

StarFive
赛昉科技

Compile and Install OpenWrt on VisionFive 2

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Legal Statements

Important legal notice before reading this documentation.

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Preface

About this guide and technical support information.

About this document

This document mainly provides the users with the basic guidance to download, compile and install OpenWrt on VisionFive 2.

Revision History

Table 0-1 Revision History

Version	Released	Revision
1.2	2025/06/23	Updated the following section: <ul style="list-style-type: none">• Download (on page 8)• Configuration (on page 10)• Compilation (on page 19)• Add Passwall Function (on page 21) Added the Flash Image (on page 20) section.
1.11	2024/04/07	Updated the configuration info of luci.
1.1	2024/01/18	Updated the content in Download (on page 8) .
1.0	2023/11/06	The first official release.

Notes and notices

The following notes and notices might appear in this guide:

-  **Tip:**
Suggests how to apply the information in a topic or step.
-  **Note:**
Explains a special case or expands on an important point.
-  **Important:**
Points out critical information concerning a topic or step.
-  **CAUTION:**
Indicates that an action or step can cause loss of data, security problems, or performance issues.
-  **Warning:**
Indicates that an action or step can result in physical harm or cause damage to hardware.

1. Introduction

OpenWrt is an embedded operating system based on Linux, designed specifically for routers and other network devices. It provides an open source platform that allows users to customize and control various aspects of network devices. Due to its flexibility and customizability, OpenWrt is widely used in home and enterprise networks.

This document mainly provides the users with the basic guidance to download, compile and install OpenWrt on VisionFive 2.



2. Download

The official OpenWrt mainline has now incorporated support for the StarFive VisionFive 2. You may choose to download the OpenWrt source code from official website and compile it yourself, allowing for custom configuration based on your needs. Alternatively, you can directly download the prebuilt VisionFive 2 image from the official website, which skips the configuration and compilation stages by using the official predefined settings. Please select the method that best suits your requirements.

- **Download the OpenWrt source code from official website:**

1. Execute the following command to download the code (it is recommended to compile on Ubuntu 20 or higher versions.):

```
git clone https://github.com/starfive-tech/openwrt.git
```

Or execute the following command:

```
git clone https://github.com/openwrt/openwrt.git
```

2. Execute the following command to switch to 24.10.1 version:

```
git checkout v24.10.1
```

- **Download the latest official OpenWrt image from official website:**



Note:

If you choose to download the image from the official website, you can skip the steps in [Configuration \(on page 10\)](#) and [Compilation \(on page 19\)](#), as the official image comes with predefined settings and requires no additional manual configuration.

1. Click the following link to visit the official website:

https://openwrt.org/toh/views/toh_fownload

2. In the Table of Hardware section at the bottom of the page, enter **StarFive** in the search bar to find compatible images.

Result:

The images compatible with the VisionFive 2 are listed in the table.

Figure 2-1 Image Search Results

You are here / [Table of Hardware](#) / Collection of views / Table of Hardware: Firmware downloads

Table of Hardware: Firmware downloads

This table shows **firmware download urls** for all devices listed in the Table of Hardware.

Using the Table of Hardware

- Sort the columns by clicking the column header
- Enter your filter criteria in the white fields
You can filter for partial matches, e.g.
 - D-Li, D-Lin, D-Link, Archer, Netg, ...
 - DIR-6, TL-WR, 3700, 43, 430, 4300, ...
- No support for 4 MB FLASH / 32 MB RAM devices in modern (18.06 and later) OpenWrt. [Details...](#)
- No support for 8 MB FLASH / 64 MB RAM devices in modern (18.06 and later) OpenWrt. [Details...](#)
- Flash MB: The ToH tables show the *total size of the flash chip(s)*. Depending on your device (e.g. dual firmware), the *flash space available for package installation* might be significantly lower. See also [Details #1](#) and [Details #2](#)



- Firmware OpenWrt Install / Upgrade URL → comes with **GUI / LuCI pre-installed**, ready to go
- Firmware OpenWrt [snapshot](#) Install / Upgrade URL → **! No GUI / LuCI pre-installed!**; LuCI needs to be [installed manually](#) !

Other Resources

- View the [Table of Hardware other ways](#)
Supported by current OpenWrt release • Full Details • All Views
- If your device is supported:
[Learn how to install OpenWrt on your Router](#).
- Help maintain this page:
[Add a device to the ToH or edit a device in the ToH](#)

Scrolling through the table: Click anywhere in the table, then use your cursor keys to scroll left/right, up/down

Show 50 entries

Search: starfive

Brand	Model	Ver...	Sup...	Target	Sub...	Fir...	Firmware...	Fir...	Firm...	Dev...
Brand	Model	Version	Support	Target	Subtag	Firmware	Firmware Obj	Firmware	Firmware	Firmware
StarFive	VisionFive	v1	24.10.0	starfive	generic					
StarFive	VisionFive2	v1.2a	24.10.0	starfive	generic					
StarFive	VisionFive2	v1.3b	24.10.0	starfive	generic					

Showing 1 to 3 of 3 entries (filtered from 2,764 total entries)

Previous 1 Next

- Download the corresponding image based on your VisionFive 2 version.

3. Configuration

This chapter introduces the following three sections:

- [Basic Configuration \(on page 10\)](#)
- [Wireless Configuration \(on page 14\)](#)
- [Install Dependency Packages \(on page 17\)](#)



Note:

If you selected the official website download option in the [Download \(on page 8\)](#), skip this step.

3.1. Basic Configuration

1. Execute the following command to enter the menu configuration GUI:

```
make menuconfig
```

In the menu configuration GUI, follow the steps to select the corresponding option:

- a. In OpenWrt Configuration, select **Target System** and **Target Profile**:

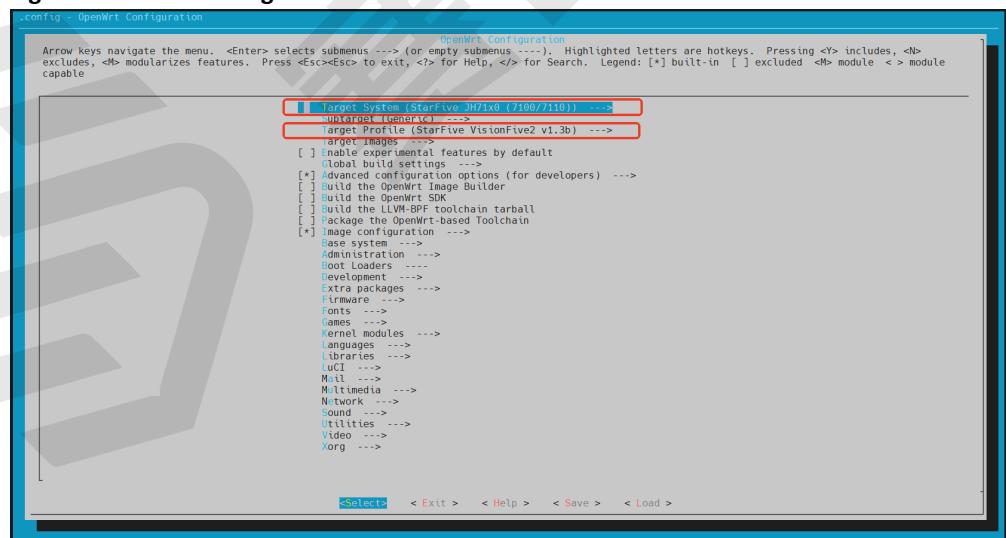
- Target System (StarFive JH71x0 (7100/7110))
- Target Profile (StarFive VisionFive 2 v1.2a) 或 Target Profile (StarFive VisionFive 2 v1.3b)



Note:

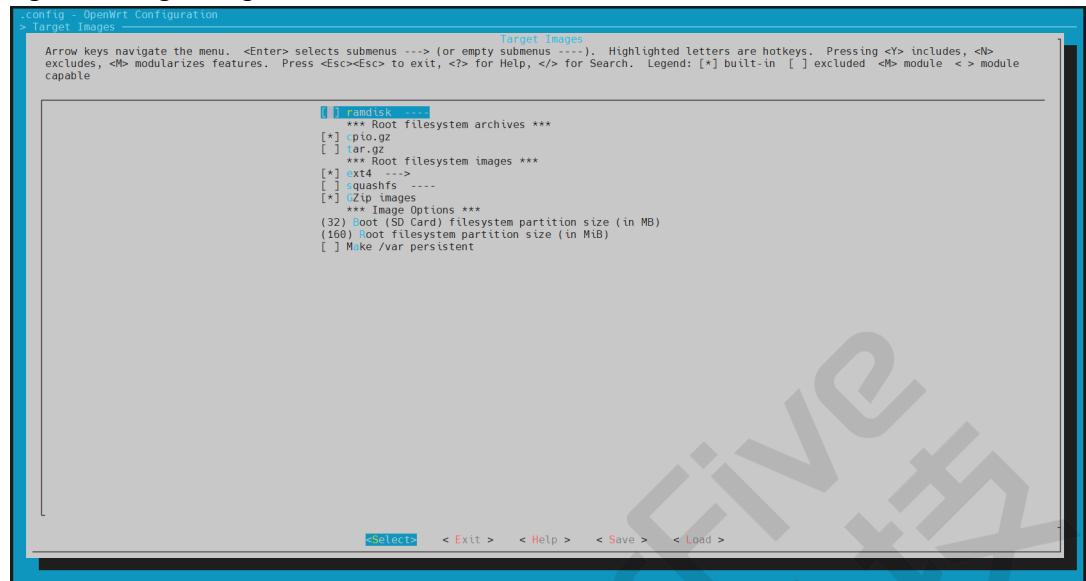
VisionFive 2 currently has 2 versions, v1.2a and v1.3b. Please select the appropriate submenu according to the actual version.

Figure 3-1 Profile Configuration



b. In OpenWrt Configuration, select **ramdisk** under **Target Image**:

Figure 3-2 Target Images



2. Luci configuration

a. Execute the following command to install luci:

```
./scripts/feeds update packages luci
./scripts/feeds install -a -p luci
```

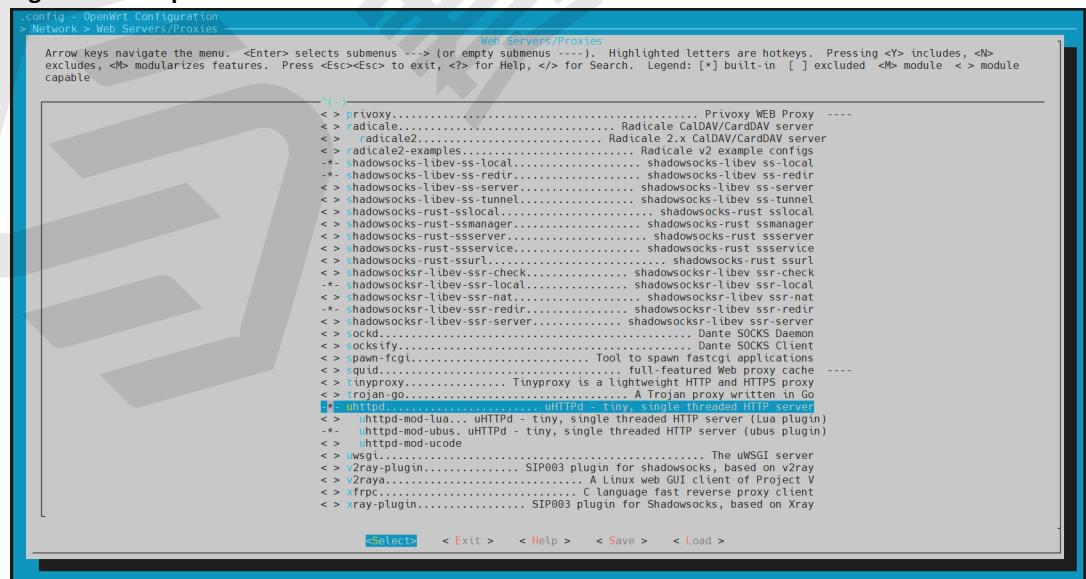
b. Execute the following command to enter the menu configuration GUI to configure luci:

```
make menuconfig
```

c. Select **uhttpd** in the configuration menu bar in the following order:

Network > Web Servers/Proxies > uhttpd

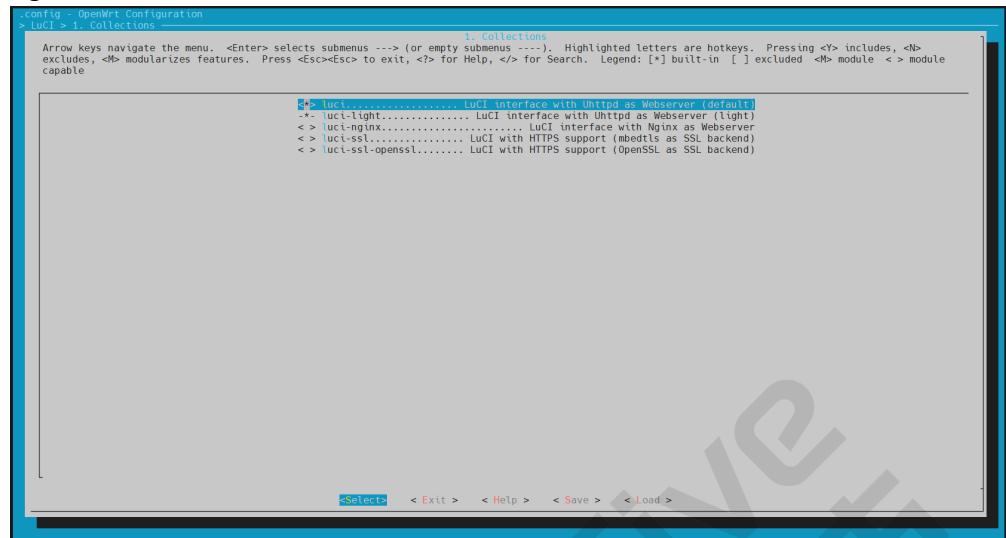
Figure 3-3 uhttpd



d. Select **luci** in the configuration menu bar in the following order:

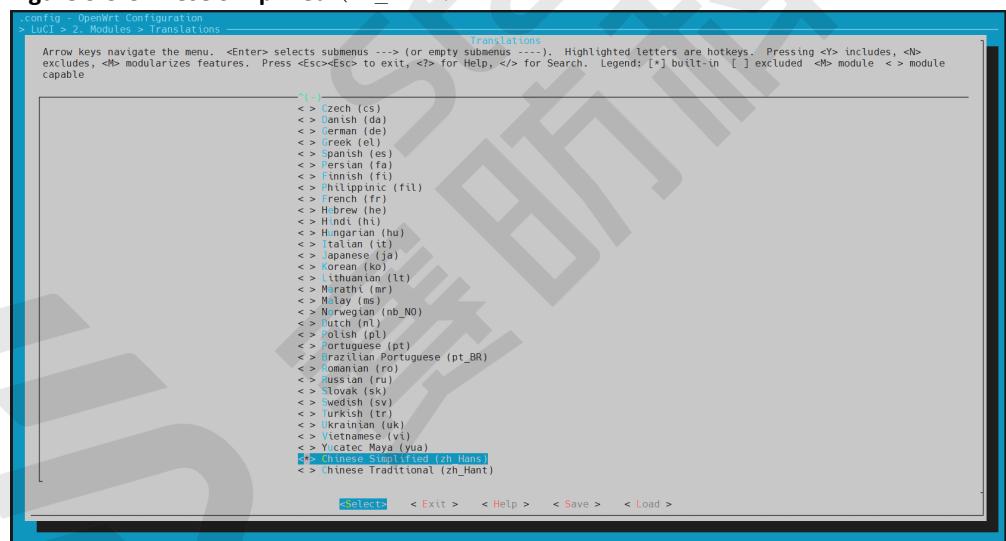
- Select **luci** in the configuration menu bar in the following order:

LuCI > 1. Collections > luci

Figure 3-4 luci

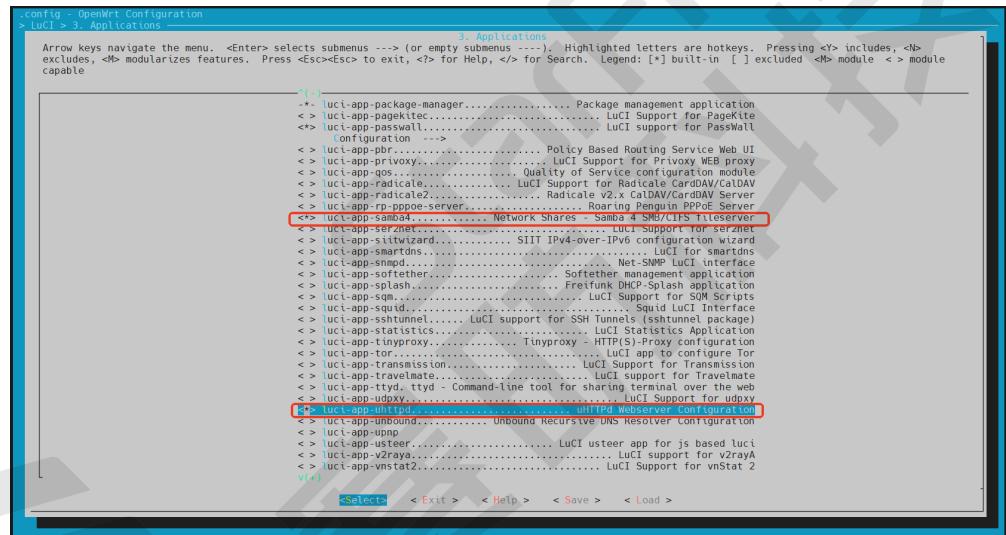
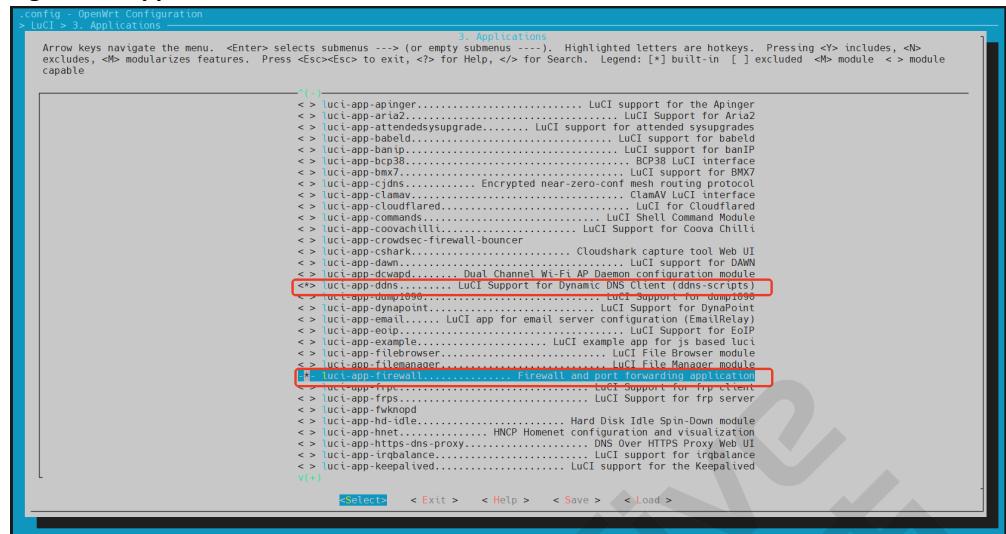
- (Optional) Select the language according to your requirement in the configuration menu bar in the following order (take Chinese Simplified as example):

LuCI > 2. Modules > Translations > Chinese Simplified (zh_Hans)

Figure 3-5 Chinese Simplified (zh_Hans)

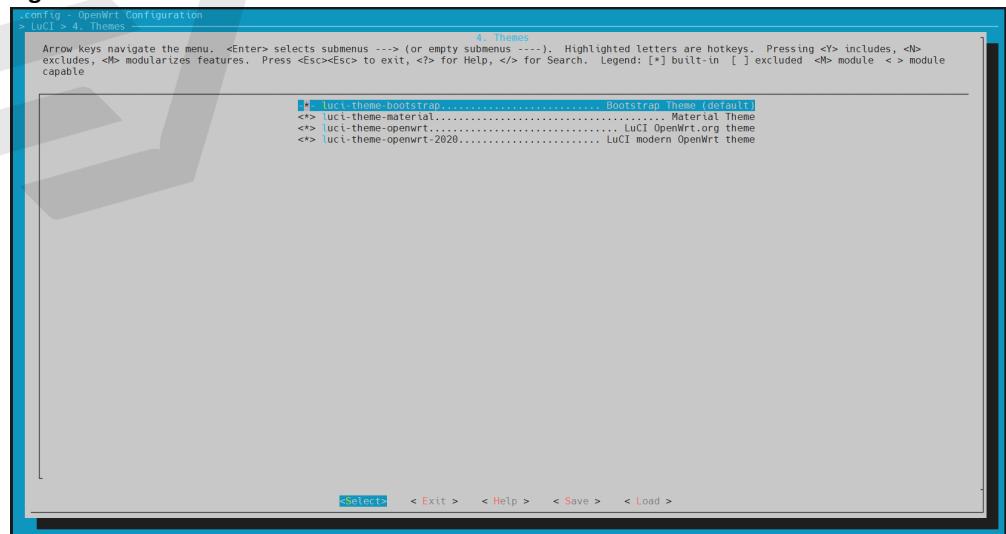
- Select **luci-app-ddns**, **luci-app-firewall**, **luci-app-samba4**, **luci-app-uhttpd** in the configuration menu bar in the following order:

LuCI > 3. Applications > luci-app-ddns, luci-app-firewall, luci-app-samba4, luci-app-uhttpd

Figure 3-6 Applications

- Select all in the configuration menu bar in the following order:

LuCI > 4. Themes > Select all

Figure 3-8 Themes

- Select **luci-lib-ipkg** in the configuration menu bar in the following order:

LuCI > 6. Libraries > luci-lib-ipkg

Figure 3-9 Libraries Configuration

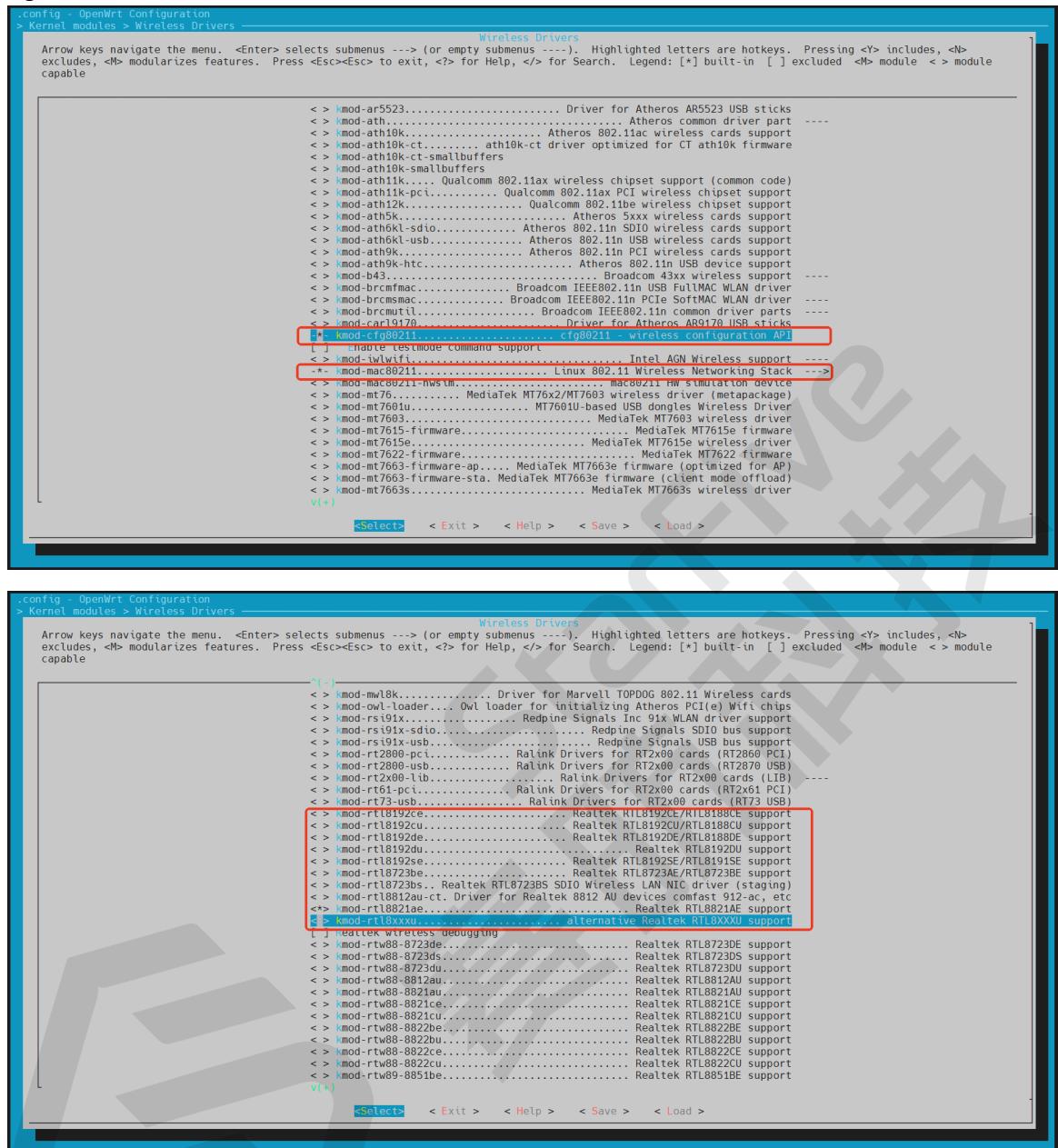
3.2. Wireless Configuration

Due to the lack of WiFi modules on VisionFive 2, you need to purchase a [WiFi Dongle](#). OpenWrt supports dozens of WiFi drivers, and the RTL8821AE PCI interface driver is chosen here for its easy availability. On VisionFive 2, there is an M.2 M-key interface, which needs to be connected to the NVME M.2 M-key to a/e key interface board to connect to the RTL8821AE module.

In the menu configuration GUI, follow the steps to configure wireless connection:

1. Select **kmmod-cfg80211**, **kmmod-mac80211**, **kmmod-rtl8821ae** in the configuration menu bar in the following order:

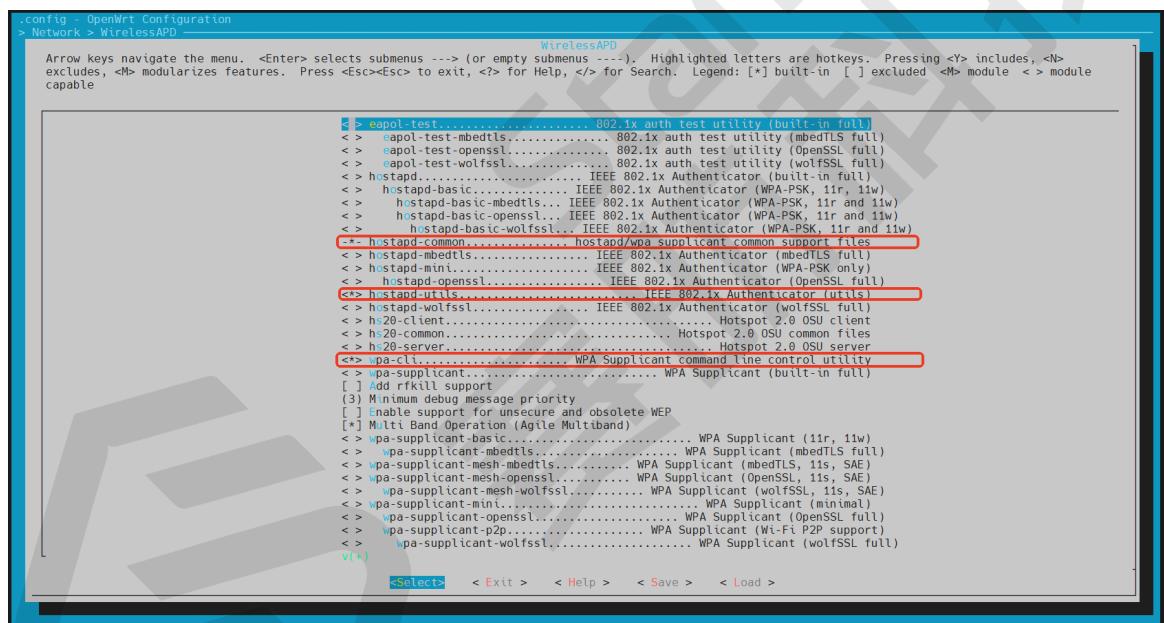
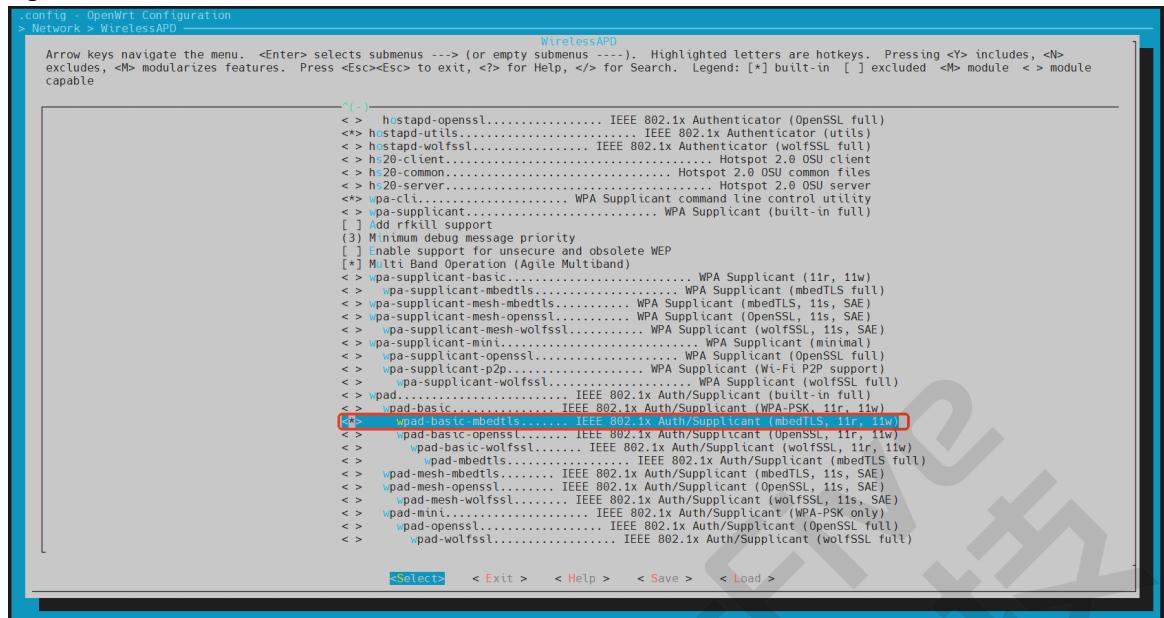
Kernel modules > Wireless Driver > kmod-cfg80211, kmod-mac80211, kmod-rtl8821ae

Figure 3-10 Wireless Driver

2. Select **wpad-basic-mbedtls**, **hostapd-common**, **wpa-cl**, **hostapd-utils** in the configuration menu bar in the following order:

Network > WirelessAPD > wpad-basic-mbedtls, hostapd-common, wpa-cl , hostapd-utils

Figure 3-12 WirelessAPD



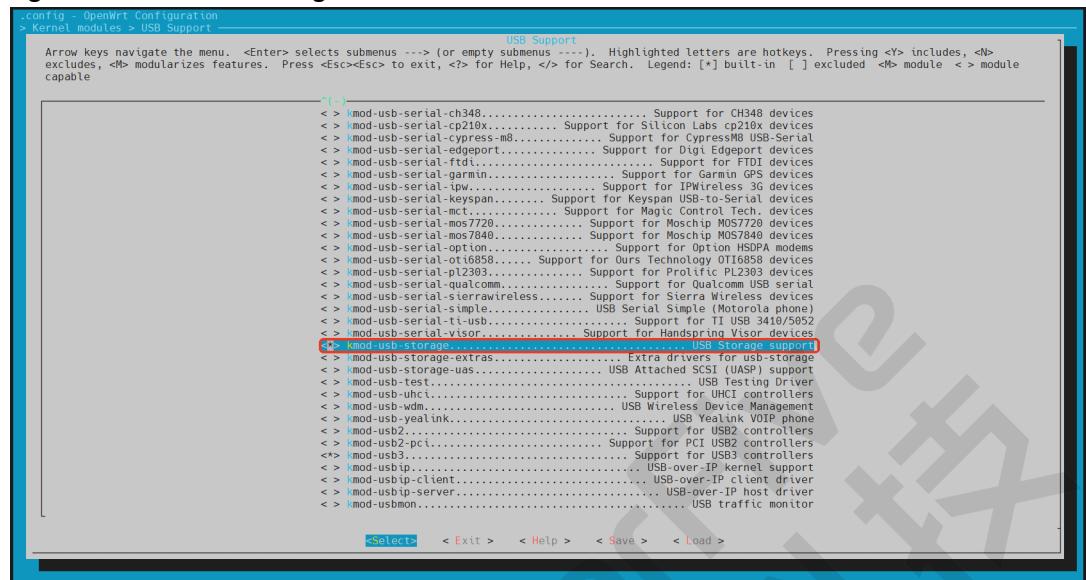
3. Storage Configuration:

Follow the steps below to enable USB and NVMe storage options, supporting USB drives and NVMe SSDs for expanded storage needs.

- a. Enable USB storage by selecting in this order:

Kernel modules > USB Support > kmod-usb-storage

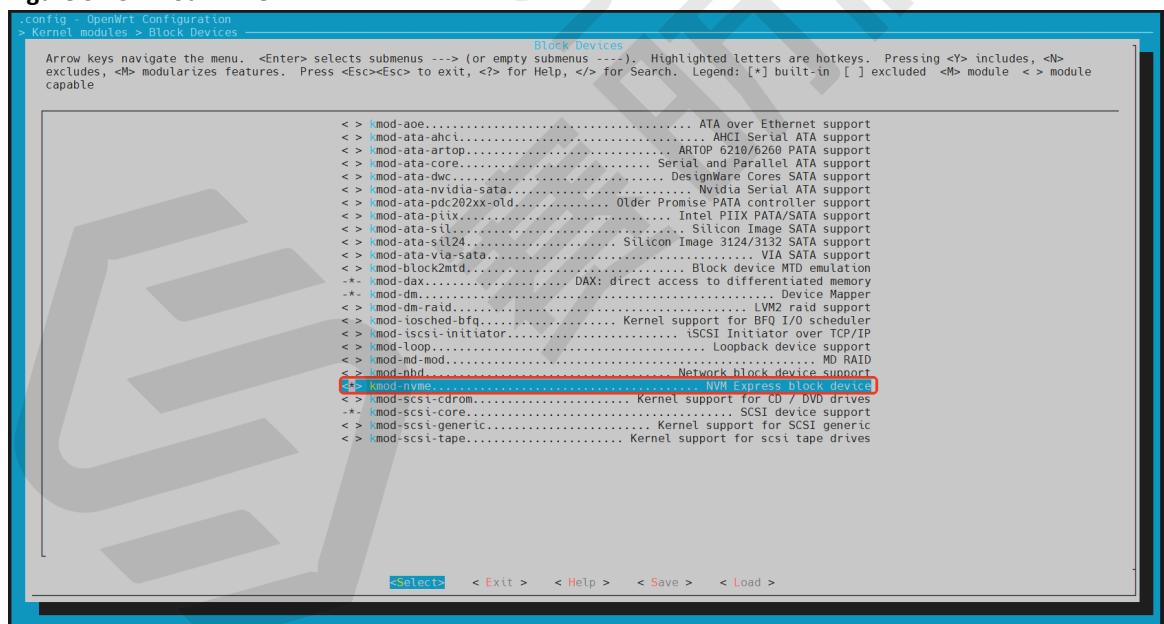
Figure 3-14 kmod-usb-storage



4. Enable NVMe support by selecting:

Kernel modules > Block Devices > kmod-nvme

Figure 3-15 kmod-nvme



3.3. Install Dependency Packages

Execute the following command to download the dependency packages:

```
./scripts/feeds update -a
./scripts/feeds install -a
make download V=s
```



Note:

The download process may take a long time, please be patient. If a `download failed` error occurs during the process, it indicates that the software package has not been fully downloaded. Please execute the above command again until no `download failed` occurs.



StarFive
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4. Compilation



Note:

If you selected the official website download option in the [Download \(on page 8\)](#), skip this step.

Follow the steps below to compile:

1. Execute the following command to compile:

```
make -j8
```



Note:

The compilation may take 2 hours.

2. Execute the following command to generate an SD card image:

```
bin/targets/jh71x0/generic/  
openwrt-jh71x0-generic-visionfive2-v1.3b-ext4-sdcard.img.gz
```

5. Flash Image

Follow these steps to flash the OpenWrt image:

1. Unzip the SD card image:

```
gunzip openwrt-jh71x0-generic-visionfive2-v1.3b-ext4-sdcard.img.gz
```

2. Flash the image into the SD card:

```
dd if=openwrt-jh71x0-generic-visionfive2-v1.3b-ext4-sdcard.img of=/dev/sdX bs=1M  
oflag=direct
```



Note:

- For Windows, you can use balenaEtcher to flash the image.
- Since the image does not include SPL and U-Boot, Nor Flash needs to have [SPL and U-Boot](#) flashed and should boot with QSPI Nor Flash.
- Use the `sudo fdisk -l` command to find your device so that you can replace X value. For example, if your device is `/dev/sdb`, X should be b.

3. Launch OpenWrt.

Figure 5-1 Launch OpenWrt

```
U-Boot 2021.10-00002-g93f6392e5e-dirty (May 09 2025 - 11:21:08 +0800)
CPU: rockchip, r8a331mu_zba_zbb
Model: StarFive VisionFive V2
DRAM: 8 GiB
MMC: sdio@01601000: 0, sdio1@016020000: 1
Loading Environment from SPIFlash... SF! Detected gd25ql28 with page size 256 Bytes, erase size 4 KiB, total 16 MiB
*** Warning - bad CRC, using default environment

StarFive EEPROM format v2
-----EEPROM INFO-----
Vendor : StarFive Technology Co., Ltd.
Product full IDN: VF710B1-253-0008E000-00002482
date: 2024-04-05
PCB revision: 0x02
BOM revision: A
Ethernet MAC1 address: 6c:cf:39:00:35:2d
Ethernet MAC1 address: 6c:cf:39:00:35:2e
-----EEPROM INFO-----
In: serial
Out: serial
Err: serial
Model: StarFive VisionFive V2
Net: eth0@ethernet@01600000, eth1: ethernet@16040000
Hit any key to stop autoboot: 0
switch to partitions #0, OK
mmc1 is current device
Try 'help' for more information...
Found U-Boot script boot.scr.uimg
285 bytes read in 5 ms (55.7 KiB/s)
## Executing script at 49600000
100048 bytes read in 1 ms (22 MiB/s)
54587 bytes read in 9 ms (5.8 MiB/s)
Moving Image from 0xa0000000 to 0x40200000, end=4153c000
## Flattened Device Tree blob at 46000000
0000000000000000 ... 0000000000000000
Using Device Tree in place at 0000000046000000, end 000000004601053a
Starting kernel ...
[    0.000000] Linux version 6.6.85 (som.qinsoft04) (riscv64-openwrt-linux-musl-gcc (OpenWrt GCC 13.3.0 r29157-84e0900867) 13.3.0, GNU ld (GNU Binutils) 2.42) #0 SMP Sat Apr 5 15:07:43 2025
[    0.000000] Machine model: StarFive VisionFive 2 v1.3B
[    0.000000] SDI implementation detected
[    0.000000] SDI TIM extension detected
[    0.000000] SDI IPI extension detected
[    0.000000] SDI SRST extension detected
[    0.000000] earlycon: sb10 at I/O port 0xd (options '')
[    0.000000] prng_gen_random [sb10] enabled
[    0.000000] FVT: UEFI not found
[    0.000000] OF reserved mem: node linux,cma compatible matching fail
[    0.000000] OF reserved mem: 0x0000000040000000..0x000000004007ffff (512 KiB) romap non-reusable opensbi@40000000
[    0.000000] OF reserved mem: 0x0000000009c00000..0x0000000009cffff (32768 KiB) map non-reusable xrpbuffer@f0000000
[    0.000000] OF reserved mem: 0x000000009c00000..0x000000009cffff (22528 KiB) map non-reusable e24@c0000000
[    0.000000] Zone ranges:
[    0.000000] DMA32   [mem 0x0000000040000000-0x00000000ffffffffff]
```

6. Add Passwall Function

Follow the steps below to add the passwall function. The passwall function is not included in the default function and requires code modification and package download support.

1. Execute the following command under `wigorigidirectory`:

```
echo "src-git passwall_packages https://github.com/xiaorouji/openwrt-passwall-packages.git;main"
>> "feeds.conf.default"
echo "src-git passwall https://github.com/xiaorouji/openwrt-passwall.git;main" >> "feeds.conf.default"
echo "src-git passwall2 https://github.com/xiaorouji/openwrt-passwall2.git;main" >> "feeds.conf.default"
```

2. Modify `include/target.mk`:

```
diff --git a/include/target.mk b/include/target.mk
index b5e3e7ff6f..f65e127ecf 100644
--- a/include/target.mk
+++ b/include/target.mk
@@ -53,7 +53,7 @@ DEFAULT_PACKAGES.nas:=\
        mdadm
# For router targets
DEFAULT_PACKAGES.router:=\
-        dnsmasq \
+        dnsmasq-full \
```

3. Download and install the package of passwall:

```
./scripts/feeds update -a
./scripts/feeds install -a
./scripts/feeds install -a -f -p PWpackages
./scripts/feeds install luci-app-passwall
```

4. Configure passwall and unconfigure dnsmasq:

- a. Execute the following command to enter the menu configuration GUI:

```
make menuconfig
```

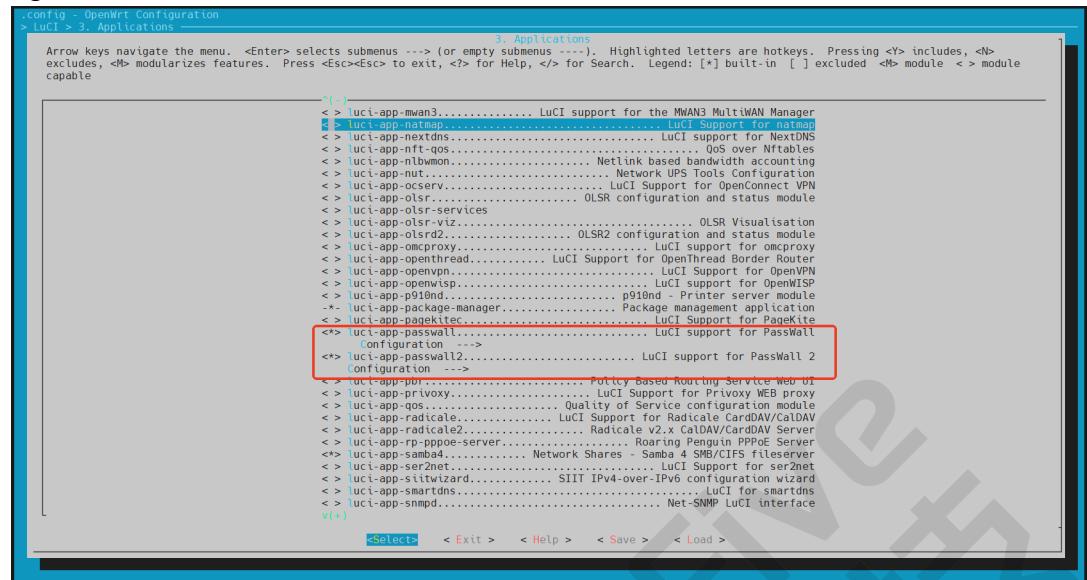
- b. Configure passwall:

OpenWrt Configuration > LuCI > 3. Application > luci-app-passwall



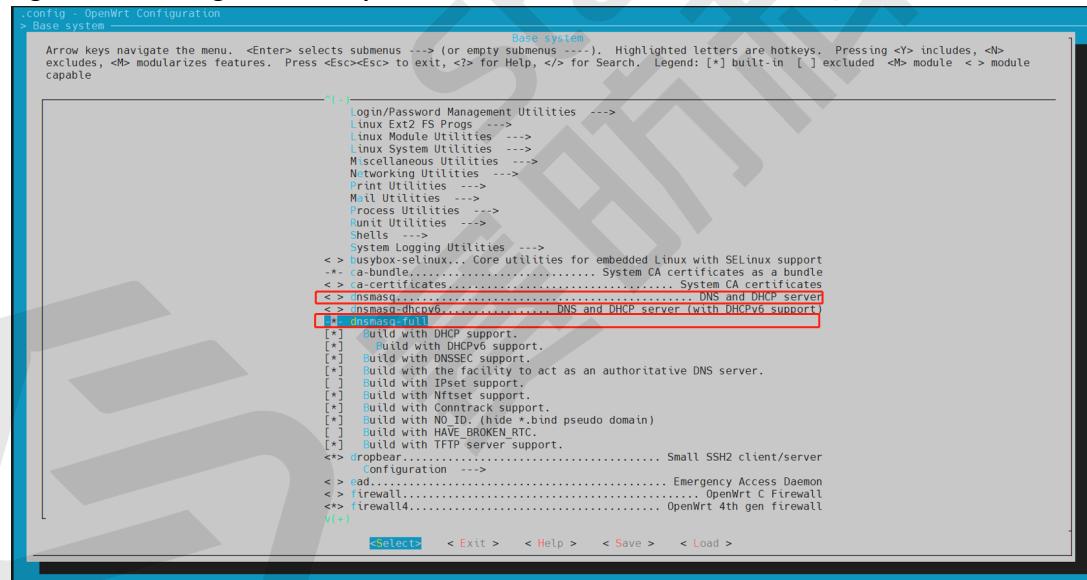
Note:

uci-app-passwall and luci-app-passwall2 are two independent plugins. They can be configured simultaneously or selected as needed.

Figure 6-1 Passwall

c. Unconfigure dnsmasq:

OpenWrt Configuration > Base system > dnsmasq, dnsmasq-full

Figure 6-2 Unconfigure Dnsmasq

d. Execute the following command to update and download software package:

```
make download V=s
```

e. Compilation: (See [Compilation \(on page 19\)](#) section for detailed steps.)



Note:

The compilation may take 2 hours.