User Guide of DR185s-G SDK

A Software Development Kit (SDK) is a collection of development tools for a specific platform or system. It provides developers with the core resources and capabilities needed to build, test, and deploy applications.

Document Introduction

This document aims to guide users on how to use the SDK to compile custom firmware for **USR-DR185s-G** .

Example Environment and Resources:：

- **Target Device**：USR-DR185s-G
- **OS**：Ubuntu 24.04.3 LTS（Download）
- **VMWARE 17**：VMware Workstation Pro 17（Download）
- **SDK**：SDK for the target router （Download）

Note：The initial firmware compilation may take a considerable amount of time (typically several hours) as all dependency packages need to be built. Subsequent compilation will be significantly

faster due to incremental builds. Actual compilation time depends on the hardware performance of your computer.

1. Prerequisites

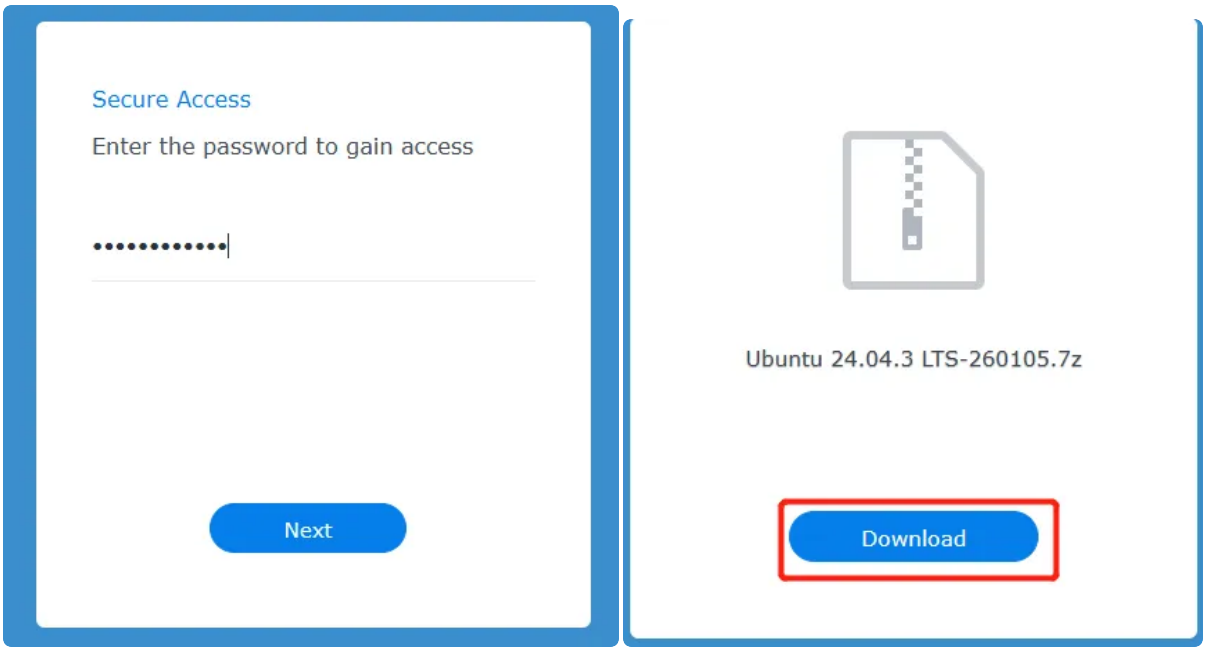
Before you begin, ensure the following conditions are met:

- **Linux Environment**：A physical machine or virtual machine with a Linux operating system installed. Ubuntu 24.04.3 LTS or a newer version is recommended.
- **Target Router**：USR-DR185s-G.
- **Software Development Kit**：SDK suitable for the target router.

2. VMware virtual machine

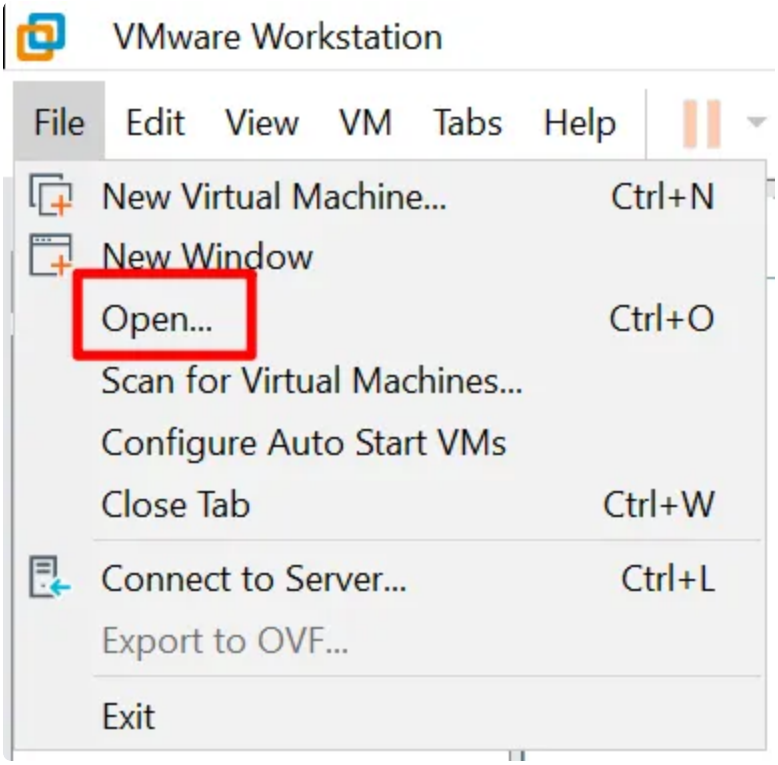
If you don't want to install the Ubuntu system by yourself, PUSR offers a VMware virtual machine. Users can simply download the files and directly open and use them in VMware.

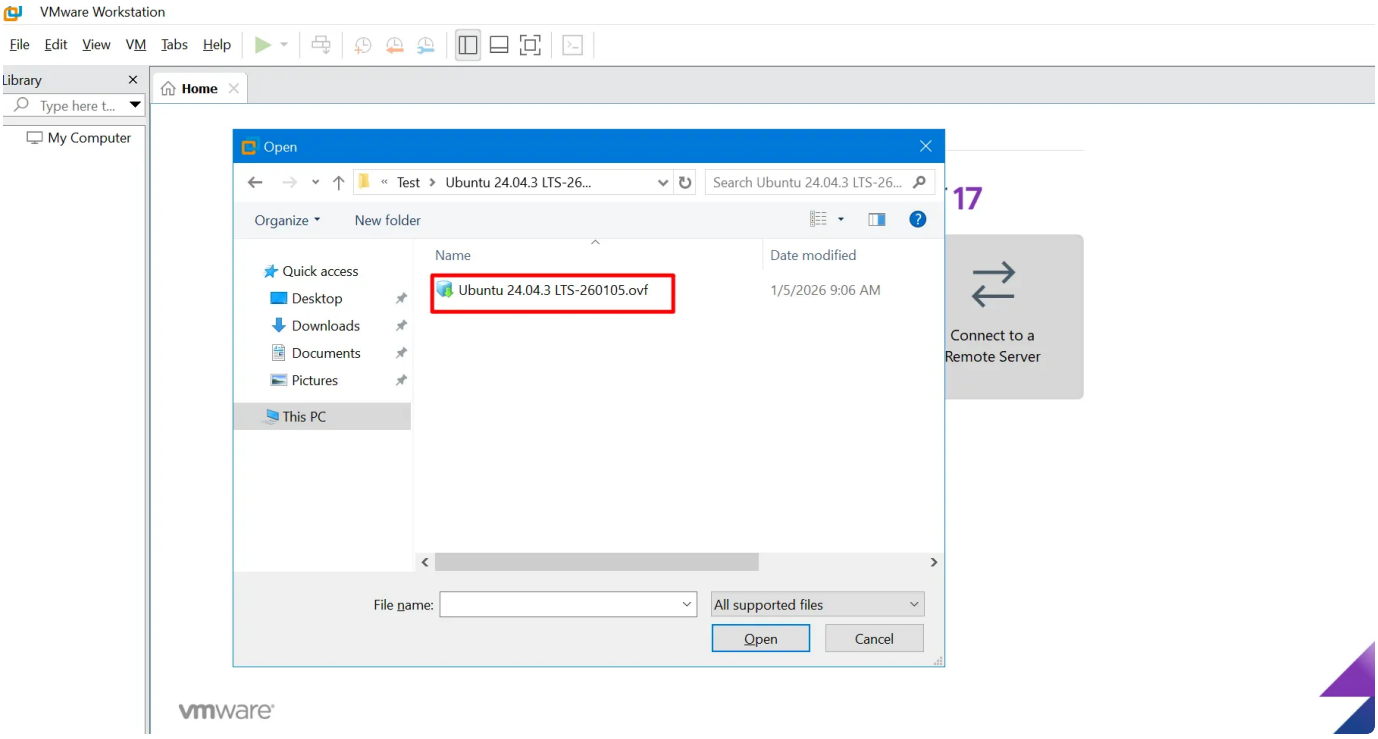
1. Download: Download, password: www.pusr.com

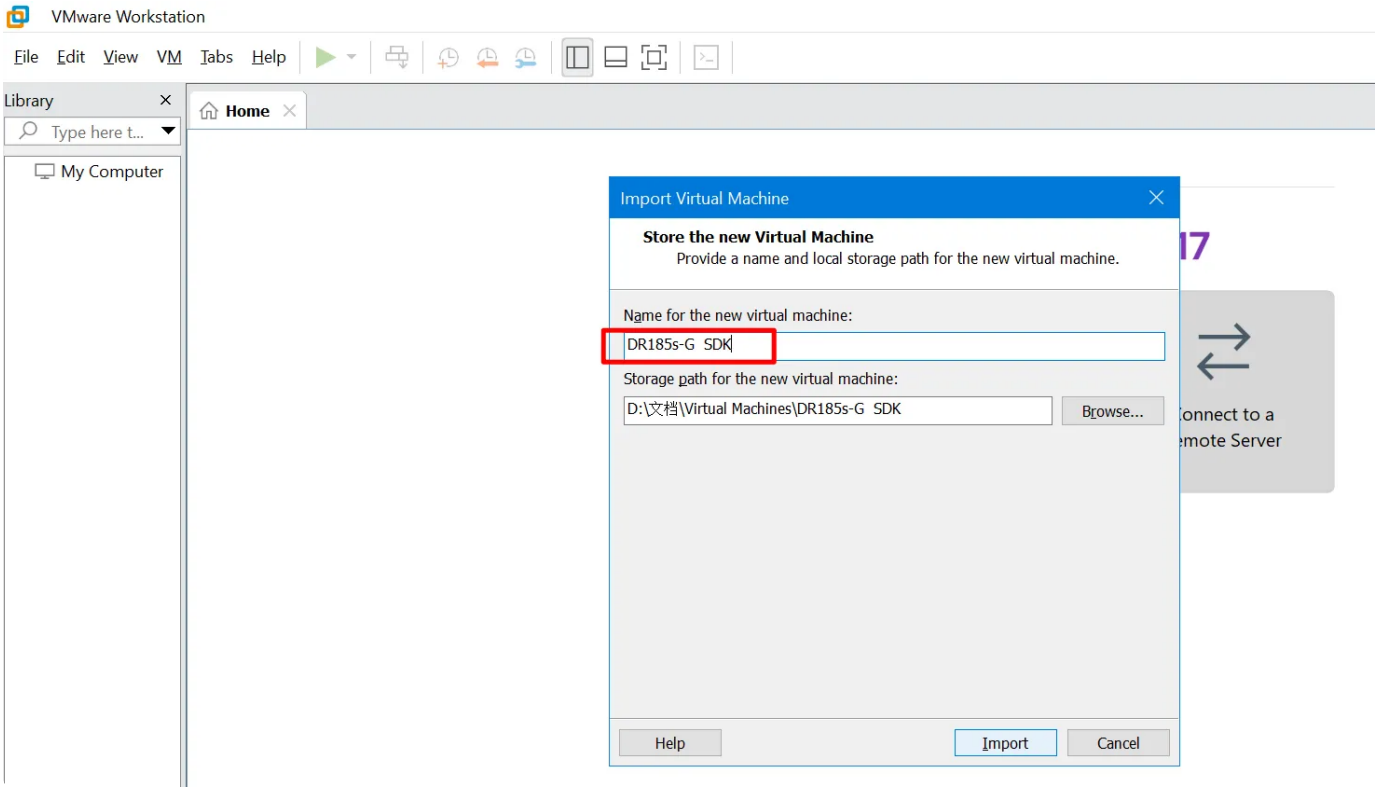


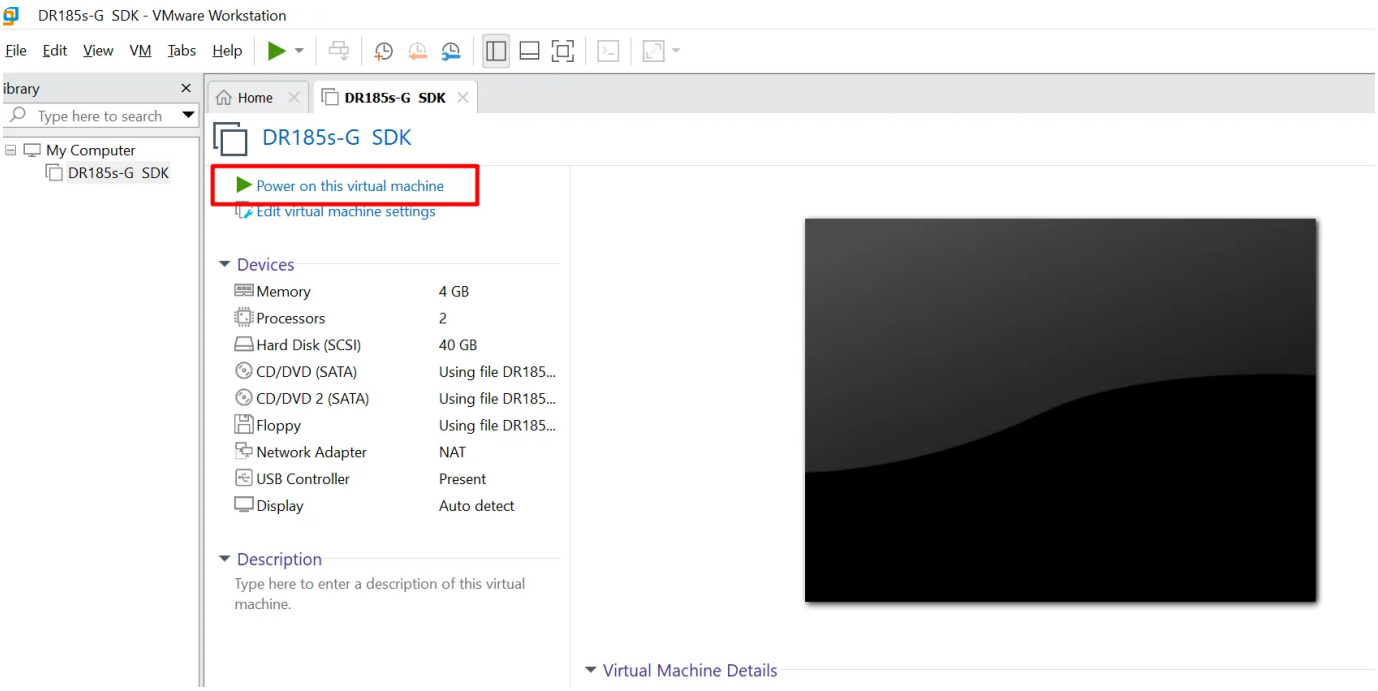
2. After finishing the download, users can open the file in VMware.

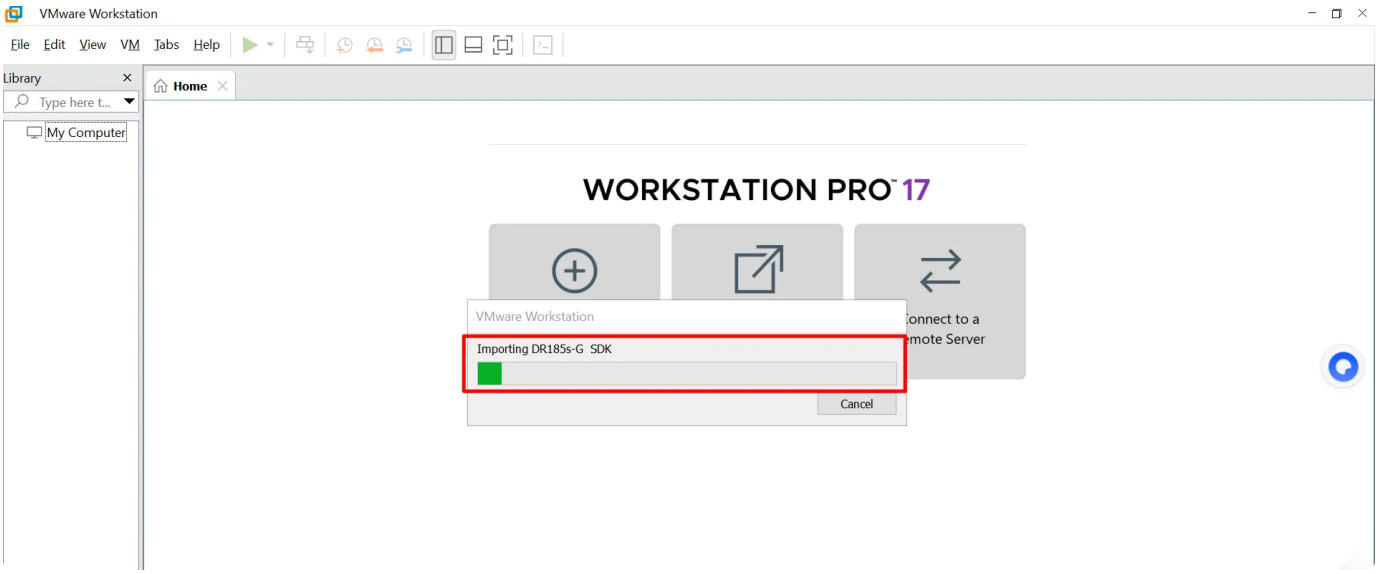
The password for entering Ubuntu OS is usr

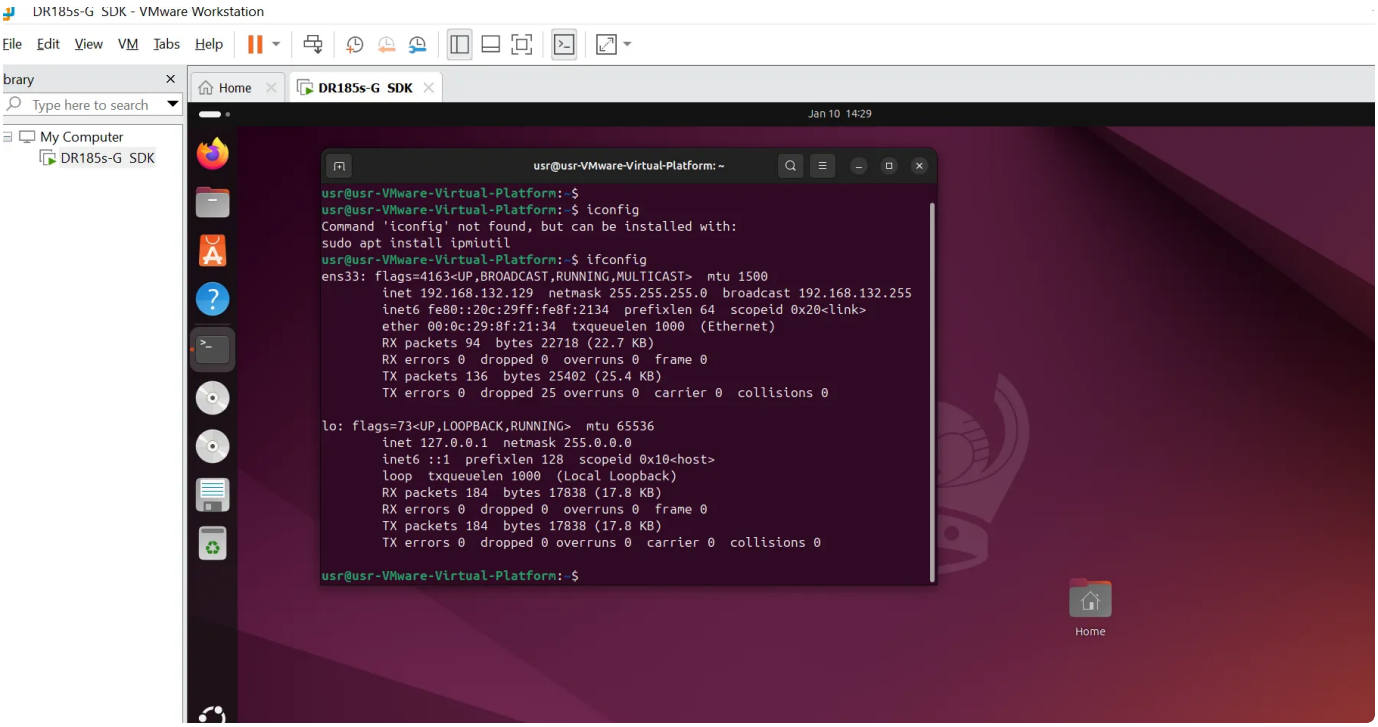

VMware Workstation
File
Edit
View
VM
Tabs
Help
New Virtual Machine... Ctrl+N
New Window
Open... Ctrl+O
Scan for Virtual Machines...
Configure Auto Start VMs
Close Tab Ctrl+W
Connect to Server... Ctrl+L
Export to OVF...
Exit


VMware Workstation
File Edit View VM Tabs Help
Library
Type here t...
My Computer
Home
Open
Test › Ubuntu 24.04.3 LTS-26...
Search Ubuntu 24.04.3 LTS-26...
Organize
New folder
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Name
Date modified
Ubuntu 24.04.3 LTS-260105.ovf
1/5/2026 9:06 AM
File name:
All supported files
Open
Cancel
17
Connect to a Remote Server
vmware

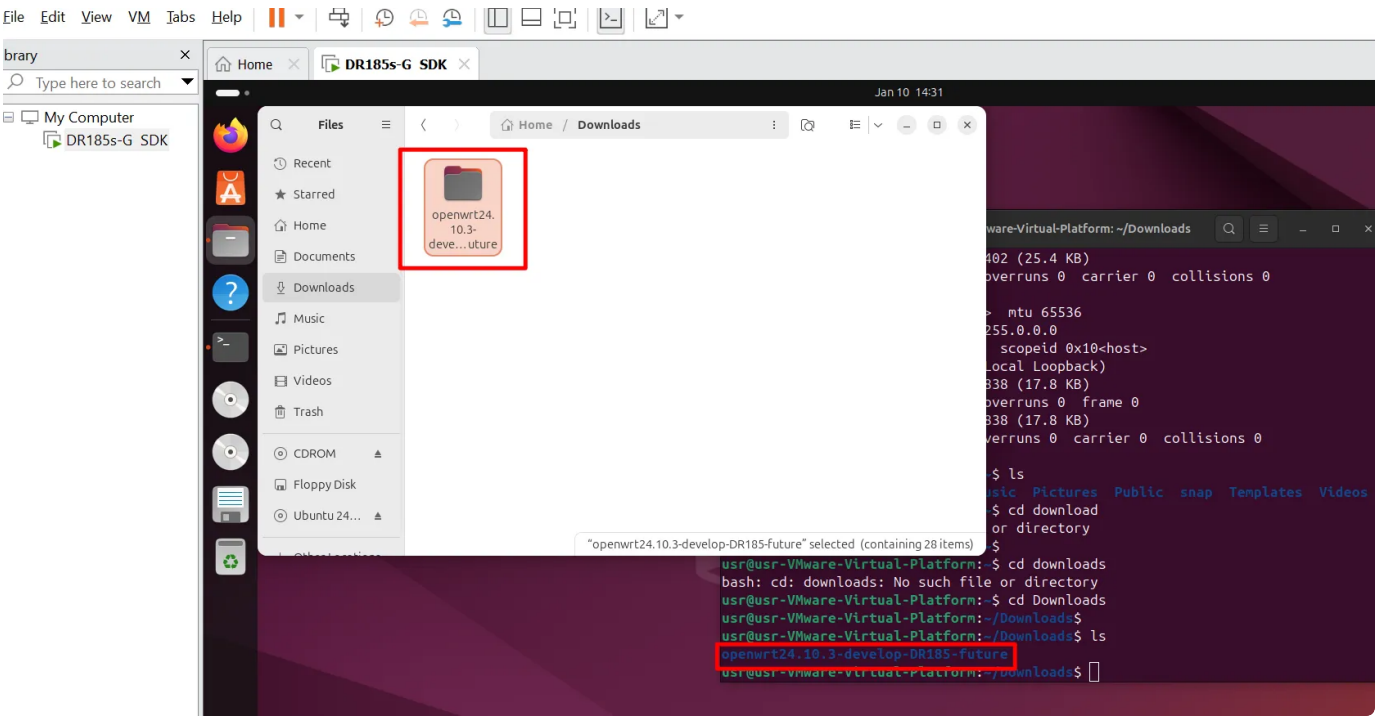

VMware Workstation
File Edit View VM Tabs Help
Library
Type here t...
My Computer
Home
Import Virtual Machine
Store the new Virtual Machine
Provide a name and local storage path for the new virtual machine.
Name for the new virtual machine:
DR185s-G SDK
Storage path for the new virtual machine:
D:\文档\Virtual Machines\DR185s-G SDK
Browse...
Help
Import
Cancel


DR185s-G SDK - VMware Workstation
File Edit View VM Tabs Help
Type here to search
My Computer
DR185s-G SDK
Home
DR185s-G SDK
DR185s-G SDK
Power on this virtual machine
Edit virtual machine settings
Devices
Memory 4 GB
Processors 2
Hard Disk (SCSI) 40 GB
CD/DVD (SATA) Using file DR185...
CD/DVD 2 (SATA) Using file DR185...
Floppy Using file DR185...
Network Adapter NAT
USB Controller Present
Display Auto detect
Description
Type here to enter a description of this virtual machine.
Virtual Machine Details





3. In the VMware virtual Machine, the SDK is already downloaded, users can use it directly.

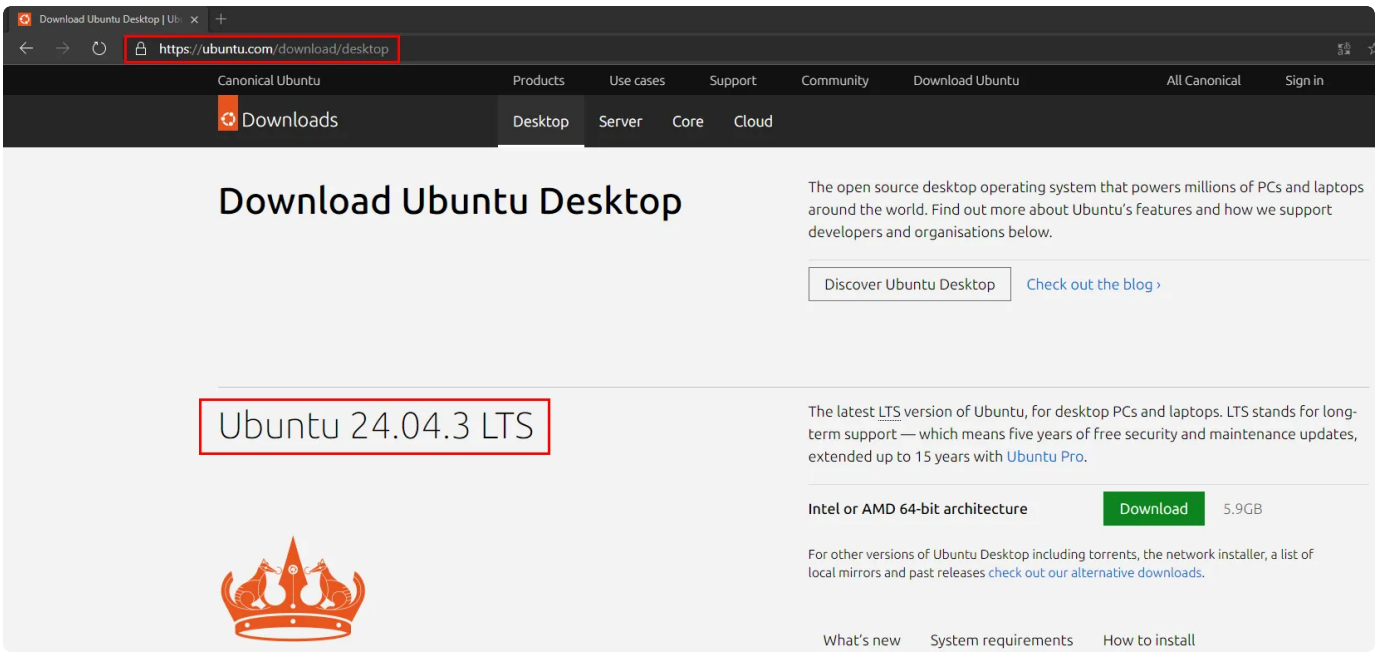


3. Ubuntu Installation

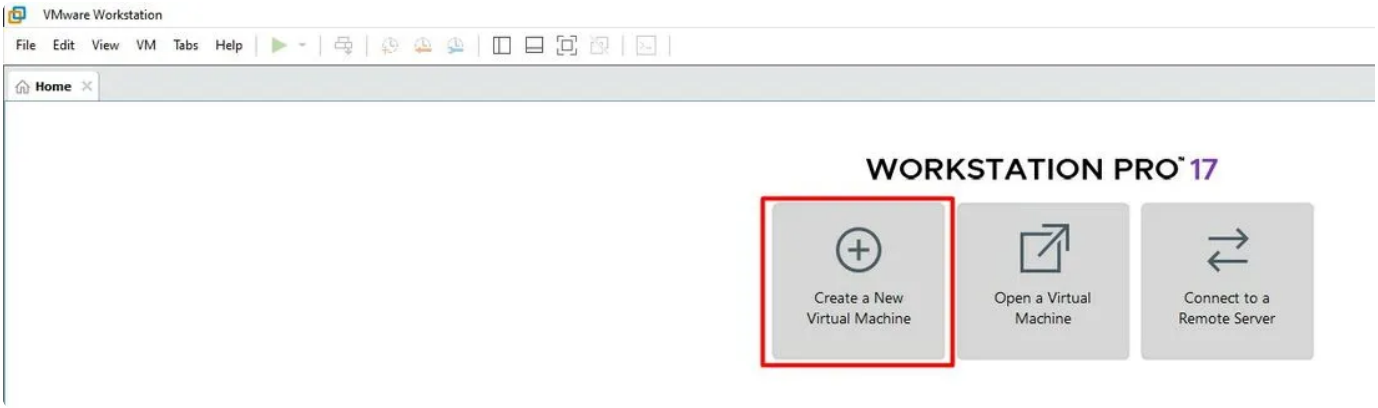
Firmware compilation can be performed on any Linux-based machine. This example uses the VMware Workstation Pro 17 virtual machine platform. (Download)

3.1 Download and Installation

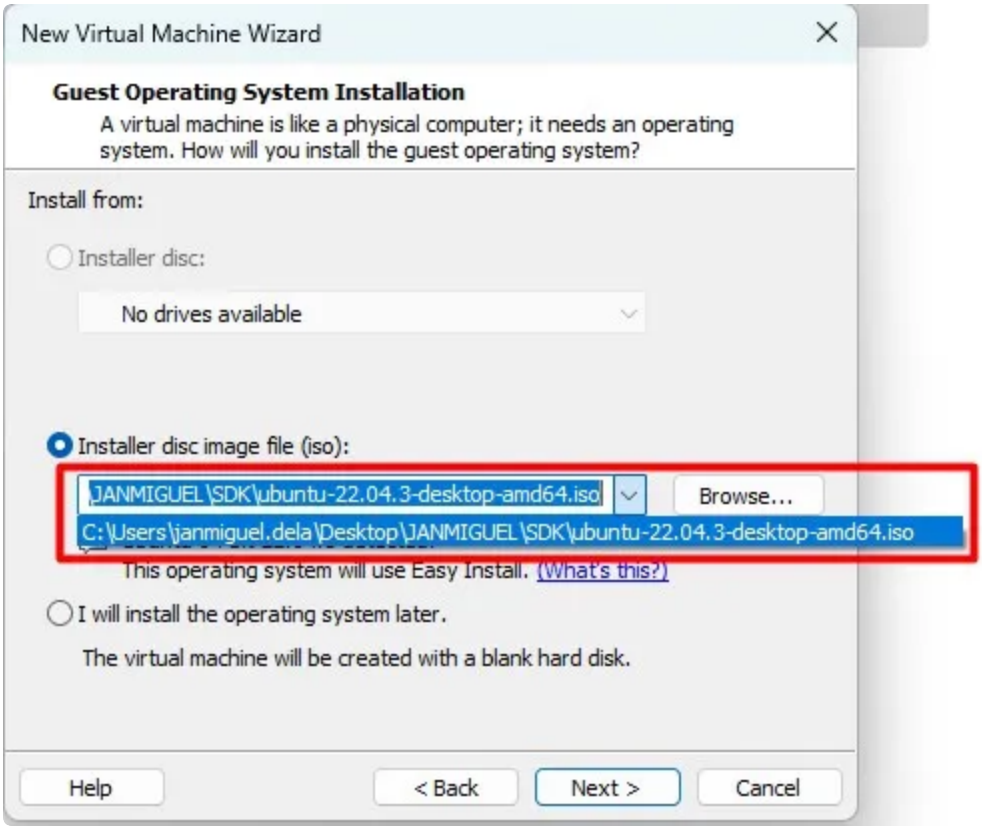
1. Download the latest version of Ubuntu Desktop: (Download)



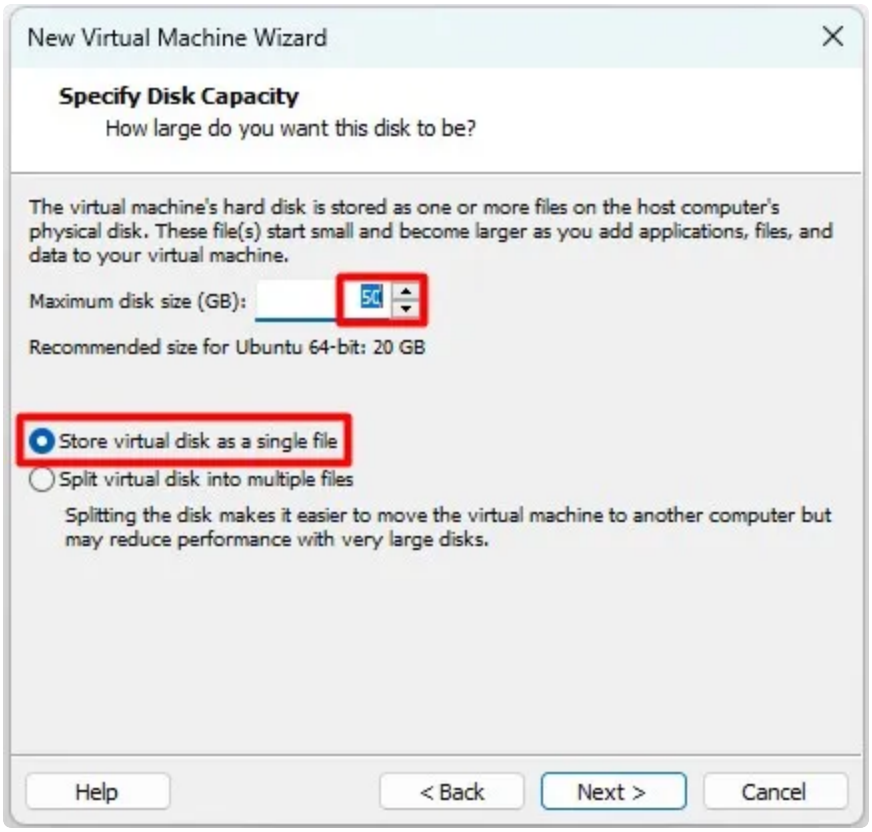
2. Start VMware Workstation Pro and click "Create a New Virtual Machine."



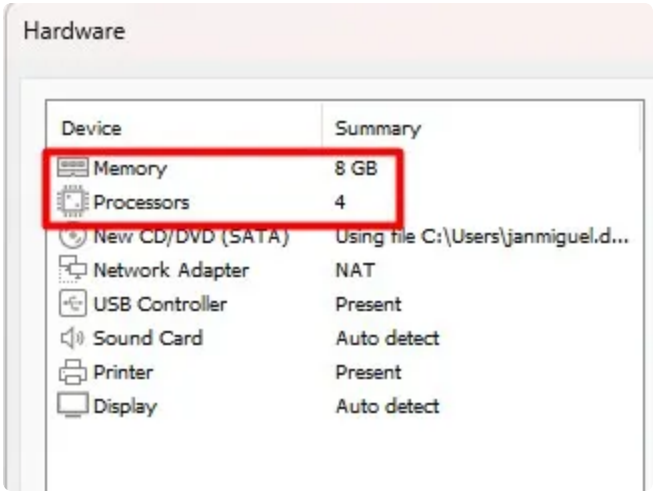
3. Select **Typical** mode, then choose the downloaded Ubuntu .iso file, and click **Next**.



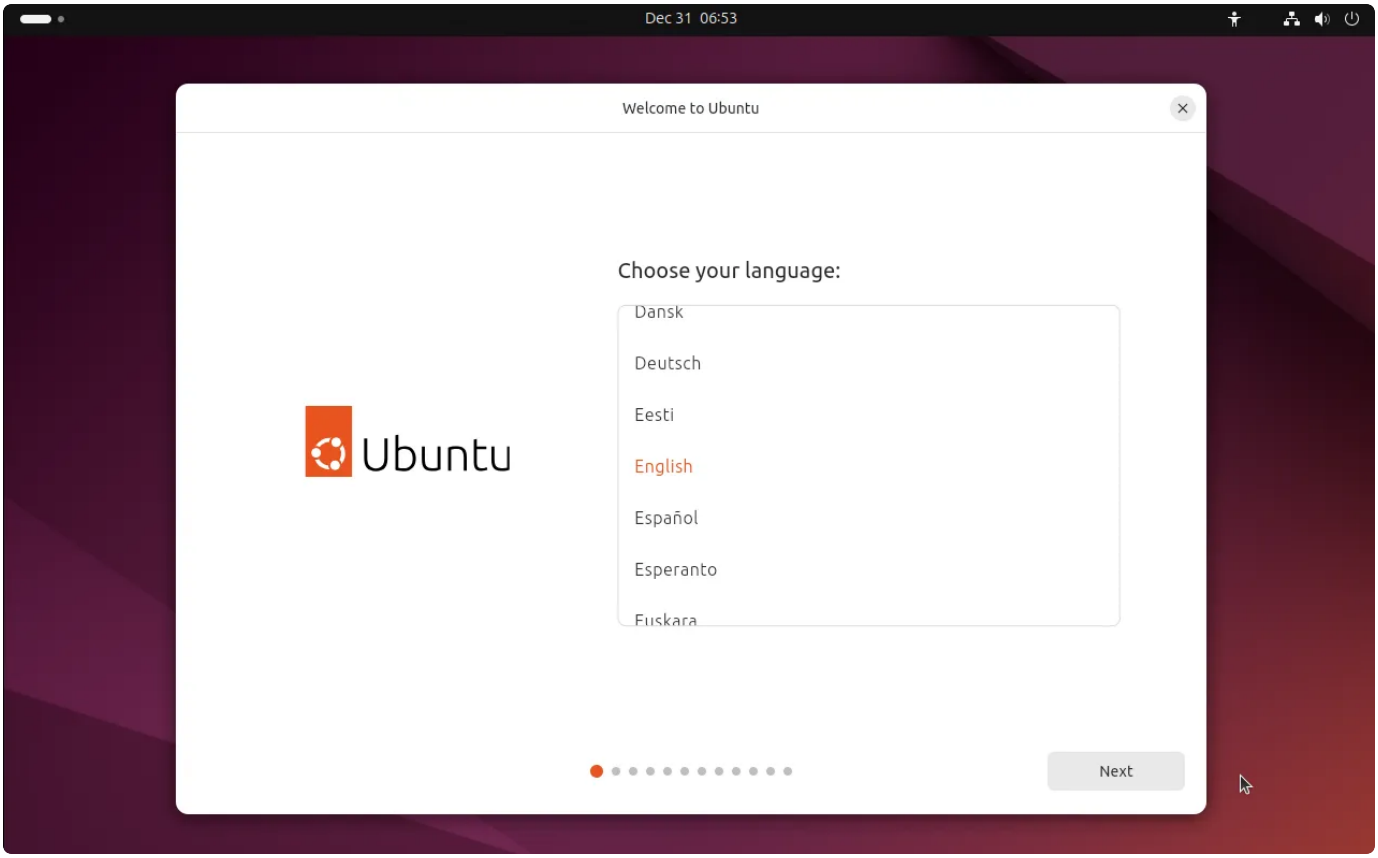
4. Enter your name, username, password, as well as the virtual machine name and save path, then click "Next." **Note**: Allocate at least **30–50GB** of disk space for the virtual machine and select "Store virtual disk as a single file."



5. Click "Customize Hardware." Allocate **4GB or more of memory** and **2 or more processor cores**, based on your host's performance. Finally, click "Finish".



6. After the installation is complete, perform the system's initial configuration. Once all items are configured, click "Restart Now".



3.2 Obtaining the SDK

After the Ubuntu system finishes booting, open a web browser and download the SDK file from the USR IOT official website. (Download Link)

4. Compiling Standard Firmware

4.1 Installing Required Packages

Open the terminal (shortcut `Ctrl + Alt + T`), and execute the following commands to install the essential packages required for compilation:

```
sudo apt update
```

```
sudo apt install -y build-essential binutils bzip2 diffutils flex gawk gettext \ libncurses5-dev libz-dev make perl python3 rsync subversion unzip which \ zlib1g-dev git ccache
```

4.2 Extracting and Configuring the SDK

1. Move the downloaded SDK archive to a suitable location (e.g., ~/Downloads) 。

2. Navigate to that directory and extract the file:

cd ~/Downloads tar –xzvf openwrt24.10.3–develop–DR185–future.tar.gz

Note：Replace the filename and path according to your actual situation.

3. Enter the extracted SDK directory: cd openwrt24.10.3–develop–DR185–future

4. Copy the device configuration file and rename it to `.config`： cp package/usr_app/configs/USR–DR815.config .config

5. Update and install the software feeds: ./scripts/feeds update –a ./scripts/feeds install –a

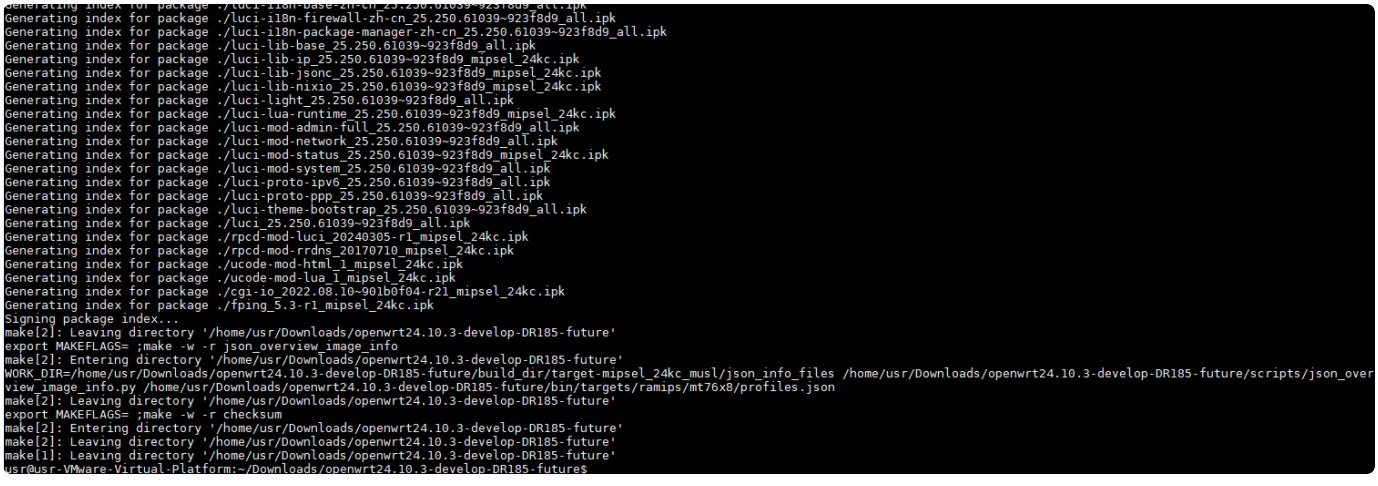
4.3 Starting the Compilation

Execute the following command to start compiling the firmware:

make V=s

The parameter `V=s` enables verbose logging, which helps troubleshoot issues during the compilation process.

Note：The initial firmware compilation may take up to several hours to complete. Do not close the terminal window during this time. A successful compilation output looks like this:



Tip：You can speed up compilation by using the `-j` parameter to enable parallel compilation. First, check the number of available threads using:

nproc

Then compile using the output number, for example: make –j4 V=s

4.4 Compilation Output

After compilation completes, the firmware will be generated in the following directory:

`./bin/targets/ramips/mt76x8/`

You will find a file named **openwrt-ramips-mt76x8-usr_dr185s-g-squashfs-sysupgrade.bin**.This file can be uploaded via the router's management interface to upgrade the firmware.

5. Troubleshooting

- **First Compilation Error**：Try re-running `./scripts/feeds update –a` to update the feeds.
- **Environment Cleanup**：If you suspect the SDK environment is corrupted, you can run `make distclean` for a thorough cleanup and then start the compilation from scratch.