
RASPBERRY Pi

Instruction en Français



Instruction Détailée

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1-1. Présentation de Raspberry Pi

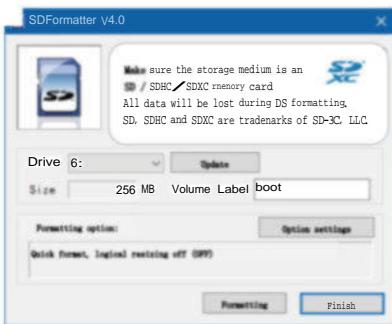
Raspberry Pi est le micro-ordinateur basé sur Linux et de la taille d'une carte de crédit spécialement conçu pour l'enseignement de la programmation informatique. Avec la sortie de Windows 10 IoT, le Raspberry Pi basé sur Windows sera également disponible.

Le Raspberry Pi est une carte mère de micro-ordinateur basée sur ARM. Sa mémoire est une carte SD / MicroSD. La carte mère de la taille d'une carte de crédit dispose d'interfaces USB 1/2/4 et d'une interface Ethernet 100/100 (pas d'interface réseau sur le type A) pour connecter le clavier, la souris et le câble réseau, en dehors de l'interface de sortie TV du signal analogique vidéo et de la sortie vidéo HDMI interface. Le Raspberry Pi a toutes les fonctions de base du PC. Une fois connecté au téléviseur et au clavier, il peut exécuter de nombreuses fonctions telles que les feuilles de calcul, le traitement de texte, les jeux et les vidéos haute définition.

La Fondation Raspberry Pi fournit des versions Debian et Arch basées sur ARM. Outre le langage de programmation principal Python, il est également compatible avec les langages de programmation tels que Java, BBC BASIC (clone «Brandy Basic » via des images RISC OS ou Linux), C et Perl

1-2.Préparations pour débutants

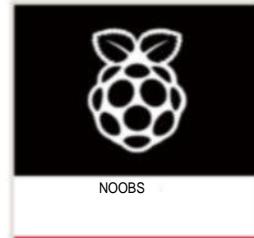
Un Raspberry Pi et le câble d'alimentation correspondant, une carte Micro SD avec NOOBS, un lecteur de carte Micro SD, un câble HDMI, une souris USB, un clavier USB et un moniteur.



1-3.Système Bum Raspbian Buster vers Micro SD

1. Une carte SD supérieure à 16G, carte haute vitesse de classe 10 préférée (la vitesse de la carte affecte directement la vitesse de fonctionnement du Raspberry Pi). Formatez d'abord Micro SD avec SDFormatter

2.Téléchargez le fichier image système officiel du Raspberry Pi:
<https://www.raspberrypi.org/downloads/>Choisissez une version appropriée parmi de nombreuses images du système d'exploitation Raspberry Pi dans le lien.



Télécharger Raspberry Pi 4B



Autres gammes de produits et modèles de Raspberry Pi

- 3.Istallez USB Image Tool sous WinXP et Win7. Lien outil d'image USB.
4. Décompressez le fichier compressé de l'image du système d'exploitation téléchargé et obtenez le fichier image img.
- 5.Connectez la carte SD à l'ordinateur avec le lecteur de carte.
- 6.Décompressez et exécutez l'outil USB Image Tool
- 7.Sélectionnez l'image système (fichier img) dans le logiciel, sélectionnez "Restaurer". Sélectionnez le fichier img d'image système correspondant, puis confirmez
- 8.Le processus d'installation peut être un peu lent, en fonction de la vitesse de la carte SD.Attendez que la boîte de dialogue 100% apparaisse et que l'installation réussisse

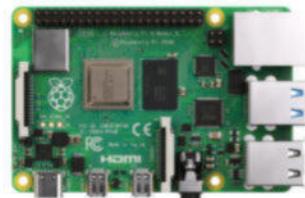


Remarque: Une fois l'écriture système terminée, si le formatage de l'espace restant du disque sort, ne le formatez pas !!! Le système peut ne pas démarrer lors de la mise sous tension du Raspberry Pi! Par défaut, le système Raspberry Pi utilise uniquement l'espace de la carte SD requis par le système d'exploitation.

Paquet d'ouverture et pratique de Raspberry Pi

Si le système démarre avec une erreur: end Kernel panic-not syncing: vfs ne peut pas monter root fs sur un -block inconnu (179,2), cela peut être dû à la fin du formatage système du disque restant sur la carte SD. Ne sélectionnez pas le formatage. Branchez simplement le Raspberry Pi et redémarrez

2-1.Comment installer, démarrer et configurer Raspberry Pi pour la première fois Montez la carte SD, connectez les périphériques



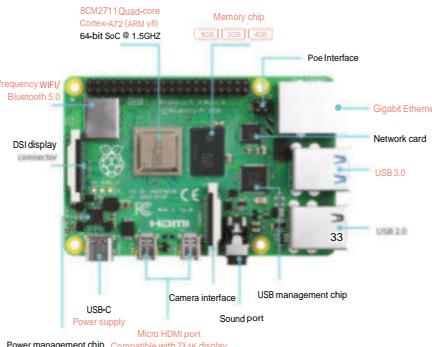
1. Insérez la carte SD avec le système installé dans le Raspberry Pi.

2. Connectez le clavier et la souris avec l'interface USB au Raspberry Pi

3. Connectez le Raspberry Pi au téléviseur ou au moniteur avec un câble HDMI. Si le moniteur adopte la sortie VGA, une conversion HDMI vers un câble VGA est requise.

4. Connectez le Raspberry Pi et le routeur avec le câble réseau.

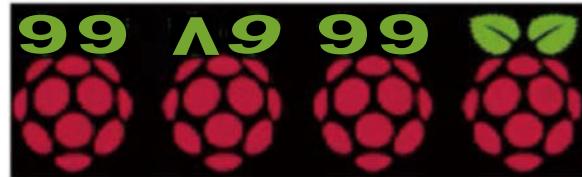
5. Branchez le câble d'alimentation et mettez l'appareil sous tension



Si la version est supérieure à 3B+, il est recommandé d'utiliser l'adaptateur secteur avec une interface Micro Usb supérieure à 3A. La version 4B nécessite le câble d'alimentation avec l'interface USB Type-c.

Démarrez Raspberry Pi

Lorsque le voyant d'alimentation rouge de la carte mère Raspberry Pi est allumé et que le voyant vert clignote, le système commence à démarrer. Le logo Raspberry Pi apparaîtra à l'écran



Pour le système Lite, l'invite de commande de connexion apparaîtra.

Veuillez entrer le nom d'utilisateur: pi, mot de passe: framboise. Si les touches du clavier n'répondent pas, cela indique le problème de compatibilité. Veuillez changer le clavier.

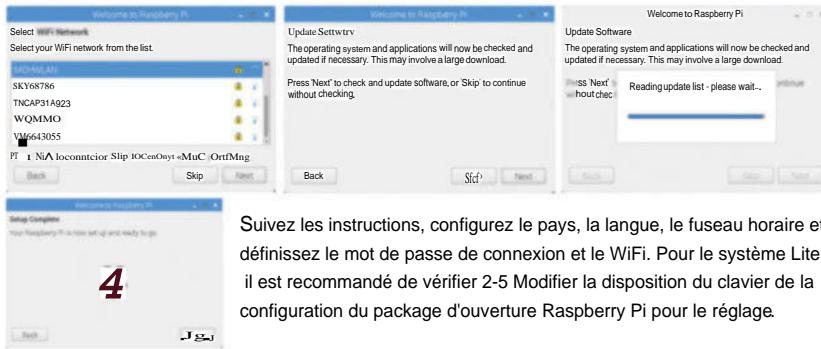
```
Starting enhanced syslogd/syslogd.  
Starting system message bus: dbus.  
Starting NTP server: ntpd.  
Starting periodic command scheduler: cron.  
Starting Hardware abstraction layer: haldStar.  
  
Debian GNU/Linux 6.0 raspberrypi tty1  
  
raspberrypi login: pi
```

Paramètres initiaux

Après avoir lancé la version de bureau, il entre automatiquement dans l'assistant de configuration d'initialisation.



Paquet d'ouverture et pratique de Raspberry Pi



Suivez les instructions, configurez le pays, la langue, le fuseau horaire et définissez le mot de passe de connexion et le WiFi. Pour le système Lite, il est recommandé de vérifier 2-5 Modifier la disposition du clavier de la configuration du package d'ouverture Raspberry Pi pour le réglage.

2-2. Connexion Raspberry Pi par PuTTY

Le Raspberry Pi basé sur Linux est le même qu'un ordinateur ordinaire. Toutes les opérations peuvent être effectuées via une connexion à distance à l'ordinateur. Connectez-vous au bureau Raspberry Pi via VNC et utilisez la ligne de commande de Raspberry Pi via SSH.

Démarrer SSH

Le dernier Raspbian a activé le support SSH par défaut. (le nouveau système doit activer le service SSH par cette méthode) Si, pour une raison quelconque, le service SSH n'est pas activé sur le système (mise à niveau à partir d'un ancien système, désactivé tc.), activez ou désactivez SSH via sudo raspi-config

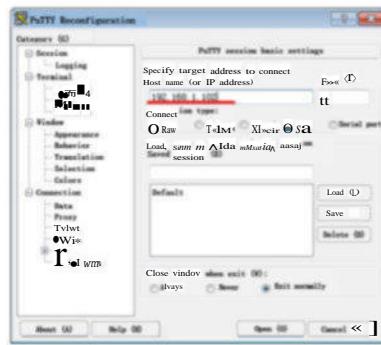
Connexion SSH

L'outil recommandé pour la connexion SSH est PuTTY.

PutTY download: [putty.zip](#) Link

<http://pan.baidu.com/share/link?sha->

Ouvrez PuTTY et entrez l'adresse IP du Raspberry Pi
pour vous connecter



5

Confirmez la clé de connexion pour la première connexion, appuyez sur «Oui» pour confirmer. Cette invite apparaît uniquement lors de la première connexion



Après la connexion, invite à entrer le nom d'utilisateur et le mot de passe. Après avoir entré le nom d'utilisateur et le mot de passe, connectez-vous à la ligne de commande du Raspberry Pi.

(Invite: nom d'utilisateur et mot de passe par défaut de Raspbian pi / raspberry)

Connexion Raspberry Pi par PuTTY

Raisons de recommander la version chinoise de PuTTY

Deux raisons:

I. La police par défaut est un NSimSun plus grand et plus clair de 12 pixels (quatre petits quatre)

II. Contrairement à la version anglaise originale, la version chinoise a été modifiée. Par défaut, le codage UTF-8 est utilisé pour la communication.

Les caractères déformés (points d'interrogation, carrés, etc.) dans l'affichage de la ligne de commande chinoise peuvent être évités sans aucun paramètre

*Lorsque vous rencontrez des caractères chinois déformés sur l'alignement de commande dans la version anglaise de PuTTY, veuillez ajuster l'option de connexion

/indow-> Translation, change the
emote character set to "UTF-8"



Fonctionnement SSH Raspberry Pi sans moniteur

Pour faire fonctionner le Raspberry Pi sans moniteur, il vous suffit de graver le système avec une carte SD, d'insérer la carte et de démarrer, puis de vous connecter via SSH.

Si vous ne connaissez pas l'adresse IP du Raspberry Pi après le démarrage, veuillez vérifier: 2-10 Connexion Raspberry Pi sans moniteur et IP inconnue

Paquet d'ouverture et pratique de Raspberry Pi

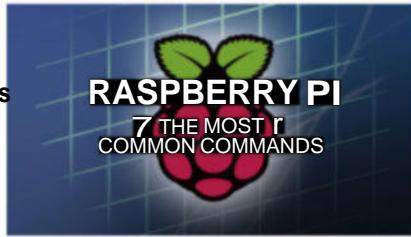
Reminder: for initial login newly installed SSH through SSH, raspi.config settings program won't Rappel: pour la connexion initiale SSH nouvellement installé via SSH, le programme de paramètres raspi-config n'apparaîtra pas. Veuillez utiliser la commande sudo raspi-config pour le démarer manuellement.

De plus, dans le premier écran de PuTTY, utilisez le bouton "Enregistrer" pour enregistrer la connexion modifiée des différentes options en tant qu'entrée dans la zone de liste.

Juste double bite la prochaine fois que tu te connectes

2-3.Commandes et descriptions Raspberry Pi Linux les plus courantes

Commandes et descriptions Linux courantes



Where to enter the command?

Login your Raspberry Pi through the SSH client, or enter the Raspberry Pi desktop to enter the command.

What is the sudo command?

Adding sudo before a command line means that you execute the command as the system administrator. Improper use may cause an accident, so only add it when it is particularly necessary to run it as the system administrator.

sudo reboot

Reboot the Raspberry Pi as the system administrator, so add sudo.

sudo poweroff

Power off as the system administrator.

sudo shutdown -h 03:14

Shut down regularly. For example, the above command will set the shutdown time at 3:14 am.

sudo halt

Halt. Unlike poweroff, this command stops all CPU functions before shutting down. During execution, kill the application process, execute the sync system call, and file system writing before stopping the kernel. This method is recommended to halt.

clear

Clear the text on the terminal.

cd /folder1/folder2

Goto the directory /folder1 /folder2.

cd ~

Goto the home directory of the current user.

ls -lha

List files and directories in the current location, display all information. If you remove the -lha, only the file names are listed.

sudo find /-name file.txt

Find the files named file.txt.

sudo find /-name file.txt -type f

Find the files named file.txt, only find files.

sudo find /-name somedir -type d

Find the files named file.txt, only find directories.

sudo find /-name file*

Find files named file. *, the asterisk is the wildcard.

sudo mv ~/file /folder1/folder2/

Move ~/file to /folder1 /folder2 /.

man command

View the command manual. Replace any command you want to know.

sudo raspi-config

Open the Raspberry Pi function configuration interface.

sudo ifconfig -a

List the network configuration information of the Raspberry Pi.

ping 192.168.1.1

Ping an IP. Check the connection status of the Raspberry Pi and this IP device.

sudo apt-get update

Update the software list.

sudo apt-get upgrade

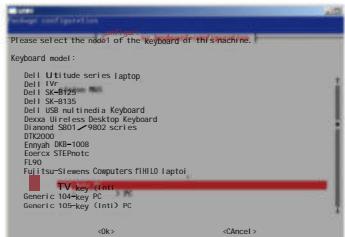
Upgrade the software package.

Paquet d'ouverture et pratique de Raspberry Pi

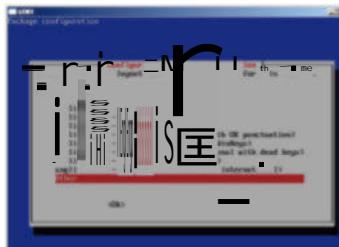
2-4.Modifier la configuration du package d'ouverture de la disposition du clavier

Raspberry Pi est le produit britannique. La disposition de clavier par défaut est le Royaume-Uni (GB) tandis que la disposition de clavier commune est généralement les États-Unis (US).

La commande pour changer la disposition du clavier:: sudo dpkg-reconfigure keyboard-configuration
Ou entrez via raspi-config, udo raspi-config Après avoir entré, sélectionnez le clavier PC universel à 101 touches



Press the tab to OK and press Enter to confirm.
In the keyboard layout selection, select Other.



Press the tab to OK and press Enter to confirm.
Then in the options, select English (US).



Press the tab to OK and press Enter to confirm.
Then select English (US, alternative international).



Press tab to OK and press Enter to confirm.Then press OK all the way.After exiting, reboot the system.

sudo reboot

During reboot, the keyboard layout is read more slowly than usual due to the changed keyboard layout.

2-5.Solution pour la connexion SSH du nouveau système Raspberry Pi refusée

Le système initialement installé ne peut pas se connecter au Raspberry Pi via SSH. L'invite de connexion SSH "connexion refusée" apparaît.

La raison en est que depuis la version de novembre 2016, Raspbian a le serveur SSH désactivé par défaut.

Le redémarrage est également très simple. Débranchez la carte SD, entrez dans le répertoire racine et créez un nouveau fichier vide nommé ssh

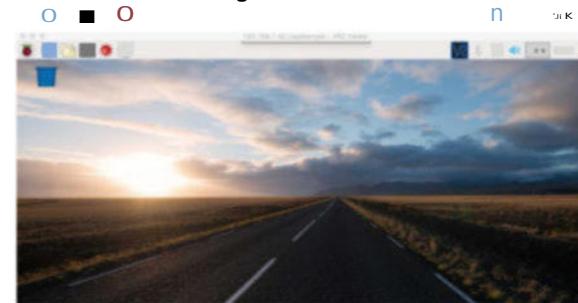


Remettez la carte dans le Raspberry Pi et utilisez SSH.

The command for P.S. Windows users to create new files under PowerShell:
new-item ssh -type file

If you still get "connection refused" after completing the operation above, the SSH service is not enabled. Manually enable SSH service on the Raspberry Pi command line by the command:
service sshd restart

2-6.Tutoriel de configuration du bureau à distance de la visionneuse VNC



Paquet d'ouverture et pratique de Raspberry Pi

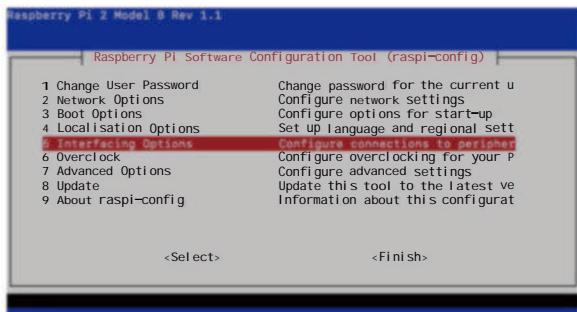
Method to login Raspberry Pi with the certified RealVNC client

Before start, login Raspberry Pi, enter the Raspberry Pi command window, connect to the monitor, keyboard and mouse, or login through SSH.

Enable Raspberry Pi VNC service

Enter the following command in the terminal to enter the configuration interface.

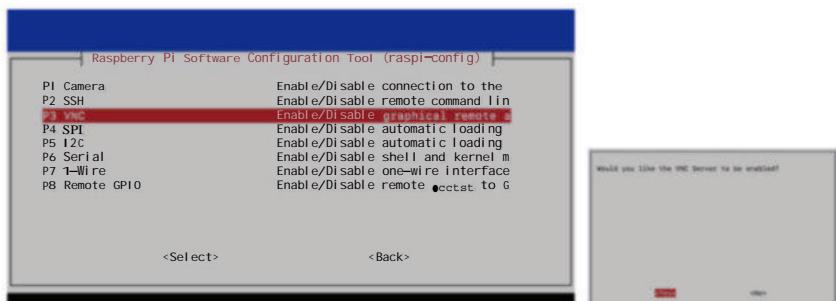
sudo raspi-config



Method to login Raspberry Pi with the certified RealVNC client.
Before start, login Raspberry Pi, enter the Raspberry Pi command window, connect to the monitor, keyboard and mouse or login through SSH.

Enable Raspberry Pi VNC service

Enter the following command in the terminal to enter the configuration interface, sudo raspi-config



```
color-sensor-argyl foomatic-db-compressed-pdfs | foomatic-cdb  
printer-driver-hpcups hplip cups-pdf smbclient antiword docx2txt  
ghostscript-x imagemagick-doc autotrace enscript gimp gnuplot grads graphviz  
hw2xx html2ps libwmf-bin mplayer povray radiance texlive-base-bin transfig  
ufracw-batch gutenprint-locates ooo2dbk rtf2xmlinkscape gutenprint-doc  
unpaper
```

The following packages will be REMOVED:
tightvncserver

The following NEW packages will be installed:

```
aci be colorl colordl data cups cups-browsed cups-core-drivers cups-daemon
cups-filters cups-filters-core-drivers cups-pdc cups-server-common
ghostscript imagemagick imagemagick-6-common imagemagick-6.q16 libcol orhug2
libcupscgsl libcupsmi libcupspcdl libdvl vul bre-text libdvl vul bre2
libfile-copy recursie-perl libfontembed libgs9 libgs9-common libgsus2
libgutenprint libl1eeel284-3 libjbig s=0.35 libjbig2dec libjxr-tools libjxro
libloui-s-data libloui-sl2 libloui-sutdm1 libloui sutdm1 data libloui sutdm1
liblqr-t-0 libmagickcore-6.q16-3 libmagickcore-6.q16-3-extra
libmagickwand-6.q16-3 libmetpbm0 libpaper-utils libpaper1 libqpdf17 lib sane
lib sane-common lib sane-extras lib sane-extras-common libwmf0.2-7 netpbm
printer-dri-ger-gutenprint gpdf realvne-vne-server same-utils update-inetd
0 upgraded, 57 newly installed, 1 to remove and 0 not upgraded.
```

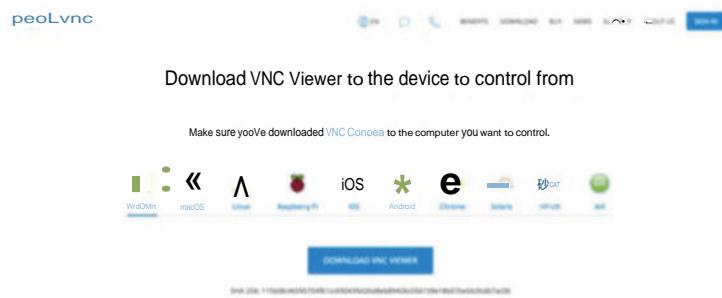
```
update-alternatives using /usr/bin/mogrify-im6.q16 to provide /usr/bin/mogrify-im6 (mogrify-im6) in auto mode
Setting up ghostscript (9.20-dfsg-3.2+deb9u2) ...
Setting up cups-core-drivers (2.2.1-8+deb9u2) ...
Setting up cups-bsd (2.2.1-8+deb9u2) ...
Locale: Cannot set LC_CTYPE to default locale: No such file or directory
Locale: Cannot set LC_ALL to default locale: No such file or directory
Setting up libmagickcore-6.q16-3-extra:armhf (8:6.9.7.4+dfsg-1+deb9u5) ...
Setting up imagemagick (8:6.9.7.4+dfsg-1+deb9u5) ...
Setting up cups-filters (1.11.6-3+rpi1) ...

Setting up cups (2.2.1-8+deb9u2) ...
Locale: Cannot set LC_CTYPE to default locale: No such file or directory
Locale: Cannot set LC_ALL to default locale: No such file or directory
Updating PPD files for cups...
Updating PPD files for gutenprint...
Processing triggers for libc-bin (2.21-1+b6) ...
Processing triggers for systemd (232-25+deb9u2) ...
Processing triggers for dbus (1.10.26-0+deb9u1) ...
```

Paquet d'ouverture et pratique de Raspberry Pi

Install VNC client

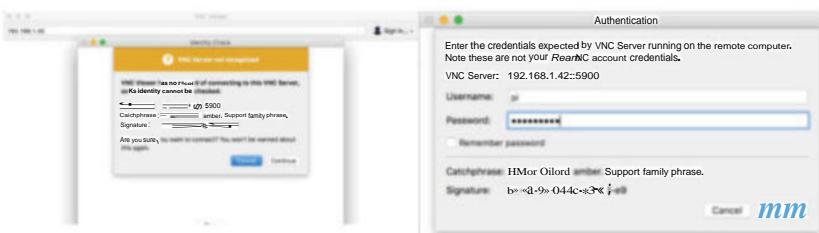
Download RealVNC Viewer from RealVNC official website, link:
<https://www.realvnc.com/en/connect/download/viewer/>



It is the RealVNC client, cross platform. Download the required platform client version.

Connexion Bureau à distance

Après avoir exécuté RealVNC Viewer, entrez l'adresse IP du Raspberry Pi, vuepar ifconfig corririend. Après avoir sélectionné la connexion, entrez le nom d'utilisateur et le mot de passe de connexion Raspberry Pi. Le nom d'utilisateur initial est pi et le mot de passe framboise. Confirmez et entrez dans le bureau à distance Raspberry Pi



Pour modifier la résolution de Raspberry Pi, exécutez sudo raspi-config dans le terminal pour accéder à l'interface de configuration.

2-7.Comment définir la résolution VNC du Raspberry Pi



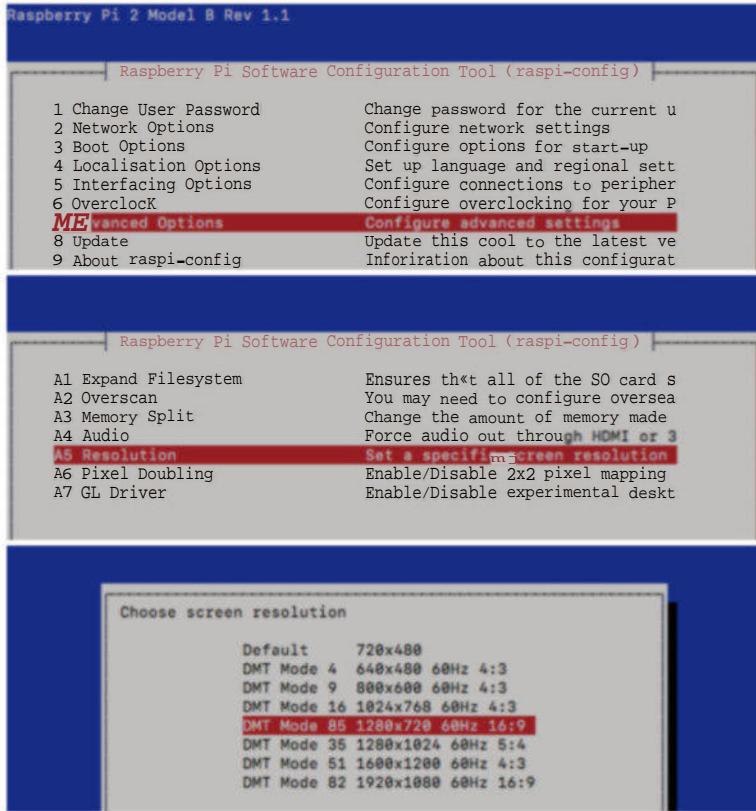
Lorsque vous utilisez VNC pour vous connecter au Raspberry Pi, la résolution par défaut est très faible. Même le bureau entier ne peut pas être affiché, vous devez donc définir.

La définition de la résolution VNC sur le Raspberry Pi est très simple. Exécutez la commande suivante dans le terminal pour accéder à l'interface de configura

sudo raspi-config

Select Advanced Options> Resolution in the following order, and finally select a more suitable resolution and confirm finish.

Paquet d'ouverture et pratique de Raspberry Pi



Il est recommandé de redémarrer le Raspberry Pi ou le service VNC pour que les paramètres soient effectifs.

2-8.Configurer Raspberry Pi WiFi et SSH sans écran ni clavier

Peu de temps après la sortie du Raspberry Pi 4B, le système officiel Raspbian du Raspberry Pi a ajouté un mécanisme permettant de configurer le réseau WiFi avant de démarrer.

Remarque: cette méthode n'est efficace que si vous n'avez effectué aucune configuration WiFi après l'installation du système Raspberry Pi sur la carte SD. Si vous avez déjà configuré le WiFi, avec la même méthode, le système utilisera la configuration existante par défaut et ignorerait la configuration ici. Il est donc recommandé de réinstaller le système avant utilisation.



I. Configuration du réseau WiFi

Users can modify the /boot/wpa_supplicant.conf file and configure the SSID and password of the WiFi without starting Raspberry Pi. Then the Raspberry Pi will read the wpa_supplicant.conf file and connect to the WiFi device.

The operation method is simple: read the SD card of the Raspbian system with a computer. Create a new wpa_supplicant.conf file in the boot partition, namely the /boot directory of the Raspberry Pi. Fill in the content according to the following reference format and save the wpa_supplicant.conf file.

```
country=CN
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1
```

```
network={
    ssid="WiFi-An
    psk="12345678"
    key_mgmt=WPA-PSK
    priority=1
}
```

Paquet d'ouverture et pratique de Raspberry Pi

```
network={  
    ssid="WiFi-B"  
    psk="12345678"  
  
    key_mgmt=WPA-PSK  
    priority=2  
    scan_ssid=1  
}
```

Descriptions and examples of WiFi configurations with different security levels:

```
#ssid: network ssid  
#psk: password  
#priority: connection priority, the higher the number, the higher the priority (not a negative number)  
#scan_ssid: This value needs to be specified as 1 when connecting to the hidden WiFi
```

If your WiFi has no password

```
network = {  
    ssid = "your wireless network name (ssid)"  
    key_mgmt = NONE  
}
```

If WiFi uses WEP encryption

```
network = {  
    ssid = "your wireless network name (ssid)"  
    key_mgmt = NONE  
    wep_key0 = "your wifi password"  
}
```

If WiFi uses WPA /WPA2 encryption

```
network = {  
    ssid = "your wireless network name (ssid)"  
    key_mgmt = WPA-PSK  
    psk = "your wifi password"  
}
```

If you don't know the encryption mode of WiFi, use root explorer on your Android phone to open
/data/misc/wifi/wpa_supplicant.conf and view WiFi information.

II. Activer le service SSH

Si vous accédez à Raspberry Pi via ssh et que l'invite Accès refusé apparaît, le service ssh n'est pas activé. L'activer manuellement est similaire à la configuration WiFi. Créez également un nouveau fichier dans la partition de démarrage, laissez-le vide et nommez le fichier ssh. Utilisez des minuscules et ne disposez d'aucune extension.

Au démarrage, Raspberry Pi activera automatiquement le service ssh après avoir détecté ce fichier. Recherchez ensuite l'adresse IP du Raspberry Pi en vous connectant au routeur et connectez-vous à Raspberry Pi via ssh, (méthode détaillée sur l'activation du service SSH)

Si vous devez faire fonctionner Raspberry Pi à distance, installez rdp via ssh et connectez-vous à Raspberry Pi avec le client de bureau à distance Windows.

2-9.Connexion Raspberry Pi sans moniteur et IP inconnue

Lorsque vous utilisez Raspberry Pi sans moniteur, vous ne connaissez peut-être pas l'adresse IP attribuée automatiquement par la carte réseau filaire Raspberry Pi. Les étapes de fonctionnement détaillées sont fournies ci-dessous pour résoudre ce problème.

Méthode d'analyse des segments de réseau

C'est la méthode recommandée. Il existe de nombreux outils d'analyse des segments de réseau. Un scanner IP avancé est recommandé



Le logiciel détecte automatiquement le segment de réseau de l'ordinateur et détermine la plage de balayage. (Par exemple ordinateur IP 192.168.1.101, et plage de balayage 192.168.1. *)

Appuyez sur Démarrer pour lancer la numérisation, la liste de tous les ordinateurs du même segment de réseau peut être disponible

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Si le routeur dispose d'une autorisation de connexion (comme le réseau domestique), affichez directement l'adresse IP attribuée au Raspberry Pi sur l'interface de gestion du routeur.

Le nom d'hôte par défaut du système Raspberry Pi Raspbian est Raspberry Pi.

(Trouvez alarmpi avec ArchLinuxARM, si vous changez vous-même le nom d'hôte)

Attaché: permet à Raspberry Pi d'être attribué dynamiquement à la même adresse IP à chaque fois

L'adresse IP dynamique est louée. À l'expiration du bail, l'adresse IP réaffectée peut changer et parfois causer des inconvénients.

Vous pouvez instruire le routeur; si gérable, se souvenir de l'adresse matérielle MAC de la carte réseau Raspberry Pi.

Tant qu'il s'agit du même Raspberry Pi, peu importe comment le système d'exploitation change, le routeur attribuera automatiquement la même adresse IP et restera inchangé..

Cette méthode est recommandée car elle maintient l'adresse IP attribuée automatiquement fixe et facilite les connexions SSH, VNC et autres.

La méthode de liaison de l'adresse IP statique à l'adresse MAC est la même pour différents routeurs.

Reportez-vous aux directives d'utilisation du routeur pour plus de détails

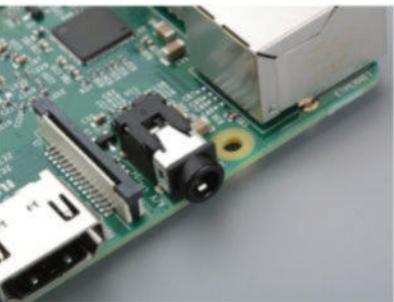
2-10. Configurer la sortie audio du Raspberry Pi: 3.5 mm / HDMI

Par défaut, le Raspberry Pi sélectionne automatiquement le port de sortie audio. Lorsque vous connectez simultanément l'écran HDMI et un casque ou un haut-parleur 3,5 mm, vous souhaitez parfois en spécifier manuellement l'un comme périphérique de sortie audio. Configurez-le par la méthode suivante. Lors de la connexion d'une carte d'extension DAC externe, sélectionnez la sortie DAC avec cette méthode après avoir configuré le pilote.

Entrez dans l'outil de configuration Raspberry Pi:

sudo raspi-config

Select Advanced Options-> Audio



Raspberry Pi Software Configuration Tool (raspi-config)

- A1 Expand Filesystem
- A2 Overscan
- A3 Memory Split
- A4 Audio**
- A5 Resolution
- A6 Pixel Doubling
- A7 GL Driver

Ensure that all of the SD card is
You may need to configure overscan
Change the amount of memory made
Force audio out through HDMI or 3.5mm
Set a specific screen resolution
Enable/Disable 2x2 pixel mapping
Enable/Disable experimental desk

<Select> <Back>

Raspberry Pi Software Configuration Tool (raspi-config)

- 1 Change User Password
- 2 Network Options
- 3 Boot Options
- 4 Localisation Options
- 5 Interfacing Options
- 6 Overclock
- 7 Advanced Options**
- 8 Update
- 9 About raspi-config

Change password for the current user
Configure network settings
Configure options for start-up
Set up language and regional settings
Configure connections to peripherals
Configure overclocking for your Pi
Configure advanced settings
Update this tool to the latest version
Information about this configuration

<Select> <Finish>

List the audio output devices here. Select Force 3.5mm or Force HDMI.

Choose the audio output

- Auto
- Force 3.5mm ('headphone') jack
- Force HDMI

<OK> <Cancel>

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2-11.Raspberry Pi un câble réseau directement connecté à l'ordinateur portable

Connectez l'ordinateur directement avec un câble réseau sans passer par le routeur.

I.Matériaux: un Raspberry Pi, un câble réseau, un ordinateur portable

1.Raspberry Pi: carte SD avec système d'alimentation et système Raspbian brûlé

2.Câble réseau: connexion croisée ou directe;

3.Ordinateur portable: double carte réseau

II. Etapes de l'opération

1.Câblage.

Connectez le Raspberry Pi avec le câble d'alimentation

Connectez une extrémité du câble réseau au Raspberry Pi et à l'autre extrémité de l'ordinateur portable

2.Partage Internet.

If the current laptop is connected to the Internet through WIFI, the Internet resources of the wireless network card can be shared to the local connection. Take win7 system as an example, Start-Control Panel-Network and Inter net-Network and Sharing Center-View Network Status and Tasks-Change Adapter Settings, find the wireless network connection, right-click "Properties" select on the sharing tab "Allow other network users to connect through this computer's Internet connection (N)" option, click OK

3.Trouver l'adresse IP du

Raspberry Pi.

Run the DOS window and enter arp -a.

The dynamic IP address under the interface 192.168.137.1 is Raspberry Pi address



C:\Windows\system32\cmd.exe			
2009 Microsoft Corporation. All Rights Reserved			
Administrator: Sharp			
Interface:	192.168.137.1	Type:	Oxa
Internet Address	Physical address	Type	
192.168.137.9	b8-27-eb-ca-f7-de	Dynamic	
192.168.137.255	ff-ff-ff-ff-ff-ff	Static	
224.0.0.22	01-00-5e-00-00-16	Static	
224.0.0.251	01-00-5e-00-00-fb	Static	
224.0.0.252	01-00-5e-00-00-fc	Static	
239.255.255.250	01-00-5e-7f-ff-fa	Static	
255.255.255.255	ff-ff-ff-ff-ff-ff	Static	
Interface:	192.168.0.16	Type:	Oxb
Internet Address	Physical address	Type	
192.168.0.1	00-1e-58-88-45-38	Dynamic	
192.168.0.255	ff-ff-ff-ff-ff-ff	Static	
221.0.0.22	01-00-5e-00-00-16	Static	
221.0.0.251	01-00-5e-00-00-fb	Static	
221.0.0.252	01-00-5e-00-00-fc	Static	
239.255.255.250	01-00-5e-7f-ff-fa	Static	
255.255.255.255	ff-ff-ff-ff-ff-ff	Static	

Why is the interface 192.168.137.1? Because during the upper Internet sharing, the "local connection" IP address is automatically set to the static IP 192.168.137.1. This IP address can also be set to other static IP addresses commonly used by you. Because the Raspberry Pi IP address is dynamic, you can only find it with this method. Set the Raspberry Pi to a static IP address by modifying the cmdline.txt file in the SD card (add the statement ip = **.**.**.**). To secure successful connection, set the static IP address of the computer's "Local Connection" at the same segment as the static IP address of Raspberry Pi

4. Utilisez le logiciel PuTTY pour connecter Raspberry Pi.

Connect to the Raspberry Pi by entering the dynamic IP address or static IP address. Perform operations such as initializing because of the initial connection.

5. Connexion d'interface graphique

According to the descriptions of VNC remote login Raspberry Pi graphic interface, connect to Raspberry Pi through VNC software for graphical interface operation, or use the "Remote Desktop Connection" that comes with Windows for graphical operation. Find related tutorials on specific settings online



2-12.Configurer Internet sans fil Raspberry Pi

I. Vérifiez si l'état de la carte réseau est normal

Plug the wireless network card into the Raspberry Pi, and enter the command ifconfig -a to see if there is any information about wlan0. If so, it means that the network card is normal. Skip the second step and directly configure the wireless network. If the information about wlan0 is not available, you need to install the wireless network card driver.

II. Afficher les informations de la carte réseau sans fil

Enter the command dmesg | grep usb and view the information of the wireless network card, solely the manufacturer. For example, the network card information
usb 1-1.3: Manufacturer: Realtek

Take Realtek as an example, install the wireless network card driver.

If the current Raspberry Pi is online, enter the installation command to install the Realtek driver. First search the Realtek driver:
apt-cache search Realtek

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See the following message:

firmware-realtek – Binary firmware for Realtek wired and wireless network adapters

Install Realtek driver:

```
sudo apt-get install firmware-realtek
```

If the Raspberry Pi is not online, go to the mirror image site and download the relevant driver.

III. Configurer le réseau sans fil

Open the interfaces file with editor nano

```
sudo nano /etc/network/interfaces
```

Interfaces file:

```
auto lo
```

```
iface lo inet loopback
```

```
iface eth0 inet dhcp
```

```
allow-hotplug wlan0
```

```
iface wlan0 inet manual
```

```
wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
```

```
iface default inet dhcp
```

Comment out all the wireless network card parts with #, and then add your own configuration information. The final result:
auto lo

```
iface lo inet loopback
```

```
iface eth0 inet dhcp
```

```
auto wlan0
```

```
# allow-hotplug wlan0
```

```
#iface wlan0 inet manual
```

```
iface wlan0 inet dhcp
```

```
wpa-conf /etc/wpa.conf
```

```
# wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
```

```
iface default inet dhcp
```

Use nano editor, ctrl + o to save, ctrl + x to exit.

Create the /etc/wpa.conf file with the editor nano:

```
sudo nano /etc/wpa.conf
```

If wifi has no password

```
network = {  
    [Tab] ssid = "your wireless network name (ssid)"  
    [Tab] key_mgmt = NONE  
}
```

If wifi uses WEP encryption

```
network = {  
    [Tab] ssid = "your wireless network name (ssid)"  
  
    [Tab] key_mgmt = NONE  
    [Tab] wep_key0 = "your wifi password"  
}
```

If wifi uses WPA /WPA2 encryption

```
network = {  
    [Tab] ssid = "your wireless network name (ssid)"  
    [Tab] key_mgmt = WPA-PSK  
    [Tab] psk = "your wifi password"  
}
```

Note 1:

All symbols are half-width (symbols in English status), "[Tab]" means press the Tab key once.
N

ote 2:

If you are not sure about the wifi encryption mode, open /data/misc/wifi/wpa/wpa_supplicant.conf with root explorer on your Android phone and view the wifi information.

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2-13.Méthode pour connecter Raspberry Pi avec Windows Remote Desktop

How to connect to Raspberry Pi withVNC has been described in the Raspberry Pi DIY notes. Under Windows, the built-in remote desktop is more convenient. How to connect to Raspberry Pi with remote desktop (mstsc.exe) rather thanVNC?

Just need to install a service xrdp under raspbian. Enter the following command to install:

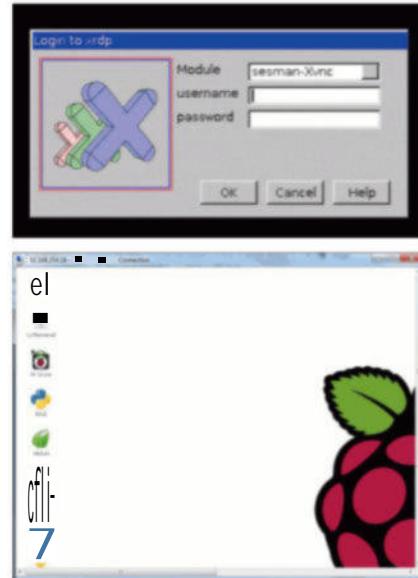
```
sudo apt-get install xrdp
```

Then it is Ok.

If an error-problem connecting occurs, the root cause is tightvnc. The version with the problem conflicts with the X font, leading to connection to the Xserver error.

Solution:

```
sudo apt-get purge tightvncxrdp sudo apt-get install tightvncserverxrdp
```



Finally, start the xrdp service and sudo /etc/init.d/xrdp restart. Enable the corresponding port and default configuration.

Through command: netstat -tnl

View 3350 3389 5910, it's OK when these three ports are in LISTEN.

dpkg-L+name of the package, you can know which files this package contains.

via <http://rpi.linux48.com/remote-rpi.html>

<http://www.linuxidc.com/Linux/2015-05/117835.htm>

2-14.Résumé des commandes d'installation et de désinstallation du logiciel sur Raspberry Pi

Basic commands

Install software apt-get install softnamel softname2 softname3 ...

Uninstall software apt-get remove softnamel softname2 softname3 ...

Uninstall and purge configuration apt-get remove --purge softname1

Update software information database apt-get update

System upgrade apt-get upgrade

Search package apt-cache search softnamel softname2 softname3 ...

If you come across errors such as slow response or non-existent sources when using apt-get, you may need to replace the sources.

Install deb package dpkg -i xxx.deb

Delete package dpkg -r xxx.deb

Delete with the configuration file dpkg -r --purge xxx.deb

View package information dpkg -info xxx.deb

View file copy details dpkg -L xxx.deb

View information about installed packages in the system dpkg -l

Reconfigure package dpkg-reconfigure xxx

Purge residual configuration files for all deleted packages

dpkg -l | grep ^ rc | awk '{print \$ 2}' | sudo xargs dpkg -P

If the following error is reported, it means that there are no residual configuration files in your system. Don't worry.

dpkg: --purge needs at least one package name argument

The dpkg installation can be uninstalled with apt, and vice versa.

aptitude command

aptitude, like apt-get, is an extremely powerful package management tool in Debian and its derivatives. Unlike apt-get, aptitude is better at handling dependencies. For example, when aptitude deletes a package, it also deletes the packages it depends on. In this way, no unnecessary packages remain in the system, and the entire system is cleaner. The following are some of the

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commonly used aptitude commands summarized by the author for reference only.

aptitude update update the list of available packages

aptitude upgrade upgrade available packages

aptitude dist-upgrade upgrade the system to a new release

aptitude install pkgnname install package

aptitude remove pkgnname delete package

aptitude purge pkgnname delete the package and its configuration file

aptitude search string search package

aptitude show pkgnname show detailed information of the package

aptitude clean delete downloaded package files

aptitude autoclean delete only expired package files

Of course, you can also use aptitude in text interface mode.

List of common apt commands

apt-cache search # ----- (package search package)

apt-cache show # ----- (package get information about the package, such as description, size, version, etc.)

sudo apt-get install # ----- (package installation package)

sudo apt-get install # ----- (package--reinstall package)

sudo apt-get -f install # ----- (force installation? # "-f = --fix-missing" when it is repair installation

...)

sudo apt-get remove # ----- (package delete package)

sudo apt-get remove--purge # ----- (package delete package, including deleting configuration files, etc.)

sudo apt-get autoremove --purge # ---- (package delete the package and its dependent packages + configuration files, etc. (only valid for 6.10, highly recommended))

sudo apt-get update # ----- update source

sudo apt-get upgrade # ----- update installed packages

sudo apt-get dist-upgrade # ----- upgrade system

sudo apt-get dselect-upgrade # ----- upgrade with dselect

apt-cache depends # ----- (package understand use dependency)

apt-cache rdepends # ----- (package know a specific dependency? # view which packages are dependent on this package ...)

sudo apt-get build-dep # ----- (package installation-related compilation environment)

```
apt-get source # ----- (package download the source code of the package)
sudo apt-get clean && sudo apt-get autoclean # ----- clean the archive of downloaded files &&
clean only outdated packages
sudo apt-get check # ----- check for broken dependencies
```

2-15.Linux Vi (vim) Editor Tutorial

vi (vim) is a very common Linux editor. Many Linux releases have vi (vim) installed by default. There are many vi (vim) commands. When used flexibly, they will greatly improve efficiency. vi is short for "visual interface", vim is vi IMProved. Vi is sufficient for general system management and maintenance. You can use vim to highlight code. Vi tutorial is given below: including vi introduction, use mode, file open, close and save, inserting text or creating new lines, moving the cursor, deleting, restoring characters or lines, searching, and so on. Such vi tutorial is very suitable for beginners.

vi has 3 modes: insert, command, and low line.

Insert: In this mode, enter characters. Press ESC to return to the command mode.

Command: Move the cursor, delete characters, etc.

Low line: Save files, exit vi, set vi, find (low line mode can also be regarded as in command mode).

I. Open, save, close the file (used in vi command mode)

vi filename //Open the filename file

:w //Save the file

:w vpser.net //Save to vpser.net file

:q //Quit the editor, if the file has been modified, please use the following command

:q! //Exit the editor without saving

:wq //Exit the editor and save the file

II. Insert text or line (used in vi command mode, execute the following command and enter insert mode, press ESC key to exit insert mode)

a //Add text to the right of the current cursor position

i //Add text to the left of the current cursor position

A //Add text at the end of the current line

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I //Add text at the beginning of the current line (at the beginning of the line of non-empty character)

O //Create a new line above the current line

o //Create a new line below the current line

R //Replace (overwrite) the current cursor position and subsequent text

J //Merge the cursor line and the next line (still in command mode)

III. Move the cursor (used in vi command mode)

1. Use the up, down, left, and right arrow keys

2. In command mode: h left, j down, k up, l right.

Spacebar right, Backspace left, Enter move to the beginning of the next line,- move to the beginning of the previous line.

IV. Delete or restore characters or lines (used in vi command mode)

x //Delete the current character

nx //Delete n characters from the cursor

dd //Delete the current line

ndd //Delete downward n lines including the current line

u //Undo the previous operation

U //Undo all operations on the current line

V. Search (used in vi command mode)

/vpser //Search vpser string under the cursor

? vpser //Search the vpser string above the cursor

n //Search downward the previous search action

N //Search upward the previous search action

VI. Jump to the specified line (used in vi command mode)

n + //n lines down

n - //n lines up

nG //Jump to line with line number n

G //Skip to the bottom of the file

VII. Setting the line number (used in vi command mode)

: set nu //Display line number

: set nonu //Cancel displaying line number

VIII. Copy and paste (used in vi command mode)

yy //Copy the current line to the buffer area. Use "ayy copy," a buffer, and a can also be replaced with any letter from a to z, which can complete multiple copy tasks.

nyy //Copy the current line downward n lines to the buffer, or use "anyy copy," a buffer, a can also be replaced with any letter from a to z, which can complete multiple copy tasks.

yw //Copy the characters from the cursor to the end of the word.

nyw //Copy n words starting from the cursor.

y ^ //Copy the content from the cursor to the beginning of the line. VPS detective

y \$ //Copy the content from the cursor to the end of the line.

p //Paste the contents of the clipboard after the cursor. If the previous custom buffer is used, it is recommended to use "ap to paste."

P //Paste the contents of the clipboard in front of the cursor. If the previous custom buffer is used, it is recommended to use "aP" to paste

IX. Replace (used in vi command mode)

: s/old/new//Replace the first old in the line with new

: s/old/new/g//Replace all old in the line with new

: n, m s/old/new/g//Replace all old lines from n to m with new

:% s/old/new/g//Replace all old in the current file with new

X Edit other files

: e otherfilename //Edit the file named otherfilename.

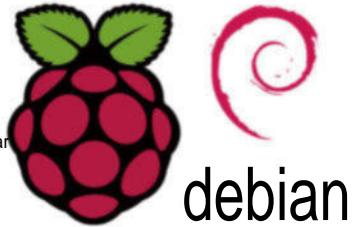
XI. Modify file format

: set fileformat = unix //Modify the file to unix format. For example, the text file under win will appear ^ M under linux.

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2-16. Descriptions de l'objectif de chaque répertoire Linux / Raspbian

Many students who are new to Raspberry Pi /Linux will wonder where the software and configuration files are stored when installing, uninstalling, and configuring software for the Raspberry PL. They may also come across issues with directory paths such as "disk partition" and U disk mount. However, Linux directories rules are very clear.



Difference between Linux and Windows

One of the significant differences between Linux and Windows is their different directory structure. Apart from the format, the things stored in different locations are very different.

On Windows, a typical path may be D:\ Folder \ subfolder \ file.txt, while on Linux, the path would be /Folder/subfolder/file.txt.

The direction of the slash is different. Linux has no concept of the C drive and D drive. After the Linux system starts, the root partition is "mounted" at the /position, and all files, folders, devices, as well as different hard disk drives are also mounted on /.

Although it may not be obvious in the following example, the Linux system is sensitive to uppercase and lowercase characters in file or file path names.

For example, /Folder/subfolder/file.txt and /folder/subfolder/file.txt are not the same file.

Linux system directory description

The directory structure of Unix and Linux is unified. All directories and files are finally unified under the "7" root file system. Whether the file system is mounted, the file system is finally arranged hierarchically under the file system starting with 7".

The Linux directory structure adopts the "Filesystem Hierarchy Structure (FHS)." This standard is maintained by the "Free Standards Group." However, most LINUX releases intentionally or unintentionally deviates from this Norm.

7" root path

This is the "root" directory of the Linux system and the lowest level of any directory structure. On UNIX and compatible systems, "/" is a separate directory.

/boot

This directory contains boot loader, such as Grub, Lilo or Kernel, and configuration files such as initrd and system.map.

Initrd ramdisk or "" initrd "" refers to a temporary file system called by the Linux kernel during the startup phase. initrd is mainly used for preparation before the "root" file system is mounted.

/sys

This directory contains the kernel, firmware, and system related files.

/sbin

Contain the binary files and management tools necessary for system operation, mainly executable files and similar to EXE files under Windows.

/bin

Contain binary files and utility programs in single-user mode, such as commands cat, ls, cp.

/lib

Contain the library files needed to run binary files in the /sbin and /bin directories.

/dev

Contain the necessary system files and drives.

/etc

Contain system configuration files, directories underneath, such as /etc/hosts, /etc/resolv.conf, nsswitch.conf, and system default settings, network configuration files, and configuration files for some systems and applications.

/home

Under this directory, each user will have a separate directory commanded by the username, where the user's personal settings files are stored, especially files ending with profile. However, there are exceptions. The data of the root user is not in this directory, but is in the root path and

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stored in a separate /root folder.

/media

A conventional mount point for all removable devices such as optical drives, USB external disks, and floppy disks.

/mnt

Temporary file system mount point. For example, if you don't want to mount a drive for a long time, but just temporarily mount a USB flash drive to copy an MP3 or the like, then you should mount it in this location.

/opt

In Linux systems, this directory is not used much. opt is short for Optional Software Packages. This directory on UNIX system is much more versatile such as Sun Solaris.

/usr

The user data directory contains utilities and applications that belong to the user. There are a lot of important but not critical file system mounted under this path. Here you will find a new bin, sbin, and lib directory that contains non-critical user and system binary files, related libraries and shared directories, and some library files.

/usr /sbin

Contain unnecessary and not particularly important system binary files and network application tools in the system.

/usr /bin

Contain unnecessary and not particularly important binary files for users.

/usr /lib

Store the library files needed by the binary files in /usr/sbin and /usr/bin.

/usr /share

A "platform independent" shared data directory.

/usr /local

It is a secondary directory under /usr. It mainly stores local system data including system binary files and runtime libraries.

/var

This path usually contains system logs, printer spool files, crontabs, mails, running processes, process lock files, and so on. We should emphasize daily inspection and maintenance on this directory, because the file size in this directory may grow quickly. It may quickly fill up the hard disk, and then the system will have various strange problems.

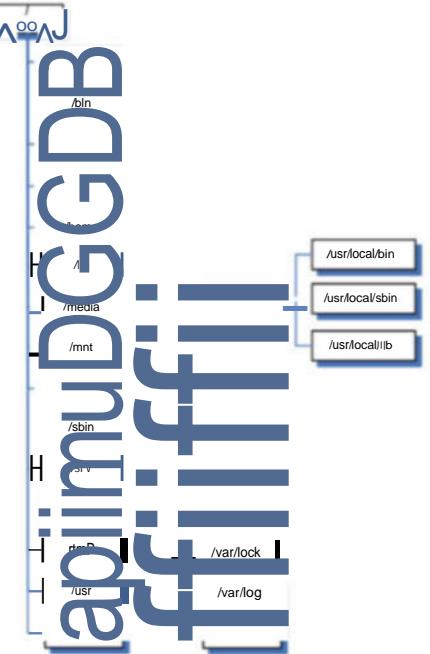
/tmp

It is a temporary folder that is used to store temporary files. During system reboot, the "temporary" files in this directory will be emptied. Likewise, /var/tmp also holds temporary files. The only difference between the two is that the files stored in the /var/tmp directory of the latter will be protected by the system, and the files in this directory will not be emptied after system reboot.

/proc

This directory is a pseudo file system residing in system memory, which holds the system kernel and process information in text format.

Linux Directory Structure in Visual View
It should be noted that there are some differences in the directory structure of different Linux releases.



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2-17.Comment arrêter et redémarrer en toute sécurité Raspberry Pi?

Many shutdown options, one option in one line.

sudo shutdown -h now

sudo haltsudo poweroffsudo init0

```
Reboot methodsudo reboot  
shutdown -r now  
shutdown -r 18:23:52 # timed reboot shutdown at 18:23:52
```



2-18.Connectez Raspberry Pi avec un câble série USB sur Mac OS X

There is no HDMI monitor while RPi has TXD and RXD plus a usb to ttl Mac OS Usb TTL driver.
Driver download address: PL2303 Mac OS X Driver Download, link: http://www.prolific.com.tw/US>ShowProduct.aspx?p_id=229&pcid=41

Restart the system after installation and find the serial device:

cd /dev

ls tty.usbserial *

```
mac os install screenThe port  
used here is screenbrew  
install screen
```

or
sudo port install screen

Then connect Raspberry Pi

Raspberry Pi serial communication

In our TTL board GND-> Ground RXD-> GPIO14 (TXD) TXD-> GPIO15 (RXD)

! Note: TXD is connected to RXD. Don't make the same connection.

Mac OS setting raspberry pi Serial communication

screen /dev/tty.usbserial 115200

During system reboot, input username and password Raspbian GNU/Linux 7

raspberrypi ttyAMA0

raspberrypi login: piPassword:

Last login: Sat Apr 26 05:58:07 UTC 2014 on ttyAMA0

Linux raspberrypi 3.10.25+ #622 PREEMPT Fri Jan 3 18:41:00 GMT 2014 armv6l

The programs included with the Debian GNU/Linux system are free software; the exact distribution terms for each program are described in the individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.

ls

NOTICE: the software on this Raspberry Pi has not been fully configured. Please run 'sudo raspi-config'

Then
sudo raspi-config

Paquet d'ouverture et pratique de Raspberry Pi

Select the first one and proceed

Expand Filesystem Ensures that all of the SD cards

After reboot, it seems that the new raspberry pi comes with openssh-server.

By the way provide a way to uninstall the driver

```
rm -rf /System/Library/Extensions/XXXX.kext
```

```
rm -rf /System/Library/Extensions.kextcache
```

```
rm -rf /System/Library/Extensions.mkext
```

```
kextcache -k /System/Library/Extensions
```

These commands may be issued when you are an administrator. It is recommended to use the root user or sudo -s. XXXX.kext is the name of the driver. For example, the two USB-Serial drivers here start with Prolific and FDTI.

2-19. Installer Raspbian sur Raspberry Pi sous Mac OS X

First download the system image in the official website of Raspberry Pi, it is recommended to download Raspbian.

After download, get an img image:

```
[usiful_@mac: pi] $ ls -lh  
total 3788800  
-rw-r--r-- 1 landzo staff 1.8G 2 9 03:44 2013-02-09-wheezy-raspbian.img
```

Insert the SD card and use the df command to view the currently mounted volume:

```
[usiful_@mac: pi] $ df -h  
Filesystem Size Used Avail Capacity Mounted on  
/dev/disk0s2 112Gi 96Gi 15Gi 87% /  
devfs 183Ki 183Ki 0Bi 100% /dev  
map -hosts 0Bi 0Bi 0Bi 100% /net  
map auto_home 0Bi 0Bi 0Bi 100% /home  
/dev/disk1s1 15Gi 2.3Mi 15Gi 1% /Volumes /unnamed
```

Compare Size and Name, find the device file corresponding to the SD card partition in the

system (here /dev/disk1s1). If you have multiple partitions, there may be disk1s2 and the like. Use diskutil unmount to unmount these partitions:

```
[usiful_@mac: pi] $ diskutil unmount /dev/disk1s1
```

```
2
```

Volume unnamed on disk1s1 unmounted

Confirm the device with diskutil list:

```
[usiful_@mac: pi] $ diskutil list  
/dev/disk0  
#: TYPE NAME SIZE IDENTIFIER  
0: GUID_partition_scheme * 121.3 GB disk0  
1: EFI 209.7 MB disk0s1  
2: Apple_HFS Macintosh HD 120.5 GB disk0s2  
3: Apple_Boot Recovery HD 650.0 MB disk0s3  
/dev/disk1  
#: TYPE
```

NAME SIZE IDENTIFIER

```
0: FDisk_partition_scheme
```

```
* 15.8 GB disk1
```

```
1: Windows_NTFS unnamed
```

```
15.8 GB disk1s1
```

Use the dd command to write the system image. Pay special attention to the number after the disk.

(Note: /dev/disk1s1 is the partition, /dev/disk1 is the block device, and /dev/rdisk1 is the original character device)

```
[usiful_@mac: pi] $ dd bs = 4m if = 2013-02-09-wheezy-raspbian.img of =/dev/rdisk1
```

After waiting for a few minutes, the following prompt appears, indicating that the SD card has been swiped:

```
462 + 1 records in
```

```
462 + 1 records out
```

```
1939865600 bytes transferred in 163.133220 secs (11891297 bytes/sec)
```

Uninstall the device with diskutil unmountDisk:
[usifull_@mac: pi] \$ diskutil unmountDisk/dev/disk1
Unmount of all volumes on disk1 was successful

Vous pouvez maintenant retirer la carte SD et la brancher sur le Raspberry Pi pour démarrer le système.
Lors du premier démarrage, entrez Raspi-config. Cette dernière méthode de configuration est la même que les autres plates-formes. Pour plus de détails, veuillez vous référer à la partie Configurer Raspberry Pi avec raspi-config.

Précautions

caveat

■ Ce produit ne peut être connecté qu'à une alimentation externe CC 5V. Toute alimentation externe utilisée avec Raspberry-P doit être conforme aux réglementations et normes applicables dans le pays / la région d'utilisation.

- Ce produit ne doit pas être au-delà de la fréquence, car il augmentera la température de certains composants.
- Le produit ne peut pas être couvert et l'environnement d'exploitation doit être ventilé.
- Le produit doit être placé sur une surface stable et non conductrice pendant l'utilisation et ne doit pas entrer en contact avec des éléments conducteurs.

Instructions pour la sécurité d'utilisation

Pour éviter tout dysfonctionnement ou endommager le Raspberry Pi, veuillez suivre les exigences suivantes:

1. Ne pas entrer en contact avec l'eau et l'humidité ou le placer sur une surface conductrice pendant le fonctionnement.
2. Ne laissez pas le Raspberry P entrer en contact avec une source de chaleur. Le produit fonctionnera de manière fiable à température ambiante normale.
3. Veillez à ne pas causer de dommages mécaniques ou électriques au circuit imprimé et aux connecteurs pendant le fonctionnement.
4. N'utilisez pas le Raspberry Pi lorsqu'il est sous tension. Opérez uniquement par les bords et évitez les dommages dus aux décharges électrostatiques.
5. Tous les périphériques utilisés avec le Raspberry Pi doivent être conformes aux normes pertinentes du pays / région d'utilisation et doivent être marqués en conséquence pour garantir la conformité aux exigences de sécurité et de performance pertinentes. Ces appareils incluent, mais sans s'y limiter, le clavier, le moniteur et la souris utilisés avec le Raspberry Pi.
6. Si vous utilisez un logiciel différent pour écrire des cartes microSD ou utilisez des cartes différentes, vous devez utiliser un logiciel compatible Pi4B. Si vous voyez un écran de démarrage arc-en-ciel avec un symbole d'éclair, cela signifie que vous n'utilisez pas de logiciel compatible.
7. Avant que la carte de circuit imprimé ne soit complètement assemblée, n'installez pas le dissipateur thermique et insérez une carte microSD dans la carte; la planche doit être installée sur une base plate sous les deux rainures;
8. N'insérez pas de carte micro dans le lecteur de carte USB. Ne démarrez pas Raspberry Pi à partir du lecteur de carte USB. Le lecteur de carte USB ne fonctionne que sur votre PC ou Mac, si vous avez besoin de réécrire.

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1-1.Raspberry Pi Introduction

Raspberry Pi (RPi or RasPi/RPI) [1] is the Linux-based and credit card-sized microcomputer specially designed for computer programming education. [2] With Windows 10 IoT released, the Windows-based Raspberry Pi will also be available.

The Raspberry Pi is developed in the United Kingdom by the Raspberry Pi Foundation. It is an ARM-based microcomputer motherboard. Its memory is SD/MicroSD card. The credit card-sized motherboard has 1/2/4 USB interfaces and 110/100 Ethernet interface (no network interface on type A) to connect the keyboard, mouse and network cable, apart from video analog signal TV output interface and HDMI video output interface. The Raspberry Pi has all basic PC functions. Once connected with the TV and keyboard, it can perform many functions such as spreadsheets, word processing, playing games and high-definition videos. Raspberry Pi B is only provided with computer board without memory, power supply, keyboard, casing or connection cables.

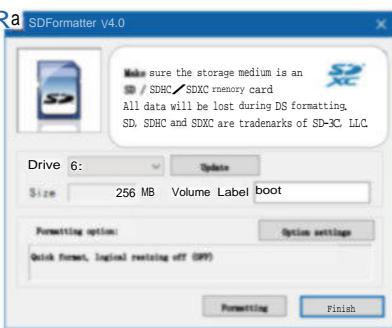
The Raspberry Pi Foundation provides ARM-based Debian and Arch versions. Apart from the Python main programming language, it's also compatible with programming languages such as Java, BBC BASIC ("Brandy Basic" clone via RISC OS images or Linux), C, and Perl.

1-2.Beginner Preparation

A Raspberry Pi and corresponding power cable, Micro SD card with NOOBS, Micro SD card reader, an HDMI cable, a USB mouse, a USB keyboard, and a monitor.

1-3.Burn Raspbian Buster System to Micro SD

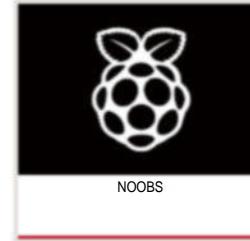
■ An SD card above 16G, class 10 high-speed card preferred (card speed directly affects the operating speed of the Raspberry Pi). Format Micro SD with SDFormatter first.



2.Download the official Raspberry Pi system image file:

<https://www.raspberrypi.org/downloads/>

Choose a suitable version among many Raspberry Pi operating system images in the link.



Raspberry Pi 4b download



Other product lineups and models of Raspberry Pi

3.Install USB Image Tool under WinXP and Win7.

Link USB Image Tool

4.Unzip the downloaded operating system image compressed file and get the img image file.

5.Connect the SD to the computer with the card reader.

6.Unzip and run the USB Image Tool.

7.Select the system image (img file) in the software, select "Restore". Select the corresponding system image img file, and then confirm.

8.The installation process may be a bit slow, depending on the SD card speed.Wait until the dialog box 100% appears, and installation succeeds.



Note: After the system writing completes, if formatting the remaining space of the disc pops out, do not format it!!! The system may not boot when turning on the Raspberry Pi! By default, the Raspberry Pi system only uses the SD card space required by the operating system.

Raspberry Pi Opening Pacckage and Hands-on

If the system starts with an error: end Kernel panic-not syncing: vfs unable to mount root fs on unknown -block (179,2), it may be caused by completing the system formatting of the remaining disk in the SD card. Do not select formatting it. Just plugin the Raspberry Pi and restart.

2-1.How to install, Start and Configure Raspberry Pi for the first time

Mount SD card, connect peripherals

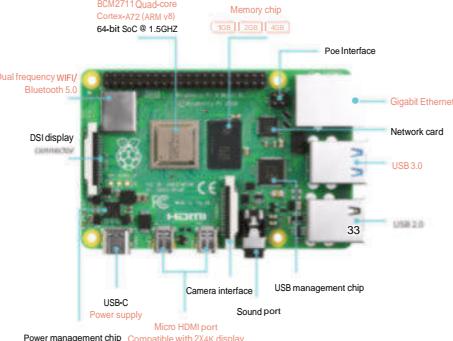
1.Insert the SD card with the installed system into the Raspberry Pi.

2.Connect the keyboard and mouse with USB interface to the Raspberry Pi.

3.Connect the Raspberry Pi to TV or monitor with an HDMI cable. If the monitor adopts the VGA output, an HDMI conversion to VGA cable is required.

4.Connect the Raspberry Pi and the router with the network cable.

5.Connect the power cable and turn on the power.

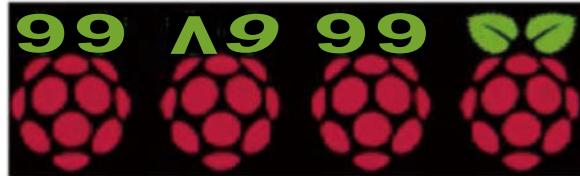


Note:

If the version is above 3B+, it is recommended to use the power adapter with MicroUsb interface above 3A. Version 4B requires the power cable with the USB Type-c interface.

Start Raspberry Pi

When the red power indicator on the Raspberry Pi motherboard is on and the green indicator flashes, the system begins to start. The Raspberry Pi logo will appear on the screen:



For the Lite system, the login command prompt will appear.

Please enter username: pi, password: raspberry. If the keyboard keys do not respond, it indicates the compatibility issue. Please change the keyboard.

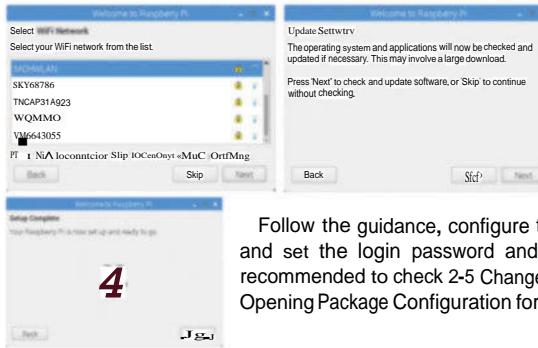
```
Starting enhanced syslogd/syslogd.  
Starting system message bus: dbus.  
Starting NTP server: ntpd.  
Starting periodic command scheduler: cron.  
Starting Hardware abstraction layer: haldStar.  
Debian GNU/Linux 6.0 raspberrypi tty1  
raspberrypi login: pi
```

Initial settings

After launching the desktop version, it automatically enters the initializing setup wizard.



Raspberry Pi Opening Package and Hands-on



Follow the guidance, configure the country, language, time zone, and set the login password and WiFi. For the Lite system, it is recommended to check 2-5 Change Keyboard Layout of Raspberry Pi Opening Package Configuration for setting.

2-2.Login Raspberry Pi by PuTTY

The Linux-based Raspberry Pi is the same as an ordinary computer. All operations can be done through remote login the computer. Login the Raspberry Pi desktop through VNC, and operate the command line of Raspberry Pi through SSH.

Start SSH

In fact, the latest 2012-10-28 Raspbian has enabled SSH support by default (Since October 2016, the new system needs to enable the SSH service by this method) If for some reason the SSH service is not enabled on the system (upgrade from an old system, turned off, etc.), enable or disable SSH through sudo raspi-config.

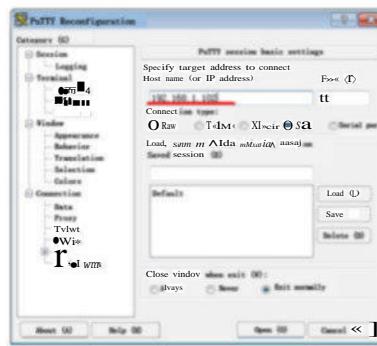
Login SSH

The only recommended tool for login SSH is PuTTY.

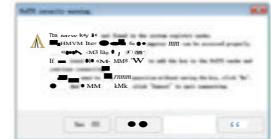
PuTTY download: putty.zip Link:

<http://pan.baidu.com/share/link?shareid=2217335081&uk=605377859>

Open PuTTY and enter the IP address of the Raspberry Pi to login.

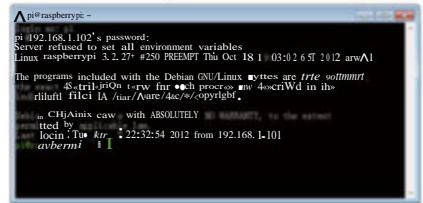


Confirm connection key for first login, press "Yes" to confirm. This prompt appears only for first login.



After login, prompt to enter username and password. After entering username and password, login the command line of the Raspberry Pi.

(Prompt: Raspbian's default username and password pi/raspberry)



Login Raspberry Pi by PuTTY

Reasons to recommend PuTTY Chinese version

Two reasons:

- I. Default font is a larger, clearer 12px (small four) NSimSun.
- II. Unlike the original English version, the Chinese version has been changed. By default, UTF-8 encoding is used for communication.

Garbled characters (question marks, squares, etc.) in the Chinese command line display can be avoided without any setting.

*When you run across Chinese garbled characters on the command line in PuTTY English version, please adjust the connection option:

Window-> Translation, change the Remote character set to "UTF-8".



SSH Raspberry Pi operation without monitor

To operate the Raspberry Pi without a monitor, you only need to burn the system with an SD card, insert the card and start, and login through SSH.

If you don't know the IP address of the Raspberry Pi after start, please check: 2-10 Login Raspberry Pi Without Monitor and Unknown IP

Raspberry Pi Opening Pacckage and Hands-on

Reminder: for initial login newly installed SSH through SSH, raspi-config settings program won't appear. Please use the sudo raspi-config command to start it manually.

In addition, in the first screen of PuTTY, use the "Save" button to save the edited connection of various options as an entry in the list box.

Just double click the next time you connect.

2-3.Most Common Raspberry Pi Linux Commands and Descriptions

Common Linux commands and descriptions



Where to enter the command?

Login your Raspberry Pi through the SSH client, or enter the Raspberry Pi desktop to enter the command.

What is the sudo command?

Adding sudo before a command line means that you execute the command as the system administrator. Improper use may cause an accident, so only add it when it is particularly necessary to run it as the system administrator.

sudo reboot

Reboot the Raspberry Pi as the system administrator, so add sudo.

sudo poweroff

Power off as the system administrator.

sudo shutdown -h 03:14

Shut down regularly. For example, the above command will set the shutdown time at 3:14 am.

sudo halt

Halt. Unlike poweroff, this command stops all CPU functions before shutting down. During execution, kill the application process, execute the sync system call, and file system writing before stopping the kernel. This method is recommended to halt.

clear

Clear the text on the terminal.

cd /folder1/folder2

Goto the directory /folder1 /folder2.

cd ~

Goto the home directory of the current user.

ls -lha

List files and directories in the current location, displayall information. If you remove the -lha, only the file names are listed.

sudo find /-name file.txt

Find the files named file.txt.

sudo find /-name file.txt -type f

Find the files named file.txt, only find files.

sudo find /-name somedir -type d

Find the files named file.txt, only find directories.

sudo find /-name file*

Find files named file. *, the asterisk is the wildcard.

sudo mv ~/file /folder1/folder2/

Move ~/file to /folder1 /folder2 /.

man command

View the command manual. Replace any command you want to know.

sudo raspi-config

Open the Raspberry Pi function configuration interface.

sudo ifconfig -a

List the network configuration information of the Raspberry Pi.

ping 192.168.1.1

Ping an IP. Check the connection status of the Raspberry Pi and this IP device.

sudo apt-get update

Update the software list.

sudo apt-get upgrade

Upgrade the software package.

Raspberry Pi Opening Pacckage and Hands-on

2-4.Change Keyboard Layout of Raspberry Pi Opening Package Configuration

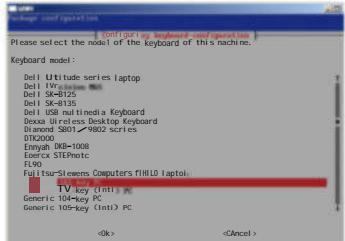
Raspberry Pi is the British product. The default keyboard layout is the United Kingdom (GB) while the common keyboard layout is generally the United States (US).

The command to change the keyboard layout:

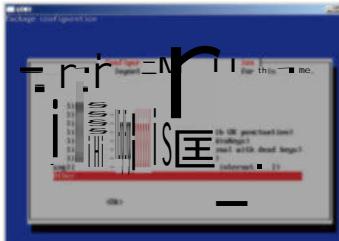
```
sudo dpkg-reconfigure keyboard-configuration
```

Or enter through raspi-config. sudo raspi-config

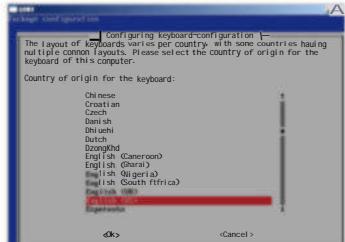
After entering, select the universal 101-key PC keyboard.



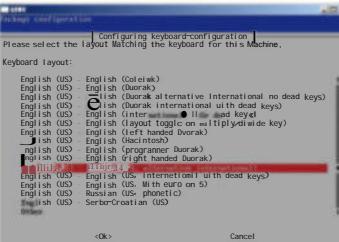
Press the tab to OK and press Enter to confirm.
In the keyboard layout selection, select Other.



Press the tab to OK and press Enter to confirm.
Then in the options, select English (US).



Press the tab to OK and press Enter to confirm.
Then select English (US, alternative international).



Press tab to OK and press Enter to confirm. Then press
OK all the way. After exiting, reboot the system.

sudo reboot

During reboot, the keyboard layout is read more slowly than usual due to the changed keyboard layout.

2-5.Solution for Raspberry Pi New System SSH Connection Refused

The initially installed system cannot connect to the Raspberry Pi through SSH. The SSH connection prompt "connection refused" appears.

The reason is that as of the November 2016 release, Raspbian has the SSH server disabled by default.

Reboot is also very simple. Unplug the SD card, enter the root directory, and create a new blank file named ssh.



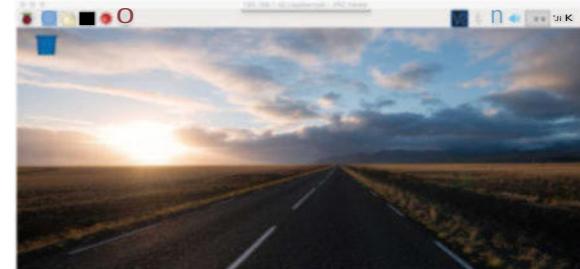
Put the card back into the Raspberry Pi, and use SSH.

The command for P.S. Windows users to create new files under PowerShell:
new-item ssh -type file

If you still get "connection refused" after completing the operation above, the SSH service is not enabled. Manually enable SSH service on the Raspberry Pi command line by the command:

```
service sshd restart
```

2-6.Raspberry Pi VNC Viewer Remote Desktop Configuration Tutorial



Raspberry Pi Opening Pacckage and Hands-on

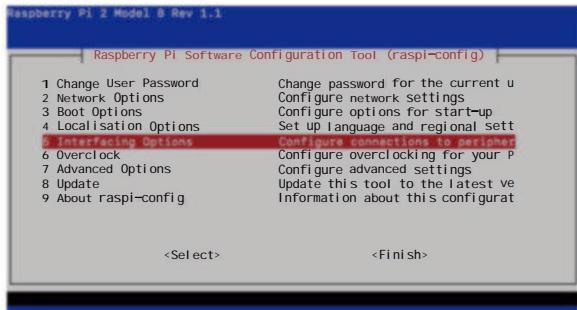
Method to login Raspberry Pi with the certified RealVNC client.

Before start, login Raspberry Pi, enter the Raspberry Pi command window, connect to the monitor, keyboard and mouse, or login through SSH.

Enable Raspberry Pi VNC service

Enter the following command in the terminal to enter the configuration interface.

sudo raspi-config



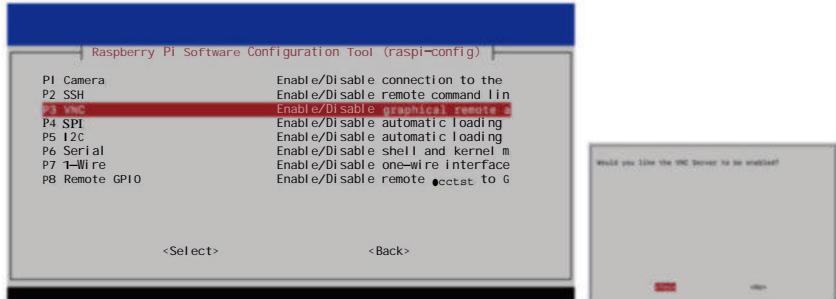
Method to login Raspberry Pi with the certified RealVNC client.

Before start, login Raspberry Pi, enter the Raspberry Pi command window, connect to the monitor, keyboard and mouse, or login through SSH.

Enable Raspberry Pi VNC service

Enter the following command in the terminal to enter the configuration interface.

sudo raspi-config



```
colord-sensor=argyll foomatic=cdb-compressed-ppds_f foomatic=cdb
printer-driver=hpcups hplip cups-pdf smbcclient antiword docx2txt
ghostscript=x11 imagemagick-doc autotrace enscript gimp gnuplot grads graphviz
hp2xx http2ps libwmf-blr mplayer povray radiance texlive-base-bin transfig
ufraw-batch gutenprint-local es 0002bd rtf2xmlinkscape gutenprint-doc
unrar e
```

The following packages will be REMOVED:

tightvncserver
The following NEW packages will be installed:

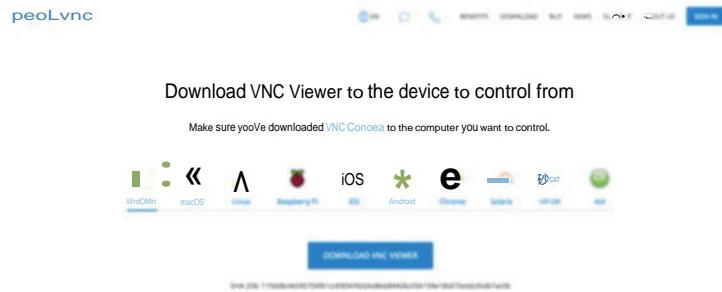
```
me following NEW packages were installed:  
acl be colord colord-data cups-cups-browsed cups-core-drivers cups-daemon  
cups-filters cups-filters-tesseract-cups cups-server-common  
ghostscript-imagemagick imagemagick-ck-6-common imagemagick-ck-6-q16-l1bc0rlorhug2  
libcupscgi libcupsmi libcupspdf1 libbdj vulibre-text libbdj vulibre21  
libfile-copy recursive-perl libfontembed1 libbgs9 libbgs9-common libgbusg2  
libgutenprint2 libeeel284-3 libjbig0-35 libjbig2dec libjxr-tools libjxr0  
liblouis-sdata liblouis12 liblouis-sutdm1 bin liblouis-sutdm1 liblouis-sutdm17  
liblqr-0 libmagickcore-6 q16-3 libmagickcore-6 q16-3-extra  
libmagickwand-6 q16-3 libnetpbm libpaper-utils libpaper1 libqpdf17 libsane  
libsane-common libsane-extras libsane-extras-common libwfmo-2-7 netpbm  
printer-driver-gutenprint qpdf realvne-vne-server sane-utils update-inetd  
0 upgraded, 57 newly installed, 1 to remove and 0 not upgraded.
```

```
update-alternatives: using /usr/bin/mogrify-im6.q16 to provide /usr/bin/mogrify-im6 (mogrify-im6) in auto mode
Setting up ghostscript (9.20-dfsg-3.2+deb9u2) ...
Setting up cups-core-drivers (2.2.1-8+deb9u2) ...
Setting up cups-bsd (2.2.1-8+deb9u2) ...
locale: Cannot set LC_CTYPE to default locale: No such file or directory
locale: Cannot set LC_ALL to default locale: No such file or directory
Setting up libmagickcore-6.q16-3-extra:armhf (8:6.9.7.4+dfsg1+deb9u5) ...
Setting up imagemagick (8:6.9.7.4+dfsg1+deb9u5) ...
Setting up cups-filters (1.11.6-3+deb9u1)
```

Raspberry Pi Opening Pacckage and Hands-on

Install VNC client

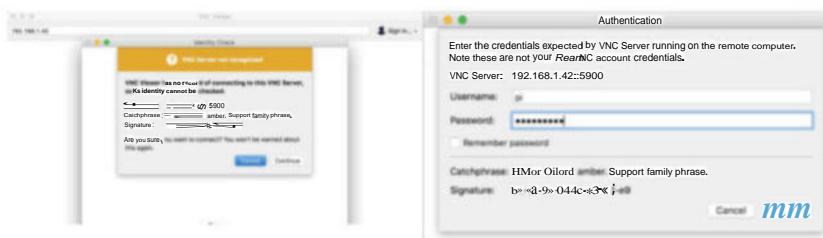
Download RealVNC Viewer from RealVNC official website, link:
<https://www.realvnc.com/en/connect/download/viewer/>



It is the RealVNC client, cross platform. Download the required platform client version.

Login Remote Desktop

After running RealVNC Viewer, enter the IP address of the Raspberry Pi, view by ifconfig command. After selecting the connection, enter the Raspberry Pi login username and password. The initial username is pi and the password raspberry. Confirm and enter Raspberry Pi remote desktop!



To change Raspberry Pi resolution, run sudo raspi-config in the terminal to enter the setting interface.

2-7.How to Set Raspberry Pi VNC Resolution



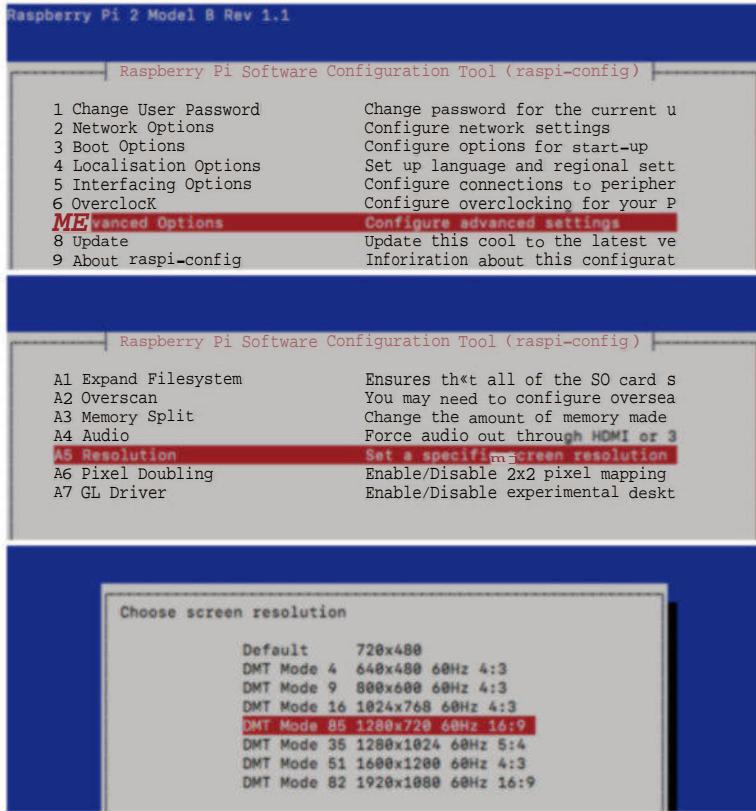
When using VNC to connect to the Raspberry Pi, the default resolution is very low. Even the entire desktop cannot be displayed, so you need to set the resolution.

Setting VNC resolution on the Raspberry Pi is very simple. Run the following command in the terminal to enter the setup interface.

`sudo raspi-config`

Select Advanced Options> Resolution in the following order, and finally select a more suitable resolution and confirm finish.

Raspberry Pi Opening Pacckage and Hands-on



It is recommended to reboot the Raspberry Pi or the VNC service for the settings to be effective.

2-8. Configure Raspberry Pi WiFi and SSH Without Screen and Keyboard

Shortly after the Raspberry Pi 4B release, the official Raspbian system of the Raspberry Pi added a mechanism that allows the WiFi network to be configured before start.

Note: This method is only effective if you have not made any Wi-Fi configuration after installing the Raspberry Pi system in the SD card. If you have configured Wi-Fi before, with the same method, the system will use the existing configuration by default and ignore the configuration here. It is therefore recommended to reinstall the system before use.



I. WiFi network configuration

Users can modify the /boot/wpa_supplicant.conf file and configure the SSID and password of the WiFi without starting Raspberry Pi. Then the Raspberry Pi will read the wpa_supplicant.conf file and connect to the WiFi device.

The operation method is simple: read the SD card of the Raspbian system with a computer. Create a new wpa_supplicant.conf file in the boot partition, namely the /boot directory of the Raspberry Pi. Fill in the content according to the following reference format and save the wpa_supplicant.conf file.

```
country=CN  
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev  
update_config=1  
  
network={  
    ssid="WiFi-An"  
    psk="12345678"  
    key_mgmt=WPA-PSK  
    priority= 1  
}
```

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```
network={  
ssid="WiFi-B"  
psk="12345678"
```

```
key_mgmt=WPA-PSK  
priority=2  
scan_ssid=1  
}
```

Descriptions and examples of WiFi configurations with different security levels:

```
#ssid: network ssid  
#psk: password  
#priority: connection priority, the higher the number, the higher the priority (not a negative number)  
#scan_ssid: This value needs to be specified as 1 when connecting to the hidden WiFi
```

If your WiFi has no password

```
network = {  
ssid = "your wireless network name (ssid)"  
key_mgmt = NONE  
}
```

If WiFi uses WEP encryption

```
network = {  
ssid = "your wireless network name (ssid)"  
key_mgmt = NONE  
wep_key0 = "your wifi password"  
}
```

If WiFi uses WPA /WPA2 encryption

```
network = {  
ssid = "your wireless network name (ssid)"  
key_mgmt = WPA-PSK  
psk = "your wifi password"  
}
```

If you don't know the encryption mode of WiFi, use root explorer on your Android phone to open /data/misc/wifi/wpa_supplicant.conf and view WiFi information.

II. Enable SSH service

If you access to Raspberry Pi through ssh and the prompt Access denied appears, ssh service is not enabled. To enable it manually is similar to the WiFi configuration. Also create a new file in the boot partition, leave it blank, and name the file ssh. Use lowercase and do not have any extensions.

When start, Raspberry Pi will automatically enable ssh service after detecting this file. Then find Raspberry Pi IP address by login the router, and connect to Raspberry Pi through ssh. (Detailed method on enabling SSH service)

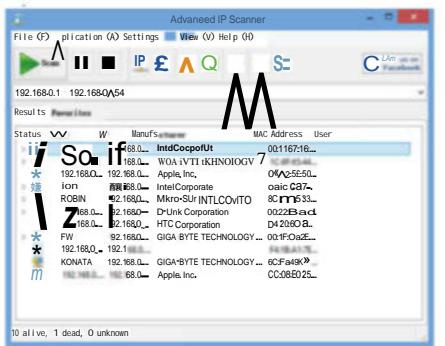
If you need to operate Raspberry Pi remotely, install xrdp through ssh, and connect to Raspberry Pi with the Windows remote desktop client.

2-9.Login Raspberry Pi Without Monitor and Unknown IP

When operating Raspberry Pi without monitor, you may not know the IP address automatically assigned by the Raspberry Pi wired network card. Detailed operation steps are provided below to address this problem.

Network segment scanning method

This is the recommended method. There are many network segment scanning tools. An Advanced IP Scanner is recommended. Download address: ipscan22.exe. Link: <http://pan.baidu.com/share/link?shareid=3434443053&uk=605377859>



The software will automatically detect the network segment of the computer and determine the scan range. (For example computer IP 192.168.1.101, and scanning range 192.168.1. *)

Press Start to start scanning, the list of all computers in the same network segment can be available.

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If the router has login permission (such as home network), directly view the IP address assigned to the Raspberry Pi on the router's management interface.

The default hostname of Raspbian Pi Raspbian system is raspberrypi.

(Find alarmpi with ArchLinuxARM, if you change the hostname yourself)

Attached: enable Raspberry Pi to be dynamically assigned to the same IP address every time

Dynamic IP is leased. When the lease expires, the reassigned IP address may change and sometimes cause inconvenience.

You can instruct the router, if manageable, to remember the MAC hardware address of the Raspberry Pi network card.

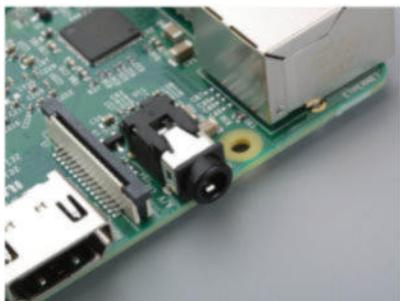
As long as it is the same Raspberry Pi, no matter how the operating system changes, the router will automatically assign the same IP address and remain unchanged.

This method is recommended because it keeps the automatically assigned IP address fixed and facilitates SSH, VNC and other connections.

The method for binding the static IP address to the MAC address is the same for different routers. Refer to the Router User Guidelines for details.

2-10.Configure Raspberry Pi Audio Output: 3.5MM /HDMI

By default, the Raspberry Pi automatically selects the audio output port. When simultaneously connecting the HDMI display and 3.5MM headphone or speaker, sometimes you want to manually specify one of them as the audio output device. Configure it by the following method. When connecting an external DAC expansion board, select the DAC output with this method after configuring the driver.



Enter Raspberry Pi configuration tool:
sudo raspi-config

Select Advanced Options- Audio.

Raspberry Pi Software Configuration Tool (raspi-config)

A1 Expand Filesystem
A2 Overscan
A3 Memory Split
A4 Audio
A5 Resolution
A6 Pixel Doubling
A7 GL Driver

Ensures that all of the SD card is
You may need to configure overscan
Change the amount of memory made
Force audio out through HDMI or 3.5mm
Set a specific screen resolution
Enable/Disable 2x2 pixel mapping
Enable/Disable experimental desktop

<Select> <Back>

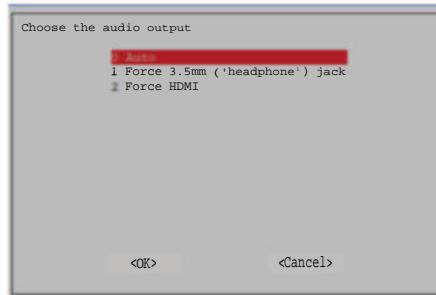
Raspberry Pi Software Configuration Tool (raspi-config)

1 Change User Password
2 Network Options
3 Boot Options
4 Localisation Options
5 Interfacing Options
6 Overclock
7 Advanced Options
8 Update
9 About raspi-config

Change password for the current user
Configure network settings
Configure options for start-up
Set up language and regional settings
Configure connections to peripherals
Configure overclocking for your Pi
Configure advanced settings
Update this tool to the latest version
Information about this configuration

<Select> <Finish>

List the audio output devices here. Select Force 3.5mm or Force HDMI.



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2-11.Raspberry Pi + One Network Cable Directly Connected to the Laptop

Connect the computer directly with a network cable without going through the router.

I. Materials: One Raspberry Pi, one network cable, one laptop.

1. Raspberry Pi: SD card with power supply system and burned Raspbian system;

2. Network cable: cross or direct connection;

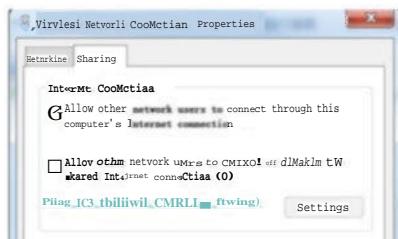
3. Laptop: dual network card.

II. Operation steps.

1. Wiring.

Connect the Raspberry Pi with the power cable;

Connect one end of the network cable to the Raspberry Pi and the other end to the laptop.



2. Internet sharing.

If the current laptop is connected to the Internet through WIFI, the Internet resources of the wireless network card can be shared to the local connection. Take win7 system as an example, Start-Control Panel-Network and Internet-Network and Sharing Center-View Network Status and Tasks-Change Adapter Settings, find the wireless network connection, right-click "Properties", select on the sharing tab "Allow other network users to connect through this computer's Internet connection (N)" option, click OK.

C:\Windows\system32\cmd.exe			
2009 Microsoft Corporation. All rights reserved			
Administrator: Zarp - a			
192.168.137.1	Oxa		
Internet Address	Physical address	Type	
192.168.137.9	b8-27-eb-ca-f7-de	Dynamic	
192.168.137.255	ff-ff-ff-ff-ff-ff	Static	
224.0.0.22	01-00-5e-00-00-16	Static	
224.0.0.251	01-00-5e-00-00-fb	Static	
224.0.0.252	01-00-5e-00-00-fc	Static	
239.255.255.250	01-00-5e-7f-ff-fa	Static	
255.255.255.255	ff-ff-ff-ff-ff-ff	Static	
Interface: 192.168.0.16			
Internet Address	Physical address	Type	
192.168.0.1	00-1c-58-88-45-38	Dynamic	
192.168.0.255	ff-ff-ff-ff-ff-ff	Static	
224.0.0.22	01-00-5e-00-00-16	Static	
224.0.0.251	01-00-5e-00-00-fb	Static	
224.0.0.252	01-00-5e-00-00-fc	Static	
239.255.255.250	01-00-5e-7f-ff-fa	Static	
255.255.255.255	ff-ff-ff-ff-ff-ff	Static	

3. Find Raspberry Pi IP address.

Run the DOS window and enter arp -a. The dynamic IP address under the interface 192.168.137.1 is Raspberry Pi address.

Why is the interface 192.168.137.1? Because during the upper Internet sharing, the "local connection" IP address is automatically set to the static IP 192.168.137.1. This IP address can also be set to other static IP addresses commonly used by you. Because the Raspberry Pi IP address is dynamic, you can only find it with this method. Set the Raspberry Pi to a static IP address by modifying the cmdline.txt file in the SD card (add the statement ip = ***.***.***.***). To secure successful connection, set the static IP address of the computer's "Local Connection" at the same segment as the static IP address of Raspberry Pi.

4. Use PuTTY software to connect Raspberry Pi.

Connect to the Raspberry Pi by entering the dynamic IP address or static IP address. Perform operations such as initializing because of the initial connection.

5. Graphical interface connection.

According to the descriptions of VNC remote login Raspberry Pi graphic interface, connect to Raspberry Pi through VNC software for graphical interface operation, or use the "Remote Desktop Connection" that comes with Windows for graphical operation. Find related tutorials on specific settings online.



2-12.Set Raspberry Pi Wireless Internet

I. Check if the network card status is normal

Plug the wireless network card into the Raspberry Pi, and enter the command ifconfig -a to see if there is any information about wlan0. If so, it means that the network card is normal. Skip the second step and directly configure the wireless network. If the information about wlan0 is not available, you need to install the wireless network card driver.

II. View the information of the wireless network card

Enter the command dmesg | grep usb and view the information of the wireless network card, solely the manufacturer. For example, the network card information
usb 1-1.3: Manufacturer: Realtek

Take Realtek as an example, install the wireless network card driver.

If the current Raspberry Pi is online, enter the installation command to install the Realtek driver. First search the Realtek driver:
apt-cache search Realtek

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See the following message:

firmware-realtek – Binary firmware for Realtek wired and wireless network adapters

Install Realtek driver:

```
sudo apt-get install firmware-realtek
```

If the Raspberry Pi is not online, go to the mirror image site and download the relevant driver.

III. Configure the wireless network

Open the interfaces file with editor nano

```
sudo nano /etc/network/interfaces
```

Interfaces file:

```
auto lo
```

```
iface lo inet loopback
```

```
iface eth0 inet dhcp
```

```
allow-hotplug wlan0
```

```
iface wlan0 inet manual
```

```
wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
```

```
iface default inet dhcp
```

Comment out all the wireless network card parts with #, and then add your own configuration information. The final result:
auto lo

```
iface lo inet loopback
```

```
iface eth0 inet dhcp
```

```
auto wlan0
```

```
# allow-hotplug wlan0
```

```
#iface wlan0 inet manual
```

```
iface wlan0 inet dhcp
```

```
wpa-conf /etc/wpa.conf
```

```
# wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf
```

```
iface default inet dhcp
```

Use nano editor, ctrl + o to save, ctrl + x to exit.

Create the /etc/wpa.conf file with the editor nano:

```
sudo nano /etc/wpa.conf
```

If wifi has no password

```
network = {  
    [Tab] ssid = "your wireless network name (ssid)"  
    [Tab] key_mgmt = NONE  
}
```

If wifi uses WEP encryption

```
network = {  
    [Tab] ssid = "your wireless network name (ssid)"  
  
    [Tab] key_mgmt = NONE  
    [Tab] wep_key0 = "your wifi password"  
}
```

If wifi uses WPA /WPA2 encryption

```
network = {  
    [Tab] ssid = "your wireless network name (ssid)"  
    [Tab] key_mgmt = WPA-PSK  
    [Tab] psk = "your wifi password"  
}
```

Note 1:

All symbols are half-width (symbols in English status), "[Tab]" means press the Tab key once.
N

ote 2:

If you are not sure about the wifi encryption mode, open /data/misc/wifi/wpa/wpa_supplicant.conf with root explorer on your Android phone and view the wifi information.

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2-13.Method to Connect Raspberry Pi with Windows Remote Desktop

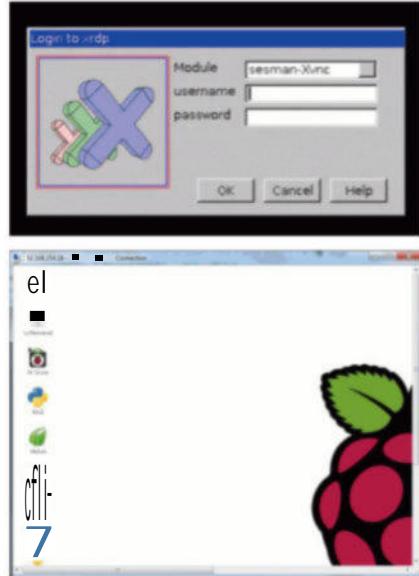
How to connect to Raspberry Pi with VNC has been described in the Raspberry Pi DIY notes. Under Windows, the built-in remote desktop is more convenient. How to connect to Raspberry Pi with remote desktop (mstsc.exe) rather than VNC?

Just need to install a service xrdp under raspbian. Enter the following command to install:

```
sudo apt-get install xrdp  
Then it is Ok.
```

If an error-problem connecting occurs, the root cause is tightvnc. The version with the problem conflicts with the X font, leading to connection to the Xserver error.

Solution:
sudo apt-get purge tightvnc xrdp
sudo apt-get install tightvncserver xrdp



Finally, start the xrdp service and sudo /etc/init.d/xrdp restart. Enable the corresponding port and default configuration.

Through command: netstat -tnl

View 3350 3389 5910, it's OK when these three ports are in LISTEN.

dpkg -L + name of the package, you can know which files this package contains.

via <http://pi.linux48.com/remote-rpi.html>

<http://www.linuxidc.com/Linux/2015-05/117835.htm>

2-14.Summary of Software Installation and Uninstallation Commands on Raspberry Pi

Basic commands

Install software apt-get install softname1 softname2 softname3 ...

Uninstall software apt-get remove softname1 softname2 softname3 ...

Uninstall and purge configuration apt-get remove --purge softname1

Update software information database apt-get update

System upgrade apt-get upgrade

Search package apt-cache search softname1 softname2 softname3 ...

If you come across errors such as slow response or non-existent sources when using apt-get, you may need to replace the sources.

Install deb package dpkg -i xxx.deb

Delete package dpkg -r xxx.deb

Delete with the configuration file dpkg -r --purge xxx.deb

View package information dpkg -info xxx.deb

View file copy details dpkg -L xxx.deb

View information about installed packages in the system dpkg -l

Reconfigure package dpkg-reconfigure xxx

Purge residual configuration files for all deleted packages

dpkg -l | grep ^ rc | awk '{print \$ 2}' | sudo xargs dpkg -P

If the following error is reported, it means that there are no residual configuration files in your system. Don't worry.

dpkg: --purge needs at least one package name argument

The dpkg installation can be uninstalled with apt, and vice versa.

aptitude command

aptitude, like apt-get, is an extremely powerful package management tool in Debian and its derivatives. Unlike apt-get, aptitude is better at handling dependencies. For example, when aptitude deletes a package, it also deletes the packages it depends on. In this way, no unnecessary packages remain in the system, and the entire system is cleaner. The following are some of the

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commonly used aptitude commands summarized by the author for reference only.

aptitude update update the list of available packages

aptitude upgrade upgrade available packages

aptitude dist-upgrade upgrade the system to a new release

aptitude install pkgnmae install package

aptitude remove pkgnmae delete package

aptitude purge pkgnmae delete the package and its configuration file

aptitude search string search package

aptitude show pkgnmae show detailed information of the package

aptitude clean delete downloaded package files

aptitude autoclean delete only expired package files

Of course, you can also use aptitude in text interface mode.

List of common apt commands

apt-cache search # ----- (package search package)

apt-cache show # ----- (package get information about the package, such as description, size, version, etc.)

sudo apt-get install # ----- (package installation package)

sudo apt-get install # ----- (package--reinstall package)

sudo apt-get -f install # ----- (force installation? # "-f = --fix-missing" when it is repair installation
...)

sudo apt-get remove # ----- (package delete package)

sudo apt-get remove--purge # ----- (package delete package, including deleting configuration files, etc.)

sudo apt-get autoremove --purge # ---- (package delete the package and its dependent packages + configuration files, etc. (only valid for 6.10, highly recommended))

sudo apt-get update # ----- update source

sudo apt-get upgrade # ----- update installed packages

sudo apt-get dist-upgrade # ----- upgrade system

sudo apt-get dselect-upgrade # ----- upgrade with dselect

apt-cache depends # ----- (package understand use dependency)

apt-cache rdepends # ----- (package know a specific dependency? # view which packages are dependent on this package ...)

sudo apt-get build-dep # ----- (package installation-related compilation environment)

```
apt-get source # ----- (package download the source code of the package)
sudo apt-get clean && sudo apt-get autoclean # ----- clean the archive of downloaded files &&
clean only outdated packages
sudo apt-get check # ----- check for broken dependencies
```

2-15.Linux Vi (vim) Editor Tutorial

vi (vim) is a very common Linux editor. Many Linux releases have vi (vim) installed by default. There are many vi (vim) commands. When used flexibly, they will greatly improve efficiency. vi is short for "visual interface", vim is vi IMproved. Vi is sufficient for general system management and maintenance. You can use vim to highlight code. Vi tutorial is given below: including vi introduction, use mode, file open, close and save, inserting text or creating new lines, moving the cursor, deleting, restoring characters or lines, searching, and so on. Such vi tutorial is very suitable for beginners.

vi has 3 modes: insert, command, and low line.

Insert: In this mode, enter characters. Press ESC to return to the command mode.

Command: Move the cursor, delete characters, etc.

Low line: Save files, exit vi, set vi, find (low line mode can also be regarded as in command mode).

I. Open, save, close the file (used in vi command mode)

vi filename //Open the filename file

:w //Save the file

:w vpser.net //Save to vpser.net file

:q //Quit the editor, if the file has been modified, please use the following command

:q! //Exit the editor without saving

:wq //Exit the editor and save the file

II. Insert text or line (used in vi command mode, execute the following command and enter insert mode, press ESC key to exit insert mode)

a //Add text to the right of the current cursor position

i //Add text to the left of the current cursor position

A //Add text at the end of the current line

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I //Add text at the beginning of the current line (at the beginning of the line of non-empty character)

O //Create a new line above the current line

o //Create a new line below the current line

R //Replace (overwrite) the current cursor position and subsequent text

J //Merge the cursor line and the next line (still in command mode)

III. Move the cursor (used in vi command mode)

1.Use the up, down, left, and right arrow keys

2. In command mode: h left, j down, k up, l right.

Spacebar right, Backspace left, Enter move to the beginning of the next line,- move to the beginning of the previous line.

IV. Delete or restore characters or lines (used in vi command mode)

x //Delete the current character

nx //Delete n characters from the cursor

dd //Delete the current line

ndd //Delete downward n lines including the current line

u //Undo the previous operation

U //Undo all operations on the current line

V. Search (used in vi command mode)

/vpser //Search vpser string under the cursor

? vpser //Search the vpser string above the cursor

n //Search downward the previous search action

N //search upward the previous search action

VI. Jump to the specified line (used in vi command mode)

n + //n lines down

n- //n lines up

nG //Jump to line with line number n

G //Skip to the bottom of the file

VII. Setting the line number (used in vi command mode)

: set nu //Display line number

: set nonu //Cancel displaying line number

VIII. Copy and paste (used in vi command mode)

yy //Copy the current line to the buffer area. Use "ayy copy," a buffer, and a can also be replaced with any letter from a to z, which can complete multiple copy tasks.

nyy //Copy the current line downward n lines to the buffer, or use "anyy copy," a buffer, a can also be replaced with any letter from a to z, which can complete multiple copy tasks.

yw //Copy the characters from the cursor to the end of the word.

nyw //Copy n words starting from the cursor.

y ^ //Copy the content from the cursor to the beginning of the line. VPS detective

y \$ //Copy the content from the cursor to the end of the line.

p //Paste the contents of the clipboard after the cursor. If the previous custom buffer is used, it is recommended to use "ap to paste.

P //Paste the contents of the clipboard in front of the cursor. If the previous custom buffer is used, it is recommended to use "aP" to paste

IX. Replace (used in vi command mode)

: s/old/new//Replace the first old in the line with new

: s/old/new/g//Replace all old in the line with new

: n, m s/old/new/g//Replace all old lines from n to m with new

:% s/old/new/g//Replace all old in the current file with new

X Edit other files

: e otherfilename //Edit the file named otherfilename.

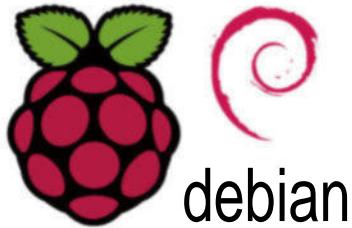
XI. Modify file format

: set fileformat = unix //Modify the file to unix format. For example, the text file under win will appear ^ M under linux.

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2-16.Descriptions of Purpose of Each Linux/Raspbian Directory

Many students who are new to Raspberry Pi /Linux will wonder where the software and configuration files are stored when installing, uninstalling, and configuring software for the Raspberry Pi. They may also come across issues with directory paths such as "disk partition" and U disk mount. However, Linux directories rules are very clear.



Difference between Linux and Windows

One of the significant differences between Linux and Windows is their different directory structure. Apart from the format, the things stored in different locations are very different.

On Windows, a typical path may be D:\ Folder \ subfolder \ file.txt, while on Linux, the path would be /Folder/subfolder/file.txt.

The direction of the slash is different. Linux has no concept of the C drive and D drive. After the Linux system starts, the root partition is "mounted" at the /position, and all files, folders, devices, as well as different hard disk drives are also mounted on /.

Although it may not be obvious in the following example, the Linux system is sensitive to uppercase and lowercase characters in file or file path names.

For example, /Folder/subfolder/file.txt and /folder/subfolder/file.txt are not the same file.

Linux system directory description

The directory structure of Unix and Linux is unified. All directories and files are finally unified under the **/** root file system. Whether the file system is mounted, the file system is finally arranged hierarchically under the file system starting with **7**.

The Linux directory structure adopts the "Filesystem Hierarchy Structure (FHS)." This standard is maintained by the "Free Standards Group." However, most LINUX releases intentionally or unintentionally deviates from this Norm.

7" root path

This is the "root" directory of the Linux system and the lowest level of any directory structure. On UNIX and compatible systems, "/" is a separate directory.

/boot

This directory contains boot loader, such as Grub, Lilo or Kernel, and configuration files such as initrd and system.map.

Initrd ramdisk or "" initrd "" refers to a temporary file system called by the Linux kernel during the startup phase. initrd is mainly used for preparation before the "root" file system is mounted.

/sys

This directory contains the kernel, firmware, and system related files.

/sbin

Contain the binary files and management tools necessary for system operation, mainly executable files and similar to EXE files under Windows.

/bin

Contain binary files and utility programs in single-user mode, such as commands cat, ls, cp.

/lib

Contain the library files needed to run binary files in the /sbin and /bin directories.

/dev

Contain the necessary system files and drives.

/etc

Contain system configuration files, directories underneath, such as /etc/hosts, /etc/resolv.conf, nsswitch.conf, and system default settings, network configuration files, and configuration files for some systems and applications.

/home

Under this directory, each user will have a separate directory commanded by the username, where the user's personal settings files are stored, especially files ending with profile. However, there are exceptions. The data of the root user is not in this directory, but is in the root path and

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stored in a separate /root folder.

/media

A conventional mount point for all removable devices such as optical drives, USB external disks, and floppy disks.

/mnt

Temporary file system mount point. For example, if you don't want to mount a drive for a long time, but just temporarily mount a USB flash drive to copy an MP3 or the like, then you should mount it in this location.

/opt

In Linux systems, this directory is not used much. opt is short for Optional Software Packages. This directory on UNIX system is much more versatile such as Sun Solaris.

/usr

The user data directory contains utilities and applications that belong to the user. There are a lot of important but not critical file system mounted under this path. Here you will find a new bin, sbin, and lib directory that contains non-critical user and system binary files, related libraries and shared directories, and some library files.

/usr /sbin

Contain unnecessary and not particularly important system binary files and network application tools in the system.

/usr /bin

Contain unnecessary and not particularly important binary files for users.

/usr /lib

Store the library files needed by the binary files in /usr/sbin and /usr/bin.

/usr /share

A "platform independent" shared data directory.

/usr /local

It is a secondary directory under /usr. It mainly stores local system data including system binary files and runtime libraries.

/var

This path usually contains system logs, printer spool files, crontabs, mails, running processes, process lock files, and so on. We should emphasize daily inspection and maintenance on this directory, because the file size in this directory may grow quickly. It may quickly fill up the hard disk, and then the system will have various strange problems.

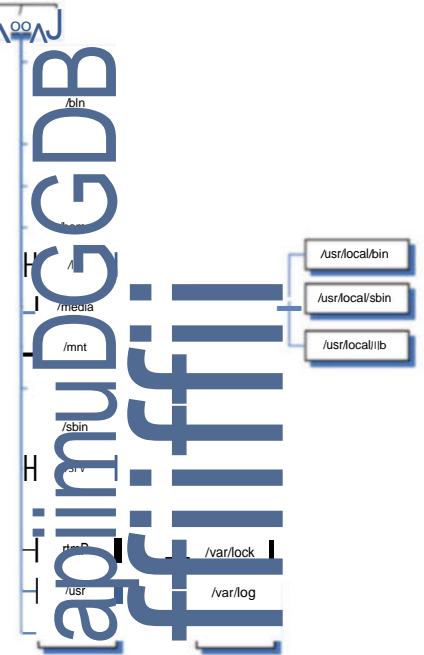
/tmp

It is a temporary folder that is used to store temporary files. During system reboot, the "temporary" files in this directory will be emptied. Likewise, /var/tmp also holds temporary files. The only difference between the two is that the files stored in the /var/tmp directory of the latter will be protected by the system, and the files in this directory will not be emptied after system reboot.

/proc

This directory is a pseudo file system residing in system memory, which holds the system kernel and process information in text format.

Linux Directory Structure in Visual View
It should be noted that there are some differences in the directory structure of different Linux releases.



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2-17.How to Safely Shutdown and Reboot Raspberry Pi?

Many shutdown options, one option in one line.

```
sudo shutdown -h now  
sudo halt  
sudo poweroff  
sudo init0
```

Reboot method

```
sudo reboot  
shutdown -r now  
shutdown -r 18:23:52 # timed reboot shutdown at 18:23 :
```



2-18.Connect Raspberry Pi with USB Serial Cable on Mac OS X

There is no HDMI monitor while RPi has TXD and RXD plus a usb to ttl.

Mac OS Usb TTL driver.

Driver download address: PL2303 Mac OS X Driver Download, link: http://www.prolific.com.tw/US>ShowProduct.aspx?p_id=229&pcid=41

Restart the system after installation and find the serial device:

```
cd /dev  
ls tty.usbserial *
```

mac os install screen

The port used here is screen
brew install screen

or
sudo port install screen

Then connect Raspberry Pi

Raspberry PI serial communication
In our TTL board
GND-> Groud
RXD-> GPIO14 (TXD)
TXD-> GPIO15 (RXD)

! Note: TXD is connected to RXD. Don't make the same connection.

Mac OSStl setting raspberry pi
Serial communication
screen /dev/tty.usbserial 115200

During system reboot, input username and password
Raspbian GNU/Linux 7 raspberrypi ttyAMA0

raspberrypi login: pi
Password:
Last login: Sat Apr 26 05:58:07 UTC 2014 on ttyAMA0
Linux raspberrypi 3.10.25+ #622 PREEMPT Fri Jan 3 18:41:00 GMT 2014 armv6l

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
ls

NOTICE: the software on this Raspberry Pi has not been fully configured. Please run 'sudo raspi-config'

Then
sudo raspi-config

Raspberry Pi Opening Pacckage and Hands-on

Select the first one and proceed

Expand Filesystem Ensures that all of the SD cards

After reboot, it seems that the new raspberry pi comes with openssh-server.

By the way provide a way to uninstall the driver

```
rm -rf /System/Library/Extensions/XXXX.kext
```

```
rm -rf /System/Library/Extensions.kextcache
```

```
rm -rf /System/Library/Extensions.mkext
```

```
kextcache -k /System/Library/Extensions
```

These commands may be issued when you are an administrator. It is recommended to use the root user or sudo -s. XXXX.kext is the name of the driver. For example, the two USB-Serial drivers here start with Prolific and FDTI.

2-19. Install Raspbian on Raspberry Pi under Mac OSX

First download the system image in the official website of Raspberry Pi, it is recommended to download Raspbian.

After download, get an img image:

```
[usiful_ @mac: pi] $ ls -lh
```

```
total 3788800
```

```
-rw-r--r-- 1 landzo staff 1.8G 2 9 03:44 2013-02-09-wheezy-raspbian.img
```

Insert the SD card and use the df command to view the currently mounted volume:

```
[usiful_ @mac: pi] $ df -h
```

Filesystem Size Used Avail Capacity Mounted on

```
/dev/disk0s2 112Gi 96Gi 15Gi 87% /
```

```
devfs 183Ki 183Ki 0Bi 100% /dev
```

```
map -hosts 0Bi 0Bi 0Bi 100% /net
```

```
map auto_home 0Bi 0Bi 0Bi 100% /home
```

```
/dev/disk1s1 15Gi 2.3Mi 15Gi 1% /Volumes /unnamed
```

Compare Size and Name, find the device file corresponding to the SD card partition in the

system (here /dev/disk1s1). If you have multiple partitions, there may be disk1s2 and the like. Use diskutil unmount to unmount these partitions:

```
[usiful_ @mac: pi] $ diskutil unmount /dev/disk1s1
```

```
2
```

Volume unnamed on disk1s1 unmounted

Confirm the device with diskutil list:

```
[usiful_ @mac: pi] $ diskutil list
```

```
/dev/disk0
```

```
#: TYPE NAME SIZE IDENTIFIER
```

```
0: GUID_partition_scheme * 121.3 GB disk0
```

```
1: EFI 209.7 MB disk0s1
```

```
2: Apple_HFS Macintosh HD 120.5 GB disk0s2
```

```
3: Apple_Boot Recovery HD 650.0 MB disk0s3
```

```
/dev/disk1
```

```
#: TYPE
```

NAME SIZE IDENTIFIER

```
0: FDisk_partition_scheme
```

```
* 15.8 GB disk1
```

```
1: Windows_NTFS unnamed
```

```
15.8 GB disk1s1
```

Use the dd command to write the system image. Pay special attention to the number after the disk.

(Note: /dev/disk1s1 is the partition, /dev/disk1 is the block device, and /dev/rdisk1 is the original character device)

```
[usiful_ @mac: pi] $ dd bs = 4m if = 2013-02-09-wheezy-raspbian.img of =/dev/rdisk1
```

After waiting for a few minutes, the following prompt appears, indicating that the SD card has been swiped:

```
462 + 1 records in
```

```
462 + 1 records out
```

```
1939865600 bytes transferred in 163.133220 secs (11891297 bytes/sec)
```

Uninstall the device with diskutil unmountDisk:

```
[usiful_@mac: pi] $ diskutil unmountDisk /dev/disk1
```

Unmount of all volumes on disk1 was successful

Now you can remove the SD card and plug it into the Raspberry Pi to start the system. During first startup, enter Raspi-config. The latter configuration method is the same as other platforms. For details, please refer to the part Configure Raspberry Pi with raspi-config.

Precautions

caveat

- This product can only be connected to the 5V external DC power supply. Any external power supply used with Raspberry-P should comply with the relevant regulations and standards applicable in the country/region of use.
- This product should not be beyond frequency, as it will increase the temperature of some components.
- The product cannot be covered, and the operating environment should be ventilated.
- The product should be placed on a stable, non-conductive surface during use and should not come in contact with any conductive items.

Instructions for use safet

To avoid malfunction or damage to the Raspberry Pi, please follow the following requirements:

1. Do not contact with water and moisture or place it on conductive surface during operation.
2. Do not allow the Raspberry P to come into contact with any heat source. The product will operate reliably under normal room temperature.
3. Be careful not to cause mechanical or electrical damage to the printed circuit board and connectors during operation.
4. Don't operate Raspberry Pi when it's energized. Operate by only the edges and avoid electrostatic discharge damage.
5. All peripheral devices used with the Raspberry Pi should comply with the relevant standards of the country/region of use and be marked accordingly to ensure compliance with relevant safety and performance requirements. These devices include, but are not limited to, keyboard, monitor, and mouse used with the Raspberry Pi.
6. If you use different software to write microSD cards or use different cards, you need to use Pi4B compatible software. If you see a rainbow boot screen with a lightning bolt symbol, it means that you are not using compatible software.
7. Before the circuit board is completely assembled, do not install the heat sink or insert a microSD card into the board; the board must be installed on a flat base under the two grooves;
8. Do not insert a micro card into the USB card reader. Don't start Raspberry Pi from the USB card reader. USB card reader only works on your PC or Mac, if you need to rewrite.