chrome menu icon (at the top right corner of Google Chrome), select **More tools**, and click **Clear browsing data**. See [Figure 1-41](#).

Figure 1-41 Clearing the browser cache

1.10.2 How Do I Assign Huawei HiLens Permissions to New IAM Users?

If you want to assign different permissions to employees in your enterprise to access Huawei HiLens resources you purchased on Huawei Cloud, Identity and Access Management (IAM) is a good choice for fine-grained permissions management. IAM provides identity authentication, permissions management, and access control, helping you secure access to your Huawei Cloud resources.

With IAM, you can use your Huawei Cloud account to create IAM users for your employees, and assign permissions to the users to control their access to specific resources of various types. For example, some software developers in your enterprise need to use Huawei HiLens resources but must not be allowed to delete skills or perform any high-risk operations. To achieve this result, you can create IAM users for the software developers and grant them only the permissions required for using Huawei HiLens resources.

If your Huawei Cloud account does not need IAM users for permissions management, you may skip over this chapter.

IAM is free of charge. You pay only for the resources in your account. For more information about IAM, see [IAM Service Overview](#).

Huawei HiLens Permissions

By default, new IAM users do not have any permissions assigned. To grant permissions to a user, add the user to one or more groups and attach permissions, policies or roles to these groups. The user then inherits permissions from the groups it is a member of. This process is called authorization. After authorization, the user can perform specified operations on Huawei HiLens based on the permissions.

Huawei HiLens is a project-level service deployed and accessed in specific physical regions. To assign HiLens permissions to a user group, specify the scope as region-

specific projects and select projects for the permissions to take effect. If **All projects** is selected, the permissions will take effect for the user group in all region-specific projects. When accessing Huawei HiLens, the users need to switch to a region where they have been authorized to use Huawei HiLens.

You can grant users permissions by using roles and policies.

- **Roles:** A type of coarse-grained authorization mechanism that defines permissions related to user responsibilities. This mechanism provides only a limited number of service-level roles for authorization. When using roles to grant permissions, you must also assign other roles on which the permissions depend. However, roles are not an ideal choice for fine-grained authorization and secure access control.
- **Policies:** A type of fine-grained authorization mechanism that defines permissions required to perform operations on specific cloud resources under certain conditions. This mechanism allows for more flexible policy-based authorization, meeting requirements for secure access control. For example, you can grant ECS users only the permissions for managing a certain type of ECSs. For the API actions supported by Huawei HiLens, see **Permissions Policies and Supported Actions** in the *Huawei HiLens User Guide*.

Table 1-11 lists all the system-defined roles and policies supported by Huawei HiLens.

Table 1-11 Huawei HiLens system policies

Policy Name	Description	Policy Type	Dependency
HiLens FullAccess	Administrator permissions for Huawei HiLens. Users granted these permissions can operate and use all Huawei HiLens resources.	System-defined policy	When you log in to HiLens, the agency information is checked in IAM. You need to grant the IAM ReadOnlyAccess permission policy. The permissions to apply for the open beta test (OBT), set alarm reporting, and set skill messages depend on the SMN Administrator role. To apply for the OBT, and set alarm receiving and skill messages, you must be granted the SMN Administrator role.

Policy Name	Description	Policy Type	Dependency
HiLens CommonOperations	Operation permissions for Huawei HiLens. Users granted these permissions can perform operations on Huawei HiLens, except deregistering devices and suspending skills.	System-defined policy	When you log in to HiLens, the agency information is checked in IAM. You need to grant the IAM ReadOnlyAccess permission policy. The permissions to apply for the open beta test (OBT), set alarm reporting, and set skill messages depend on the SMN Administrator role. To apply for the OBT, and set alarm receiving and skill messages, you must be granted the SMN Administrator role.
HiLens ReadOnlyAccess	Read-only permissions for Huawei HiLens. Users granted these permissions can only view Huawei HiLens data.	System-defined policy	When you log in to HiLens, the agency information is checked in IAM. You need to grant the IAM ReadOnlyAccess permission policy.

Table 1-12 lists the common operations supported by each system policy of Huawei HiLens (Basic Edition). Please choose proper system policies according to this table.

Table 1-12 Common operations supported by each system-defined policy or role of Huawei HiLens

Functional Module	Operation	Huawei HiLens FullAccess	Huawei HiLens CommonOperations	Huawei HiLens ReadOnlyAccess
Device management	Obtain the list of devices.	√	√	√
	Register a device.	√	√	x
	Obtain the list of skills installed on a device.	√	√	√
	Obtain the device configuration information.	√	√	√
	Update the device configuration information.	√	√	x
	Update the device information.	√	√	x
	Upgrade device firmware.	√	√	x
	Deregister a device.	√	x	x
	Uninstall a specified skill on a specified device.	√	√	x
	Start a specified skill on a specified device.	√	√	x
	Update the configuration information of a specified skill on a specified device.	√	√	x
	Stop a specified skill on a specified device.	√	√	x

Functional Module	Operation	Huawei HiLens FullAccess	Huawei HiLens CommonOperations	Huawei HiLens ReadOnlyAccess
	Obtain the configuration information of a specified skill on a specified device.	√	√	√
Skill development	Obtain the list and details of developed skills.	√	√	√
	Create a skill.	√	√	x
	Edit a developed skill.	√	√	x
	Release a developed skill to the skill market.	√	√	x
	Deploy a developed skill to a device.	√	√	x
	Delete a developed skill.	√	√	x
	Obtain the list and details of skill models.	√	√	√
	Obtain the list and details of model conversion jobs.	√	√	√
	Import a skill to Huawei HiLens.	√	√	x
	Create a model conversion job.	√	√	x
	Obtain the list and details of skill templates.	√	√	√
	Download a skill template.	√	√	x

Functional Module	Operation	Huawei HiLens FullAccess	Huawei HiLens CommonOperations	Huawei HiLens ReadOnlyAccess
	Add a skill template to favorites.	√	√	x
	Remove a skill template from favorites.	√	√	x
	Delete a skill model.	√	√	x
Skill market	Obtain the skill list of the skill market.	√	√	√
	Install a skill purchased from the skill market.	√	√	x
	Obtain the skill details in the skill market.	√	√	√
	Obtain the skill billing information in the skill market.	√	√	√
	Create a skill order in the skill market.	√	√	x
	Obtain the skill order list in the skill market.	√	√	√
	Download a skill from the skill market.	√	√	x
	Remove a released skill from the catalog of the skill market.	√	x	x

Functional Module	Operation	Huawei HiLens FullAccess	Huawei HiLens CommonOperations	Huawei HiLens ReadOnlyAccess
Product management	Update the product information.	√	√	x
	Obtain the list of products.	√	√	√
	Create a product.	√	√	x
	Delete a product.	√	√	x
	Distributes skill orders to products.	√	√	x
	Obtain the skill order list of a product.	√	√	√
	Update the skill order information of a product.	√	√	x
	Delete the skill order information of a product.	√	√	x

Helpful Links

- [IAM Service Overview](#)
- [Creating a User and Granting Permissions](#)
- [Permissions Policies and Supported Actions](#)

1.10.3 Does Huawei HiLens Support 3D Object Recognition?

Built-in HiLens Kit devices do not support the depth information, but 3D objects in 2D images can be recognized by Huawei HiLens.

1.10.4 What Can I Do If the System Displays a Message Indicating that the AK/SK Pair Is Unusable?

Issue Analysis

An AK and SK form a key pair required for accessing OBS. Each SK corresponds to a specific AK, and each AK corresponds to a specific user. If the system displays a

message indicating that the AK/SK pair is unavailable, it is possible that the account is in arrears or the AK/SK pair is incorrect.

Solution

1. Use the current account to log in to the OBS console and check whether the current account can access OBS.
 - If the account can access OBS, rectify the fault by referring to [2](#).
 - If the account cannot access OBS, rectify the fault by referring to [3](#).
2. If the account can access OBS, click the username in the upper right corner and select **My Credentials** from the drop-down list. Then, follow the instructions provided in [Access Keys](#) to check whether the AK/SK pair is created using the current account.
 - If the AK/SK pair is created using the current account, submit a service ticket.
 - If the AK/SK pair is not created using the current account, replace the AK/SK with those of the current account by following the instructions provided in [Access Keys](#).
3. If the account cannot access OBS, check whether it is in arrears.
 - If the account balance is insufficient, top up the account. For details, see [How Does a Common HUAWEI CLOUD Customer Top Up an Account?](#)
 - If the account is not in arrears and the system displays a message indicating that the resource reservation is overdue, submit a [service ticket](#) to request OBS resources.

1.10.5 What Devices Does Huawei HiLens Support?

The Huawei HiLens platform supports devices powered by Ascend D310, HiSilicon Hi35xx series chips, Atlas 800, and IVS1800/3800.

You can register, manage, and deregister Ascend D310 devices as HiLens Kit devices and Atlas 500 AI edge stations. For details about how to register a HiLens Kit device, see [Registering HiLens Kit Devices](#).

Manufacturers can use the Huawei HiLens console to manage devices that run HiSilicon Hi35xx series chips in batches and deploy AI capabilities onto them. For details, see [Managing Products](#).