

# tuya Wind IDE User Guide

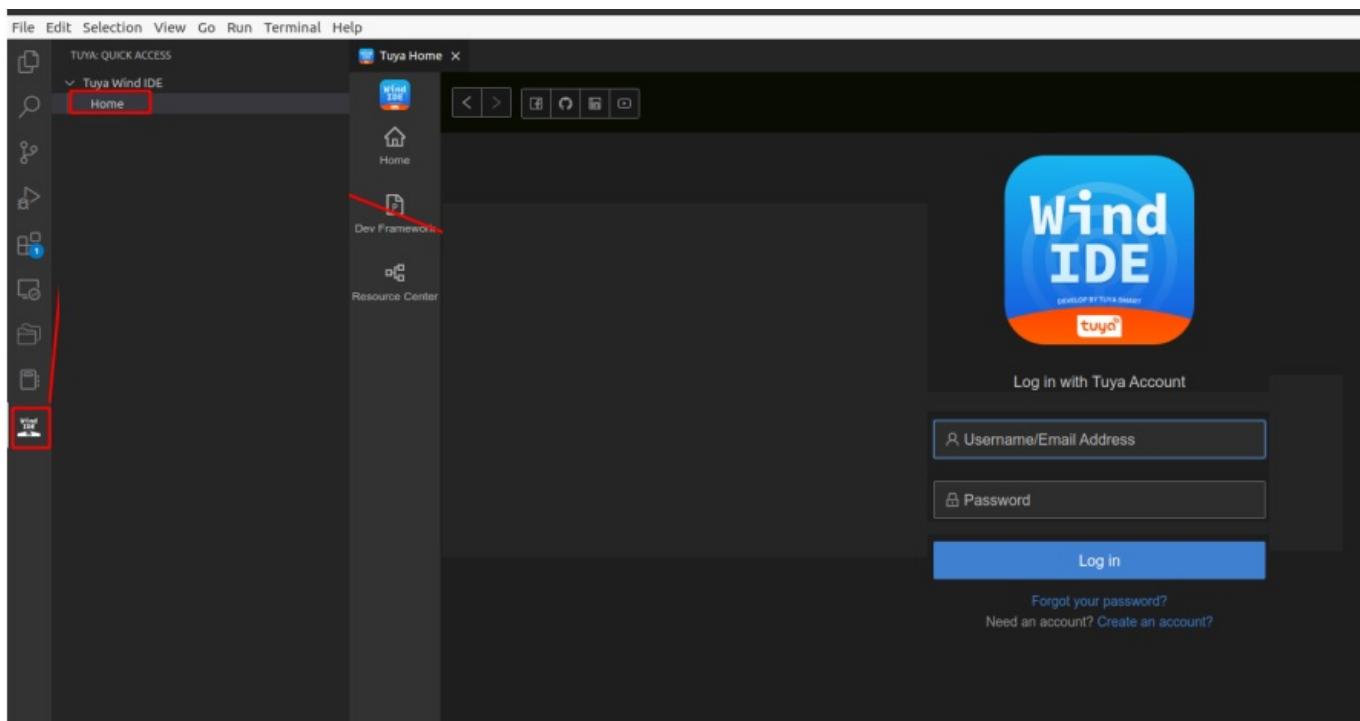
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**tuya Wind IDE**



## Product Information

Tuya Wind IDE (integrated development environment) is an extension of Visual Studio Code (VS Code) available in English and Chinese. It provides comprehensive facilities to TuyaOS EasyGo developers, managing, distributing, and updating the TuyaOS EasyGo development kits for a consistent development experience across hosts and programming tools.

## Product Instructions

### *Installation Instructions*

#### **Installation Environment:**

- Install VM software (VirtualBox or VMware) and create a VM.
- Install Ubuntu 18.04 or 20.04 on the VM with recommended RAM set to 8GB.

#### **Prerequisites:**

##### **Step 1:** Install Linux VM Environment:

1. Install VM software and create a VM with Ubuntu 18.04 or 20.04.
2. Set VM RAM to 8GB.

##### **Step 2:** Enable SSH Login Without Password:

1. For Windows 10 or 11, configure SSH login without password by running commands in PowerShell.

#### **Install IDE:**

1. Log in to Tuya Wind IDE using your Tuya Developer Platform account.

2. Download the development framework.
3. Create an application, build it, clean the build, flash firmware, and debug as needed.

## FAQ

- **Q:** What does Tuya Wind IDE provide to developers?
  - **A:** Tuya Wind IDE offers comprehensive facilities for TuyaOS EasyGo developers, managing, distributing, and updating development kits for a consistent experience.
- **Q:** How can I enable SSH login without a password for Windows hosts?
  - **A:** You can configure SSH login without a password on Windows hosts by running specific commands in PowerShell.

Tuya Wind IDE (integrated development environment) provides comprehensive facilities to TuyaOS EasyGo developers.

## Background

Tuya Wind IDE is provided as an extension of Visual Studio Code (VS Code) and is available in both English and Chinese. You log in to this IDE with the account of the [Tuya Developer Platform](#). Tuya Wind IDE manages, distributes, and updates the TuyaOS EasyGo development kits, enabling a consistent development experience across hosts and programming tools.

## Installation environment

**Tuya Wind IDE supports the following environments:**

- **Linux virtual machine (VM) on Windows host, or Linux VM:** used for developing most networked products, cellular products, gateways, control panels, IP cameras (IPCs), and network video recorders (NVRs).
- **Windows:** used for developing most sub-devices.
- **macOS:** only supports browsing and permission request for TuyaOS development frameworks, not for downloading.

## Prerequisites

### info

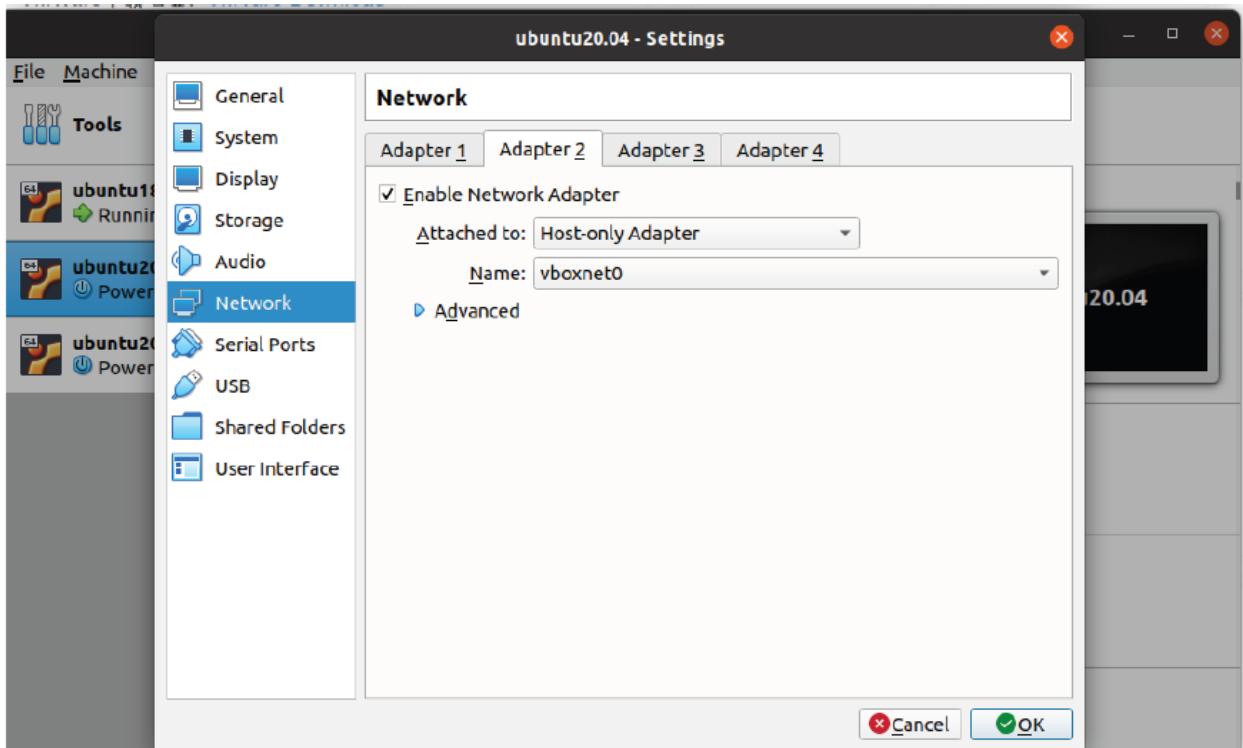
- If you use a Linux virtual machine (VM) on a Windows host throughout the development, see Step 1: Install Linux VM environment and then see the section Install IDE for the following operations.
- If you use a Linux host (or VM) or a Windows system throughout the development, skip Step 1: Install Linux VM environment.

### Step 1: Install Linux VM environment

Install VM software, VirtualBox or VMware, and create a VM. Install Ubuntu 18.04 or 20.04 on the VM. It is recommended to set the RAM of the VM to 8G.

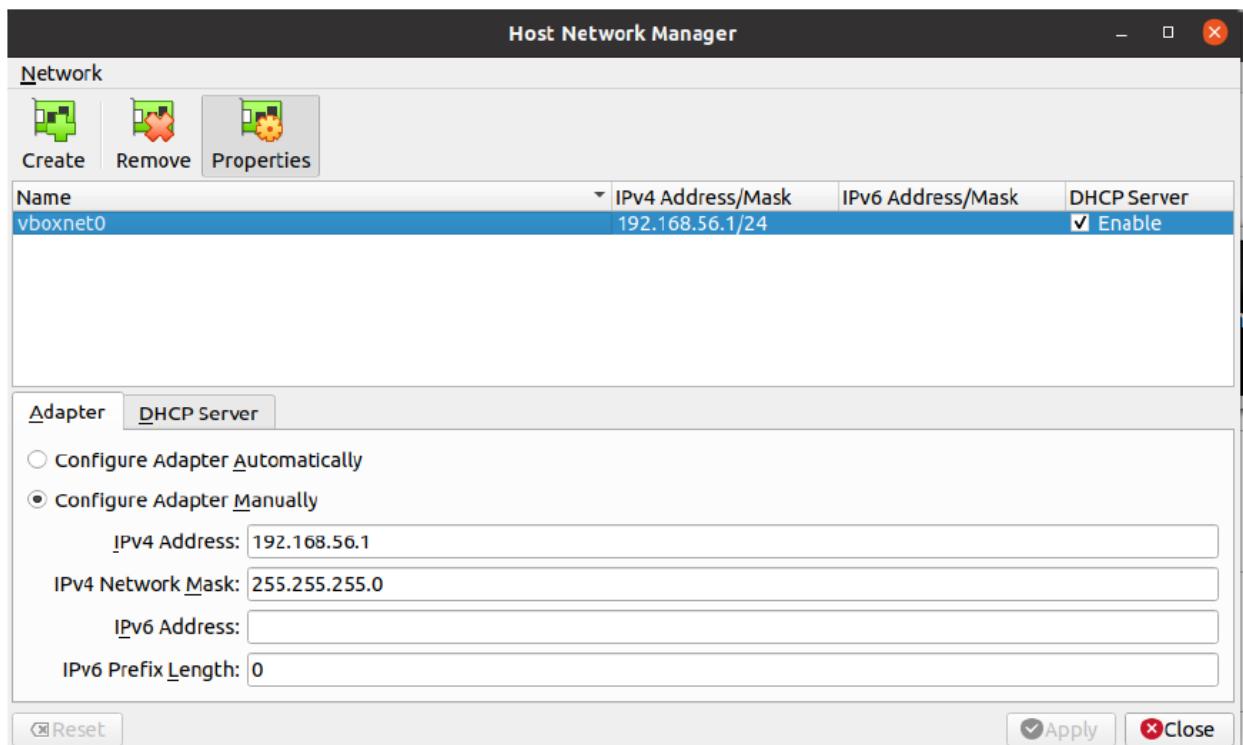
- VirtualBox:

1. If you use VirtualBox, set the Adapter 2 to Host-only Adapter to ensure VS Code on Windows can connect to the VM via SSH.

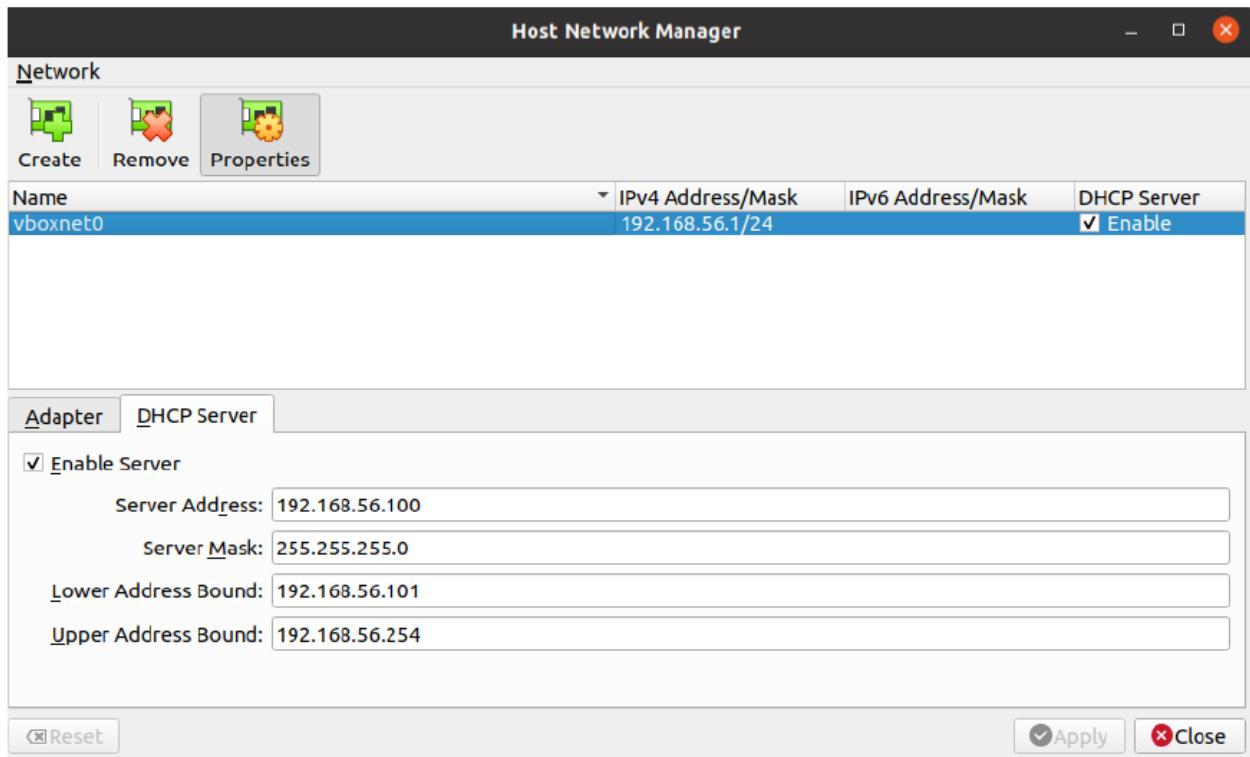


**Figure 1:** img

2. If you cannot create Host-only Adapter, on the main VirtualBox window, choose File > Host Network Manager and configure as shown below. Or visit [this website](#) for troubleshooting.



**Figure 2:** img



**Figure 3:** img

- Power on your VM and get the IP address of your VM.

```
vscode@vscode-VirtualBox:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
        inet6 fe80::8fe3:a1cd:8102:4b7b prefixlen 64 scopeid 0x20<link>
          ether 08:00:27:a2:b1:45 txqueuelen 1000 (Ethernet)
            RX packets 186 bytes 159092 (159.0 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 153 bytes 20513 (20.5 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.56.105 netmask 255.255.255.0 broadcast 192.168.56.255
        inet6 fe80::9491:d0ec:7ed2:a8ab prefixlen 64 scopeid 0x20<link>
          ether 08:00:27:83:56:eb txqueuelen 1000 (Ethernet)
            RX packets 6 bytes 1019 (1.0 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 39 bytes 5027 (5.0 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
            RX packets 156 bytes 13436 (13.4 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 156 bytes 13436 (13.4 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

**Figure 4:** img

- Install the necessary software on the virtual machine.

```
1 sudo apt install openssh-server openssh-client build-essential
      lib32
2 stdc++6
```

If you only use a Linux VM throughout the development, see the section [Install IDE](#) for the following operations.

## Step 2: Enable SSH login without password

- Windows 10 or 11 has a built-in SSH client.
- On the Windows host, run the following commands in PowerShell to configure an SSH login without password.
- Assume the username of the VM is vscode.
- The IP address of the VM is 192.168.56.105.

1. Generate an SSH key.

```
1 ssh-keygen -t rsa -b 4096
```

2. Specify the username and IP address of your VM.

```
1 $USER_AT_HOST="vscode@192.168.56.105"
```

3. Specify the location where the public key to upload resides.

```
1 $PUBKEYPATH="$HOME\.ssh\id_rsa.pub"
```

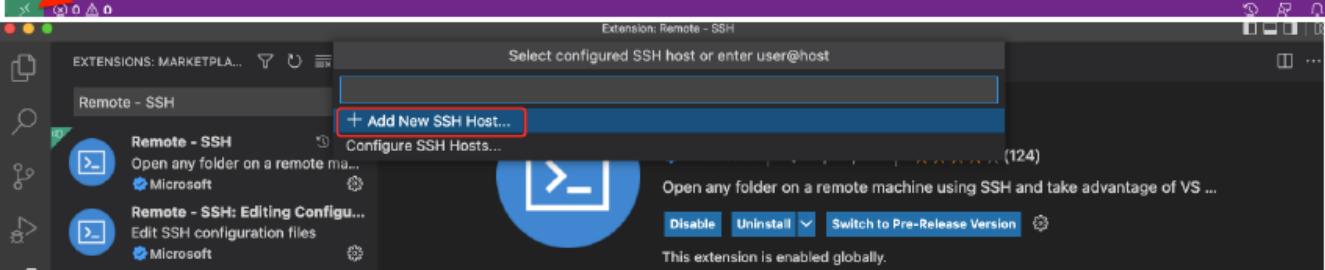
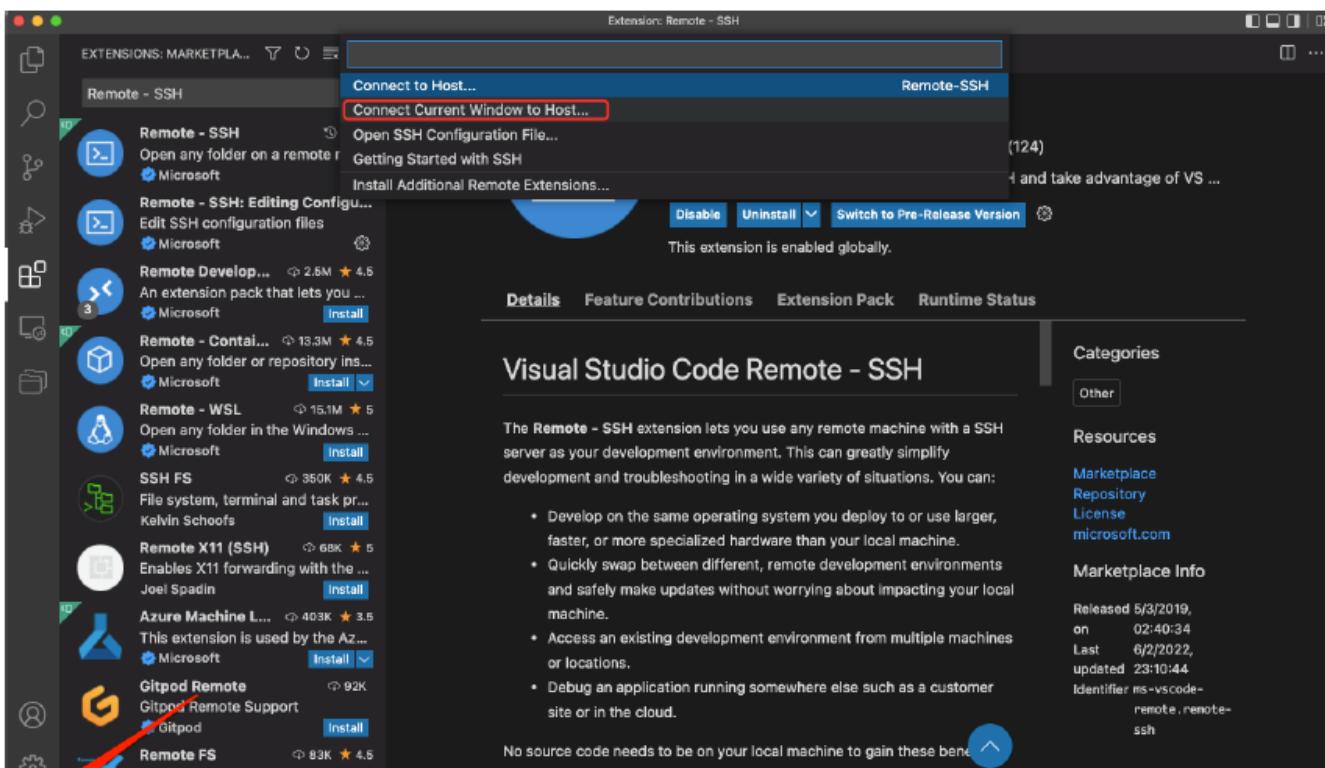
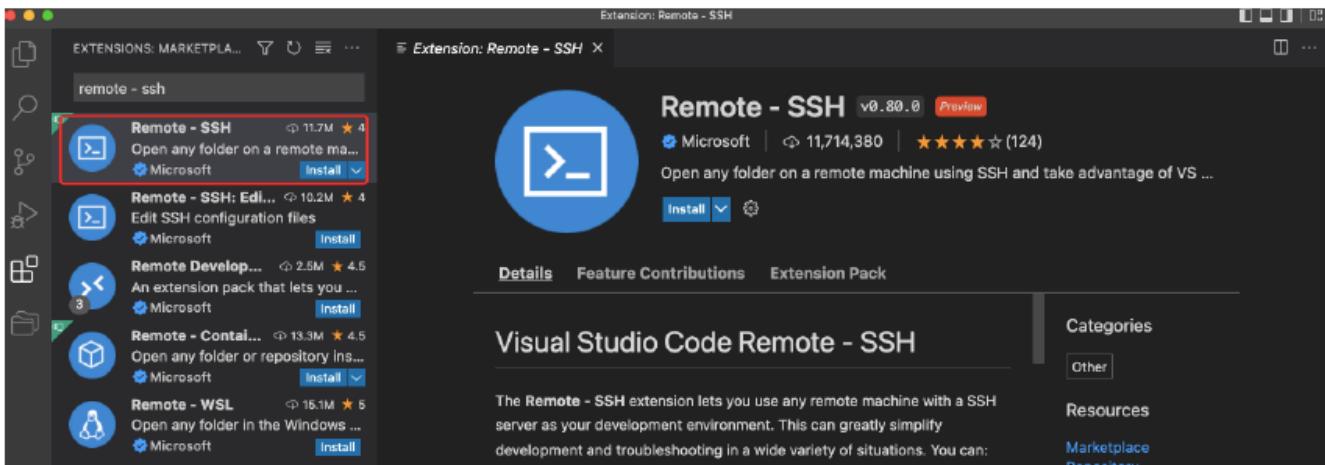
4. Register the public key. You are required to enter the username and password of the server.

```
1 $pubKey=(Get-Content "$PUBKEYPATH" | Out-String); ssh "$USER_AT_HOST"  
2 " "mkdir -p ~/.ssh && chmod 700 ~/.ssh && echo '$pubKey' >> ~/.ssh  
3 /authorized_keys && chmod 600 ~/.ssh/authorized_keys"
```

```
PS C:\Users\york.wang> $USER_AT_HOST="vscode@192.168.56.105"  
PS C:\Users\york.wang> $PUBKEYPATH="$HOME\.ssh\id_rsa.pub"  
PS C:\Users\york.wang> $pubKey=(Get-Content "$PUBKEYPATH" | Out-String); ssh "$USER_AT_HOST" "mkdir -p ~/.ssh && chmod 700 ~/.ssh && echo '$pubKey' >> ~/.ssh/authorized_keys && chmod 600 ~/.ssh/authorized_keys"  
PS C:\Users\york.wang>
```

## Step 3: Install Remote SSH extension

1. Install and open VS Code.
2. Click Extensions in the left navigation pane. Search for and install Remote – SSH.



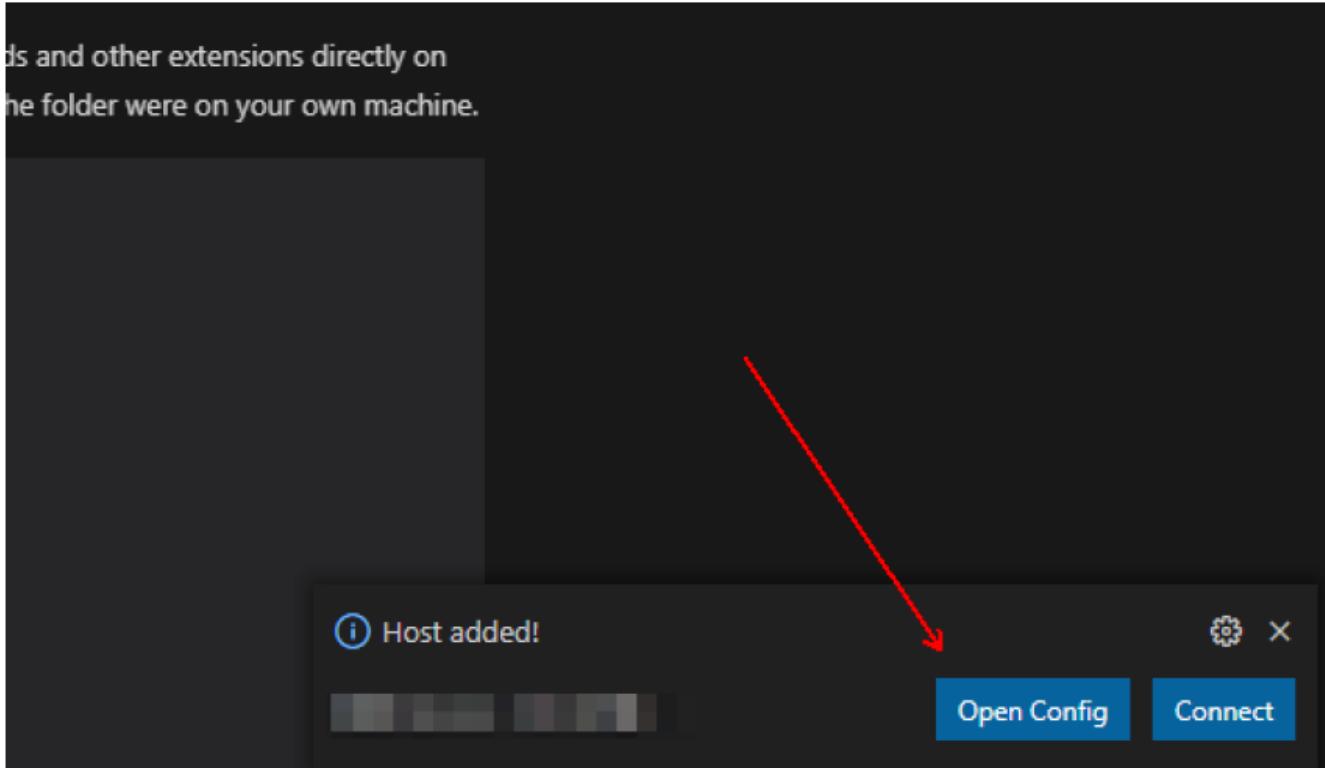
3. Set up and connect to SSH. This example uses the IP address 192.168.56.105.

Extension: Remote - SSH

Enter SSH Connection Command

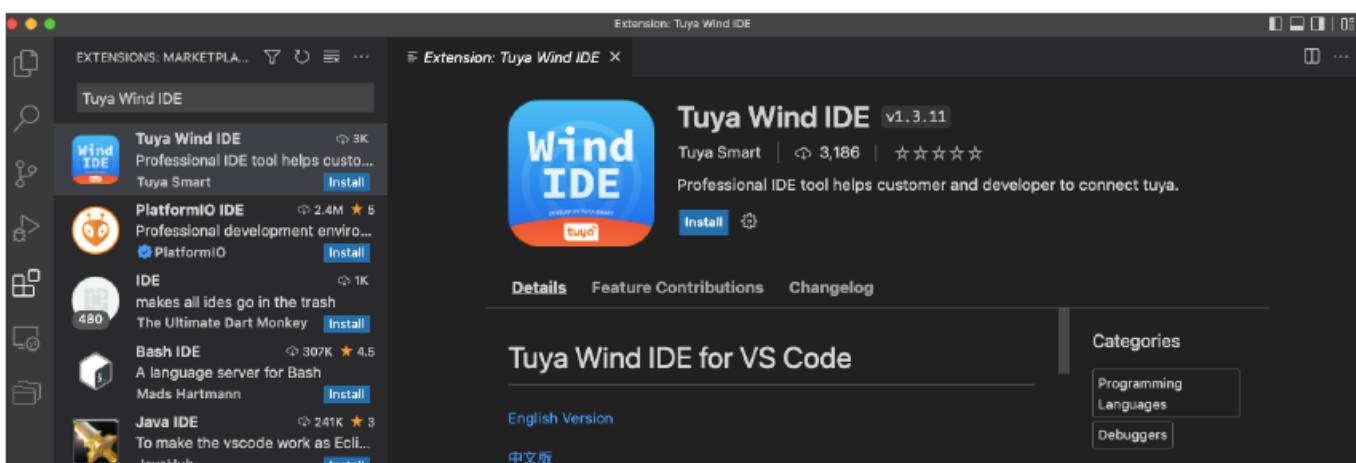
ssh vscode@192.168.56.105

Press 'Enter' to confirm your input or 'Escape' to cancel



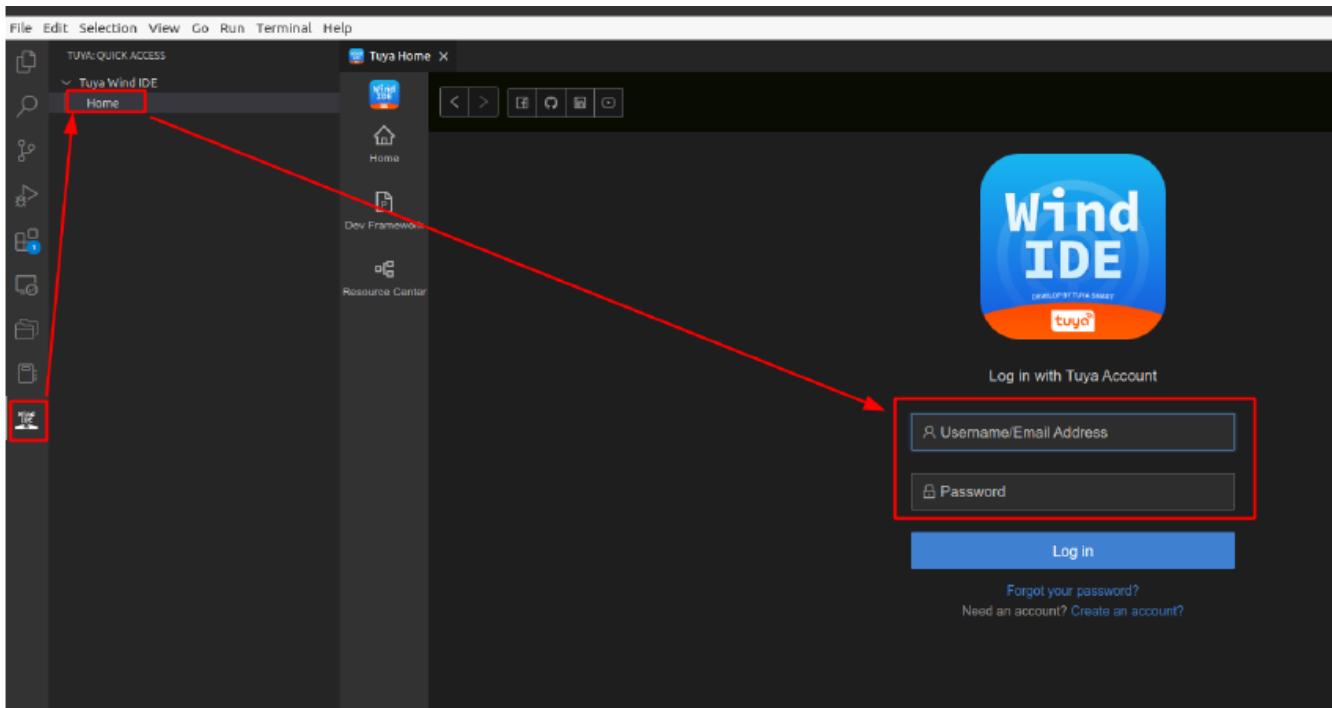
## Install IDE

- Install [VS Code](#) on your Windows computer.
- Open VS Code. Search for and install Tuya Wind IDE as shown in the following figures.



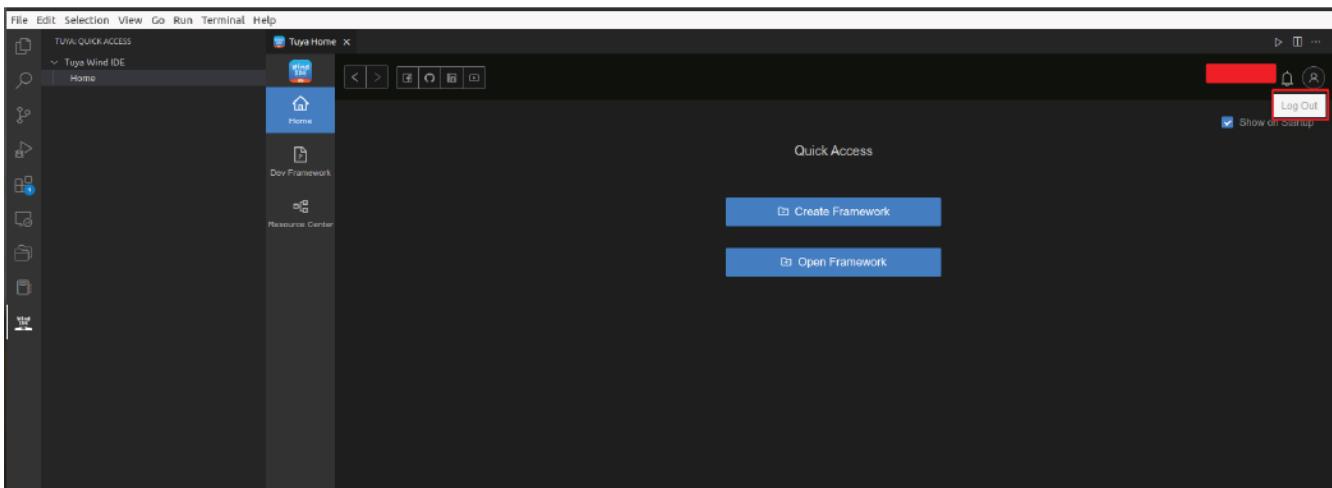
## Log in

- Open the login page as shown in the following figure. Log in to the IDE with the account of the [Tuya Developer Platform](#).



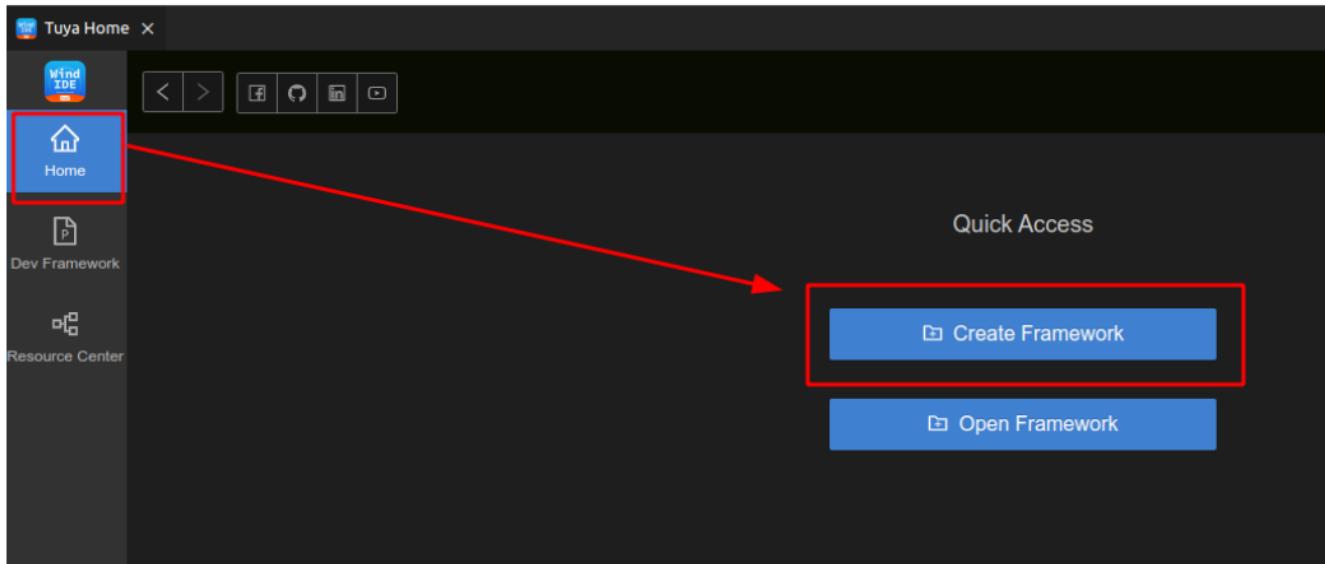
## Log out

- Click the account icon in the top right corner and click Log Out.



## Download development framework

- Choose Home > Create Framework.



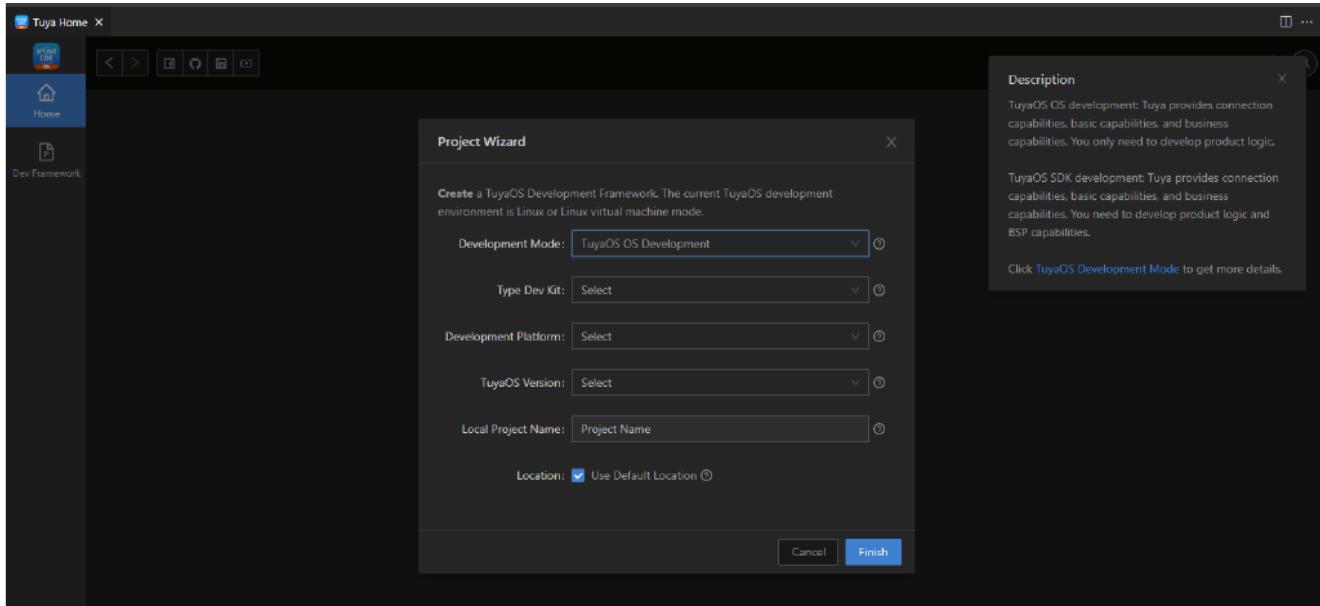
Complete the required fields on the TuyaOS Framework Wizard. The following table lists the parameters and their description.

Parameter	Description
Development mode	<p><b>OS mode:</b> Tuya has adapted programs to chip platforms. You can directly focus on application development using the provided development kit.</p> <p><b>What is in the development kit:</b> development kit, tool, and kernel.</p>
	<p><b>What to develop:</b> application driver and application code.</p>
	<p><b>SDK mode:</b> Tuya provides the basic development kit that has the TuyaOS Kernel built in. You need to adapt to the target chip platform first before application development.</p> <p><b>What is in the development kit:</b> development kit and tool.</p>

	What to develop: Kernel, application driver, and application code.
Type development kit	Various development kits are provided in terms of development frameworks and application scenarios.
Development platform	The chip platform that a development framework supports. Choose the chip platform according to the processor, manufacturer, category, and model.
TuyaOS version	The version number is in the format <code>xx.xx.xx</code> .
Local project name	Give your project a name.
Location	Use the default location or enter a custom location. Note: If you use a custom location, make sure that you have the write permission for the specified directory.

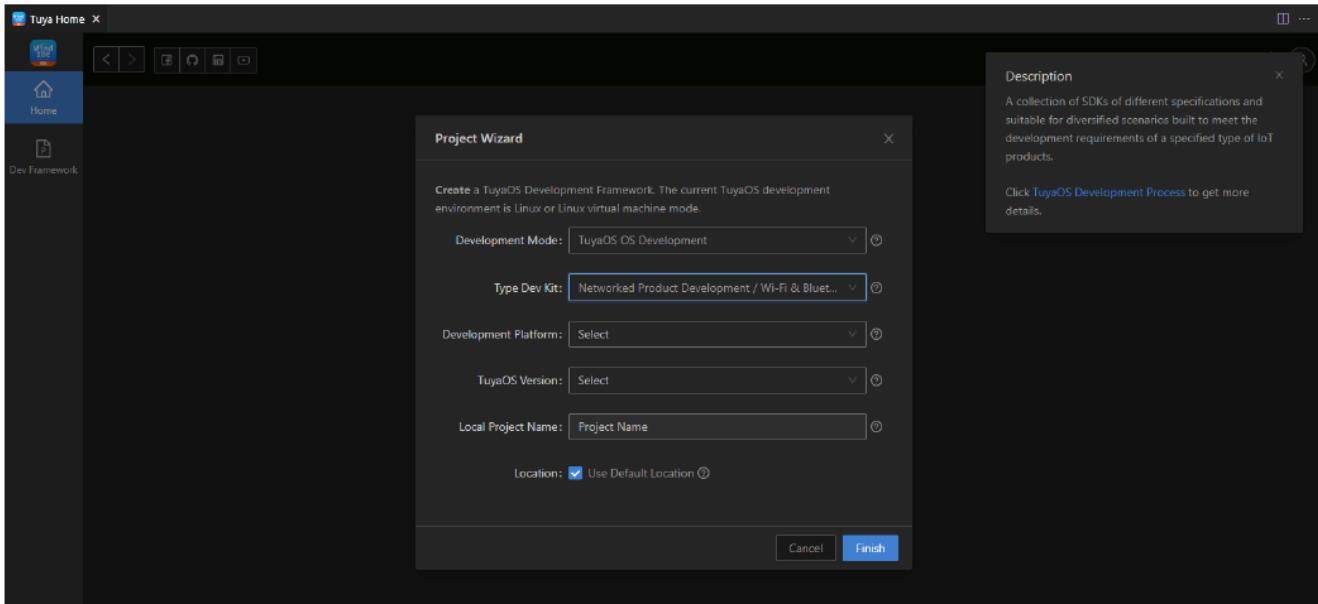
You can click the link in the pop-up window to learn more about the development mode and type development kit you choose.

- **Development framework:**



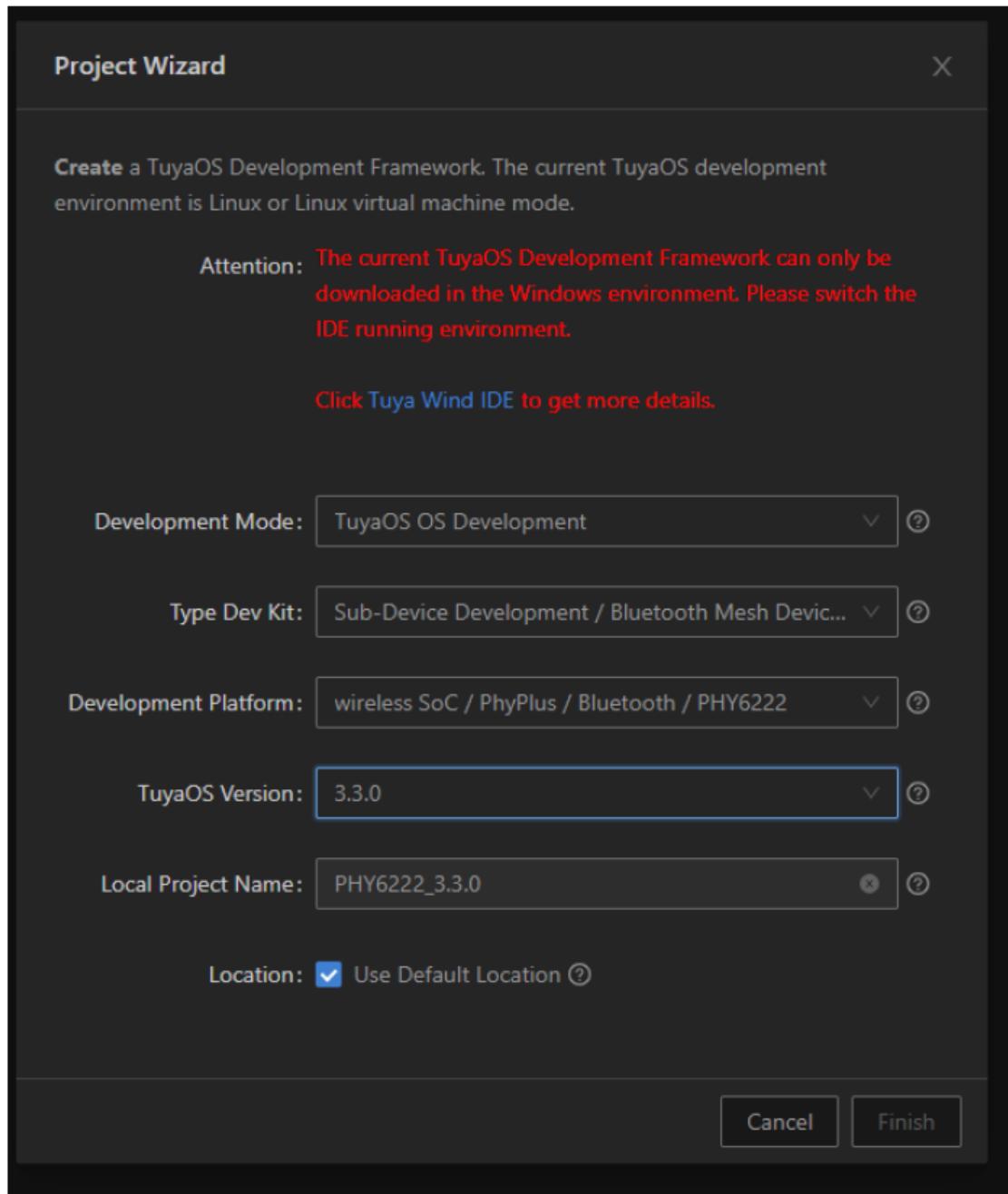
**Figure 5:** img

- **Type development kit:**



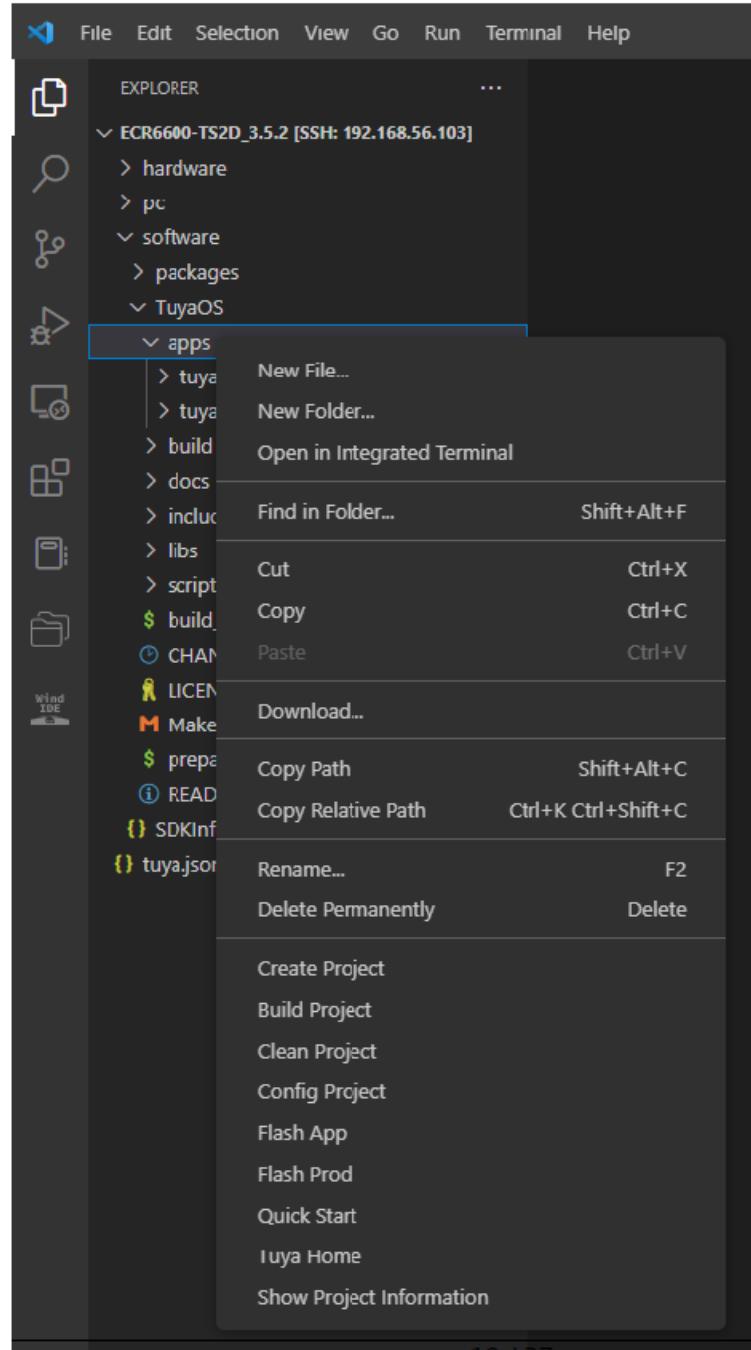
**Figure 6:** img

- Be sure to download the TuyaOS development framework in the correct development environment and use that framework accordingly. Click Finish to download the development kit.



**Figure 7:** img

## Context menu



**In the following table:**

- {project} represents the path of the current TuyaOS development framework.
- {project}/software/apps/{application} represents the path of the application of the current TuyaOS development framework.

Context menu	Feature	Scope
Create Project	Create an application.	{project}/software/apps
Build Project	Build the current application.	{project}/software/apps/{application}
Clean Project	Clean the build of the current application.	{project}/software/apps/{application}
Config Project	Configure the current application with a graphical interface (GUI). This action applies to product development kits that support dynamic configurations.	{project}/software/apps/{application}
Flash App/Flash Prod	Flash firmware to hardware. This action applies to Windows environments only.	{project}/software/apps/{application}
Quick Start	Development framework documentation.	{project}/software/subdirectory
Tuya Home	Log in or out of your account, and download or import a TuyaOS development framework.	{project}/software/subdirectory
Show Project Information	The information about all the development frameworks in the current VS Code workspace.	{project}/software/subdirectory

## Actions on development frameworks

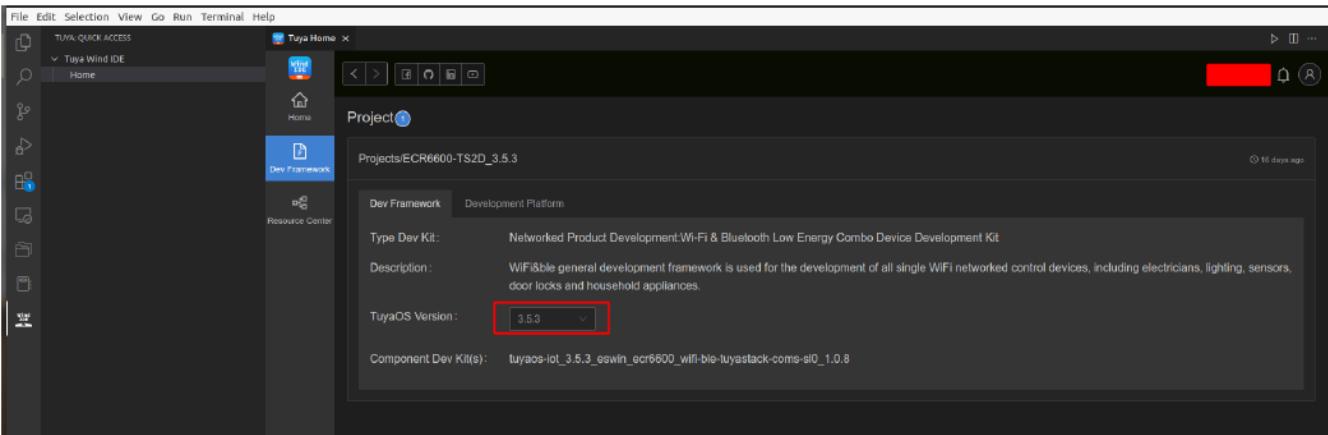
- You have a product development kit opened in the workspace.

Product Dev Kit Version	TuyaOS Version	Description	Version Description	Operation
0.0.18	3.7.1	It is applicable to Anyka platform	[IPC type development kit-ak3918ev330] 1. Fix the problem that the onvif component does not take effect after it is enabled	<button>Request Permission</button>
0.0.16	3.7.0	It is applicable to Anyka platform	[IPC product development kit-ak3918ev330] 1. Support visual configuration	<button>Download</button>

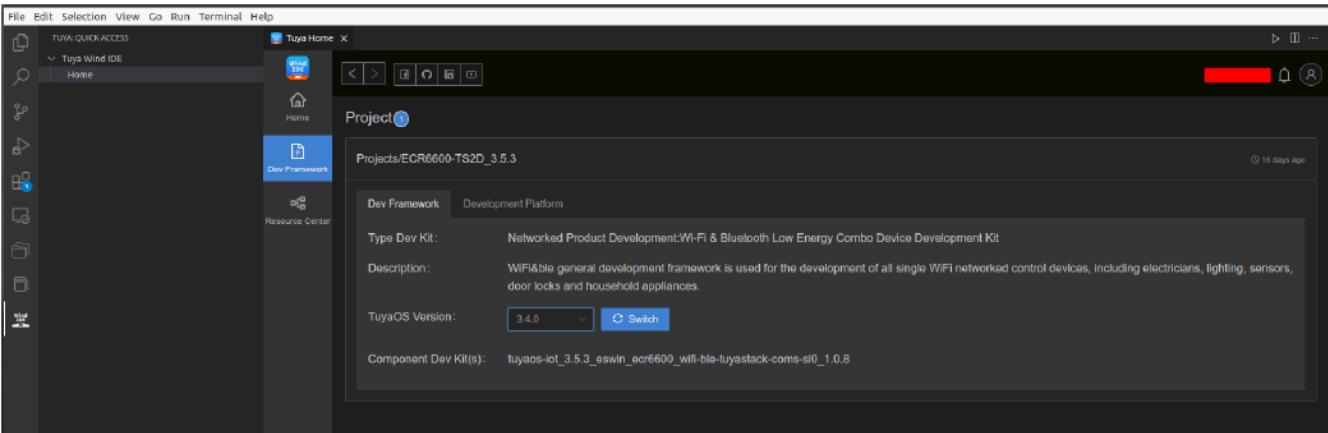
Expand the software directory in Explorer. Right-click on software or any subdirectory and choose Show Project Information. Click Development Framework in the left navigation pane of Tuya Home. The information about the development framework is displayed on the right side of the screen.

## Switch between development frameworks (Linux environment only)

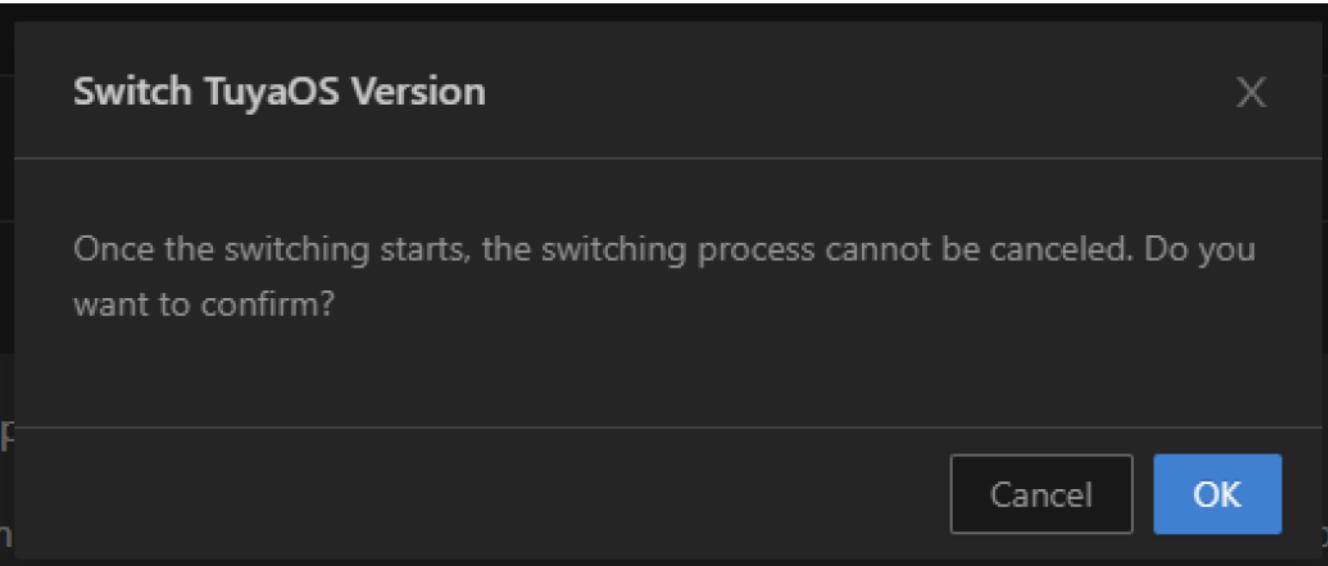
- If the development framework has multiple versions, you will see a drop-down menu next to TuyaOS Version.



- Select the desired TuyaOS version from the drop-down menu.

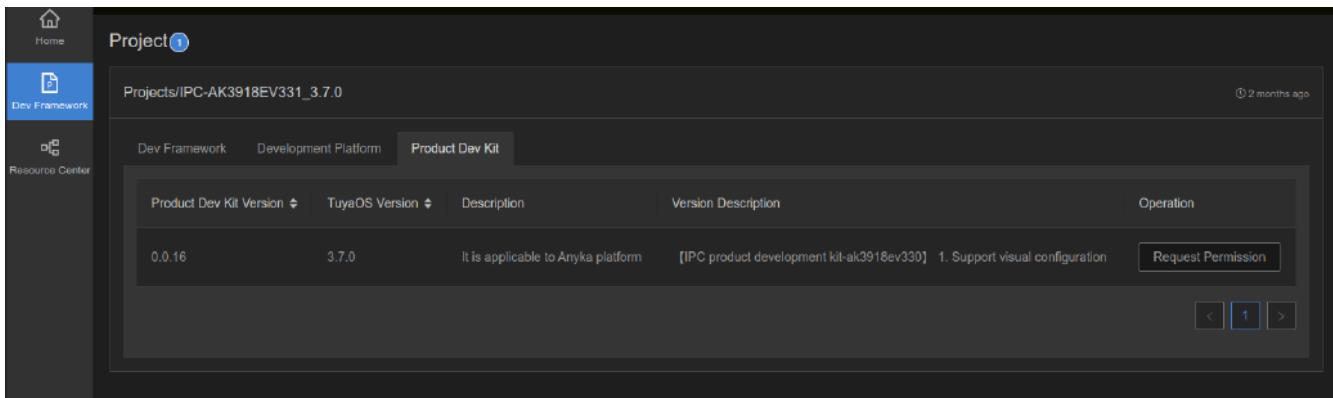


- Click Switch to change to that version.



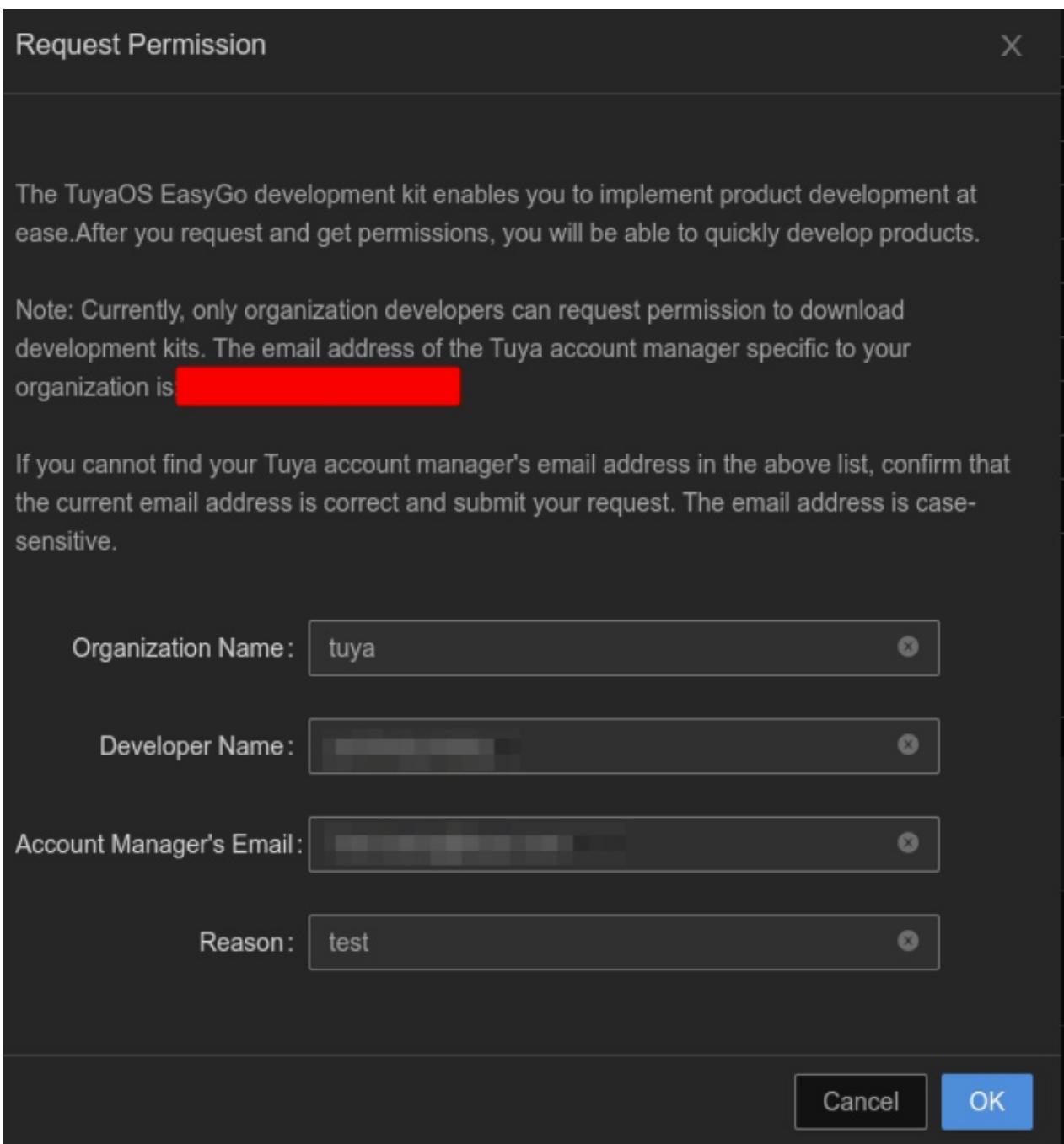
## Download product development kit

- If a TuyaOS development framework provides a product development kit to download, the Product Dev Kit tab will appear on the page of Dev Framework information.



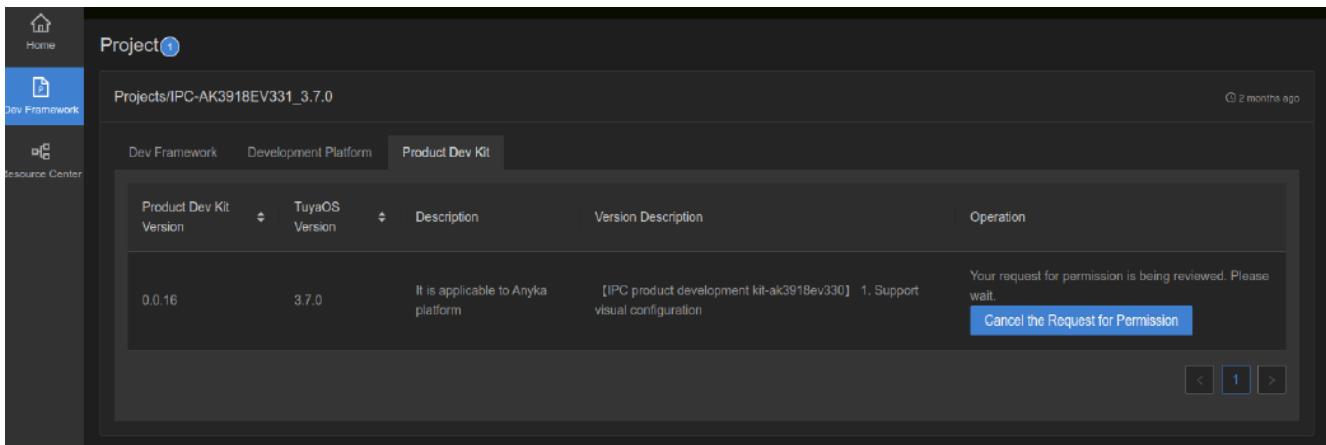
The screenshot shows a Project page with a table listing a Product Dev Kit. The table has columns: Product Dev Kit Version, TuyaOS Version, Description, Version Description, and Operation. The first row shows '0.0.16', '3.7.0', 'It is applicable to Anyka platform', '[IPC product development kit-ak3918ev330] 1. Support visual configuration', and a 'Request Permission' button. Navigation buttons for the table are at the bottom right.

- Click Request Permission and complete the required information accurately to get access to the product development kit.
  - Request Permission is only available to enterprise developers, so be sure to enter the correct email address of the account manager that you are in touch with. If you have questions about the required information, contact your account manager.



The dialog box has a title 'Request Permission' and a close button 'X'. It contains the following text: 'The TuyaOS EasyGo development kit enables you to implement product development at ease. After you request and get permissions, you will be able to quickly develop products.' Below this is a note: 'Note: Currently, only organization developers can request permission to download development kits. The email address of the Tuya account manager specific to your organization is [REDACTED]'. It then asks for the developer's information: 'Organization Name: tuya', 'Developer Name: [REDACTED]', 'Account Manager's Email: [REDACTED]', and 'Reason: test'. At the bottom are 'Cancel' and 'OK' buttons.

- After you submit the request, you will get a message saying Your request for permission is being reviewed. Please wait. You can Cancel the Request for Permission during the review process.



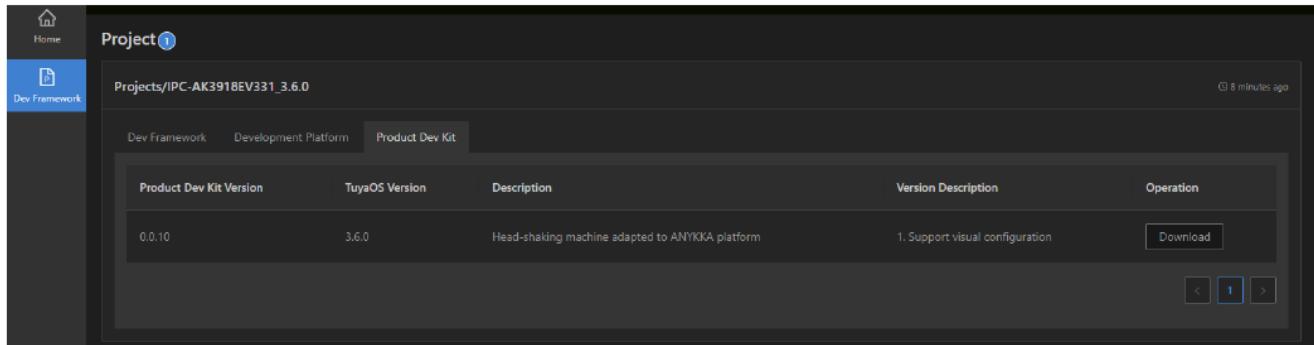
The screenshot shows a user interface for managing product development kits. The top navigation bar includes 'Home', 'Dev Framework' (which is the active tab), and 'Resource Center'. The main content area is titled 'Project 1' and shows a list for 'Projects/IPC-AK3918EV331\_3.7.0'. The 'Product Dev Kit' tab is selected. A table displays the following data:

Product Dev Kit Version	TuyaOS Version	Description	Version Description	Operation
0.0.16	3.7.0	It is applicable to Anyka platform	[IPC product development kit-ak3918ev330] 1. Support visual configuration	<p>Your request for permission is being reviewed. Please wait.</p> <p><a href="#">Cancel the Request for Permission</a></p>

At the bottom right of the table, there are navigation buttons: '<', '1' (highlighted in blue), and '>'.

**Figure 8:** img

- After approval, you can download the requested product development kit.

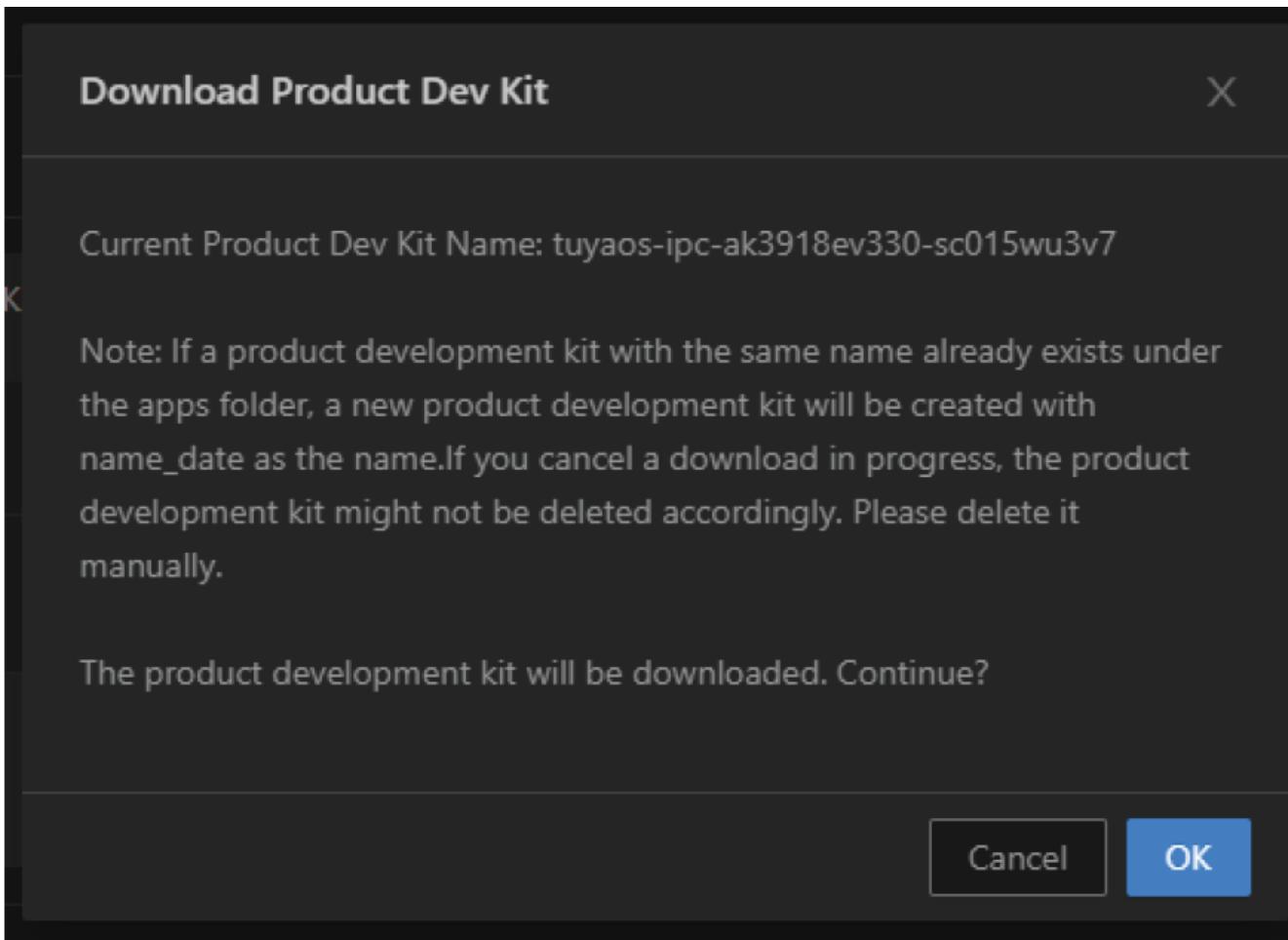


The screenshot shows the same interface as Figure 8, but the permission request has been approved. The table now includes a 'Download' button in the 'Operation' column for the first row.

Product Dev Kit Version	TuyaOS Version	Description	Version Description	Operation
0.0.10	3.6.0	Head-shaking machine adapted to ANYKKA platform	1. Support visual configuration	<a href="#">Download</a>

**Figure 9:** img

- The downloaded product development kit will be found in the directory software /TuyaOS/apps in the workspace.



**Figure 10:** img

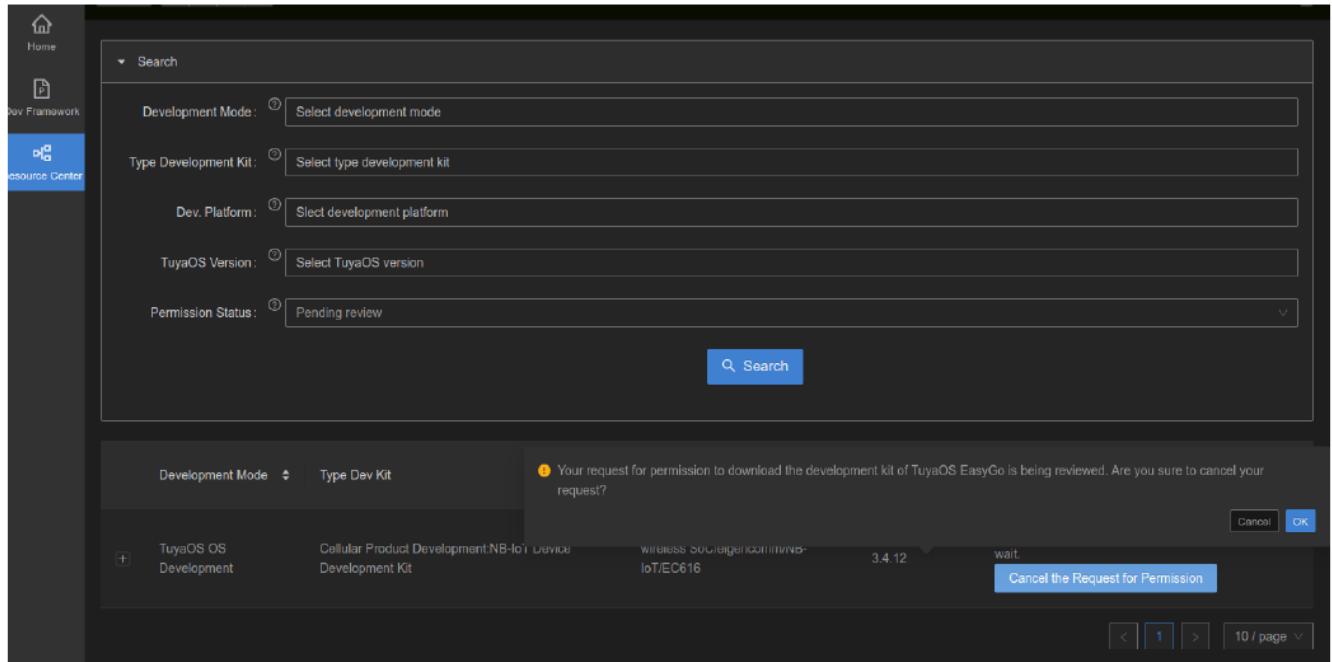
## View resource center

Development Mode	Type Dev Kit	Development Platform	TuyaOS Version	Permission Status
+ TuyaOS OS Development	Networked Product Development: Wi-Fi & Bluetooth Low Energy Combo Device Development Kit	wireless SoC/espwin/Wi-Fi/ECR6600-TS2D	3.5.3	Available for download
+ TuyaOS OS Development	Cellular Product Development: NB-IoT Device Development Kit	wireless SoC/eigencomm/NB-IoT/EC616	3.4.12	<button>Request Permission</button>
+ TuyaOS OS Development	Gateway Development: Gateway Device Development Kit	wireless SoC/realtek/Wi-Fi/RTL8197FS	3.3.12	<button>Request Permission</button>
+ TuyaOS OS Development	Sub-Device Development: Bluetooth Device Development Kit	wireless SoC/Beken/Bluetooth/BK3281	3.7.0	Available for download

- Click Search in the top left corner of the Resource Center screen to show or hide the search box. You can narrow down your search by using multiple search fields including Development Mode (multi-select), Type Development Kit (multi-select), Dev. Platform (multi-select), TuyaOS Version (multi-select), and Permission

Status (single-select). If you leave a field blank, no criteria are considered for that field in the search. The search results are displayed as a list below the search box. You can sort results by Development Mode, Type Dev Kit, Development Platform, or TuyaOS Version separately, or using weighted sorting.

- **Separate sorting:** Click a table header to sort by that field.
- **Weighted sorting:** The priority from high to low is Development Mode > Type Dev Kit > Development Platform > TuyaOS Version. Suppose that you have sorted the results by Development Mode. After you click Type Dev Kit, the results will be sorted by that field without changing the order of the Development Mode column. If you then click Development Platform, the results will be sorted by that field, with the order of Development Mode and Type Dev Kit columns unchanged.
- You can request permission to download a development kit of TuyaOS EasyGo and cancel a request that is in the review state. After your request is approved, the target development kit will be available to download.



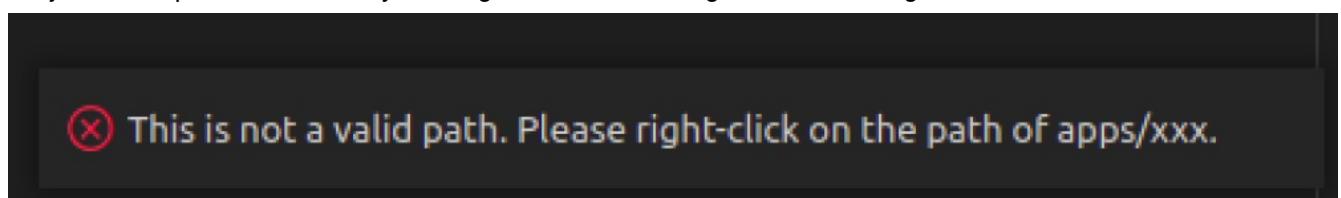
**Figure 11:** img

## Create an application

- Expand the software/TuyaOS/apps directory in Explorer. Right-click on the apps folder and choose Create Project.

## Build an application

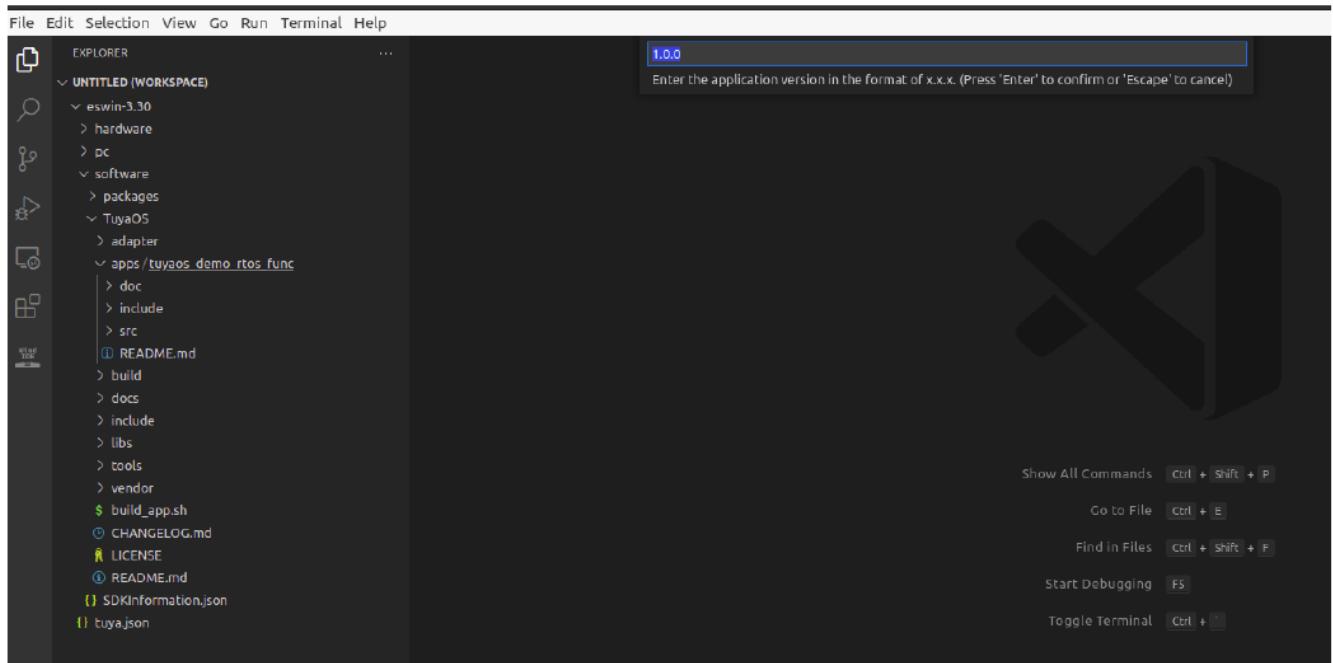
1. Expand the software/TuyaOS/apps/xxx directory in Explorer. Right-click on the xxx folder and choose Build Project. If the path is incorrect, you will get an error message in the lower right corner.



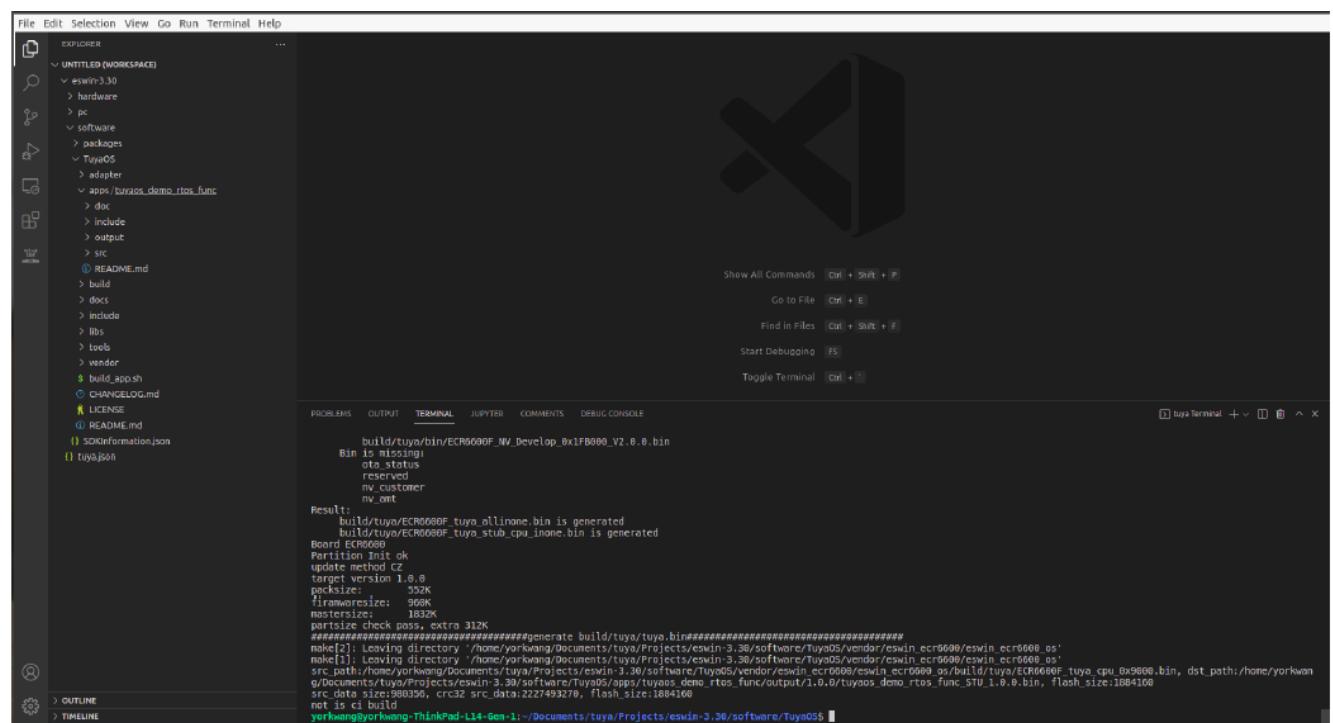
- **info:** If there is only one demo in the apps directory, the demo folder is shown behind the apps directory in Explorer due to the design of VS Code. You need to choose and right-click on the subdirectory of apps. Otherwise, you will get an error message in the lower right corner.

2. Choose Build Project, enter the version number of the build in the format x.x.x, and hit the Enter key to confirm.

The version number of the application for Bluetooth mesh and Beacon takes the format x.x and for other protocols, x.x.x is used.

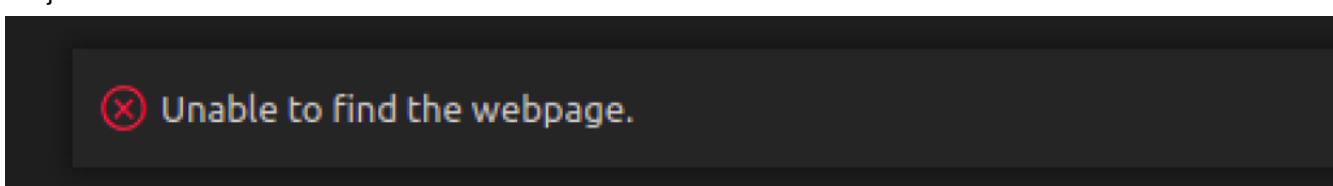


3. Wait for the IDE terminal to download the toolchain and build the project. The directory where the built firmware resides is shown in the terminal window.



## Clean a build

1. Expand the software/TuyaOS/apps/xxx directory in Explorer. Right-click on the xxx folder and choose Clean Project.

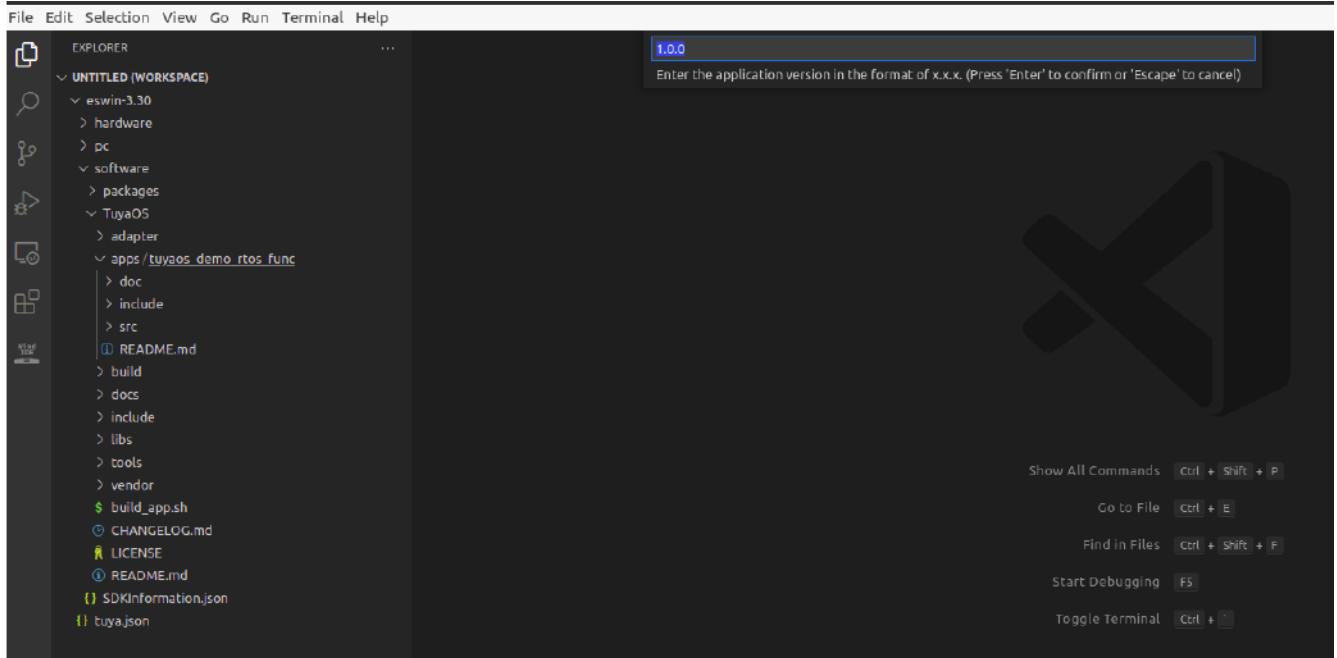


- **Info:** If there is only one demo in the apps directory, the demo folder is shown behind the apps directory

in Explorer due to the design of VS Code. You need to choose and right-click on the subdirectory of apps.

Otherwise, you will get an error message in the lower right corner.

2. Choose Clean Project, enter the version number of the build in the format x.x.x, and hit the Enter key to confirm. The version number of the application for Bluetooth mesh and Beacon takes the format x.x and for other protocols, x.x.x is used.

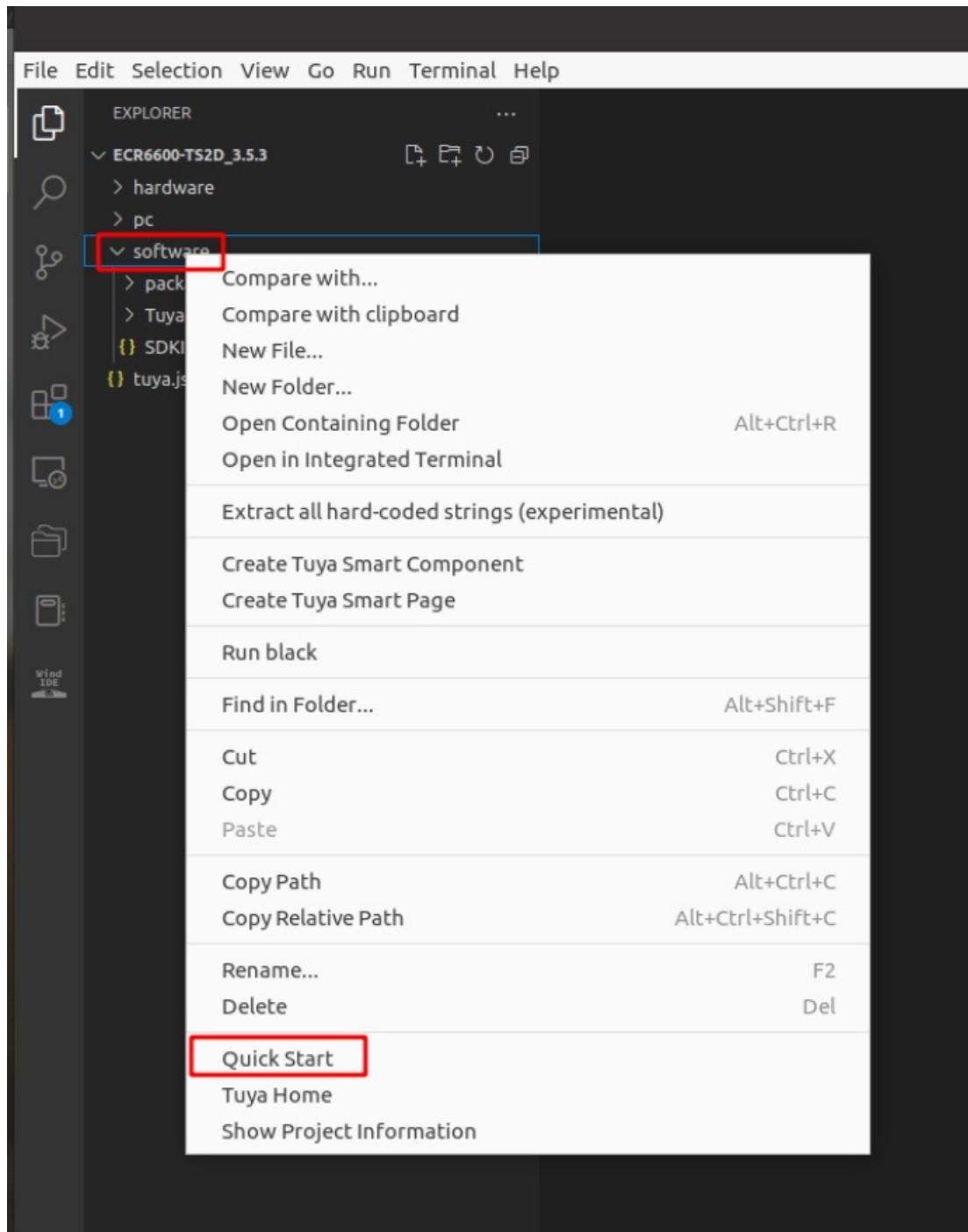


## Flash firmware

- If your environment is a Linux virtual machine on Windows, find the flashing tool in the pc/tools directory. You can use the provided tools for firmware flashing and verification on Windows.
- You can use the Flash App and Flash Prod features on the context menu to flash the firmware.
- Expand the software/TuyaOS/apps/xxx directory in Explorer. Right-click on the xxx folder and choose Flash App.
  - Flash App erases data on the user area.
- Expand the software/TuyaOS/apps/xxx directory in Explorer. Right-click on the xxx folder and choose Flash Prod.
  - Flash Prod erases all the data.

## View TuyaOS documentation

1. Right-click on software or other subdirectories and choose Quick Start.



2. TuyaOS documentation navigation appears.

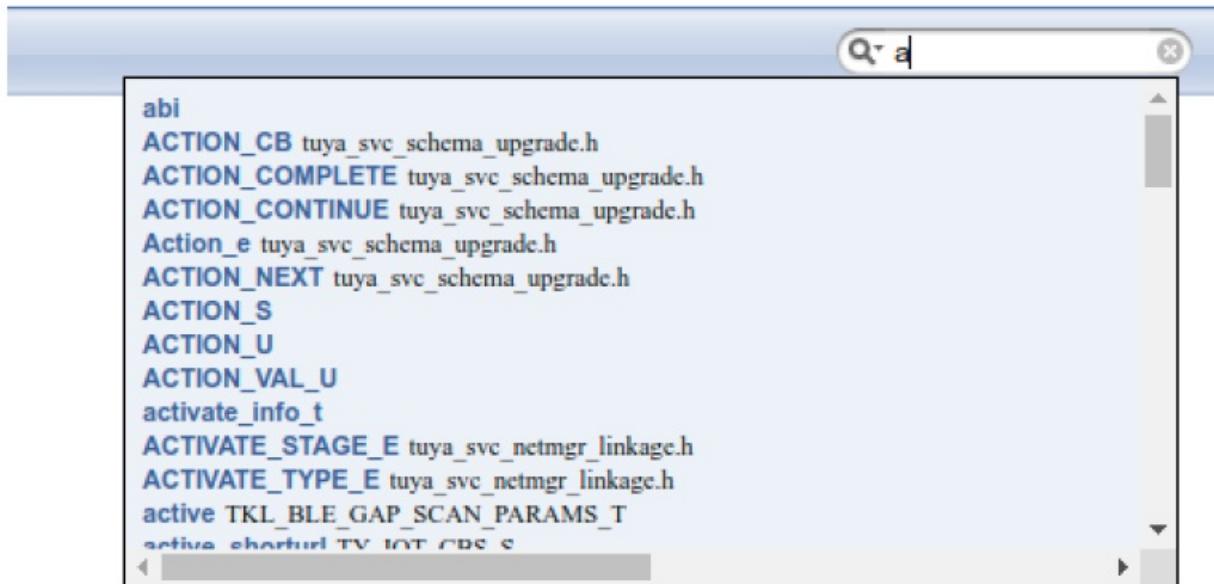


#### TuyaOS development documentation includes:

- **hardware directory:** documentation for embedded software development.
- **pc/tools directory:** documentation for programs running on the host, such as the flashing tool.
- **software directory:** documentation for demos and APIs.

#### What you can do:

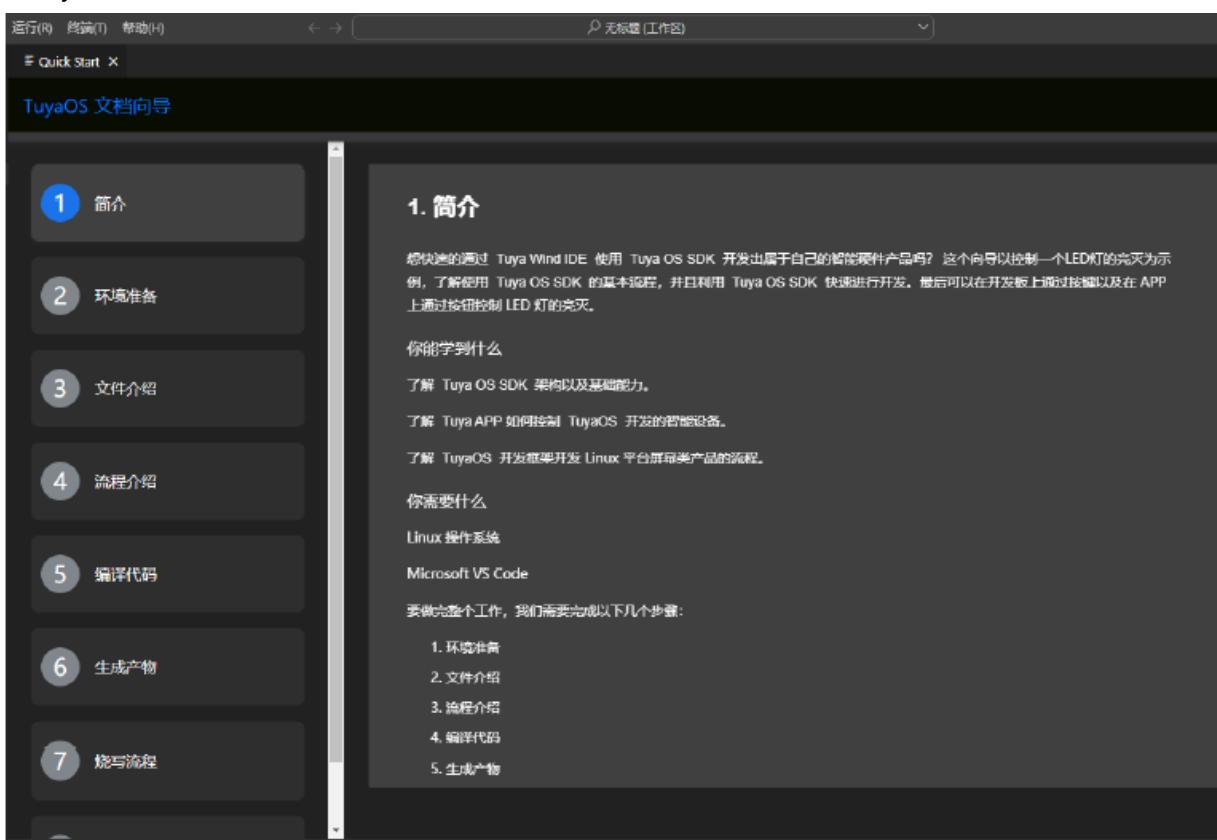
- You can always go back to the documentation hub page by clicking TuyaOS Documentation Navigation in the top left corner.
- Check TuyaOS API documentation.



```
abi
ACTION_CB tuya_svc_schema_upgrade.h
ACTION_COMPLETE tuya_svc_schema_upgrade.h
ACTION_CONTINUE tuya_svc_schema_upgrade.h
Action_e tuya_svc_schema_upgrade.h
ACTION_NEXT tuya_svc_schema_upgrade.h
ACTION_S
ACTION_U
ACTION_VAL_U
activate_info_t
ACTIVATE_STAGE_E tuya_svc_netmgr_linkage.h
ACTIVATE_TYPE_E tuya_svc_netmgr_linkage.h
active TKL_BLE_GAP_SCAN_PARAMS_T
active_struct TV_IOT_CPC_C
```

**Figure 12:** img

- Check TuyaOS demo documentation.



**Figure 13:** img

### Directory structure of API reference

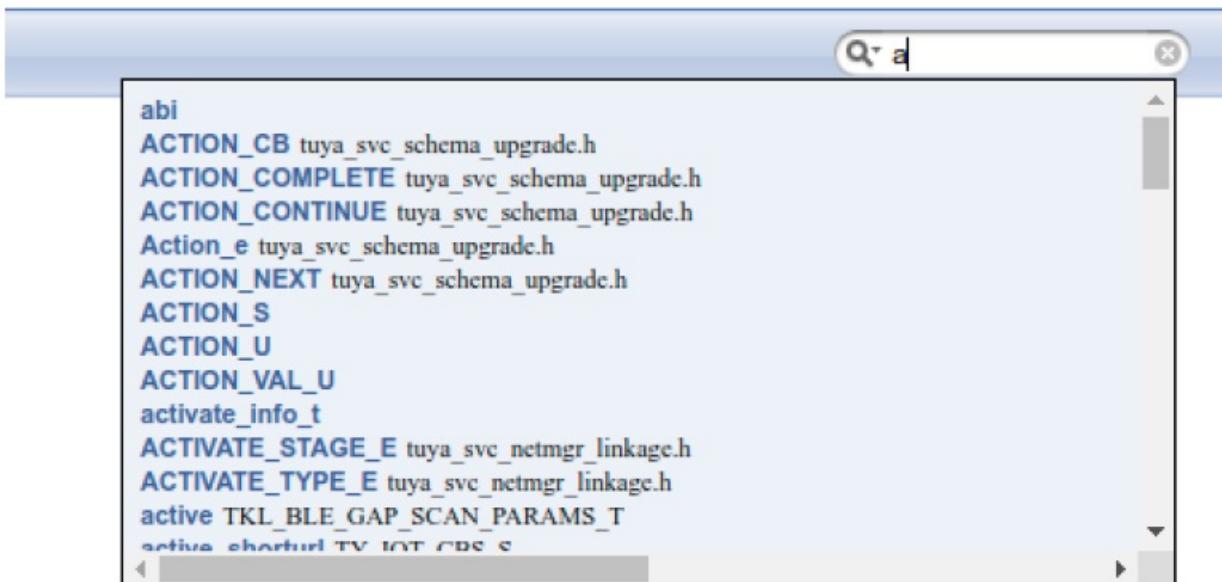
- **Homepage:** describes the current development kit.
- **Related webpages/developer guide:** describes the development process, process diagram, and things to note.
- **Struct:** provides information about the structs for use.

- **Files:** describes functions, definitions, enumeration, macros, and more.
- **Search box:** searches for any information about development with global search (default) and filters (such as structs and files).



**Figure 14:** img

- Fuzzy search is supported. For example, if you enter the character a, all relevant information will be returned.



**Figure 15:** img

## Debug

Install a preferred debugging extension on VS Code.

- [GDB Debugger](#)
- [Cortex-Debug](#)

## Documents / Resources

 Tuya Wind IDE Version: 2020.01	<p><a href="#"><u>tuya Wind IDE [pdf] User Guide</u></a> Wind IDE, Wind, IDE</p>
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## References

-  [Creating a New Host-Only Adapter in VirtualBox - School of Computer Science](#)
-  [Download Visual Studio Code - Mac, Linux, Windows](#)
-  [Cortex-Debug - Visual Studio Marketplace](#)
-  [Tuya Smart Developer Center](#)
- [User Manual](#)

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