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: • 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 (t 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:

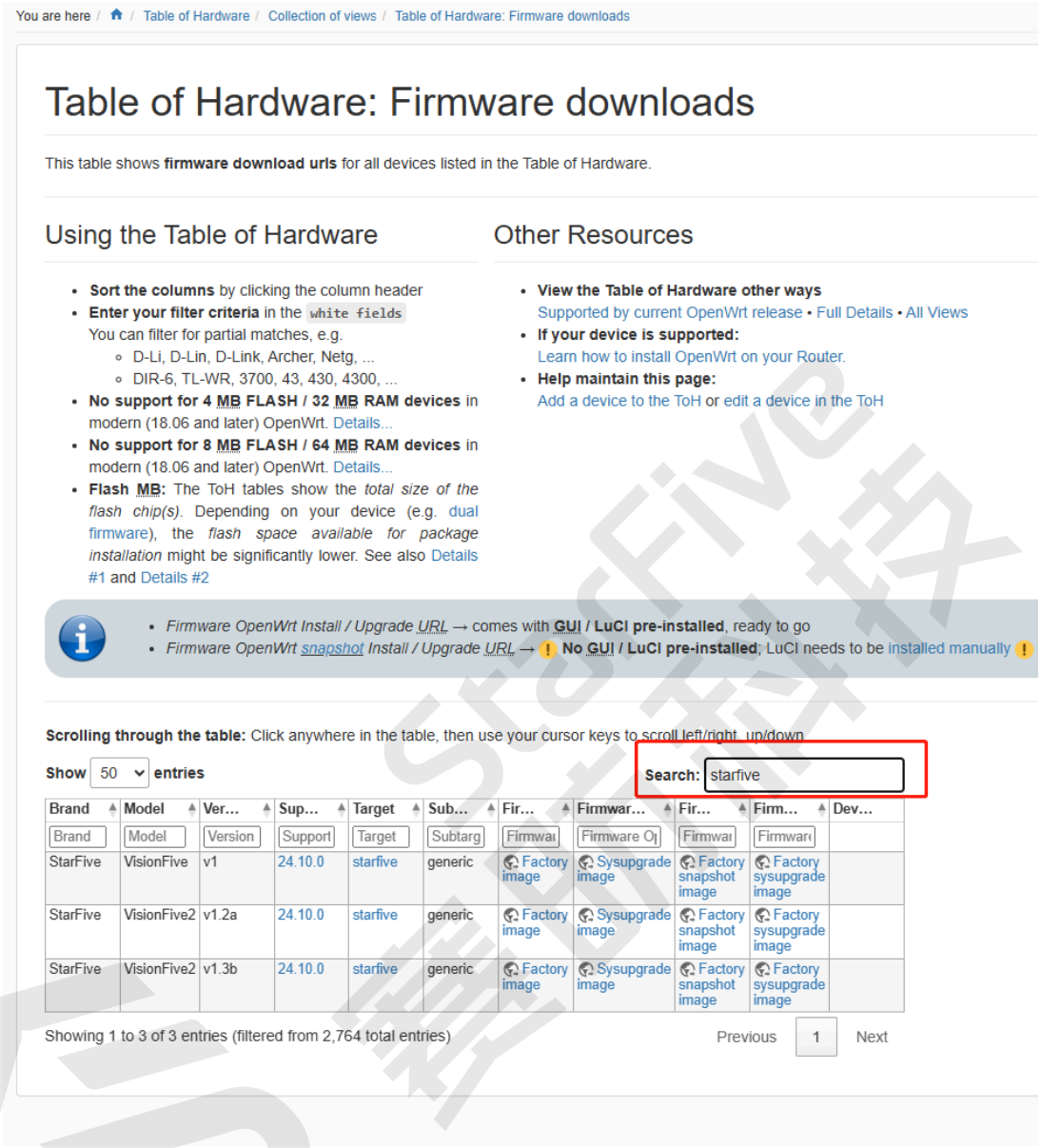
     https://openwrt.org/toh/views/toh_fwdownload

  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



3. 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
   ```

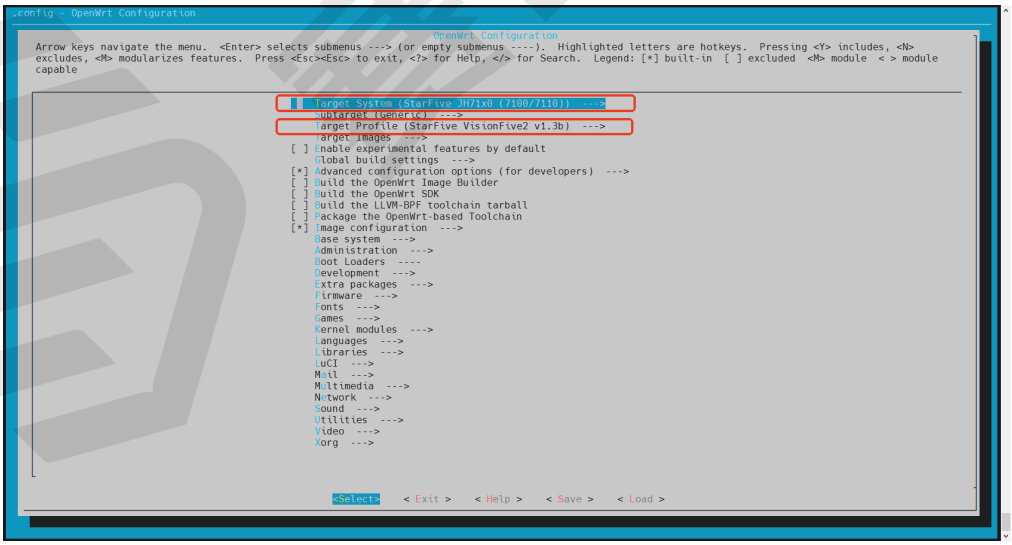
   In the menu configuration GUI, follow the steps to select the corresponding option:

   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)

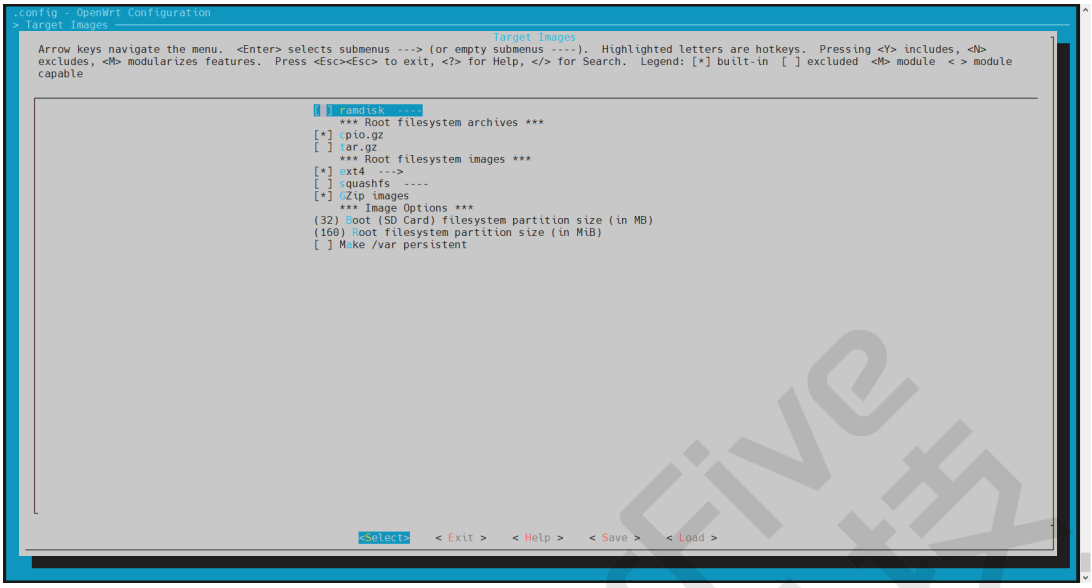
   Note:
   VisionFive 2 currently has 2 versions, v1.2a and v1.3b. Please select the appropriate submenu according to the actual version.

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
```

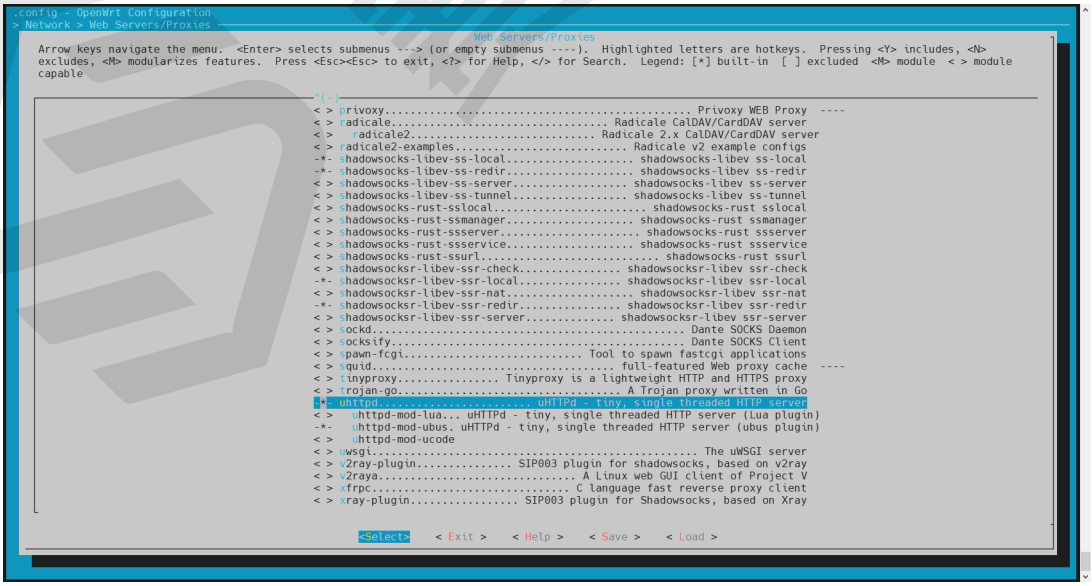
b. Execute the following command to enter the menu configuration GUI to configure luci:

```
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:

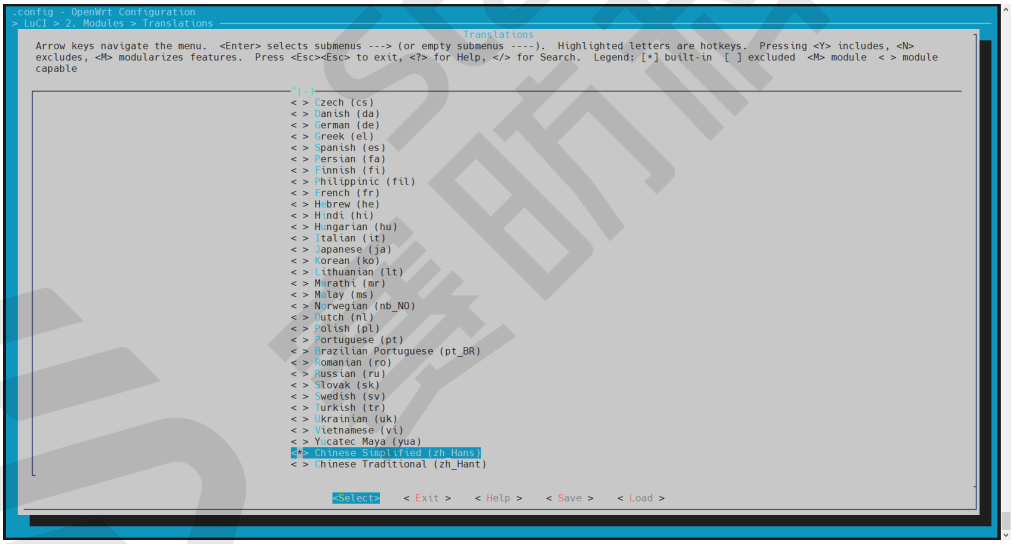
  LuCI > 1. Collections > luci

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)

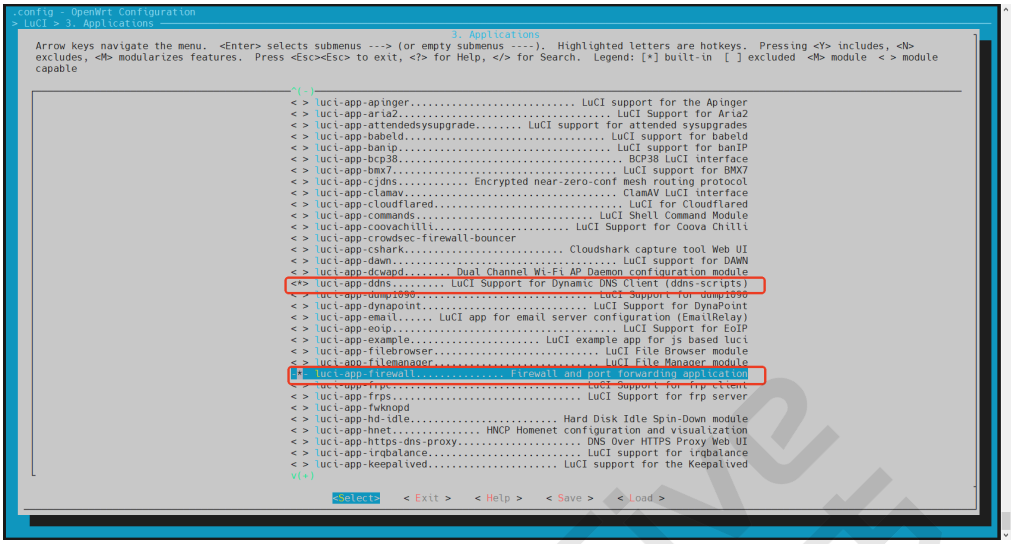
Figure 3-5 Chinese Simplified (zh_Hans)

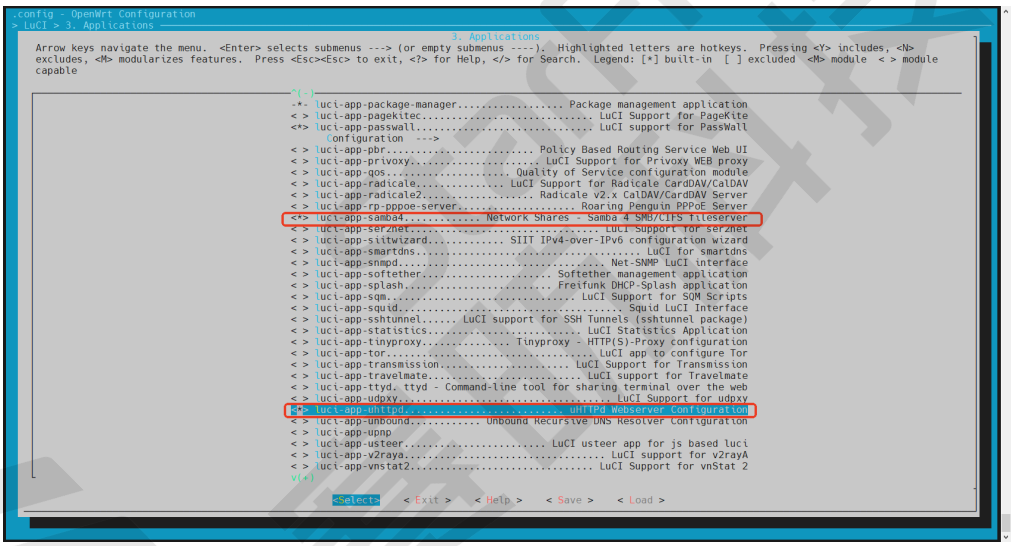


- Select **luci-app-ddns**, **luci-app-firewall**, **luci-app-samba4**, **luci-app-uhttpd** in the configuration menu bar in the following order:

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

Figure 3-6 Applications

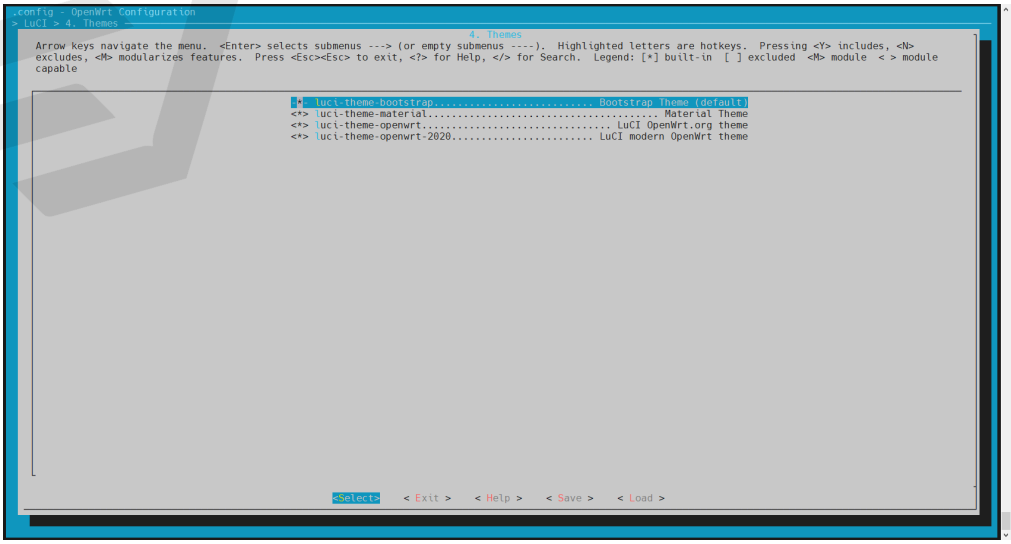




- Select all in the configuration menu bar in the following order:

LuCI > 4. Themes > Select all

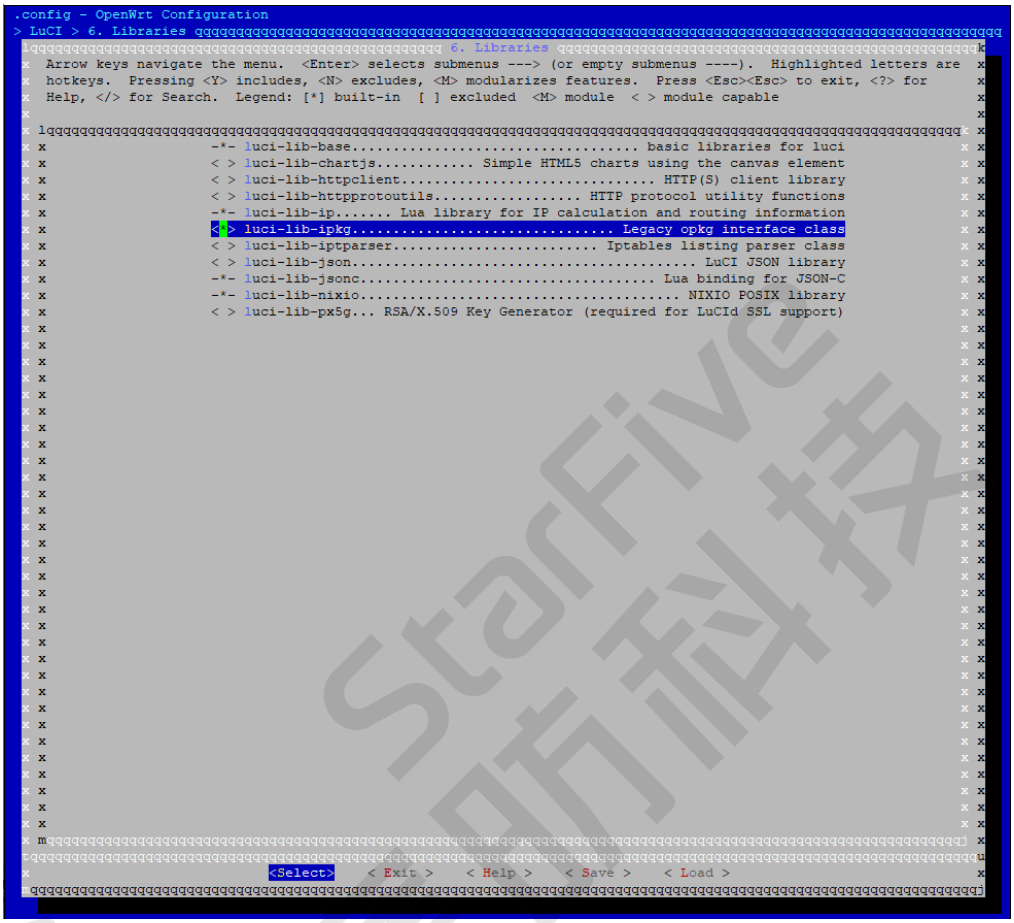
Figure 3-8 Themes



- 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

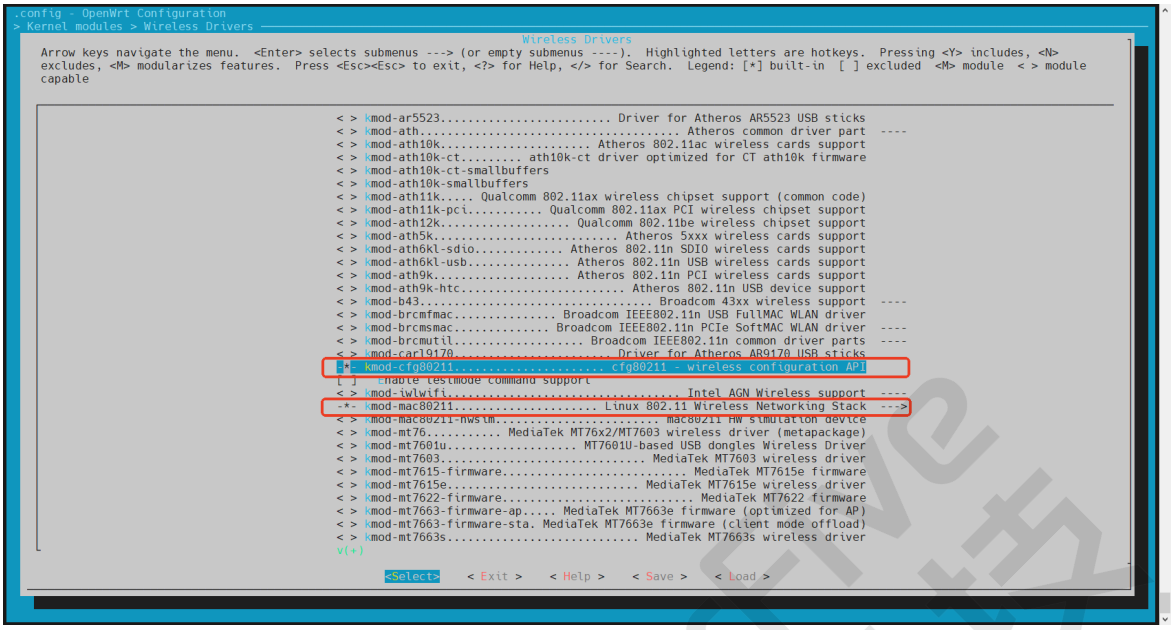
Due to the lack of WiFi modules on VisionFive 2, you need to purchase a WiFi Dongle. OpenWrt supports dozens of WiFi drivers, and the RTL8821AE PCI interface driver is chosen here for its easy availability. On VisionFive 2, there is an M.2 M-key interface, which needs to be connected to the NVME M.2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

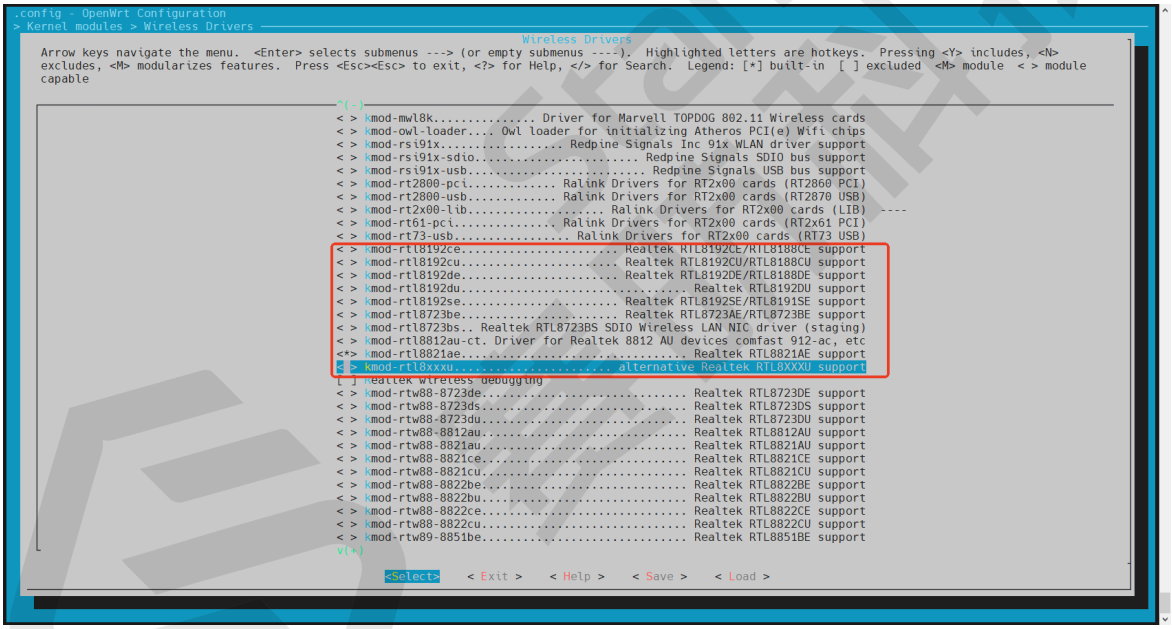
In the menu configuration GUI, follow the steps to configure wireless connection:

1. Select **kmod-cfg80211**, **kmod-mac80211**, **kmod-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

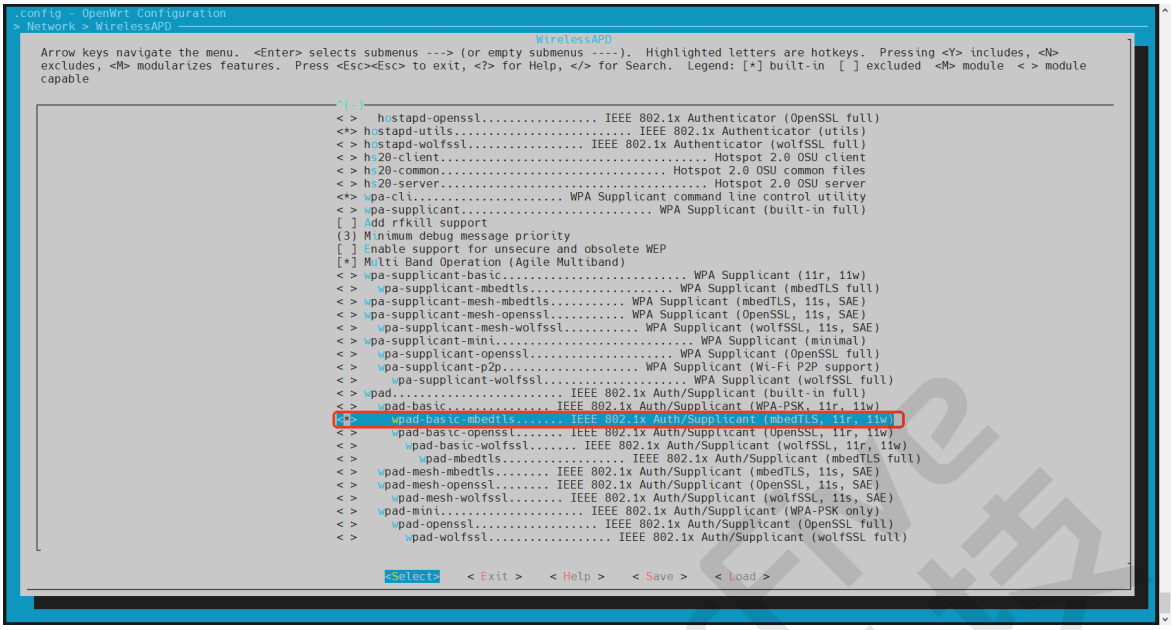


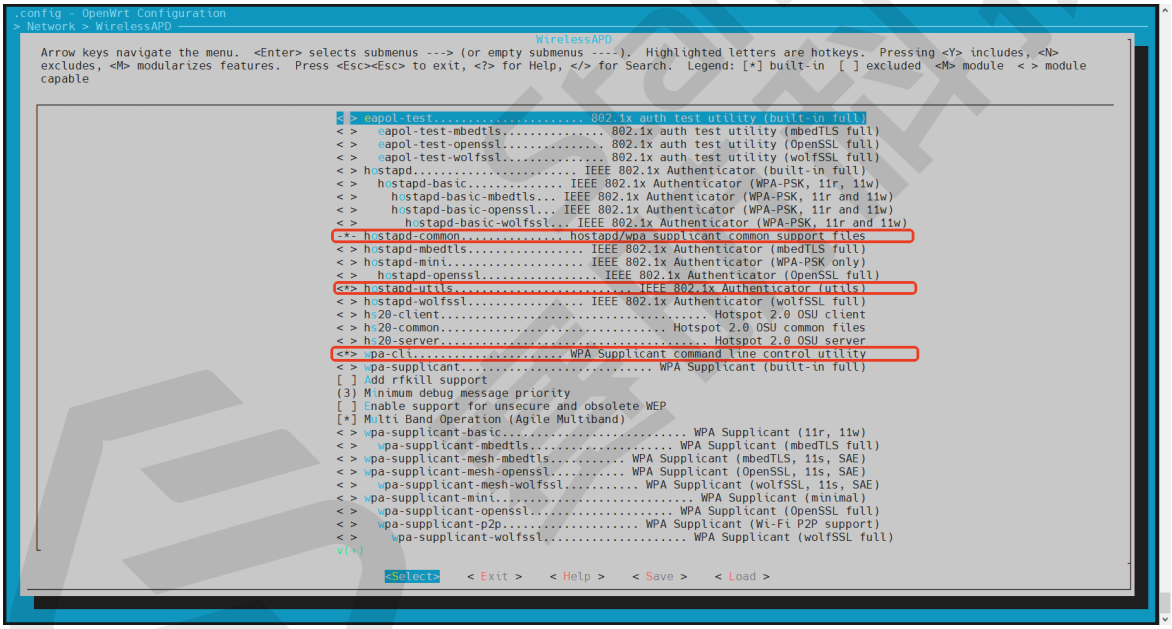


2. Select **wpad-basic-mbedtls**, **hostapd-common**, **wpa-cli**, **hostapd-utils** in the configuration menu bar in the following order:

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

Figure 3-12 WirelessAPD





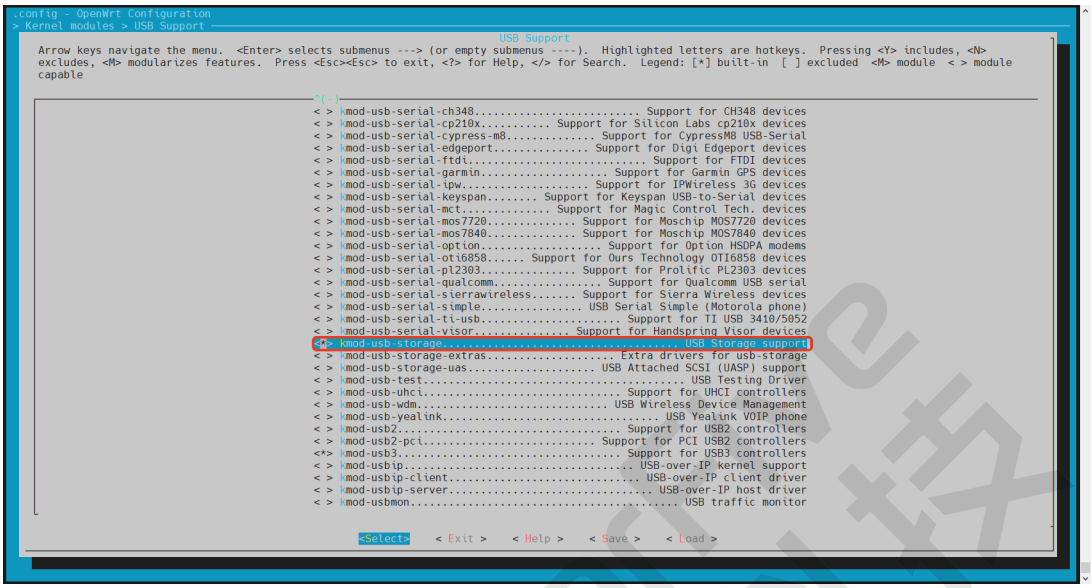
3. **Storage Configuration**:

   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

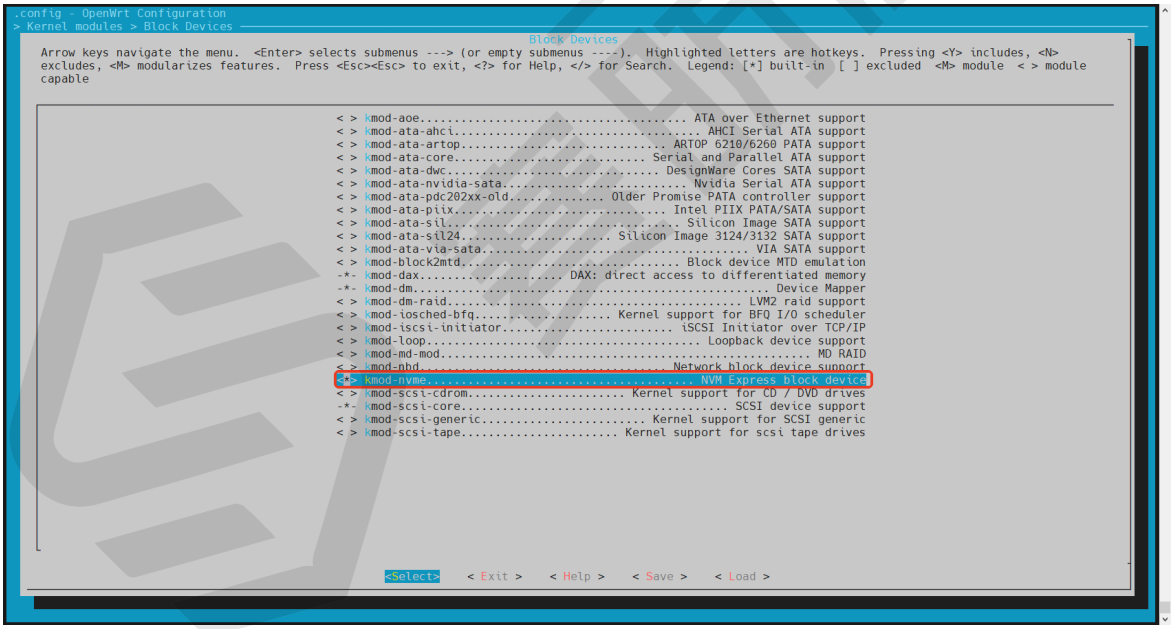
Figure 3-14 kmod-usb-storage



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.

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:

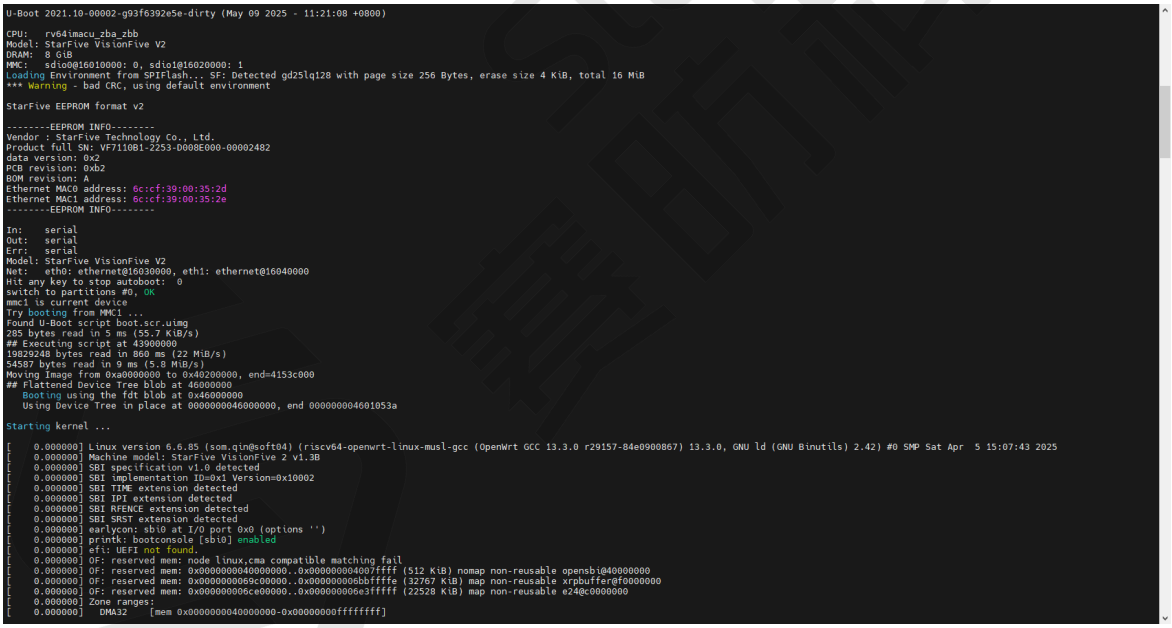
```
dd if=openwrt-jh71x0-generic-visionfive2-v1.3b-ext4-sdcard.img of=/dev/sdX bs=1M
oflag=direct
```

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



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 `wigori`directory:

```
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:

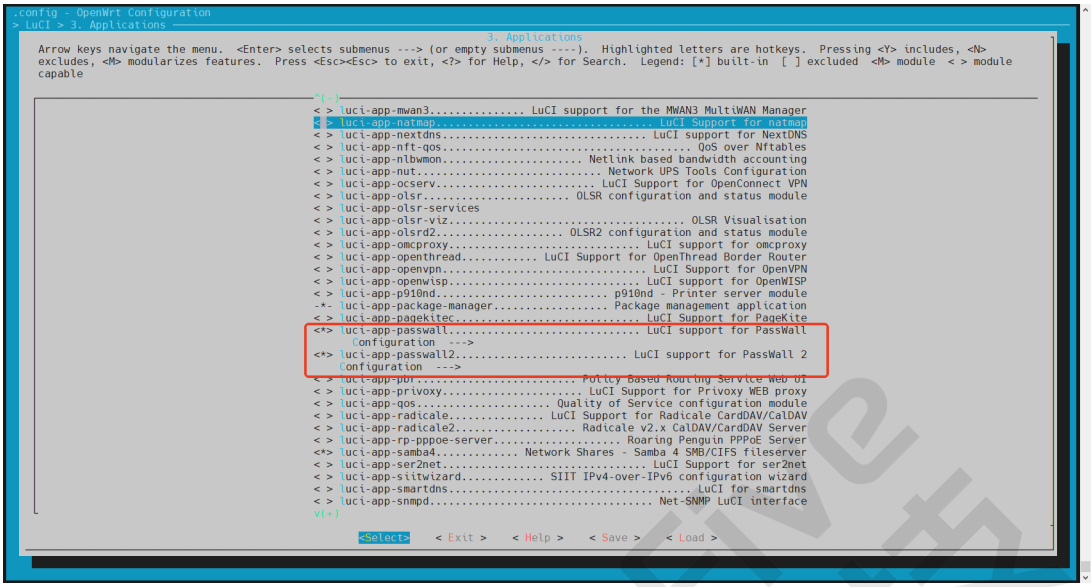
   ```
   make menuconfig
   ```

   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.

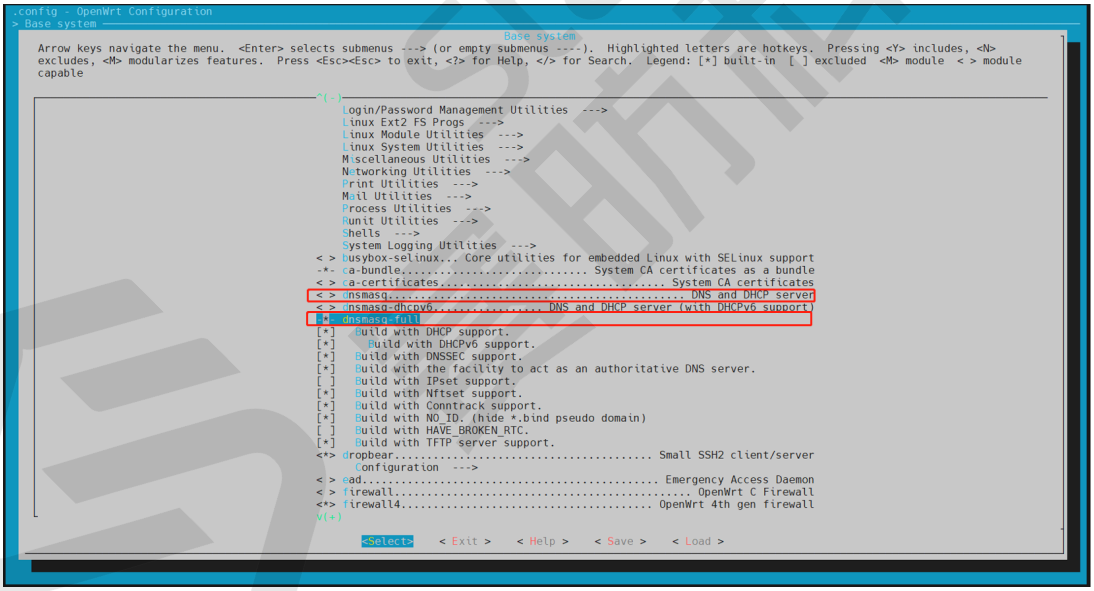
Figure 6-1 Passwall



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.