全场景鸿蒙创新开发

实验箱使用介绍

BOSSAY

博 赛 网 络

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1.全场景鸿蒙创新开发实验箱简介

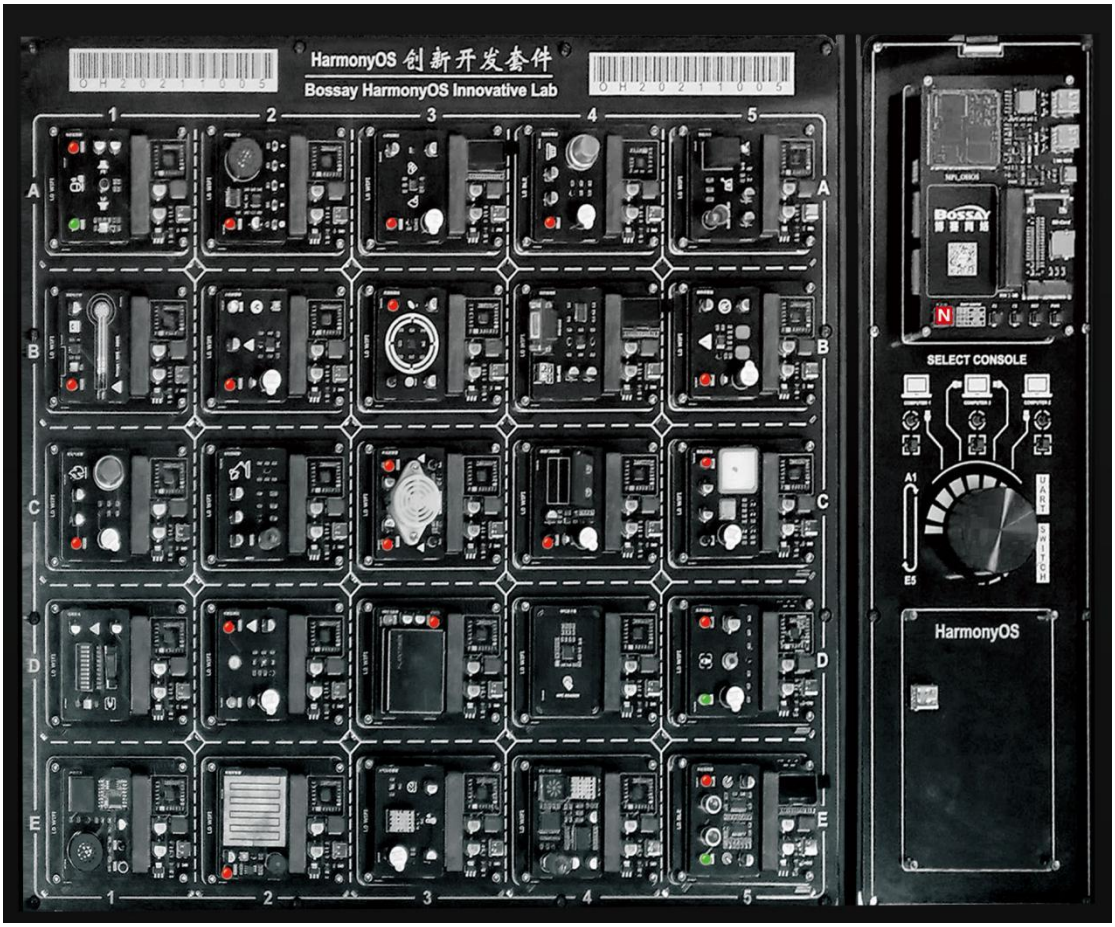
1.1 实验箱概述

“全场景鸿蒙创新开发实验箱”是济南博赛网络技术有限公司结合多年教育培训及校企合作交付经验，专项研发的一款面向高校软硬件开发相关专业日常教学及实训教学，用于全场景分布式鸿蒙设备及应用开发教育的全场景一体化鸿蒙创新开发教学平台。平台面向分布式应用场景，采用场景化案例设计，实验平台预置四款主流 MCU，匹配 L0~L5 所有级别设备开发；整体只需要一条 Type-C 线连接开发 PC，就可以完成功能开发；案例开发板模块采用磁吸附设计，采用触控开关方式在不同开发板之间切换烧录调试接口；案例板支持 WiFi、BLE 等方式组网，完美适配 OpenHarmony，支持鸿蒙“碰一碰”，并可以无缝对接商用鸿蒙产品；实验平台还配备了“创新成果展示区”，用于学生实验成果展示；配套在线开发平台，支持公有云或私有化部署，方便教师对学生学习进度及完成情况的统一管理；在线开发平台在设备开发方面做了 MicroPython 封装，降低开发难度。

全场景鸿蒙创新开发套件每个模块都植入鸿蒙操作系统，进行多种排列组合，构建不同的鸿蒙生态应用场景，满足 1+8+N 生态战略，完美诠释智能家居、车联网等场景，富鸿蒙开发区域可安装一部手机，作为“1”个核心，同时，可以与“8”款设备联动，包括大屏、PC、平板、耳机、车机、手表、眼镜、音箱。最终可以与“N”种轻量级物联网设施互联，实现万物互联。

实训箱配有 GPIO 通用扩展模块，可拓展工业互联网拓展板以及多种传感设备，实现科研创新开发。

开发实验箱功能分布图：



1.2 系统要求

- PC 系统：Windows 7 64 位及以上操作系统
- 虚拟机系统：Ubuntu20.04

1.3 开发工具

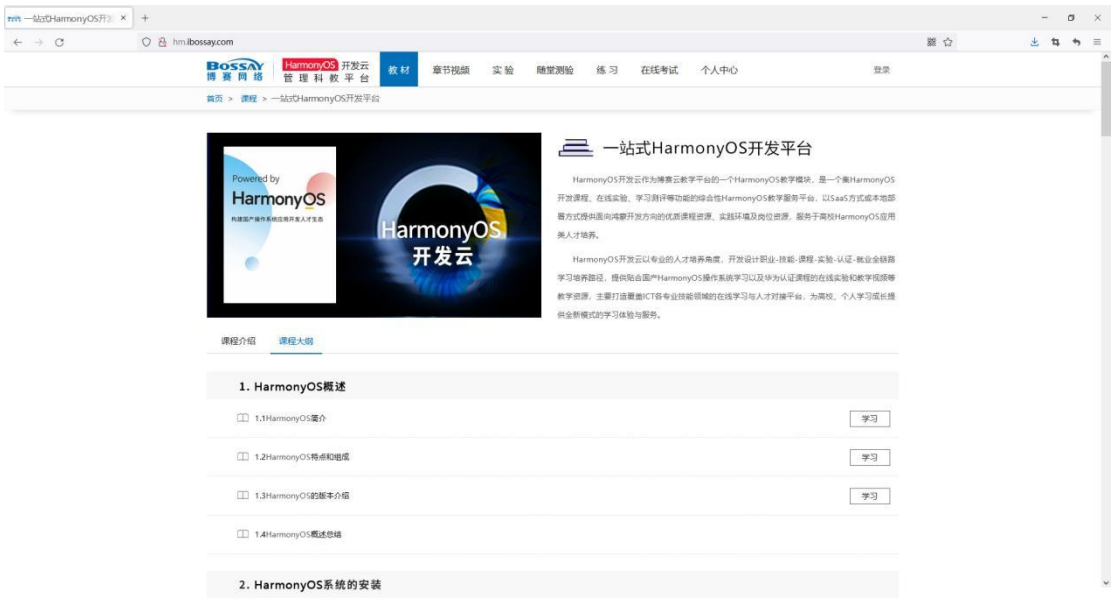
- QCOM 串口调试工具
- HiBurn 烧录工具
- DevEco Device Tool
- Visual Studio Code 代码编辑工具
- USB Type-C 线（PC 通过 USB 与实验箱 Type-C 连接）
- 鸿蒙手机一台

1.4 对接平台

- 鸿蒙开发云

鸿蒙开发云作为博赛云教学平台的一个鸿蒙教学模块，是一个集鸿蒙开发课程、在线实验、学习测评等功能的综合性鸿蒙教学服务平台，以 SaaS 方式或本地部署方式提供面向鸿蒙开发方向的优质课程资源、实践环境及岗位资源，服务于高校鸿蒙应用类人才培养，其产品特点如下：

- 丰富的课程和视频资源：技术专业课程+华为认证课程；（包含鸿蒙应用开发、HMSCore 集成、鸿蒙设备开发基础类、鸿蒙综合应用实训类课程、华为 1+X 移动应用开发以及华为 HCIA-鸿蒙的认证学习课程等）
- 方便、快捷、易用的实验环境：覆盖鸿蒙应用开发和鸿蒙设备开发两个方向的开发实验课程，满足日常教学+培训授课所需要的实验环境；
- 线上鸿蒙开发云与全场景鸿蒙创新开发套件深度融合，做到在线实验代码开发编译，线下程序烧录，免去学生独立搭建开发环境的繁琐步骤。
- 智能、精准的学习跟踪管理：提供专项学习、模拟考试等多种测评方式，准确评估用户知识点掌握情况；
- 灵活部署，支持公有云、私有化部署方式，保障资源充分利用；



鸿蒙开发云以专业的人才培养角度，开发设计职业-技能-课程-实验-认证-就业全链路学习培养路径，提供贴合国产鸿蒙操作系统学习以及华为认证课程的在线实验和教学视频等教学资源，主要打造覆盖 ICT 各专业技能领域的在线学习与人才对接平台，为高校、个人学习成长提供全新模式的学习体验与服务。

2.实验箱功能模块简介

2.1 轻量型鸿蒙案例开发板模块

➢ 模块综述（wifi）：

1、基于海思 Hi3861/Hi3861L 高度集成的 2.4GHz Wi-Fi 芯片内部集成高性能 32bit 微处理器、硬件安全引擎以及丰富的外设接口；

2、支持 Liteos、鸿蒙和第三方组件,可与华为 Hi-Link 协同；

3、支持复杂环境下 TPC、自动速率、弱干扰免疫等可靠性通信算法；

4、支持 256 节点 Mesh 组网，支持 20MHz 标准带宽和 5MHz/10MHz 窄带宽，提供最大 72.2Mbit/s 物理层速率；

5、硬件加密，支持多种加密协议，安全组件+LiteOS+自研 CPU。

- 模块综述（BLE）：

主控：BK7231M

尺寸：9.4cm * 7.4cm

供电方式：Type-C USB2.0 / 底座触点

电气参数：5V 1A

吸附方式：四点磁吸

2.2 小型鸿蒙开发板模块

- 模块综述：

主控：STM32MP157AAC

尺寸：15cm * 10cm

供电方式：Type-C USB2.0

电气参数：5V 1A

固定方式：四点铜柱

外设：案例板接口、Mini PCI-E 接口、板载 SDIO Wi-Fi、两路 USB HOST、SD Card、用户按键

2.3 标准型鸿蒙开发板模块

- 模块综述：

处理器：双核 ARM Cortex A7/ 650MHz 和 Cortex••M4/ 209MHz 内核的异构架构

内存：16bit DDR3L SDRAM,

存储：4GB eMMC Flash

接口：8bit SDIO 接口

USB OTG MiniUSBOTG 接口

USB Host 4 路 USBTypeA 接口

1 路标准 HDMI 1.4a 接口

1 路 10/100/1000 RJ45 自适应以太网接口

扩展 GPIO 接口

操作系统支持鸿蒙

2.4 案例展示区

案例展示区支持将开发模块吸附到其上面，可进行独立供电开发，用于开发综合案例作品介绍。

2.5 模块切换旋钮

模块切换旋钮可以对所要开发的模块进行选定，支持顺时针和逆时针双方向旋转，模块下方通过灯光显示确定目前选中位置，无需插拔模组，按下旋钮即可锁定模块。

2.6 LED 显示屏

显示屏支持触控，可展示鸿蒙元素，Logo，实验数据，实验效果等；

3.开发环境介绍

对实验箱开发主要分为两种方式，一种是使用鸿蒙开发云平台进行线上开发，开发环境和案例代码可以直接使用。另一种是本地开发，需要执行搭建开发环境，具体操作步骤如下：

3.1 安装 Linux 编译工具

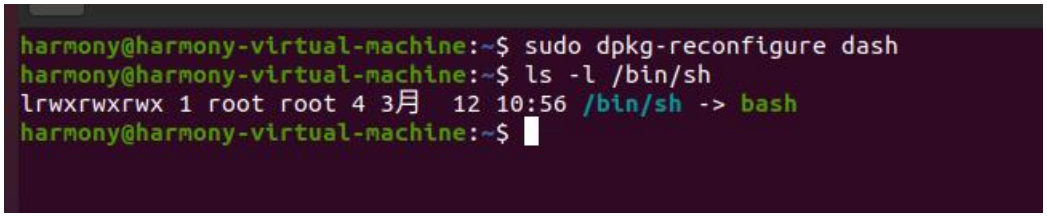
将 Ubuntu shell 改为 bash

打开终端工具，执行如下命令，输入密码，然后选择 No，将 Ubuntu shell 修改为 bash

sudo dpkg-reconfigure dash

执行如下命令，确认输出结果为 bash

ls -l /bin/sh



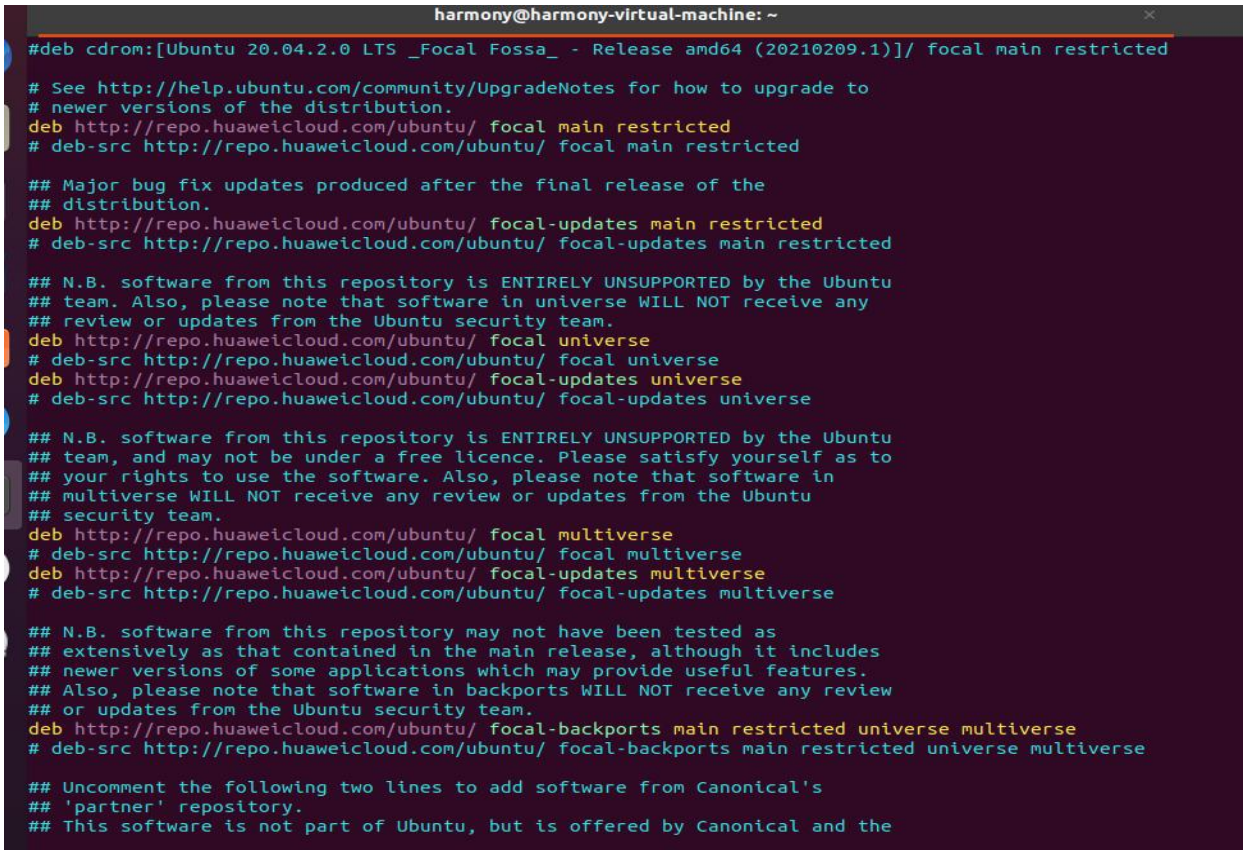
修改 apt 源

备份之前的 sources.list 文件

```
sudo cp -a /etc/apt/sources.list /etc/apt/sources.list.bak
```

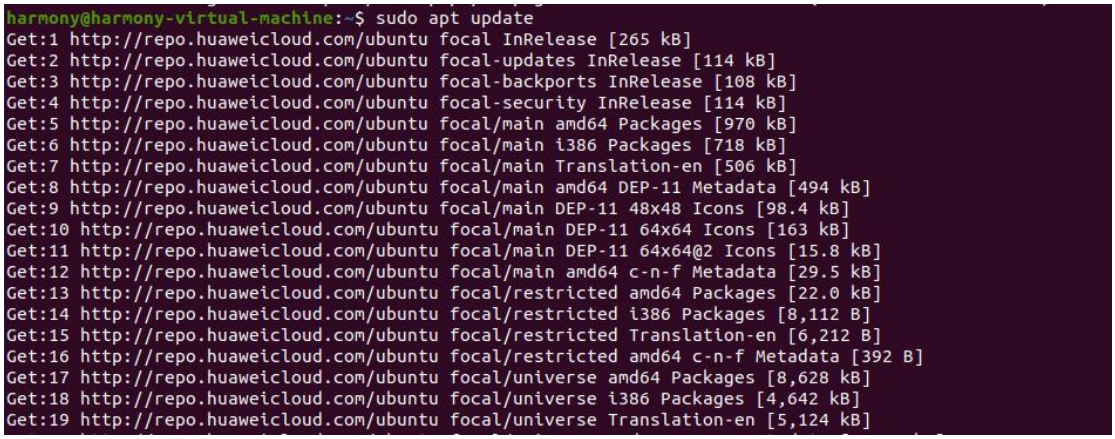
2、修改 sources.list 文件，执行下面两条命令

```
sudo sed -i "s@http://.*archive.ubuntu.com@http://repo.huaweicloud.com@g"
 /etc/apt/sources.list
sudo sed -i "s@http://.*security.ubuntu.com@http://repo.huaweicloud.com@g
" /etc/apt/sources.list
```

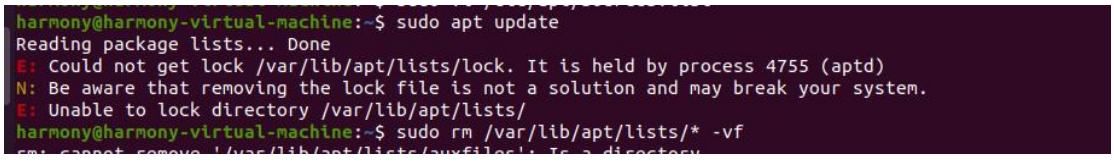


更新 apt 缓存

sudo apt update



如果出现一下问题先执行 sudo rm /var/lib/apt/lists/* -vf



sudo apt upgrade

如果出现以下问题

```
ne:~$ sudo  apt upgrade
 not get lock /var/lib/dpkg/lock-frontend. It is held by process 4755 (aptd)... 92s
ne:~$
```

首先输入 ps afx|grep apt 查看进程然后 sudo kill -9 4755

```
harmony@harmony-virtual-machine:~$ ps afx|grep apt
   7944 pts/2    S+     0:00          \_ grep --color=auto apt
   4755 ?        SNl    0:05 /usr/bin/python3 /usr/sbin/aptd
   4814 ?        SN     0:13  \_ /usr/lib/apt/methods/http
   5261 ?        SN     0:00  \_ /usr/lib/apt/methods/http
harmony@harmony-virtual-machine:~$ sudo kill -9 7944
kill: (7944): No such process
harmony@harmony-virtual-machine:~$ sudo kill -9 4755
harmony@harmony-virtual-machine:~$ ps afx|grep apt
   7951 pts/2    S+     0:00          \_ grep --color=auto apt
```

执行完 sudo apt upgrade 结果如下

```
   23  history
harmony@harmony-virtual-machine:~$ sudo apt upgrade
[sudo] password for harmony:
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libllvm11
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
harmony@harmony-virtual-machine:~$
```

安装 net-tools

sudo apt install net-tools

```
harmony@harmony-virtual-machine:~$ sudo apt install net-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libllvm11
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  net-tools
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 196 kB of archives.
After this operation, 864 kB of additional disk space will be used.
Get:1 http://repo.huaweicloud.com/ubuntu focal/main amd64 net-tools amd64 1.60+git20180626.aebd88e-1ubuntu1 [196 kB]
Fetched 196 kB in 2s (86.1 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 182295 files and directories currently installed.)
Preparing to unpack .../net-tools_1.60+git20180626.aebd88e-1ubuntu1_amd64.deb ...
Unpacking net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Setting up net-tools (1.60+git20180626.aebd88e-1ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
harmony@harmony-virtual-machine:~$
```

安装 vim 工具

sudo apt install vim

```
harmony@harmony-virtual-machine:~$ sudo apt install vim
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  vim-common vim-runtime vim-tiny
Suggested packages:
  ctags vim-doc vim-scripts indent
The following NEW packages will be installed:
  vim vim-runtime
The following packages will be upgraded:
  vim-common vim-tiny
2 upgraded, 2 newly installed, 0 to remove and 378 not upgraded.
Need to get 7,110 kB/7,773 kB of archives.
After this operation, 34.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://mirrors.aliyun.com/ubuntu focal-updates/main amd64 vim-runtime all 2:8.1.2269-1ubuntu5.7 [5,872 kB]
Get:2 http://mirrors.aliyun.com/ubuntu focal-updates/main amd64 vim amd64 2:8.1.2269-1ubuntu5.7 [1,238 kB]
Fetched 7,110 kB in 13s (537 kB/s)
(Reading database ... 180177 files and directories currently installed.)
Preparing to unpack .../vim-tiny_2%3a8.1.2269-1ubuntu5.7_amd64.deb ...
Unpacking vim-tiny (2:8.1.2269-1ubuntu5.7) over (2:8.1.2269-1ubuntu5) ...
Preparing to unpack .../vim-common_2%3a8.1.2269-1ubuntu5.7_all.deb ...
```

安装 SSH 工具

sudo apt install openssh-server

```
harmony@harmony-virtual-machine:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libllvm11
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
  molly-guard monkeysphere ssh-askpass
The following NEW packages will be installed:
  ncurses-term openssh-server openssh-sftp-server ssh-import-id
0 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
Need to get 688 kB of archives.
After this operation, 6,010 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://repo.huaweicloud.com/ubuntu focal/main amd64 ncurses-term all 6.2-0ubuntu2 [249 kB]
Get:2 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 openssh-sftp-server amd64 1:8.2p1-4ubuntu0.4 [51.5 kB]
Get:3 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 openssh-server amd64 1:8.2p1-4ubuntu0.4 [377 kB]
Get:4 http://repo.huaweicloud.com/ubuntu focal/main amd64 ssh-import-id all 5.10-0ubuntu1 [10.0 kB]
Fetched 688 kB in 0s (2,455 kB/s)
Preconfiguring packages ...
Selecting previously unselected package ncurses-term.
```

samb 服务器的安装与配置

创建共享目录

sudo mkdir ~/share

设置权限

sudo chmod 777 ~/share

安装 samb

sudo apt install samba

```
harmony@harmony-virtual-machine:~$ sudo mkdir ~/share
harmony@harmony-virtual-machine:~$ sudo chmod 777 ~/share
harmony@harmony-virtual-machine:~$ sudo apt install samba
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libllvm11
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  attr ibverbs-providers libcephfs2 libibverbs1 librados2 librdmacm1 python3-crypto python3-dnspython python3-gpg python3-mar
  python3-tdb samba-common samba-common-bin samba-dsdb-modules samba-vfs-modules tdb-tools
Suggested packages:
  python-markdown-doc python-pygments-doc ttf-bitstream-vera python-pyparsing-doc bind9 bind9utils ctdb ldb-tools ntp | chron
The following NEW packages will be installed:
  attr ibverbs-providers libcephfs2 libibverbs1 librados2 librdmacm1 python3-crypto python3-dnspython python3-gpg python3-mar
  python3-tdb samba samba-common samba-common-bin samba-dsdb-modules samba-vfs-modules tdb-tools
0 upgraded, 21 newly installed, 0 to remove and 0 not upgraded.
Need to get 10.3 MB of archives.
After this operation, 68.1 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://repo.huaweicloud.com/ubuntu focal/main amd64 python3-dnspython all 1.16.0-1build1 [89.1 kB]
Get:2 http://repo.huaweicloud.com/ubuntu focal/main amd64 python3-crypto amd64 2.6.1-13ubuntu2 [237 kB]
Get:3 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 python3-tdb amd64 1.4.3-0ubuntu0.20.04.1 [13.4 kB]
Get:4 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 python3-samba amd64 2:4.13.17~dfsg-0ubuntu0.21.04.1 [2,614
Get:5 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 samba-common all 2:4.13.17~dfsg-0ubuntu0.21.04.1 [69.4 kB]
Get:6 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 samba-common-bin amd64 2:4.13.17~dfsg-0ubuntu0.21.04.1 [555
Get:7 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 tdb-tools amd64 1.4.3-0ubuntu0.20.04.1 [24.9 kB]
Get:8 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 samba amd64 2:4.13.17~dfsg-0ubuntu0.21.04.1 [1,065 kB]
Get:9 http://repo.huaweicloud.com/ubuntu focal/main amd64 attr amd64 1:2.4.48-5 [21.9 kB]
Get:10 http://repo.huaweicloud.com/ubuntu focal/main amd64 libibverbs1 amd64 28.0-1ubuntu1 [53.6 kB]
Get:11 http://repo.huaweicloud.com/ubuntu focal/main amd64 ibverbs-providers amd64 28.0-1ubuntu1 [232 kB]
```

创建 samb 用户

sudo smbpasswd -a harmony（需要输入密码和确认密码-a 后面为自己的虚机名称）

```
harmony@harmony-virtual-machine:~$ sudo smbpasswd -a harmony
New SMB password:
Retype new SMB password:
Added user harmony.
harmony@harmony-virtual-machine:~$
```

修改配置文件

sudo vim /etc/samba/smb.conf

在文件末尾添加如下代码

[share]

comment = share folder

browseable = yes

path = /data（更改为要共享的目录）

create mask = 0700

directory mask = 0700

valid users = HarmonyOS（更改为自己的用户）

force user = HarmonyOS

force group = HarmonyOS

public = yes

available = yes

writable = yes

```
   guest ok = no
# Uncomment to allow remote administration of Windows print drivers.
# You may need to replace 'lpadmin' with the name of the group your
# admin users are members of.
# Please note that you also need to set appropriate Unix permissions
# to the drivers directory for these users to have write rights in it
;   write list = root, @lpadmin
[share]
comment = share folder
browseable = yes
path = /home/harmony/share
create mask = 0700
directory mask = 0700
valid users = harmony
force user = harmony
force group = harmony
public = yes
available = yes
writable = yes
:wq
```

输完代码后按下 ESC 输入 wq 保存退出

重启 samb 服务器

service smbd restart

安装 python 以及相关依赖

cd /usr/bin/

sudo ln -s python3.8 python

安装 pip3

sudo apt install python3-pip

```
harmony@harmony-virtual-machine:~$ service smbd restart
harmony@harmony-virtual-machine:~$ cd /usr/bin/
harmony@harmony-virtual-machine:/usr/bin$ sudo ln -s python3.8 python
harmony@harmony-virtual-machine:/usr/bin$ sudo apt install python3-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libllvm11
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dpkg-dev fakeroot g++ g++-9 gcc gcc-9 libalgorith
  libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0 libctf0 libexpat1-dev libfakeroot libgcc-9-dev libitm1
  libubsan1 linux-libc-dev make manpages-dev python-pip-whl python3-dev python3-distutils python3-setuptools python3-w
Suggested packages:
  binutils-doc debian-keyring g++-multilib g++-9-multilib gcc-9-doc gcc-multilib autoconf automake libtool flex bison
  python-setuptools-doc
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dpkg-dev fakeroot g++ g++-9 gcc gcc-9 libalgorith
  libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0 libctf0 libexpat1-dev libfakeroot libgcc-9-dev libitm1
  libubsan1 linux-libc-dev make manpages-dev python-pip-whl python3-dev python3-distutils python3-pip python3-setuptoo
0 upgraded, 43 newly installed, 0 to remove and 0 not upgraded.
Need to get 44.1 MB of archives.
After this operation, 199 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 binutils-common amd64 2.34-6ubuntu1.3 [207 kB]
Get:2 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 libbinutils amd64 2.34-6ubuntu1.3 [474 kB]
Get:3 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 libctf-nobfd0 amd64 2.34-6ubuntu1.3 [47.4 kB]
Get:4 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 libctf0 amd64 2.34-6ubuntu1.3 [46.6 kB]
Get:5 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 binutils-x86-64-linux-gnu amd64 2.34-6ubuntu1.3 [1,6
Get:6 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 binutils amd64 2.34-6ubuntu1.3 [3,380 B]
Get:7 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 libc-dev-bin amd64 2.31-0ubuntu9.7 [71.6 kB]
Get:8 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 linux-libc-dev amd64 5.4.0-104.118 [1,117 kB]
Get:9 http://repo.huaweicloud.com/ubuntu focal/main amd64 libcrypt-dev amd64 1:4.4.10-10ubuntu4 [104 kB]
Get:10 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 libc6-dev amd64 2.31-0ubuntu9.7 [2,518 kB]
Get:11 http://repo.huaweicloud.com/ubuntu focal-updates/main amd64 libitm1 amd64 10.3.0-1ubuntu1~20.04 [26.2 kB]
```

设置 pip 镜像源

pip config set global.trusted-host repo.huaweicloud.com

pip config set global.index-url https://repo.huaweicloud.com/repository/pypi/simple

pip config set global.timeout 120

pip3 install --upgrade pip

```
harmony@harmony-virtual-machine:/usr/bin$ pip config set global.trusted-host repo.huaweicloud.com
Writing to /home/harmony/.config/pip/pip.conf
harmony@harmony-virtual-machine:/usr/bin$ pip config set global.index-url https://repo.huaweicloud.com/repository/pypi/simple
Writing to /home/harmony/.config/pip/pip.conf
harmony@harmony-virtual-machine:/usr/bin$ pip config set global.timeout 120
Writing to /home/harmony/.config/pip/pip.conf
harmony@harmony-virtual-machine:/usr/bin$ pip3 install --upgrade pip
Looking in indexes: https://repo.huaweicloud.com/repository/pypi/simple
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: Unverified HTTPS request is being made to host 'repo.huaweicloud.com'. Adding certifica
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: Unverified HTTPS request is being made to host 'repo.huaweicloud.com'. Adding certifica
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
Collecting pip
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: Unverified HTTPS request is being made to host 'repo.huaweicloud.com'. Adding certifica
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  Downloading https://repo.huaweicloud.com/repository/pypi/packages/4d/16/0a14ca596f30316efd412a60bdfac02a7259bf8673d4d917dc60b9a21812/pip-22.0.4-py3-none-any.whl (2.1 MB)
     |████████████████████████████████| 2.1 MB 10.1 MB/s
Installing collected packages: pip
  WARNING: The scripts pip, pip3 and pip3.8 are installed in '/home/harmony/.local/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed pip-22.0.4
harmony@harmony-virtual-machine:/usr/bin$
```

安装 python 模块

```
pip install setuptools
```

安装 GUI 工具

pip3 install kconfiglib

```
harmony@harmony-virtual-machine:/usr/bin$ pip install setuptools
Looking in indexes: https://repo.huaweicloud.com/repository/pypi/simple
Requirement already satisfied: setuptools in /usr/lib/python3/dist-packages (45.2.0)
harmony@harmony-virtual-machine:/usr/bin$ pip3 install kconfiglib
Looking in indexes: https://repo.huaweicloud.com/repository/pypi/simple
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: Unverified HTTPS request is being made to host 'repo.huaweicloud.com'. Adding certifica
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
Collecting kconfiglib
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: Unverified HTTPS request is being made to host 'repo.huaweicloud.com'. Adding certifica
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  Downloading https://repo.huaweicloud.com/repository/pypi/packages/8a/f1/d98a89231e779b079b977590efcc31249d959c8f1d4b5858cad69695ff9c/kconfiglib-14.1.0-py2.py3-none-any.whl (145 kB)
     |████████████████████████████████| 145 kB 13.8 MB/s
Installing collected packages: kconfiglib
  WARNING: The scripts alldefconfig, allmodconfig, allnoconfig, allyesconfig, defconfig, genconfig, guiconfig, listnewconfig, menuconfig, oldconfig, olddefconfig, savedefconfig and setconfig are installe
d in '/home/harmony/.local/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed kconfiglib-14.1.0
harmony@harmony-virtual-machine:/usr/bin$
```

升级 python 组件包

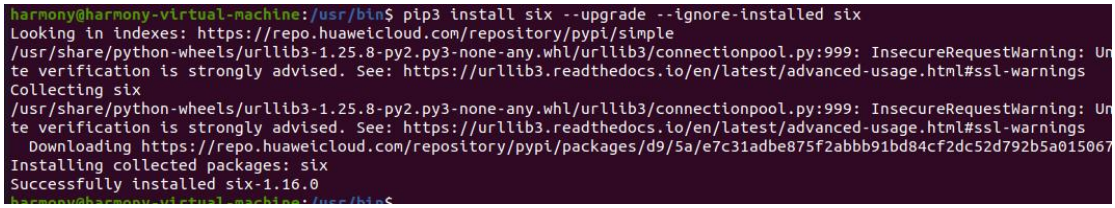
pip3 install pycryptodome

```
harmony@harmony-virtual-machine:/usr/bin$ pip3 install pycryptodome
Looking in indexes: https://repo.huaweicloud.com/repository/pypi/simple
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning:
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
Collecting pycryptodome
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning:
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  Downloading https://repo.huaweicloud.com/repository/pypi/packages/71/6b/965be3bec8fc1f6013739fea2bba86cf43a3be09a
     |████████████████████████████████| 2.0 MB 17.3 MB/s
Installing collected packages: pycryptodome
Successfully installed pycryptodome-3.14.1
harmony@harmony-virtual-machine:/usr/bin$ pip3 install launchpadlib
```

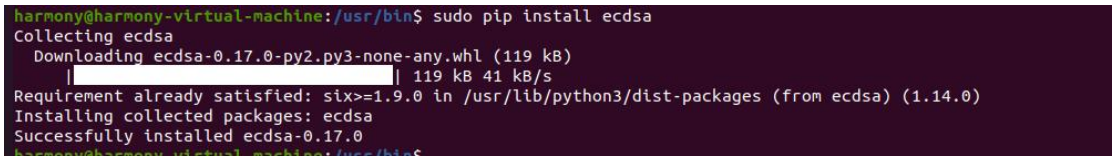
pip3 install launchpadlib

```
harmony@harmony-virtual-machine:/usr/bin$ pip3 install launchpadlib
Looking in indexes: https://repo.huaweicloud.com/repository/pypi/simple
Requirement already satisfied: launchpadlib in /usr/lib/python3/dist-packages (1.10.13)
Requirement already satisfied: httplib2 in /usr/lib/python3/dist-packages (from launchpadlib) (0.14.0)
Requirement already satisfied: keyring in /usr/lib/python3/dist-packages (from launchpadlib) (18.0.1)
Requirement already satisfied: lazr.restfulclient>=0.9.19 in /usr/lib/python3/dist-packages (from launchpadlib) (0.14
Requirement already satisfied: lazr.uri in /usr/lib/python3/dist-packages (from launchpadlib) (1.0.3)
Requirement already satisfied: setuptools in /usr/lib/python3/dist-packages (from launchpadlib) (45.2.0)
Requirement already satisfied: six in /usr/lib/python3/dist-packages (from launchpadlib) (1.14.0)
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: U
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
Collecting testresources
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: U
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  Downloading https://repo.huaweicloud.com/repository/pypi/packages/45/4d/79a9a1f71de22fbc6c6433ac135f68d005de72fbe73
Requirement already satisfied: wadllib in /usr/lib/python3/dist-packages (from launchpadlib) (1.3.3)
Requirement already satisfied: secretstorage in /usr/lib/python3/dist-packages (from keyring->launchpadlib) (2.3.1)
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: U
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
Collecting pbr>=1.8
/usr/share/python-wheels/urllib3-1.25.8-py2.py3-none-any.whl/urllib3/connectionpool.py:999: InsecureRequestWarning: U
te verification is strongly advised. See: https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  Downloading https://repo.huaweicloud.com/repository/pypi/packages/5a/f0/28b2d5398ed905ce67045670e076c8dfa23ea54c19f
     |████████████████████████████████| 113 kB 4.0 MB/s
Installing collected packages: pbr, testresources
  WARNING: The script pbr is installed in '/home/harmony/.local/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed pbr-5.8.1 testresources-2.0.1
```

pip3 install six --upgrade --ignore-installed six



sudo pip install ecdsa



sudo apt-get install scons –y

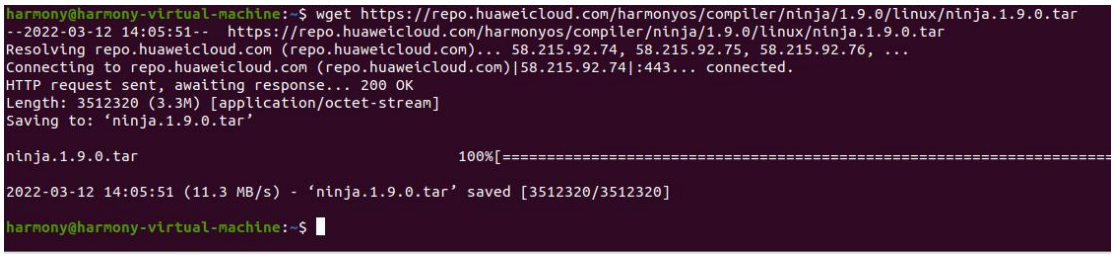
交叉编译工具安装

下载交叉编译工具

wget https://repo.huaweicloud.com/HarmonyOS/compiler/gn/1523/linux/gn.1523.tar

wget

https://repo.huaweicloud.com/HarmonyOS/compiler/ninja/1.9.0/linux/ninja.1.9.0.tar



wget

https://repo.huaweicloud.com/HarmonyOS/compiler/clang/9.0.0-36191/linux/llvm-linux-9.0.0-36191.tar

```
harmony@harmony-virtual-machine:~$ wget https://repo.huaweicloud.com/harmonyos/compiler/clang/9.0.0-36191/linux/llvm-linux-9.0.0-36191.tar
--2022-03-12 14:06:59--  https://repo.huaweicloud.com/harmonyos/compiler/clang/9.0.0-36191/linux/llvm-linux-9.0.0-36191.tar
Resolving repo.huaweicloud.com (repo.huaweicloud.com)... 58.215.92.71, 58.215.92.72, 58.215.92.73, ...
Connecting to repo.huaweicloud.com (repo.huaweicloud.com)|58.215.92.71|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 759541760 (724M) [application/octet-stream]
Saving to: 'llvm-linux-9.0.0-36191.tar'

llvm-linux-9.0.0-36191.tar                    100%[=============================================================================================

2022-03-12 14:08:44 (6.86 MB/s) - 'llvm-linux-9.0.0-36191.tar' saved [759541760/759541760]
```

wget

https://repo.huaweicloud.com/HarmonyOS/compiler/gcc_riscv32/7.3.0/linux/gcc_riscv32-linux-7.3.0.tar.gz

```
harmony@harmony-virtual-machine:~$ wget https://repo.huaweicloud.com/harmonyos/compiler/gcc_riscv32/7.3.0/linux/gcc_riscv32-linux-7.3.0.tar.gz
--2022-03-12 14:09:18--  https://repo.huaweicloud.com/harmonyos/compiler/gcc_riscv32/7.3.0/linux/gcc_riscv32-linux-7.3.0.tar.gz
Resolving repo.huaweicloud.com (repo.huaweicloud.com)... 58.215.92.75, 58.215.92.76, 58.215.92.77, ...
Connecting to repo.huaweicloud.com (repo.huaweicloud.com)|58.215.92.75|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 42844044 (41M) [application/octet-stream]
Saving to: 'gcc_riscv32-linux-7.3.0.tar.gz'

gcc_riscv32-linux-7.3.0.tar.gz                100%[=============================================================================================

2022-03-12 14:09:22 (10.6 MB/s) - 'gcc_riscv32-linux-7.3.0.tar.gz' saved [42844044/42844044]

harmony@harmony-virtual-machine:~$
```

wget

https://repo.huaweicloud.com/HarmonyOS/compiler/hc-gen/0.65/linux/hc-gen-0.65-linux.tar

```
harmony@harmony-virtual-machine:~$ wget https://repo.huaweicloud.com/harmonyos/compiler/hc-gen/0.65/linux/hc-gen-0.65-linux.tar
--2022-03-12 14:09:49--  https://repo.huaweicloud.com/harmonyos/compiler/hc-gen/0.65/linux/hc-gen-0.65-linux.tar
Resolving repo.huaweicloud.com (repo.huaweicloud.com)... 58.215.92.71, 58.215.92.74, 58.215.92.72, ...
Connecting to repo.huaweicloud.com (repo.huaweicloud.com)|58.215.92.71|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 112640 (110K) [application/octet-stream]
Saving to: 'hc-gen-0.65-linux.tar'

hc-gen-0.65-linux.tar                         100%[=============================================================================================

2022-03-12 14:09:49 (5.59 MB/s) - 'hc-gen-0.65-linux.tar' saved [112640/112640]

harmony@harmony-virtual-machine:~$
```

解压工具

tar -xvf gn.1523.tar -C ~/

```
harmony@harmony-virtual-machine:~$ tar -xvf gn.1523.tar -C ~/
gn/
gn/LICENCE
gn/gn
```

tar -xvf ninja.1.9.0.tar -C ~/

```
harmony@harmony-virtual-machine:~$ tar -xvf ninja.1.9.0.tar -C ~/
ninja/
ninja/ninja
ninja/COPYING
```

tar -xvf gcc_riscv32-linux-7.3.0.tar.gz -C ~/

```
harmony@harmony-virtual-machine:~$ tar -xvf gcc_riscv32-linux-7.3.0.tar.gz -C ~/
gcc_riscv32/
gcc_riscv32/libexec/
gcc_riscv32/libexec/gcc/
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/liblto_plugin.so.0.0.0
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/lto1
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/cc1plus
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/cc1
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/liblto_plugin.la
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/liblto_plugin.so
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/install-tools/
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/install-tools/fixinc.sh
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/install-tools/mkheaders
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/install-tools/fixincl
gcc_riscv32/libexec/gcc/riscv32-unknown-elf/7.3.0/install-tools/mkinstalldirs
```

tar -xvf llvm-linux-9.0.0-36191.tar -C ~/

```
harmony@harmony-virtual-machine:~$  tar -xvf llvm-linux-9.0.0-36191.tar -C ~/
llvm/
llvm/lib/
llvm/lib/libLLVM.so
llvm/lib/libclang.so.9
llvm/lib/libclang-cpp.so.9
llvm/lib/libLLVM-9.so
llvm/lib/liblldb.so.9
llvm/lib/liblldb.so.9.0.0
llvm/lib/libc++.so
llvm/lib/libRemarks.so.9
llvm/lib/arm-liteos/
llvm/lib/arm-liteos/c++/
llvm/lib/arm-liteos/c++/a7_softfp_neon-vfpv4/
llvm/lib/arm-liteos/c++/a7_softfp_neon-vfpv4/libunwind.a
llvm/lib/arm-liteos/c++/a7_softfp_neon-vfpv4/libc++.so
llvm/lib/arm-liteos/c++/a7_softfp_neon-vfpv4/libc++abi.a
```

tar -xvf hc-gen-0.65-linux.tar -C ~/

```
harmony@harmony-virtual-machine:~$  tar -xvf hc-gen-0.65-linux.tar -C ~/
hc-gen/
hc-gen/hc-gen
hc-gen/LICENSE
```

添加环境变量

vim ~/.bashrc

最后添加

export PATH=~/gn:$PATH

export PATH=~/ninja:$PATH

export PATH=~/gcc_riscv32/bin:$PATH

export PATH=~/llvm/bin:$PATH

export PATH=~/hc-gen:$PATH

```
# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi
export PATH=~/gn:$PATH
export PATH=~/ninja:$PATH
export PATH=~/gcc_riscv32/bin:$PATH
export PATH=~/llvm/bin:$PATH
export PATH=~/hc-gen:$PATH
:wq
```

添加完成后 wq 保存退出

source ~/.bashrc

检查工具安装情况

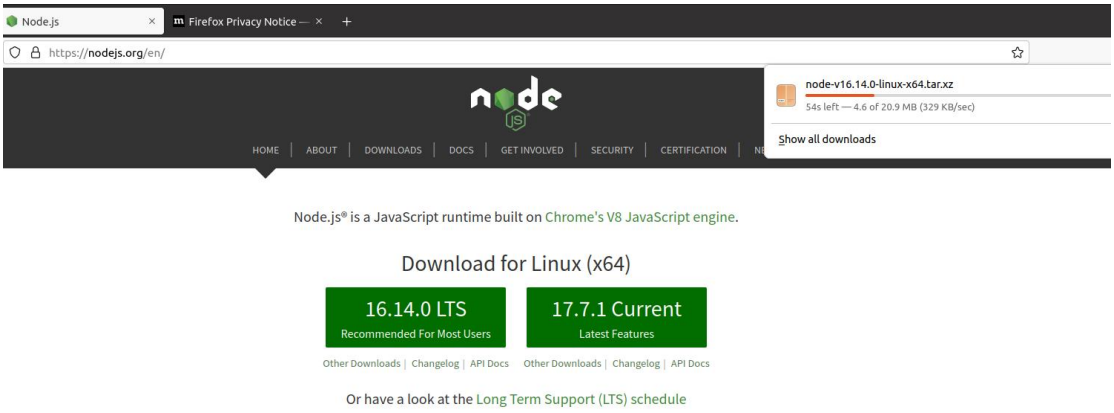
riscv32-unknown-elf-gcc -v

```
harmony@harmony-virtual-machine:~$ source ~/.bashrc
harmony@harmony-virtual-machine:~$ riscv32-unknown-elf-gcc -v
Using built-in specs.
COLLECT_GCC=riscv32-unknown-elf-gcc
COLLECT_LTO_WRAPPER=/home/harmony/gcc_riscv32/bin/../libexec/gcc/riscv32-unknown-elf/7.3.0/lto-wrapper
Target: riscv32-unknown-elf
Configured with: ../riscv-gcc/configure --prefix=/home/yuanwenhong/gcc_compiler_riscv/gcc_riscv32/gcc_riscv32 --target=riscv32-unknown-elf
sable-libgomp --disable-libmudflap --enable-libssp --disable-libstdcxx-pch --disable-nls --disable-shared --disable-threads --disable-multi
--with-gnu-as --with-gnu-ld --with-newlib --with-system-zlib CFLAGS='-fstack-protector-strong -O2 -D_FORTIFY_SOURCE=2 -Wl,-z,relro,-z,now,-
ORTIFY_SOURCE=2 -Wl,-z,relro,-z,now,-z,noexecstack -fPIE' LDFLAGS=-Wl,-z,relro,-z,now,-z,noexecstack 'CXXFLAGS_FOR_TARGET=-Os -mcmodel=medl
tack -Wtrampolines -fno-short-enums -fno-short-wchar' 'CFLAGS_FOR_TARGET=-Os -mcmodel=medlow -Wall -fstack-protector-strong -Wl,-z,relro,-z
har' --with-headers=/home/yuanwenhong/gcc_compiler_riscv/gcc_riscv32/gcc-riscv32/riscv32-unknown-elf/include --with-mpc=/usr/local/mpc-1.1.
0.2
Thread model: single
gcc version 7.3.0 (GCC)
harmony@harmony-virtual-machine:~$
```

安装 nodejs

官网下载

搜索 nodejs 点击下载



cd Downloads/切换到下载目录然后解压文件

```
harmony@harmony-virtual-machine:~$ cd Downloads/
harmony@harmony-virtual-machine:~/Downloads$ ls
node-v16.14.0-linux-x64.tar.xz
```

tar -xvf node-v16.14.0-linux-x64.tar.xz -C ~/（根据子下载的版本解压对应文件）

```
harmony@harmony-virtual-machine:~/Downloads$ tar -xvf node-v16.14.0-linux-x64.tar.xz -C ~/
node-v16.14.0-linux-x64/
node-v16.14.0-linux-x64/bin/
node-v16.14.0-linux-x64/bin/node
node-v16.14.0-linux-x64/bin/npm
node-v16.14.0-linux-x64/bin/npx
node-v16.14.0-linux-x64/bin/corepack
node-v16.14.0-linux-x64/share/
node-v16.14.0-linux-x64/share/systemtap/
node-v16.14.0-linux-x64/share/systemtap/tapset/
node-v16.14.0-linux-x64/share/systemtap/tapset/node.stp
node-v16.14.0-linux-x64/share/doc/
node-v16.14.0-linux-x64/share/doc/node/
node-v16.14.0-linux-x64/share/doc/node/gdbinit
node-v16.14.0-linux-x64/share/doc/node/lldb_commands.py
node-v16.14.0-linux-x64/share/man/
node-v16.14.0-linux-x64/share/man/man1/
node-v16.14.0-linux-x64/share/man/man1/node.1
```

sudo mv node-v16.14.0-linux-x64 /usr/local

```
harmony@harmony-virtual-machine:~/Downloads$ cd
harmony@harmony-virtual-machine:~$ ls
Desktop    Downloads    gcc_riscv32-linux-7.3.0.tar.gz  gn.1523.tar  hc-gen-0.65-linux.tar  llvm-linux-9.0.0-36191.tar  ninja           node-v16.14.0-linux-x64
Documents  gcc_riscv32  gn                              hc-gen       llvm                   Music                       ninja.1.9.0.tar  Pictures
harmony@harmony-virtual-machine:~$ sudo mv node-v16.14.0-linux-x64 /usr/local
[sudo] password for harmony:
harmony@harmony-virtual-machine:~$ sudo mv node-v16.14.0-linux-x64 /usr/local
mv: cannot stat 'node-v16.14.0-linux-x64': No such file or directory
harmony@harmony-virtual-machine:~$ ls
Desktop    Downloads    gcc_riscv32-linux-7.3.0.tar.gz  gn.1523.tar  hc-gen-0.65-linux.tar  llvm-linux-9.0.0-36191.tar  ninja           Pictures  Templates
Documents  gcc_riscv32  gn                              hc-gen       llvm                   Music                       ninja.1.9.0.tar  Public    snap  Videos
harmony@harmony-virtual-machine:~$
```

vim ~/.bashrc

export NODE_HOME=/usr/local/node-v14.18.1-linux-x64

export PATH=$NODE_HOME/bin:$PATH

export PATH=~/.local/bin:$PATH

```
fi
export PATH=~/gn:$PATH
export PATH=~/ninja:$PATH
export PATH=~/gcc_riscv32/bin:$PATH
export PATH=~/llvm/bin:$PATH
export PATH=~/hc-gen:$PATH
export NODE_HOME=/usr/local/node-v16.14.0-linux-x64
export PATH=$NODE_HOME/bin:$PATH
export PATH=~/.local/bin:$PATH
:wq
```

source ~/.bashrc

安装 npm

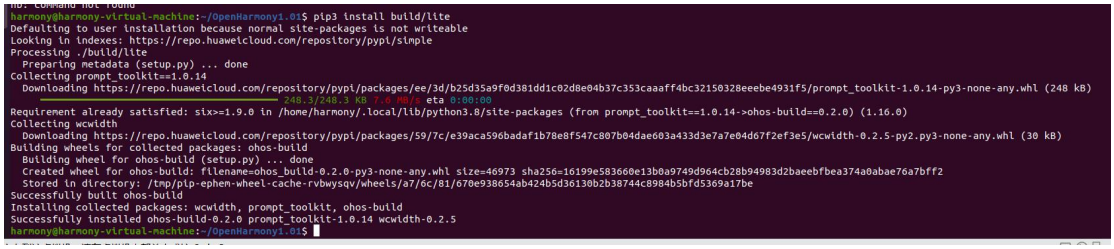
npm config set registry https://repo.huaweicloud.com/repository/npm/

npm install -g @ohos/hpm-cli

```
harmony@harmony-virtual-machine:~$ source ~/.bashrc
harmony@harmony-virtual-machine:~$ npm config set registry https://repo.huaweicloud.com/repository/npm/
harmony@harmony-virtual-machine:~$ npm install -g @ohos/hpm-cli
npm WARN deprecated @babel/polyfill@7.4.4: 🚨 This package has been deprecated in favor of separate inclusion of a polyfill and regenerator-runt
beljs.io/docs/en/babel-polyfill) for more information.
npm WARN deprecated core-js@2.6.12: core-js@<3.4 is no longer maintained and not recommended for usage due to the number of issues. Because of t
ns could cause a slowdown up to 100x even if nothing is polyfilled. Please, upgrade your dependencies to the actual version of core-js.
npm WARN deprecated core-js@2.6.12: core-js@<3.4 is no longer maintained and not recommended for usage due to the number of issues. Because of t
ns could cause a slowdown up to 100x even if nothing is polyfilled. Please, upgrade your dependencies to the actual version of core-js.

added 226 packages in 24s

15 packages are looking for funding
  run `npm fund` for details
npm notice
npm notice New minor version of npm available! 8.3.1 -> 8.5.4
npm notice Changelog: https://github.com/npm/cli/releases/tag/v8.5.4
npm notice Run npm install -g npm@8.5.4 to update!
npm notice
harmony@harmony-virtual-machine:~$
```

在代码目录下安装对应的 hb 工具

pip3 install build/lite



3.2 编译

编译（Docker 方式搭建环境）

请在获取 Docker 环境中进入的 Docker 构建环境中，执行如下命令进行编译：

hb set(设置编译路径)

.（选择当前路径）

选择 wifiiot_hispark_pegasus@hisilicon 并回车

hb build -f（执行编译）

图 1 Hi3861 编译设置图例-Docker 方式

```
harmmonyos@harmmonyos-virtual-machine:~/share/code2$ hb set
[OHOS INFO] hb root path: /home/harmmonyos/share/code2
OHOS Which product do you need?  (Use arrow keys)

hisilicon
 ❯ wifiiot_hispark_pegasus
   ipcamera_hispark_aries
   ipcamera_hispark_taurus

team_x
   smart_curtain
   smart_humidifier
   electronic_board
   smart_watch
   smart_smoke_sensation_python_version
   smart_door_viewer_3518
   smart_flower_machine
   smart_smoke_sensation
   smart_gas_detection
   smart_camera
   smart_cenctrl_board
   smart_lamp
   smart_fan
   smart_weight_scale
   smart_cleaner
   smart_lock
   smart_door_bell
   smart_hoods
   smart_trashcan
   smart_cenctrl_lamp
   smart_TVOC_detection
   smart_door_viewer_3516
```

编译结束后，出现“wifiiot_hispark_pegasus build success”字样，则证明构建成功。

```
[OHOS INFO] [199/217] STAMP obj/utils/native/lite/os_dump/utils_os_dump.stamp
[OHOS INFO] [200/217] gcc cross compiler obj/third_party/unity/src/libhctest.unity.o
[OHOS INFO] [201/217] AR libs/libhctest.a
[OHOS INFO] [202/217] AR libs/libmodule_ActsUpdaterFuncTest.a
[OHOS INFO] [203/217] STAMP obj/test/xts/tools/lite/tools.stamp
[OHOS INFO] [204/217] ACTION //test/xts/acts/update_lite/updater_hal:ActsUpdaterFuncTest(//build/lite/toolc
[OHOS INFO] [205/217] STAMP obj/test/xts/acts/update_lite/updater_hal/ActsUpdaterFuncTest.stamp
[OHOS INFO] [206/217] STAMP obj/test/xts/acts/build_lite/acts_component.stamp
[OHOS INFO] [207/217] ACTION //test/xts/acts/build_lite:acts_xdevice(//build/lite/toolchain:riscv32-unknown
[OHOS INFO] [208/217] STAMP obj/test/xts/acts/build_lite/acts_xdevice.stamp
[OHOS INFO] [209/217] ACTION //test/xts/acts/build_lite:acts_generate_module_data(//build/lite/toolchain:r
[OHOS INFO] [210/217] STAMP obj/test/xts/acts/build_lite/acts_generate_module_data.stamp
[OHOS INFO] [211/217] ACTION //test/xts/acts/build_lite:acts(//build/lite/toolchain:riscv32-unknown-elf)
[OHOS INFO] [212/217] STAMP obj/test/xts/acts/build_lite/acts.stamp
[OHOS INFO] [213/217] STAMP obj/build/lite/ohos.stamp
[OHOS INFO] [214/217] ACTION //build/lite:gen_rootfs(//build/lite/toolchain:riscv32-unknown-elf)
[OHOS INFO] [215/217] STAMP obj/build/lite/gen_rootfs.stamp
[OHOS INFO] [216/217] ACTION //device/hisilicon/hispark_pegasus/sdk_liteos:run_wifiiot_scons(//build/lite/t
[OHOS INFO] [217/217] STAMP obj/device/hisilicon/hispark_pegasus/sdk_liteos/run_wifiiot_scons.stamp
[OHOS INFO] /home/harmmonyos/share/code3/vendor/hisilicon/hispark_pegasus/fs.yml not found, stop packing fs
[OHOS INFO] wifiiot_hispark_pegasus build success
[OHOS INFO] cost time: 0:00:25
```

注意

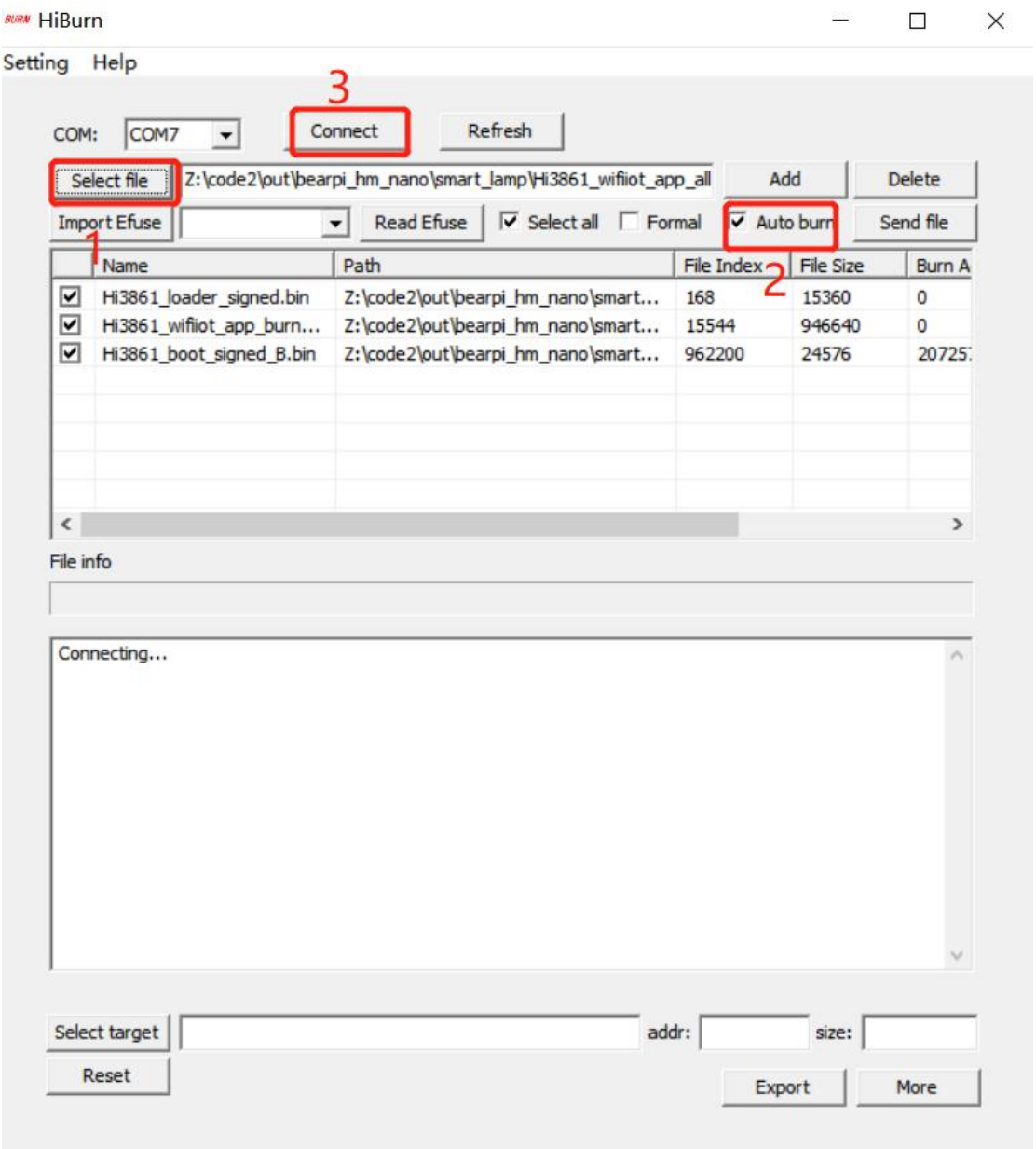
烧录结果文件文件获取路径：out/hispark_pegasus/wifiiot_hispark_pegasus。

3.3 烧录

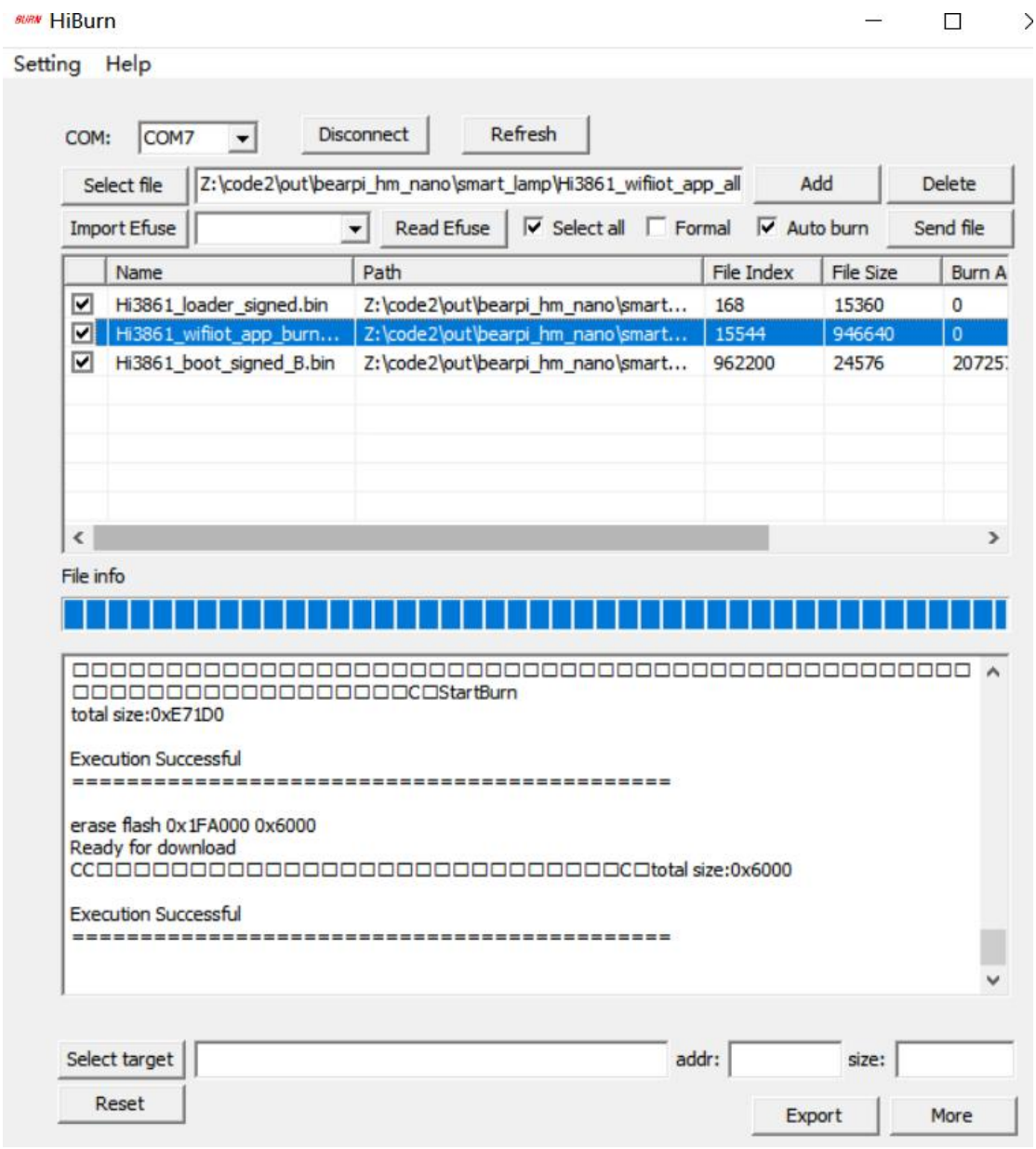
烧录是指将编译后的程序文件下载到芯片开发板上的动作，为后续的程序调试提供基础。

使用 HiBurn 工具进行烧录

打开 HiBurn 工具添加 bin 文件，勾选如下选项



出现如下结果表示烧录完成



4.应用开发案例-智能台灯

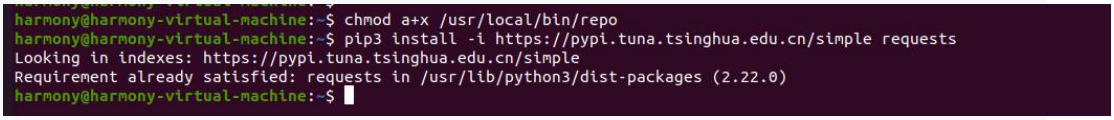
4.1 源码下载&编译准备

1.码云工具下载

```
cd ~

curl https://gitee.com/oschina/repo/raw/fork_flow/repo-py3 >
/usr/local/bin/repo（如果下载不下来可以切换个目录然后再将下载完的移动回来）
```

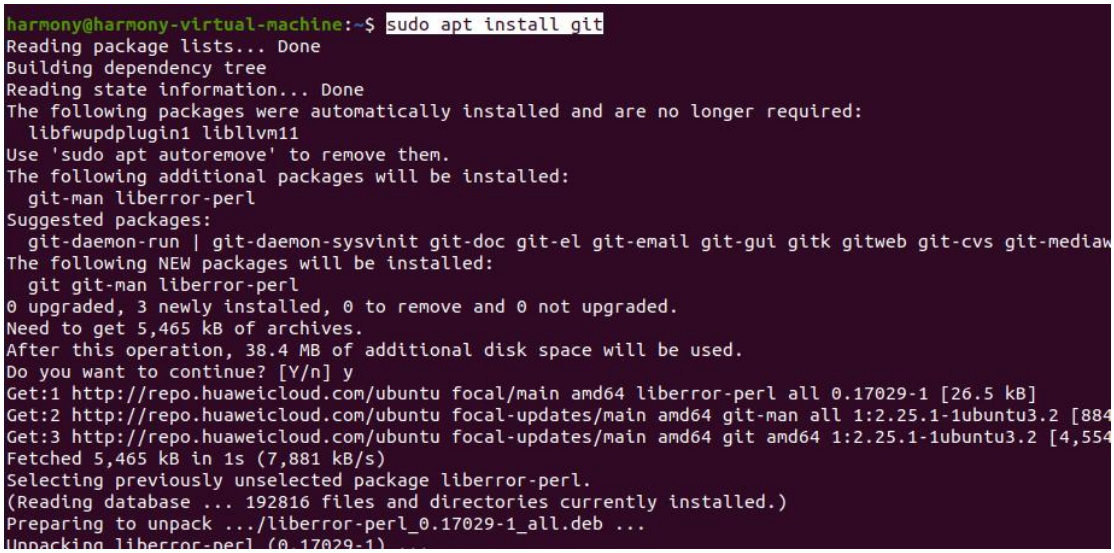
```
mkdir 1

curl https://gitee.com/oschina/repo/raw/fork_flow/repo-py3 > ~/1/repo

sudo mv repo /usr/local/bin/
```

```
chmod a+x /usr/local/bin/repo

pip3 install -i https://pypi.tuna.tsinghua.edu.cn/simple requests
```



下载 git

sudo apt install git



配置 git 信息

git config --global user.name "xx"（git 名字）

git config --global user.email "xx@gmail.com" （邮箱）

git config --list(查看配置的信息)

```
harmony@harmony-virtual-machine:~$ git config --global user.name "zqy"
harmony@harmony-virtual-machine:~$ git config --global user.email "1913279282@qq.com"
harmony@harmony-virtual-machine:~$ git config --list
user.name=zqy
user.email=1913279282@qq.com
harmony@harmony-virtual-machine:~$
```

生成公钥

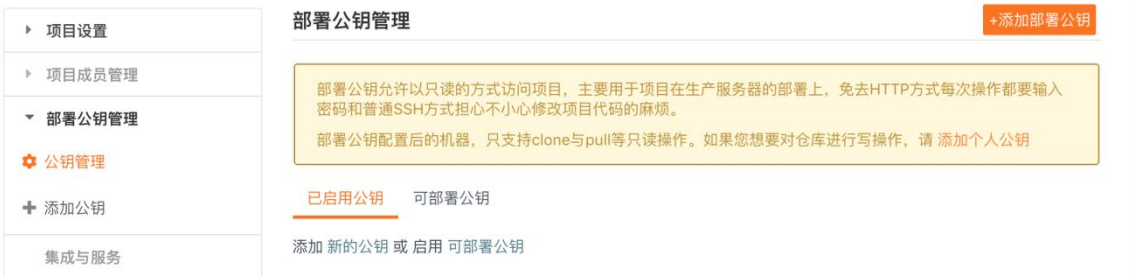
ssh-keygen -t ed25519 -C "xxxxx@xxxxx.com"

xxxxx@xxxxx.com 只是生成的 sshkey 的名称，并不约束或要求具体命名为某个邮箱。

按照提示完成三次回车，即可生成 ssh key。通过查看 ~/.ssh/id_ed25519.pub 文件内容，获取到你的 public key

cat ~/.ssh/id_ed25519.pub

复制生成后的 ssh key，通过仓库主页 **「管理」->「部署公钥管理」->「添加部署公钥」** ，添加生成的 public key 添加到仓库中。



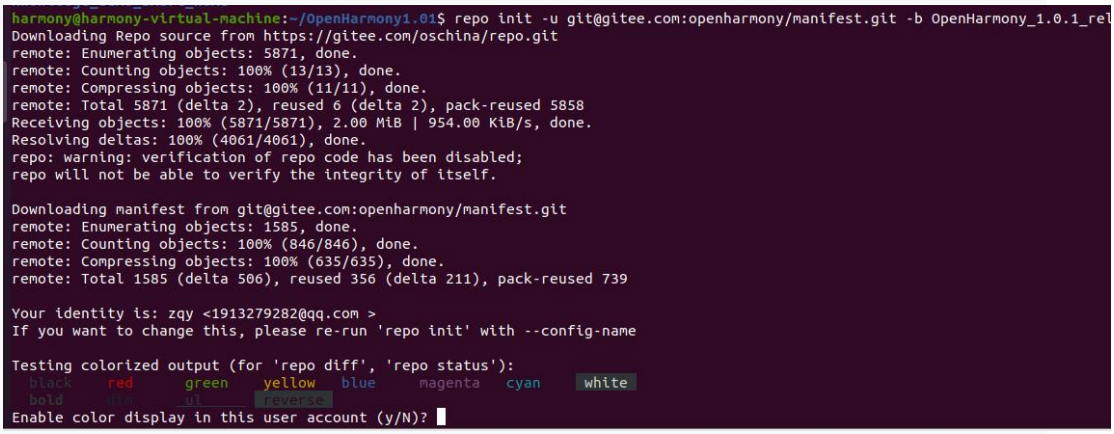
地址如下

https://gitee.com/profile/sshkeys

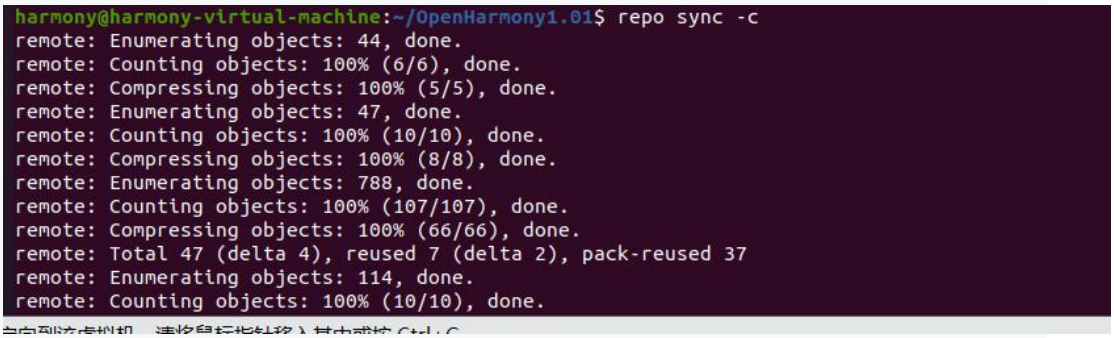
2.代码下载

1) OpenHarmony 代码下载

```
#特别注意：请下载 OpenHarmony 1.0.1 版本，后续会更新支持 OpenHarmony 其他版本

mkdir ~/OpenHarmony1.01

 cd ~/OpenHarmony1.01


repo init -u git@gitee.com:openharmony/manifest.git -b
OpenHarmony_1.0.1_release --no-repo-verify
```




```
repo sync -c
```




```
repo forall -c 'git lfs pull'
```

2) 设备侧代码下载

具体仓库地址：https://gitee.com/openharmony-sig/knowledge_demo_smart_home/

具体下载命令如下：

```
git clone git@gitee.com:openharmony-sig/knowledge_demo_smart_home.git
```

3) 编译前准备

1.代码拷贝

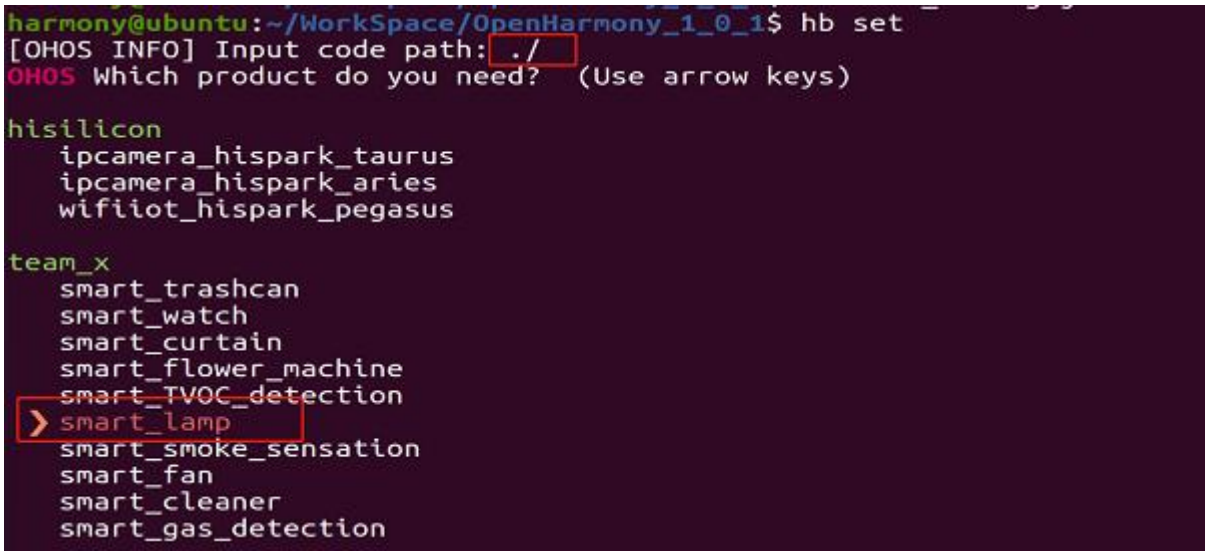
```
    cp -rfa  ~/knowledge_demo_smart_home/dev/device/bearpi
~/OpenHarmony1.01/device/

    cp -rfa  ~/knowledge_demo_smart_home/dev/team_x
~/OpenHarmony1.01/vendor/
```

```
    cp -rfa  ~/knowledge_demo_smart_home/dev/third_party/iot_link
~/OpenHarmony1.01/third_party/
```

2.整合并修改完成后的目录结构如下图：

4.2 编译&烧录

编译命令：hb set // 如果是第一次编译，Input code path 命令行中键入"./" 指定 OpenHarmony 工程编译根目录后 回车，如下图所示，使用键盘上下键选中智能台灯




```
hb build // 如果需要全量编译，可以添加-f 选项
```

详细的代码编译及固件烧录步骤，请参考 开发环境搭建中的编译烧录

4.3 设备配网

1.在设备上电前需准备好安装了数字管家应用的鸿蒙手机，详情见数字管家应用开发，并在设置中开启手机的 NFC 功能；

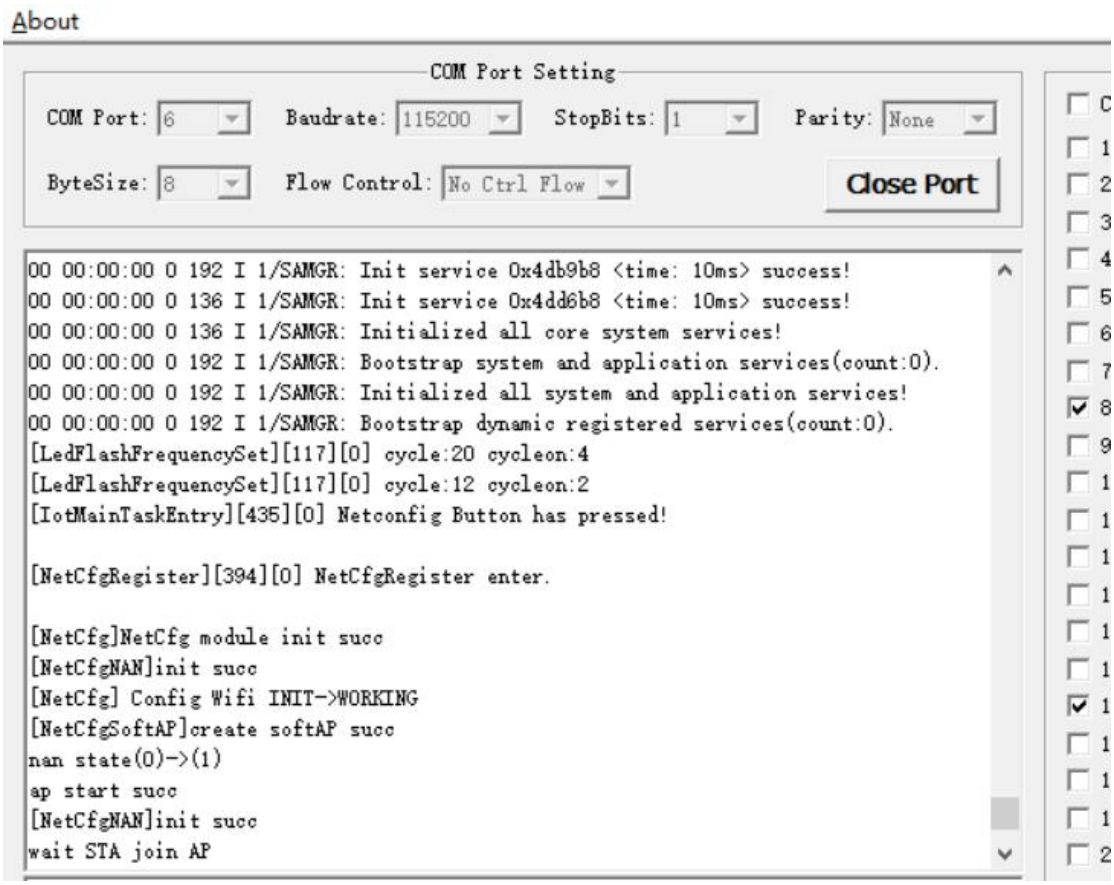
数字管家应用开发：https://gitee.com/openharmony-sig/knowledge_demo_smart_home/blob/master/FA/DistSchedule/README_zh.md

2.写设备 NFC 标签，详细操作见设备 NFC 标签指导文档;

NFC 标签指导文档：https://gitee.com/openharmony-sig/knowledge_demo_smart_home/blob/master/dev/docs/NFC_label_definition/README.md

- 3.烧录完成后，打开串口工具按下复位键可以看到串口中有

等待 STA 加入 AP 的消息



4.只需将手机触碰 NFC 标签，将会自动拉起数字管家应用并进入配网状态，配网过程中无需输入热点账号密码。 具体无感配网相关流程参考 无感配网指南

无感配网指南：

https://gitee.com/openharmony-sig/knowledge_demo_smart_home/blob/master/dev/docs/net_config/README.md

4.4 操作体验

1）设备控制

配网完成后，数字管家应用会自动进入智能台灯的控制页面，通过控制页面可以实现对智能台灯开关、亮度控制的操作。

2） 添加日程

使用者可以进入数字管家的日程管理页面中添加智能台灯的相关日程，具体步骤如下：

1.在输入日程名称后，选择相关通知成员和台灯设备；

2.选择期待执行的台灯操作，例如：设置台灯在特定时间段内亮灯或关灯；

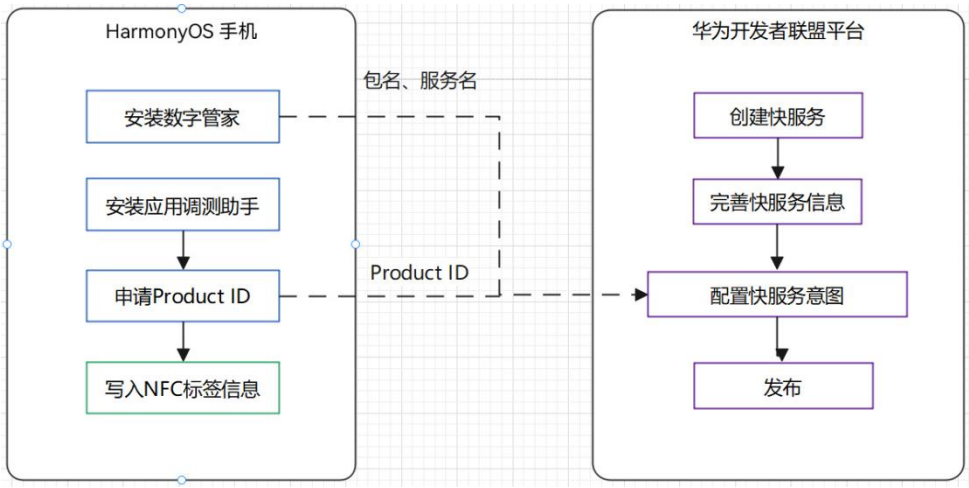
3.设置日程的重复日期，例如：可以设置单次日程(仅在当天执行)，或者重复日程(设置日程在设定的 星期几重复执行)

5.设备碰一碰配置指南

5.1 简介

碰一碰是鸿蒙具备的多终端业务协同技术。其依托 NAN 短距通信技术，通过碰一碰的交互方式，将手机和全场景设备连接起来。然后通过手机端的原子化服务能力，快速完成配网、远程控制的能力，解决了应用与设备之间接续慢、配网复杂、传输难的问题，为用户带来无缝切换的流畅体验。

5.2 碰一碰配置



前提

- 已安装数字管家应用。
- 准备已经升级至鸿蒙 2 系统的华为 Mate 系列或 P 系列手机，系统版本号为 2.0.0.168 及以上。
- 在华为应用市场，下载并安装“应用调测助手”APP，用于写 NFC 标签。
- 若开发板不包含 NFC 模块，则需准备 1 个 NFC 标签，可以用手机触碰 NFC 标签，提前确保 NFC 功能可用。
- 打开手机**设置 > 应用和服务 > 应用管理**，搜索“智慧生活基础服务”，检测智慧生活基础服务的版本是否为 12.0.2.306 及以上。如果不是，请打开华为手机的“智慧生活”APP，点击“**我的 > 设置 > 检查应用更新**”，更新“智慧生活基础服务”。

智慧服务配置

申请 Product ID

注：本节中 Product ID 是碰一碰拉起标识，而非 IoTDA 平台的设备品类 ID。

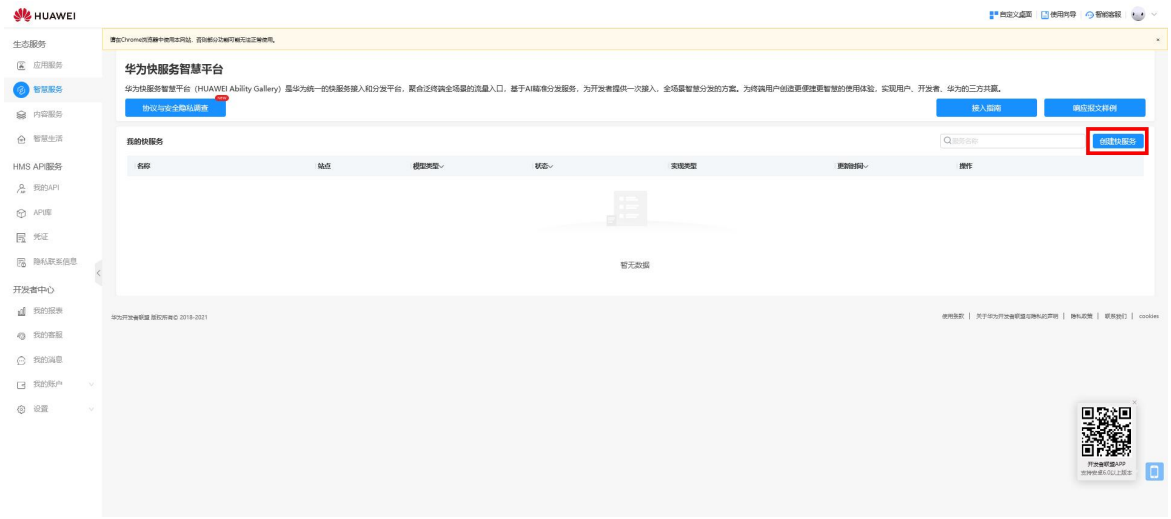
登陆华为开发者联盟

登陆华为开发者联盟，主页右上角管理中心按钮，进入管理中心。

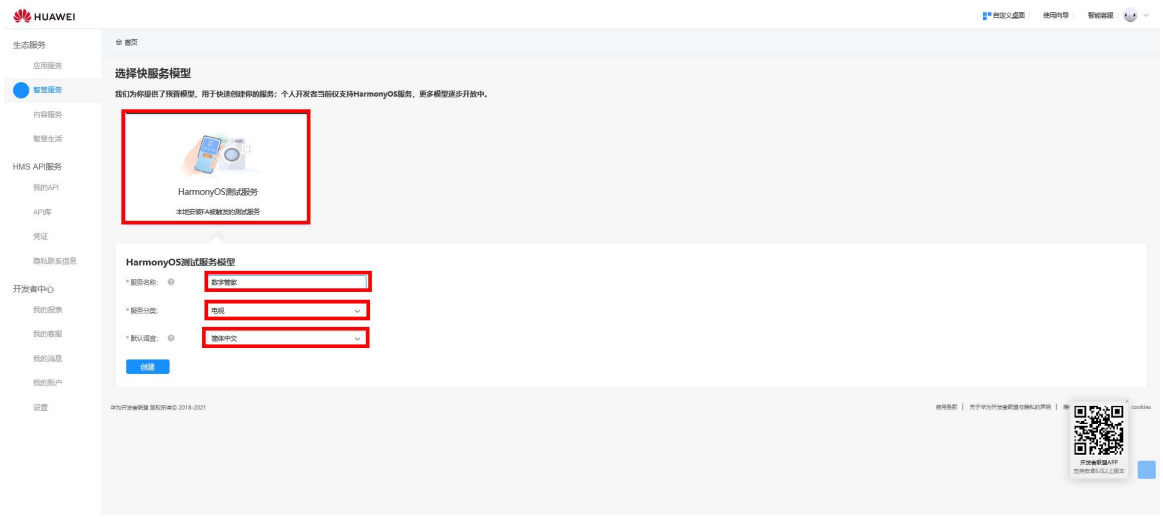
创建快服务

在管理中心页面中依次点击智慧服务->华为快服务智慧平台进入快服务智慧平台。

点击右上角创建快服务按钮。

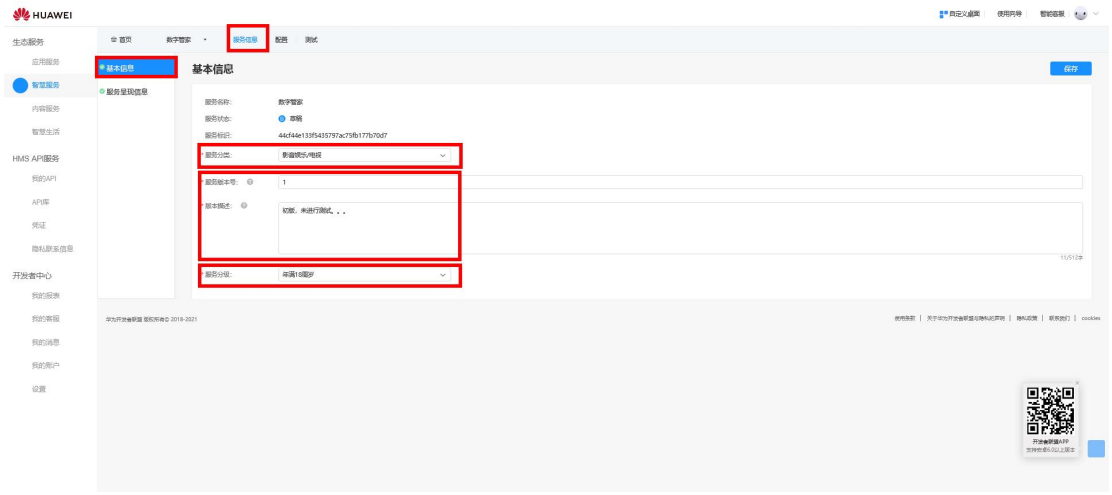


点击快服务模型，填写服务相关信息，点击创建按钮完成快服务模型的创建。

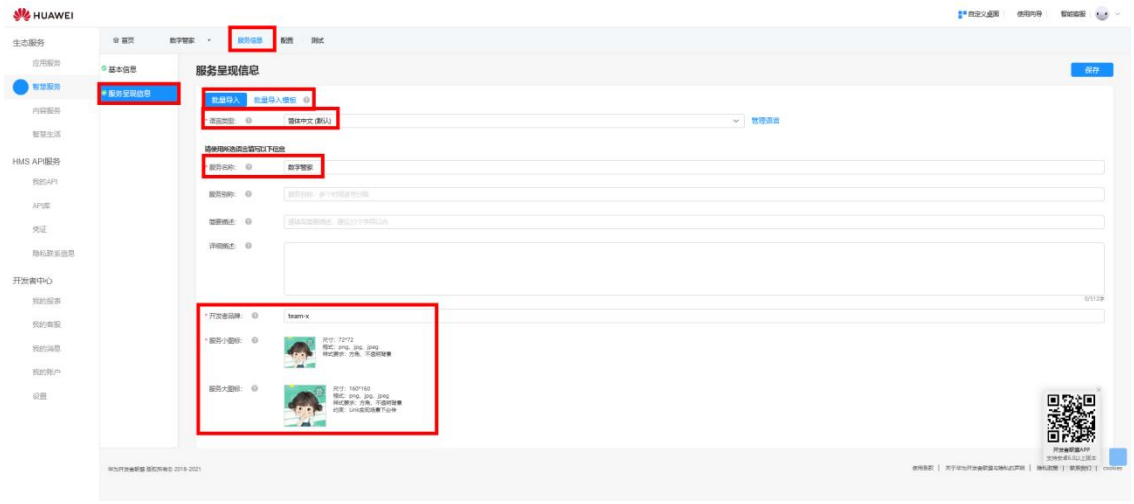


录入快服务信息

在服务信息栏下的基本信息页面完善快服务模型基本信息后，点击右上角保存按钮，保存快服务基本信息。



进入服务呈现信息页面完善相关信息（星标项目必填，其它项目视需要进行填写），可下载批量导入模板并填写，进行批量导入。点击右上角保存按钮，保存服务呈现信息。

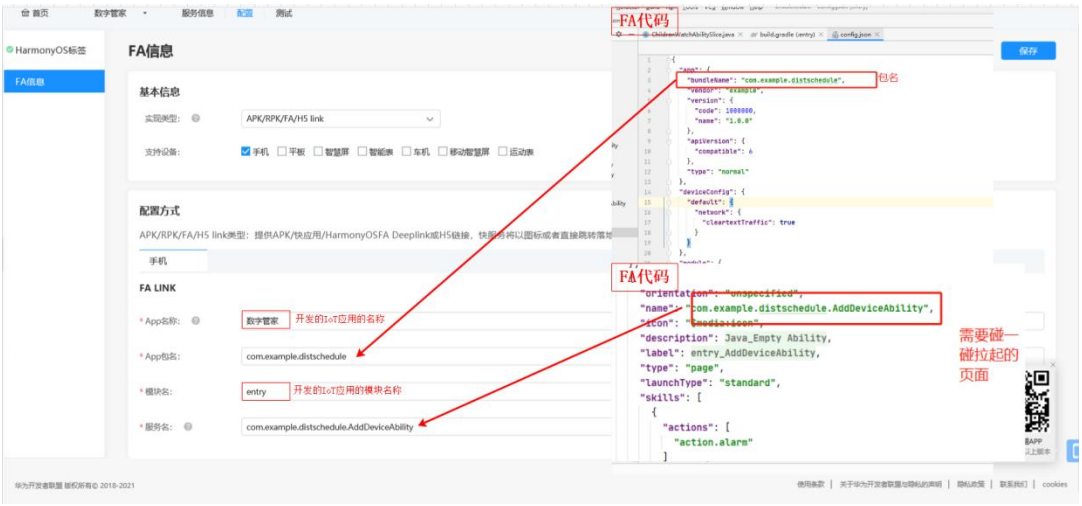


录入快服务配置信息

点击配置栏，进行配置信息的填写。 鸿蒙标签页面如下图，其中产品型号填写在应用调测助手中申请的 Product ID ，产品子型号填写 00。

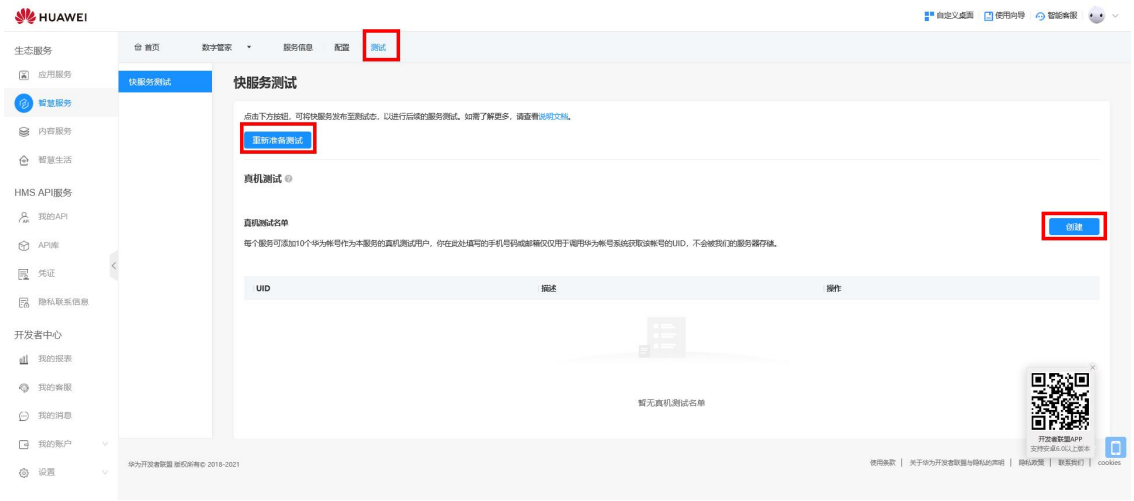
FA 信息页面填写信息如下图，其中 App 包名、服务名分别为 FA 开发中对

应的 IoT 应用的包名，以及开发者期望通过 NFC 唤起的 IoT 应用的服务名（本项目唤起的服务为设备配网）。

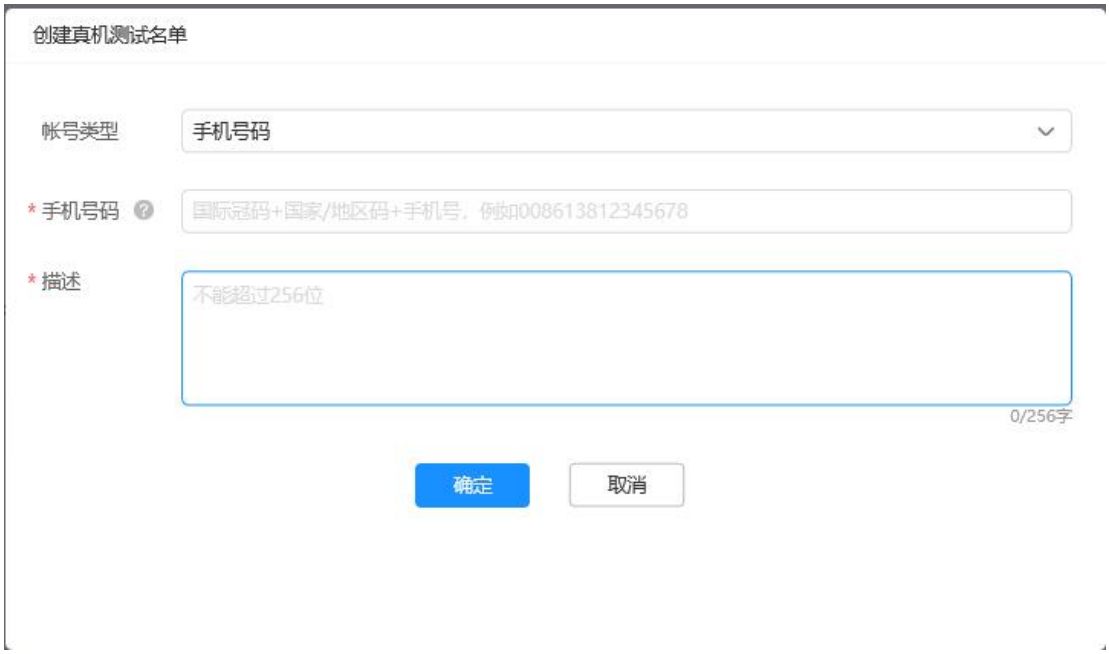


录入快服务测试信息

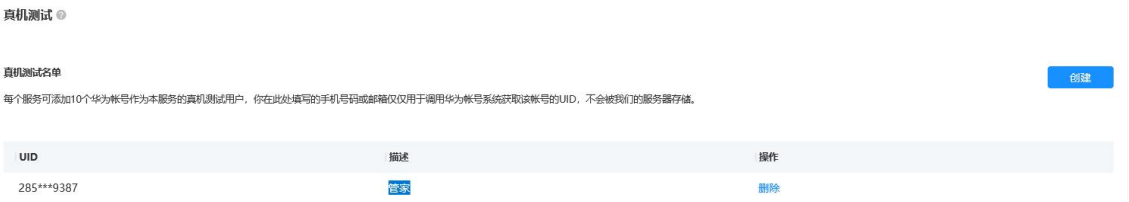
点击测试栏，进入快服务测试页面，进行测试相关信息的填写。 点击创建进入创建真机测试名单窗口。



填写手机号码与描述。



点击确定可以看到该手机已经录入名单中。



到此，应用功能唤起信息申请和配置完成。

5.3 NFC 数据写入

更多操作指导案例和学习资料请到博赛云教育平台 edu.ibossay.com 进行学习交流。