第一次亲密接触 - 环境搭建

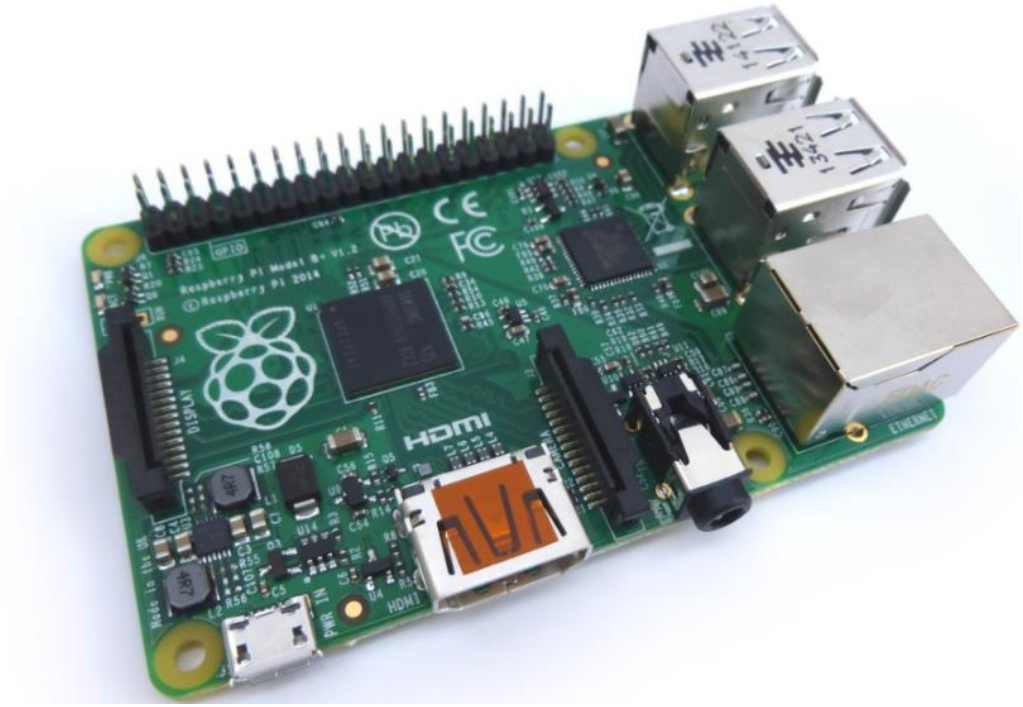
主讲人：曹家英

第一部分：树莓派底层硬件

- 1. 树莓派介绍
- 2. 树莓派环境搭建
- 3. 树莓派与命令行
- 4. 相关知识扩展
- 5. 树莓派基础外设操作
- 6. 树莓派Buildroot SDK环境搭建

课程概览

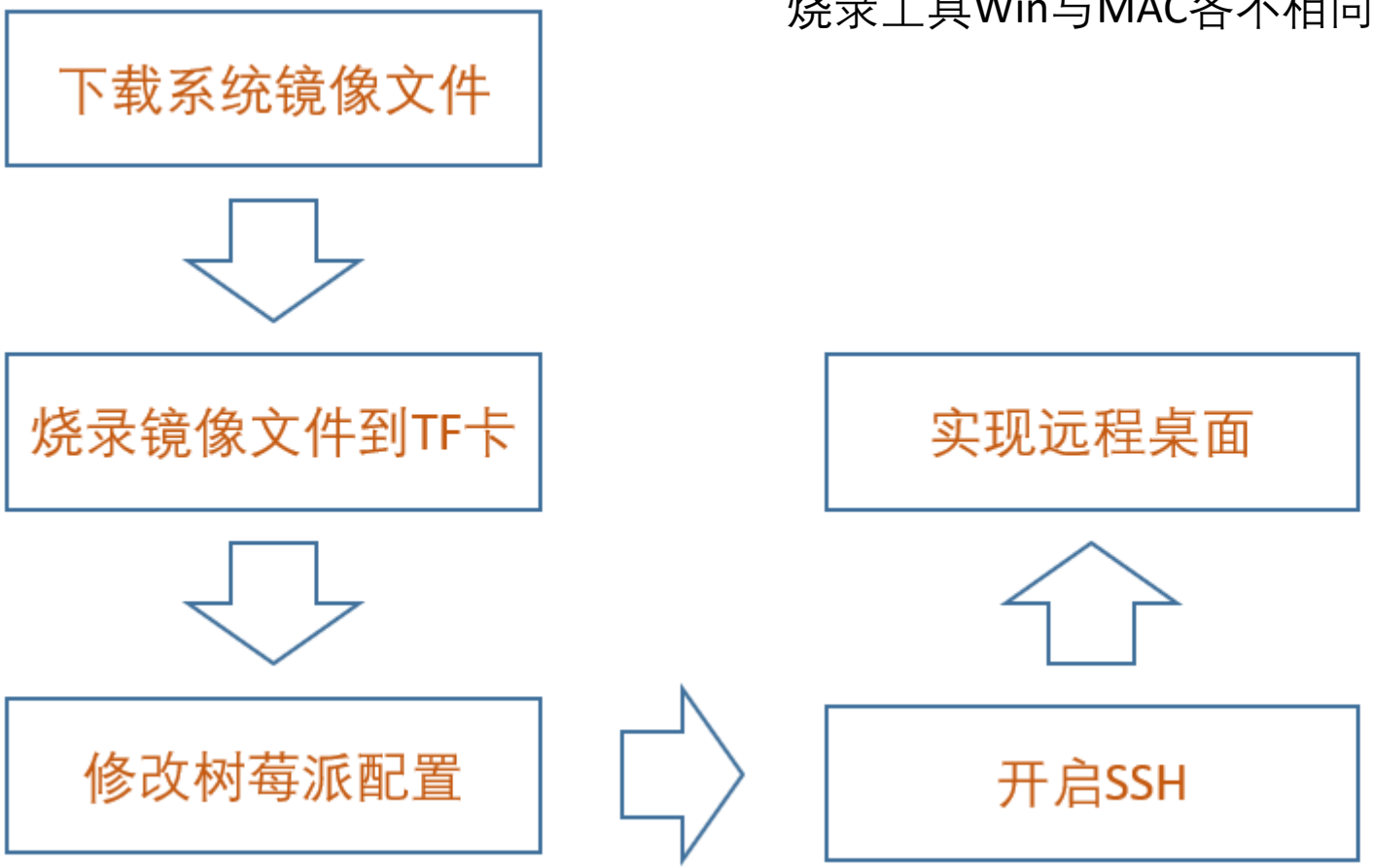
- 环境搭建基本流程
- Windows下搭建
- MAC OS下搭建
- 无显示设备下搭建
- 备份Image



环境搭建基本流程

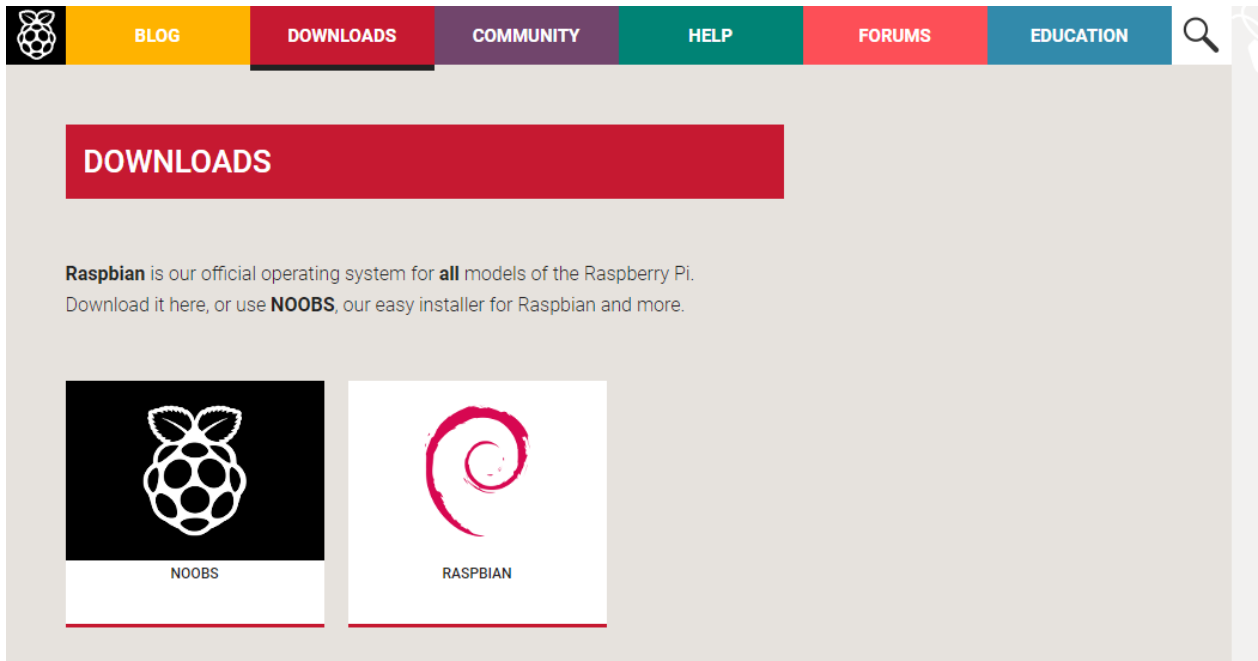
环境搭建基本流程

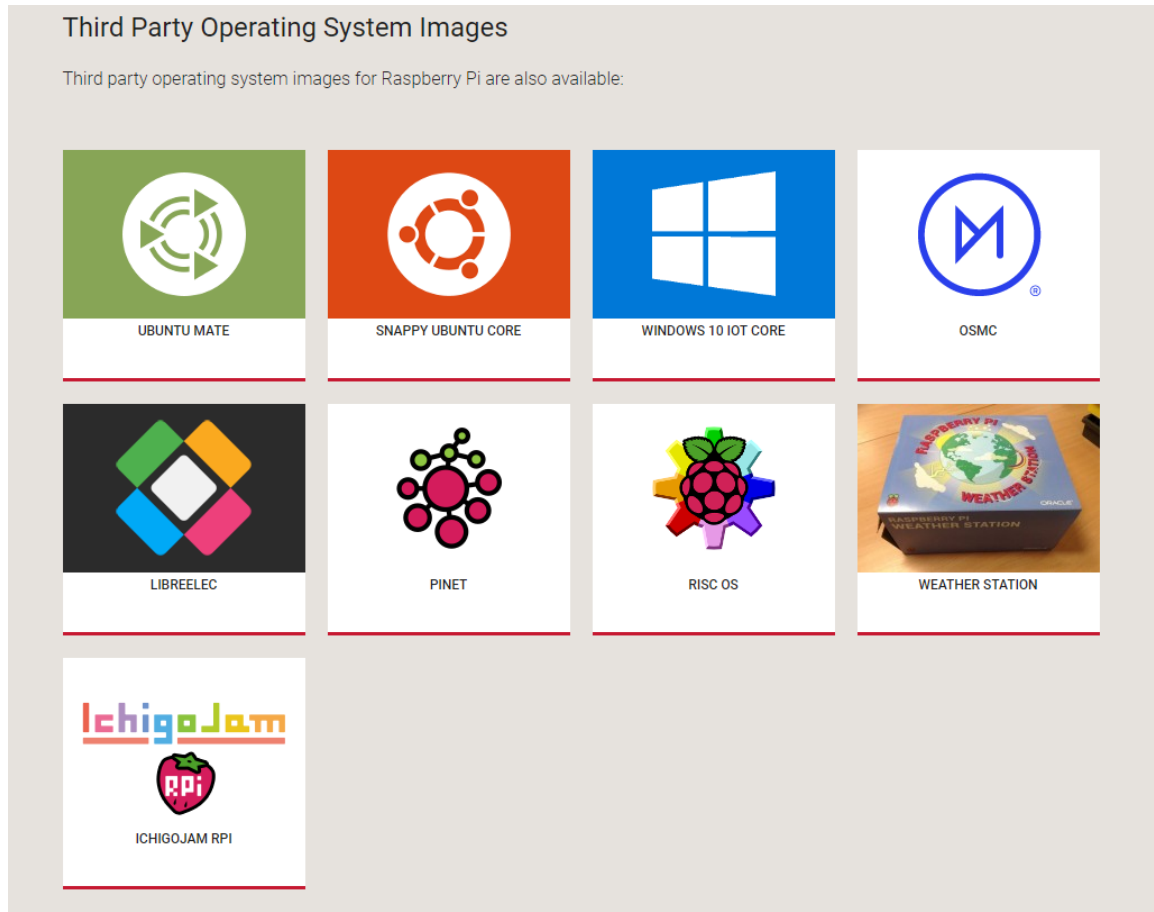
最终目标：可以通过电脑进行远程访问
下载Image地址：https://www.raspberrypi.org/downloads/
烧录工具Win与MAC各不相同后面会介绍。



最简单的搭建方式：
1.下载NOOBS
2.将安装包解压到SD卡中
3.为树莓派接上显示屏，键盘鼠标
4.上电。

环境搭建基本流程——Image下载





Windows下搭建

Windows下搭建——准备

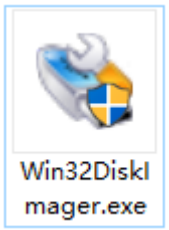
准备工作:

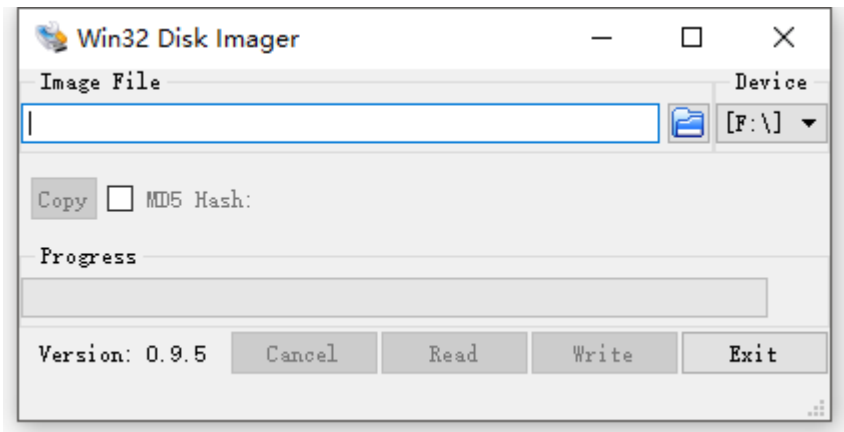
一台Windows电脑
SD卡及读卡器
树莓派及电源
显示器，键盘鼠标

准备软件:

SD Formatter	:	SD卡格式化软件
Win32DiskImager	:	Image烧录软件
Xshell	:	SSH远程登录工具
VNC Viewer	:	VNC远程桌面工具

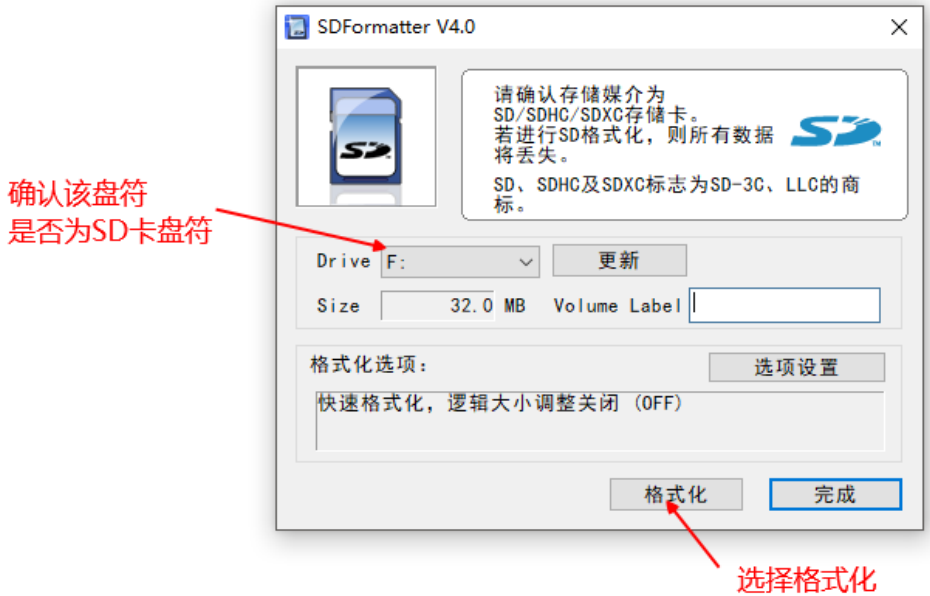
树莓派Image镜像包





Windows下搭建——格式化

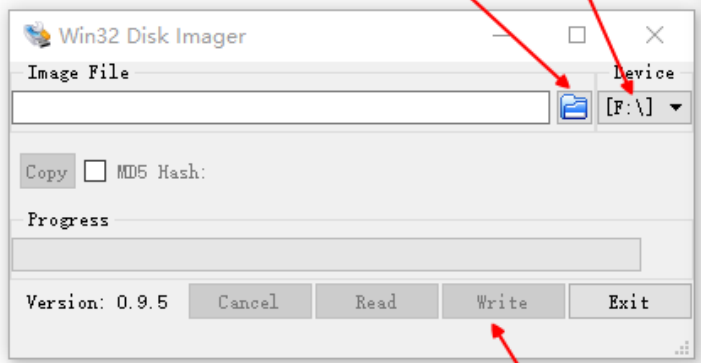
1. 格式化SD卡

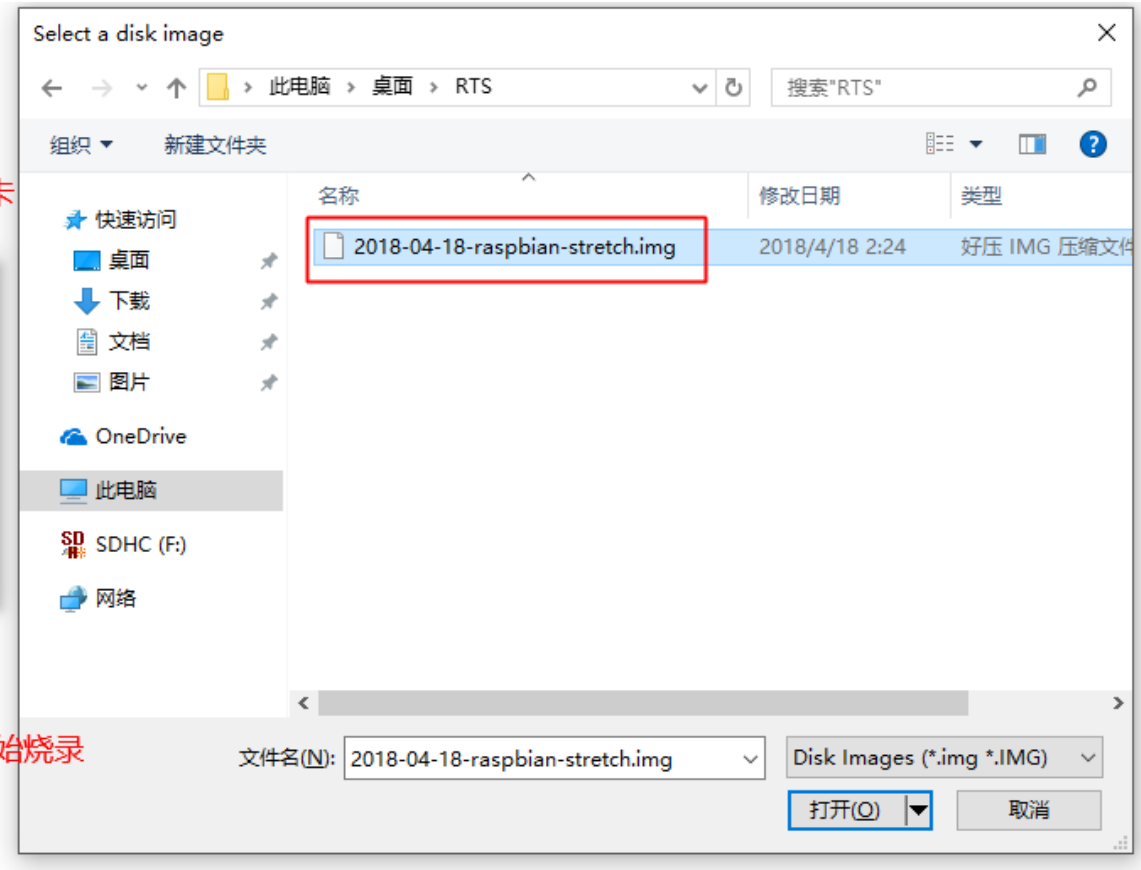


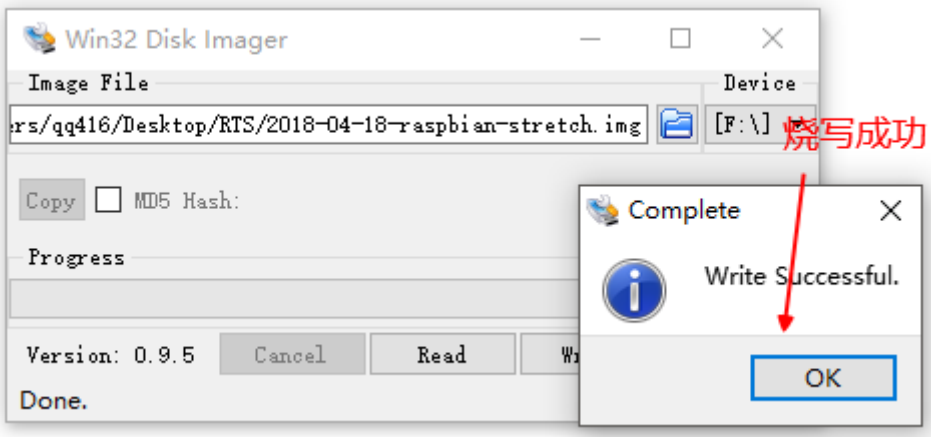
2. 格式化后可以发现SD卡恢复原有大小
既可以说明SD卡格式化成功

Windows下搭建——烧录

3. 打开Win32 Disk Image进行烧录
   选择官网下载后解压出来的.img文件
   确认Device设备为SD卡盘符
   点击Write开始烧写
   等待烧写成功



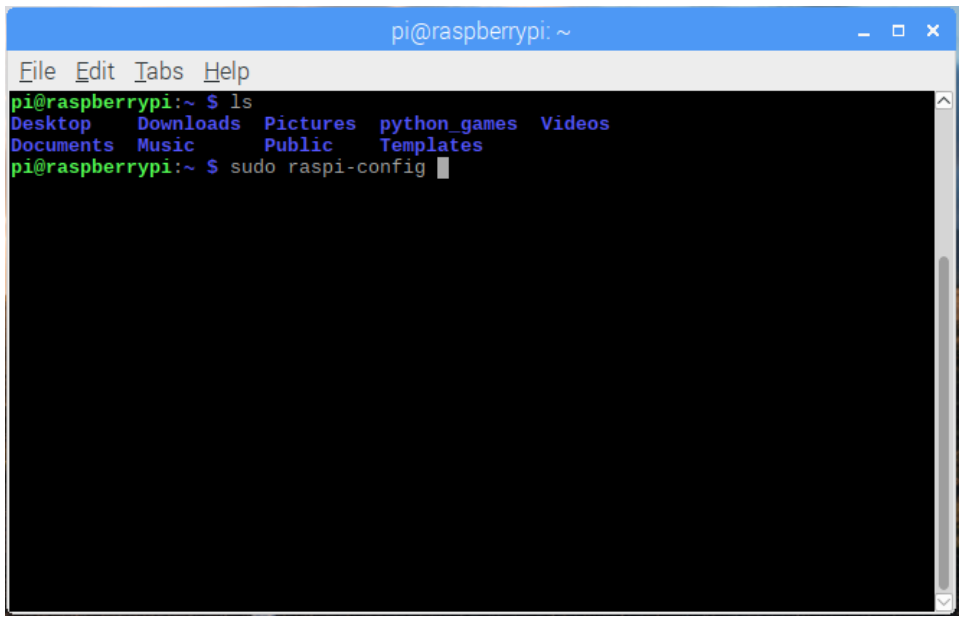


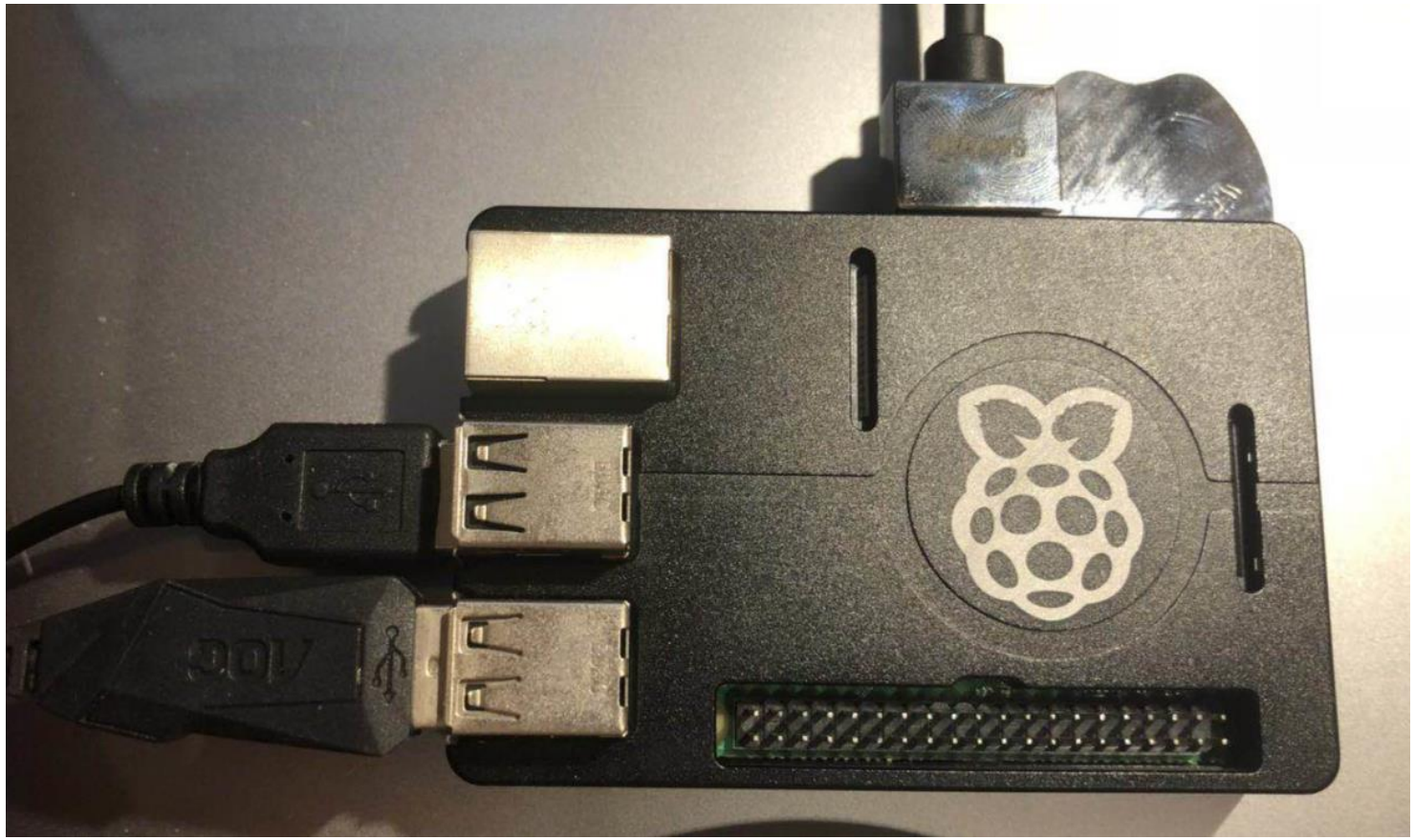


Windows下搭建——开机配置

4. 将显示器鼠标键盘接在树莓派上
   接通电源上电，稍等树莓派会进入系统。

5. 进行配置：
   a. 为树莓派连接网线或下面步骤配置WIFI
   b. 基本的配置都可以在raspi-config中配置
   在命令行中输入：sudo raspi-config





Windows下搭建——开机配置

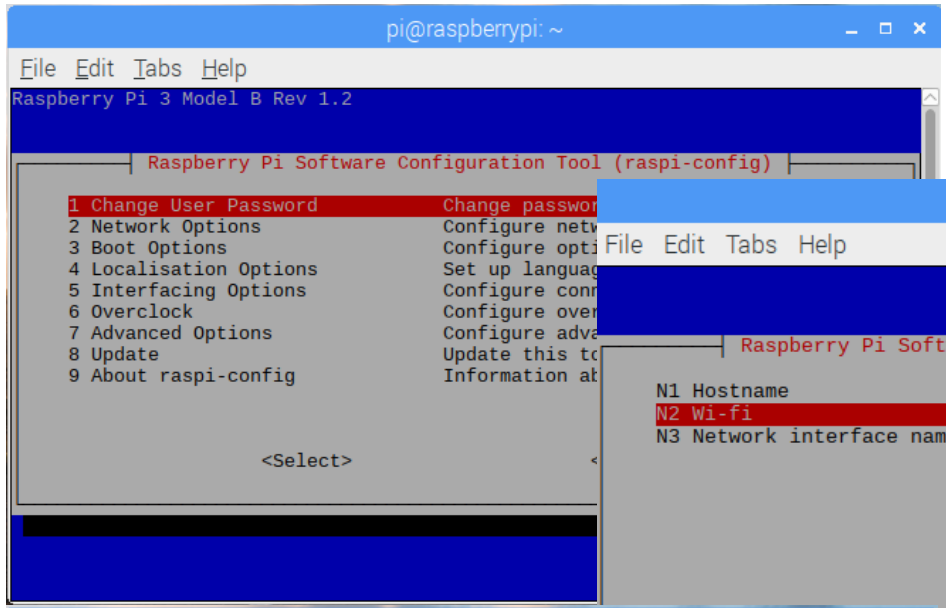
6. 如右图，首先修改用户密码
   选择1，输入密码即可

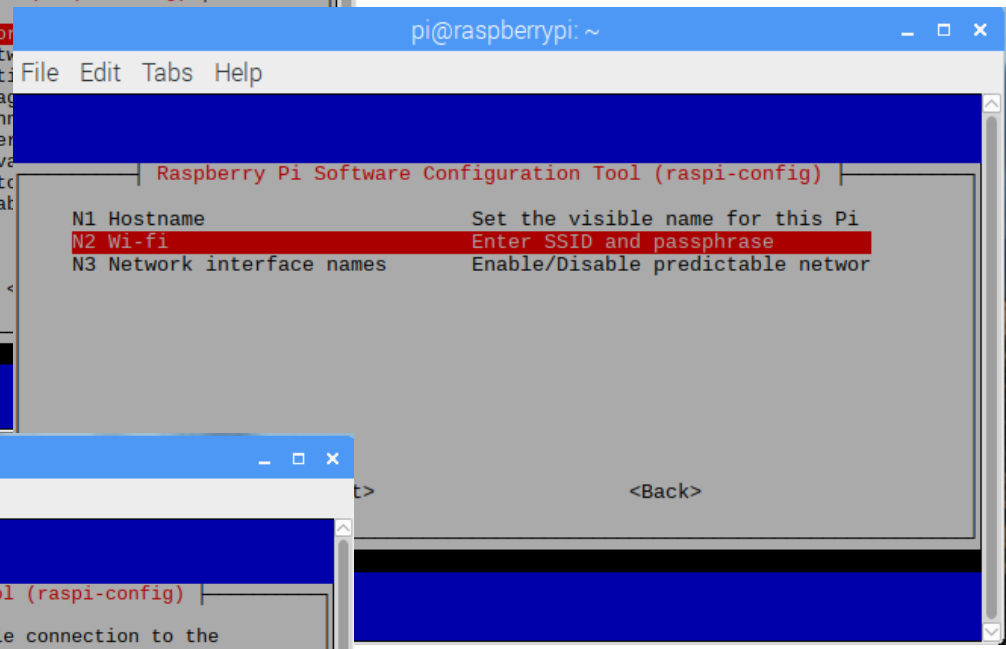
7. 配置WIFI，
   选择2，选择N2，国家选择China。
   输入SSID及密码。
   （也可以点击右上角网络图标配置）

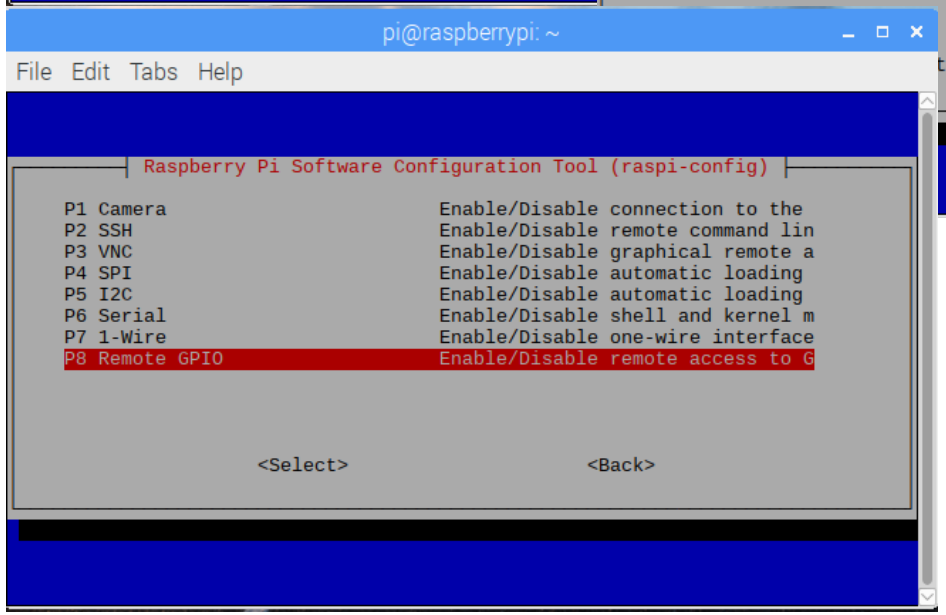
8. 接口配置：
   选择5，将SSH，VNC打开

9. 选择Finish重启系统

10. 重启后使用“ifconfig” 查看Ip地址







Windows下搭建——远程命令行连接

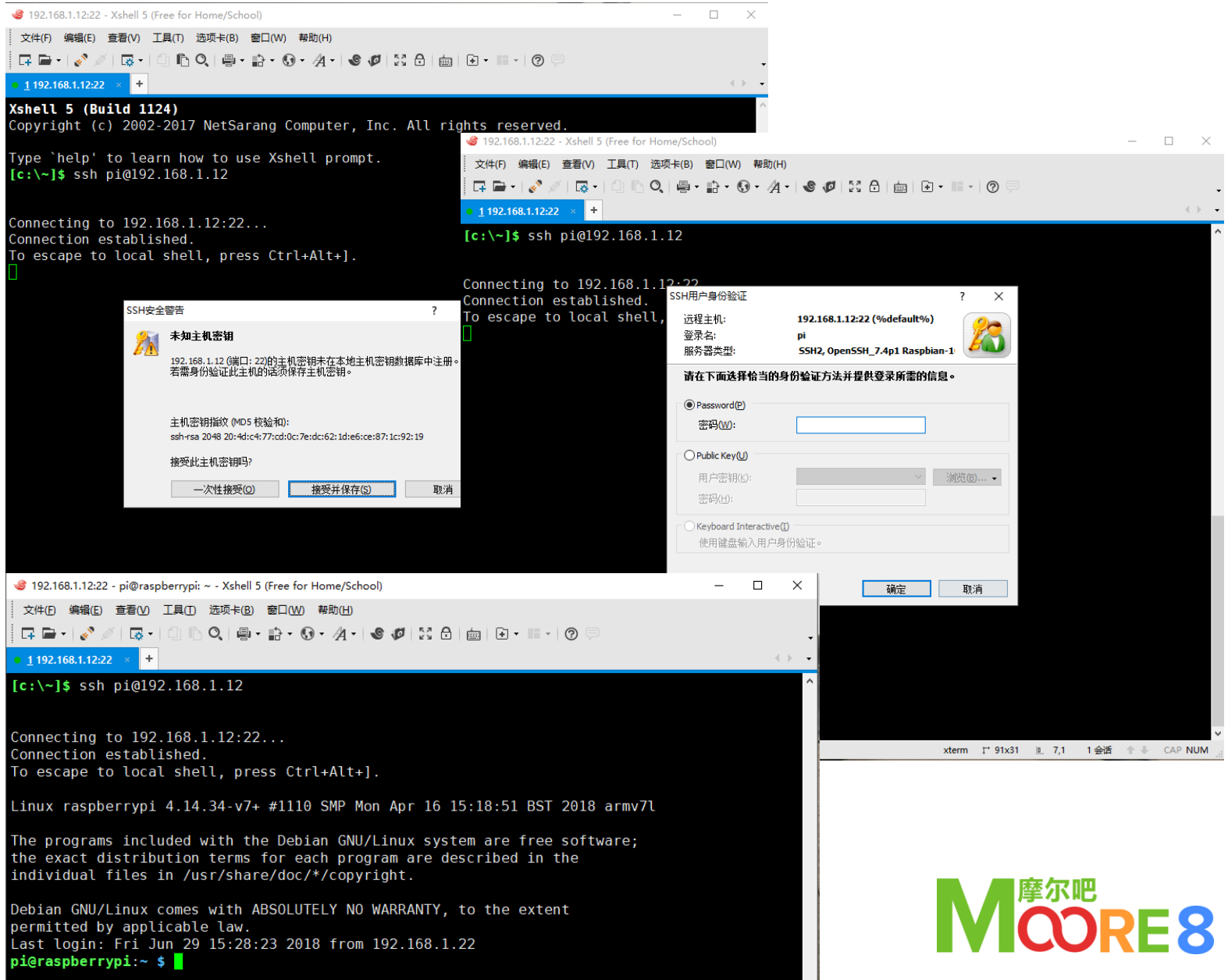
使用Xshell在Windows上远程连接树莓派

打开Xshell输入“ssh pi@树莓派IP地址”

在SSH安全警告中选择“接受并保存”

输入密码

远程连接树莓派



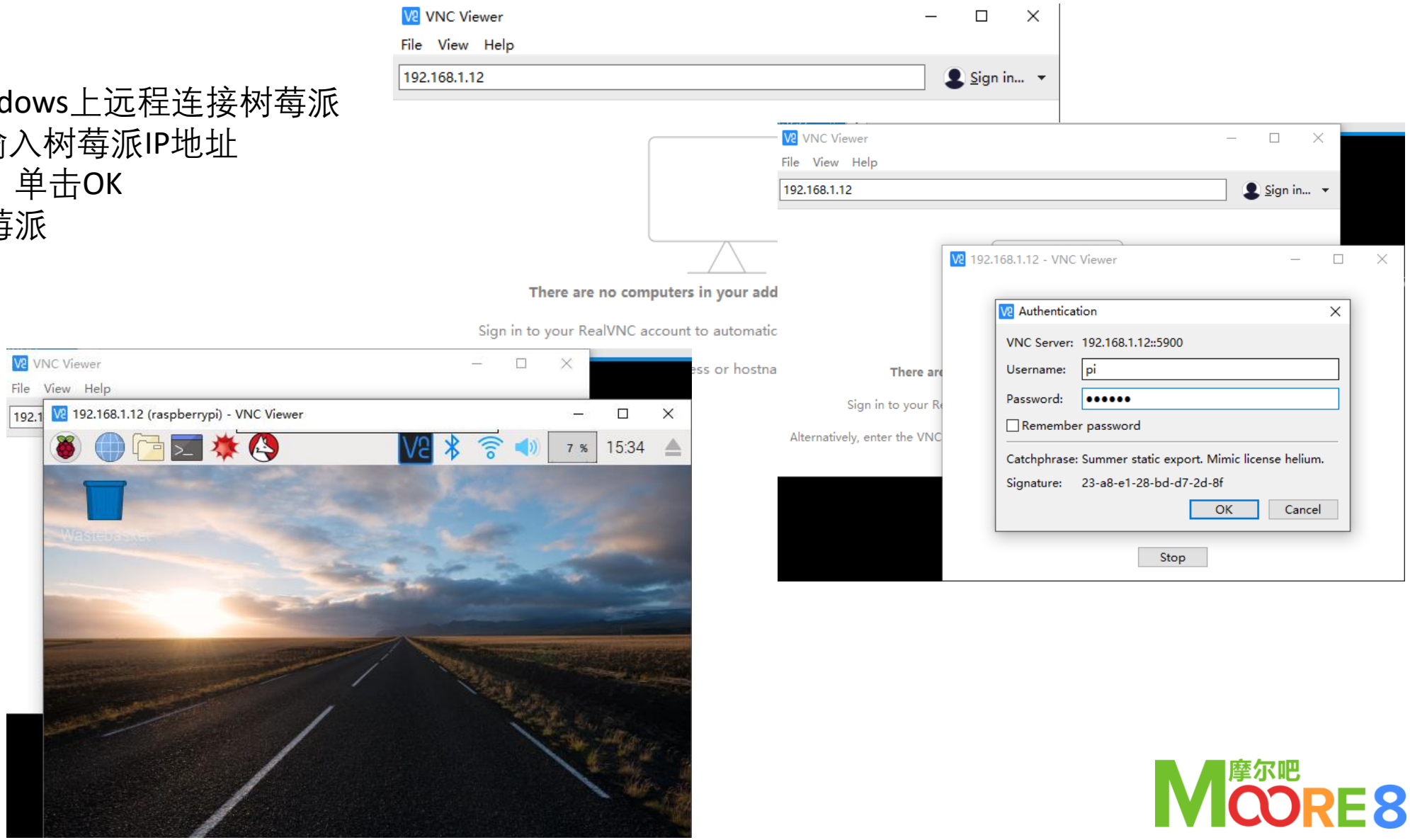
Windows下搭建——远程桌面连接

使用VNC Viewer在Windows上远程连接树莓派

打开VNC Viewer输入树莓派IP地址

输入用户名密码，单击OK

远程桌面连接树莓派

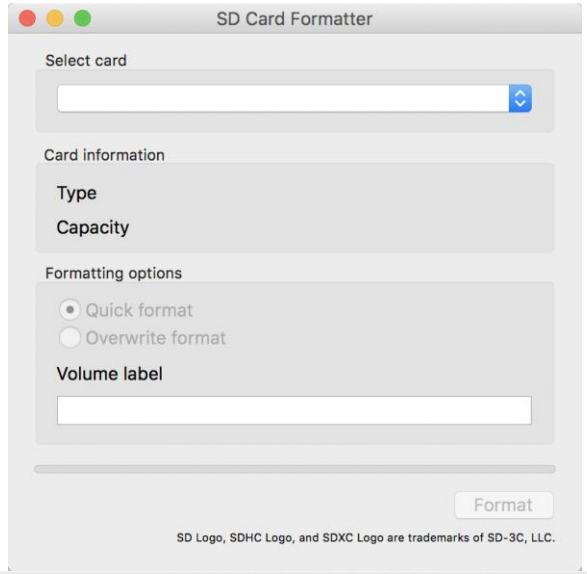


MAC OS下搭建

MAC OS下搭建——准备

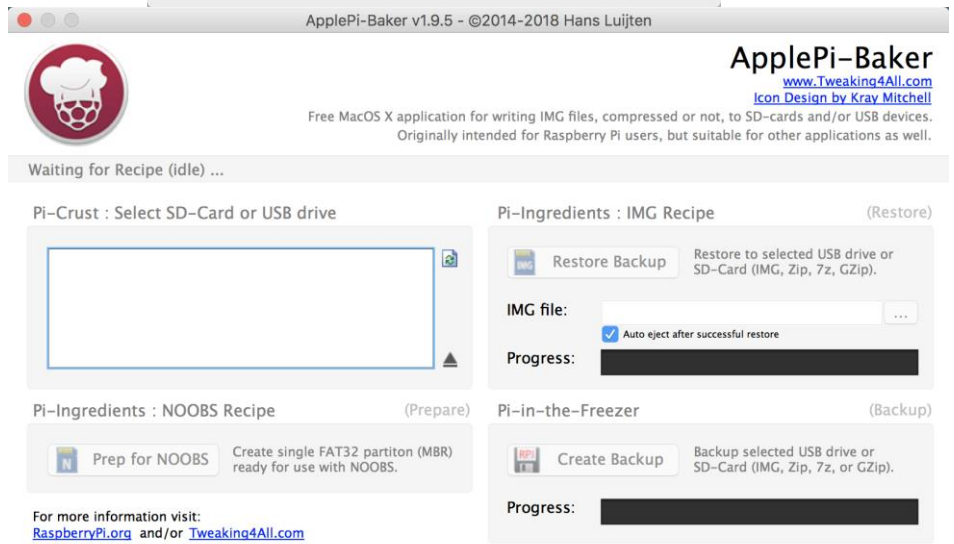
准备工作:

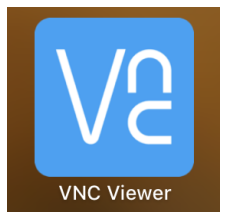
一台MAC电脑
SD卡及读卡器
树莓派及电源
显示器，键盘鼠标



准备软件:

SD Card Formatter ： SD卡格式化软件
ApplePi-Baker ： Image烧录软件
VNC Viewer ： VNC远程桌面工具
树莓派Image镜像包





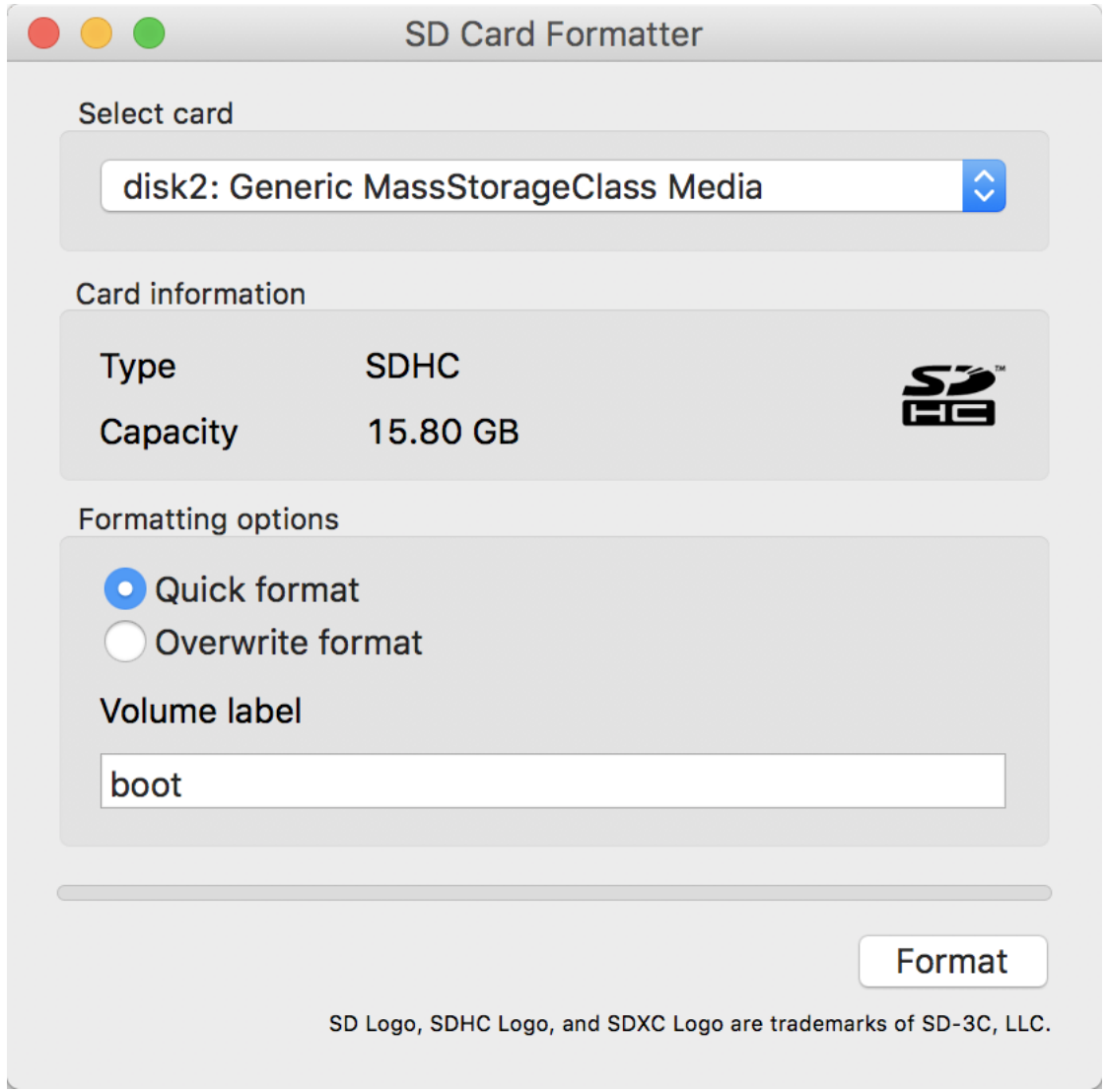
1. MAC OS下\使用brew cask 进行软件的安装:
2. 官网： https://brew.sh/index_zh-cn.html
3. 安装软件:
    1. brew cask install sdformatter
    2. brew cask install applepi-baker
    3. Brew cask install vnc-viewer

MAC OS下搭建——格式化

MAC 格式化

选择好需要格式化的设备

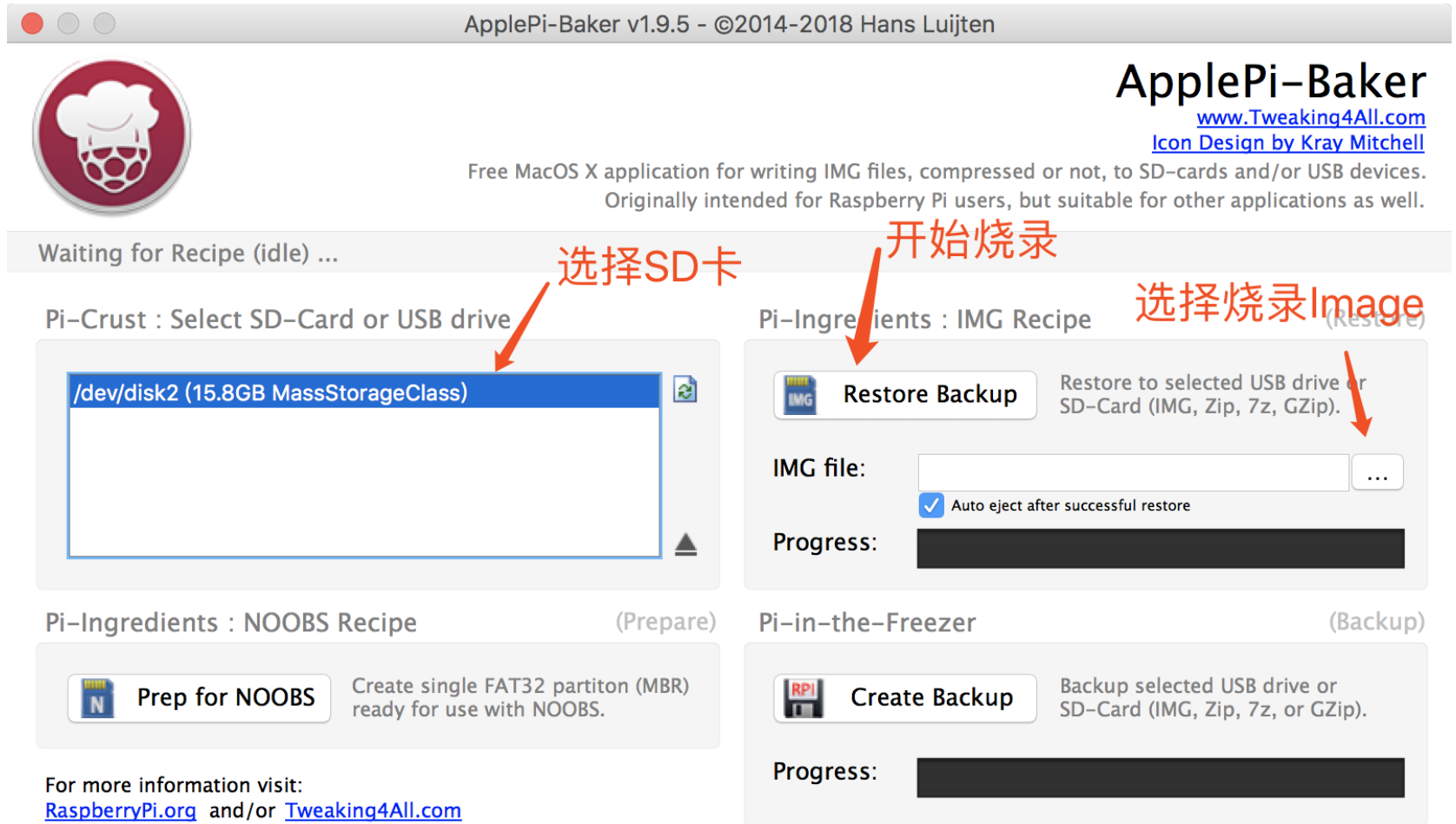
点击Format



MAC OS下搭建——烧录

MAC 烧录

打开ApplePi-Baker
选择烧录的SD卡
选择image
点击Restore Backup开始烧录



无显示设备下搭建

无显示设备下搭建

开启SSH：

更新日志：http://downloads.raspberrypi.org/raspbian/release_notes.txt

开启SSH 方法，再log中有记录：创建一个ssh文件在/boot 目录下

```
[ 12:30上午 ]  [ caojiaying@MAC:/Volumes/boot ]
 $ touch ssh
[ 12:30上午 ]  [ caojiaying@MAC:/Volumes/boot ]
 $ touch wpa_supplicant.conf
[ 12:30上午 ]  [ caojiaying@MAC:/Volumes/boot ]
 $ ls -al
total 42401
drwxrwxrwx@ 1 caojiaying  staff     2560  6 30 00:30 .
drwxr-xr-x@ 7 root        wheel      224  6 30 00:15 ..
drwxrwxrwx  1 caojiaying  staff      512  6 30 00:15 .fseventsd
-rwxrwxrwx  1 caojiaying  staff    18693  8 21  2015 COPYING.linux
-rwxrwxrwx  1 caojiaying  staff     1494 11 18  2015 LICENCE.broadcom
-rwxrwxrwx  1 caojiaying  staff    18974  9  7  2017 LICENSE.oracle
drwxrwxrwx  1 caojiaying  staff      512 10 14  2017 System Volume Information
-rwxrwxrwx  1 caojiaying  staff    15660  5 15  2017 bcm2708-rpi-0-w.dtb
-rwxrwxrwx  1 caojiaying  staff    15456  5 15  2017 bcm2708-rpi-b-plus.dtb
-rwxrwxrwx  1 caojiaying  staff    15197  5 15  2017 bcm2708-rpi-b.dtb
-rwxrwxrwx  1 caojiaying  staff    14916  5 15  2017 bcm2708-rpi-cm.dtb
-rwxrwxrwx  1 caojiaying  staff    16523  5 15  2017 bcm2709-rpi-2-b.dtb
-rwxrwxrwx  1 caojiaying  staff    17624  5 15  2017 bcm2710-rpi-3-b.dtb
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-rwxrwxrwx  1 caojiaying  staff    50248  8 11  2017 bootcode.bin
-rwxrwxrwx  1 caojiaying  staff      187  1  1  1980 cmdline.txt
-rwxrwxrwx  1 caojiaying  staff     1590  9  7  2017 config.txt
-rwxrwxrwx  1 caojiaying  staff     6688  8 11  2017 fixup.dat
-rwxrwxrwx  1 caojiaying  staff     2594  8 11  2017 fixup_cd.dat
-rwxrwxrwx  1 caojiaying  staff     9834  8 11  2017 fixup_db.dat
-rwxrwxrwx  1 caojiaying  staff     9830  8 11  2017 fixup_x.dat
-rwxrwxrwx  1 caojiaying  staff      145  9  7  2017 issue.txt
-rwxrwxrwx  1 caojiaying  staff  4381216  8 11  2017 kernel.img
-rwxrwxrwx  1 caojiaying  staff  4581064  8 11  2017 kernel7.img
drwxrwxrwx  1 caojiaying  staff    10240  9  7  2017 overlays
-rwxrwxrwx  1 caojiaying  staff        0  6 30 00:30 ssh
-rwxrwxrwx  1 caojiaying  staff  2868132  8 11  2017 start.elf
-rwxrwxrwx  1 caojiaying  staff   666404  8 11  2017 start_cd.elf
-rwxrwxrwx  1 caojiaying  staff  5007204  8 11  2017 start_db.elf
-rwxrwxrwx  1 caojiaying  staff  3952100  8 11  2017 start_x.elf
-rwxrwxrwx  1 caojiaying  staff        0  6 30 00:30 wpa_supplicant.conf
[ 12:30上午 ]  [ caojiaying@MAC:/Volumes/boot ]
 $
```

配置WIFI方法：

在/boot 目录下创建wpa_supplicant.conf文件，并编辑：

ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev

update_config=1

country=CN

network={

ssid=”SSID"

psk= " Password”

Priority = 4

}

```
1 ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
2 update_config=1
3 country=CN
4
5 network={
6 ssid="ASUS"
7 psk= "1.2.3.4."
8 }
9
~
~
~
~
~
~
~
~
~
~
~
wpa_supplicant.conf [+]                    6,10          All
```

无显示设备下搭建

树莓派上电后会自动开启SSH 并链接WIFI

通过nmap搜索IP地址

nmap安装： brew install nmap

在终端输入 nmap 192.168.1.0/24
nmap 会列出所有网络中的设备。
可以看出我们要的IP地址为 192.168.1.21

这样就可以通过SSH或VNC进行远程链接。

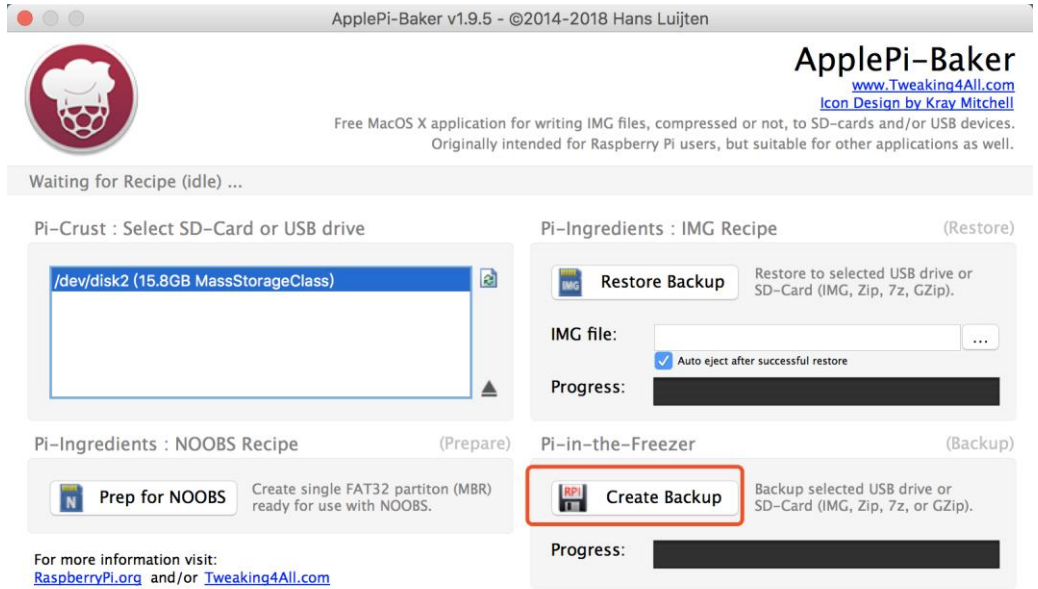
```
 $ nmap 192.168.1.0/24
Starting Nmap 7.70 ( https://nmap.org ) at 2018-06-30 00:38 CST
Nmap scan report for RT-AC66U_B1-BD48 (192.168.1.1)
Host is up (0.012s latency).
Not shown: 992 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
53/tcp   open  domain
80/tcp   open  http
515/tcp  open  printer
3333/tcp open  dec-notes
8443/tcp open  https-alt
9100/tcp open  jetdirect
9998/tcp open  distinct32

Nmap scan report for Synology (192.168.1.2)
Host is up (0.012s latency).
Not shown: 992 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
80/tcp   open  http
139/tcp  open  netbios-ssn
443/tcp  open  https
445/tcp  open  microsoft-ds
3261/tcp open  winshadow
5000/tcp open  upnp
5001/tcp open  commplex-link

Nmap scan report for RPi3B-1 (192.168.1.17)
Host is up (0.012s latency).
Not shown: 997 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
5000/tcp open  upnp
5900/tcp open  vnc

Nmap scan report for MAC (192.168.1.21)
Host is up (0.00031s latency).
All 1000 scanned ports on MAC (192.168.1.21) are closed

Nmap done: 256 IP addresses (4 hosts up) scanned in 9.98 seconds
```

备份Iamge

备份image

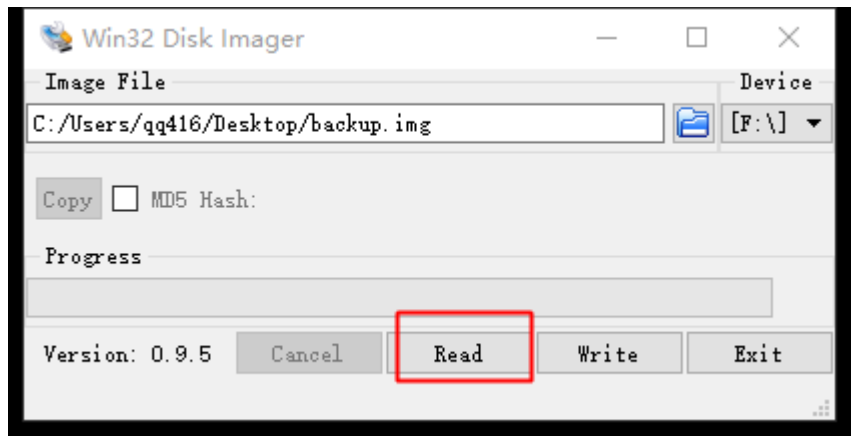
Mac OS：

备份 iamge使用ApplePi-Baker create Backup
点击Create Backup输入存储名及目录
格式选择IMG files
点击Save



Windows：

首先需要新建文件重命名为***.img
选择打开这个文件
点击Read开始备份



谢谢您的观看

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