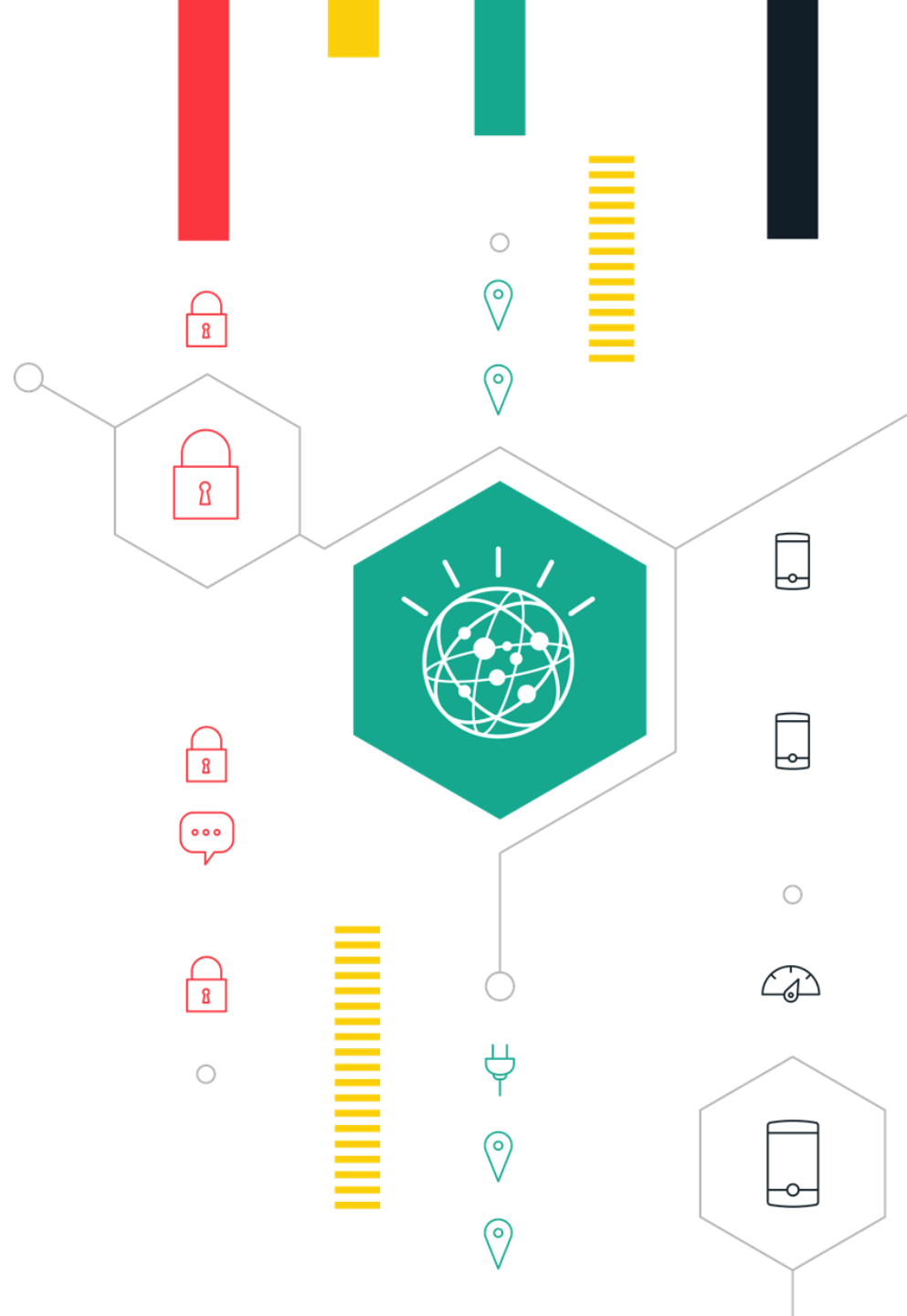# Remotely Connecting to the Raspberry Pi

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IBM

Remote Connection to the Raspberry Pi

Instructions for Raspberry Pi V2 or V3

Device and Raspberry Pi must be on the same subnet

No need to connect a monitor, keyboard, or mouse directly to the Pi (after initial setup)

No need to access the wired/wireless router settings

Connect the Pi and Power it Up

Connect the monitor, mouse, and keyboard to the Pi

Connect power to the Pi

- Wait until the Pi is completes its bootup
  - The first time boot of the Pi may take up to 5 minutes to complete (the newest version of the Pi will boot quicker than older versions)
  - Subsequent boots should complete in about a minute

Update software on the Pi

sudo apt-get update

sudo apt-get dist-upgrade

Configure Pi

Change Hostname
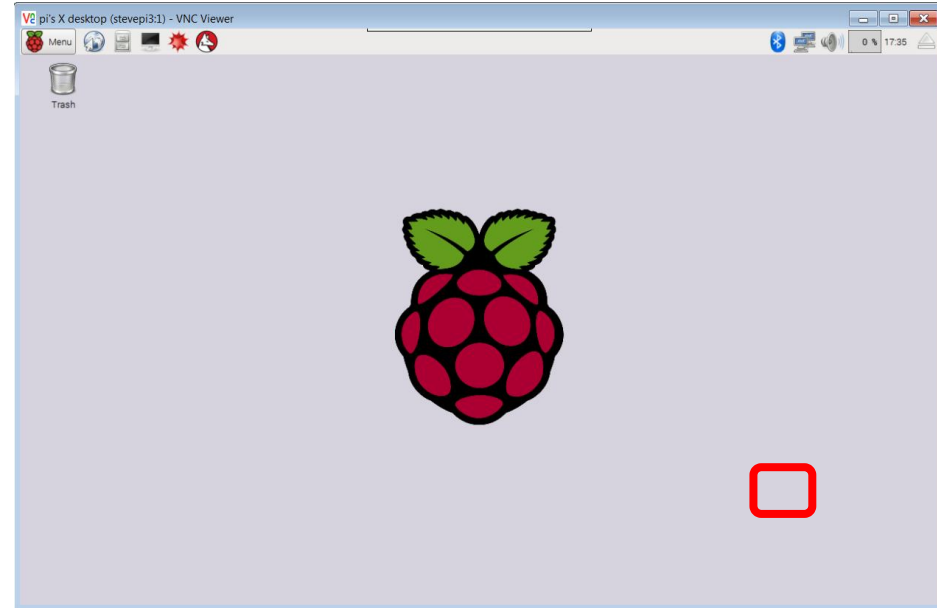- Click Raspberry -> Preferences -> Raspberry Pi Configuration

Change Password (optional)
- Click Change Password …
- Enter Current password and New Password
- Click OK

Open Terminal (ctrl + alt + t)
- Cd /boot
- Sudo leafpad configure.txt
- Uncomment hdmi_force_hotplug and set = 1
- Uncomment hdmi_group and set = 2
- Uncomment hdmi_mode and set = 82
- Save

Reboot

Changing your password

Create a secure password
- When logged in as pi, enter 'passwd' on the command line
- Enter the current password to authenticate, and then enter a new password
- Hit Enter and then confirm the new password (no characters will be displayed while entering your password)
- Once confirmed, a message will indicate your password has been changed
- See this page for more details.

Remember the new password!

Recovering a lost password without an external keyboard and monitor is not straightforward and requires access to another linux system

Apps for Windows

SSH Session Manager

- http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html
- Can use other apps instead of PuTTY that support SSH sessions

VNC Viewer

- https://www.realvnc.com/download/viewer/
- Only need the viewer, the server will be running on the Pi
- Can use other VNC viewer apps

Network Scanner

- http://angryip.org/download/#windows
- Download the portable app or other network scanning app

Apps for Mac

SSH Session Manager

- Use the built-in Terminal (Applications folder => click on the Utilities folder => then click on Terminal)

VNC Viewer

- https://www.realvnc.com/download/viewer/
- Only need the viewer, the server will be running on the Pi
- Can use other VNC viewer apps

Angry IP Scanner

- http://angryip.org/download/#mac
- Can use the built-in 'arp' command instead if you are familiar with it

Apps for iOS

SSH Session Manager
- Reflection

VNC Viewer
- Real VNC Viewer

IP Scanner
- Fing

Apps for Android

SSH Session Manager
- Mobile SSH

VNC Viewer
- Real VNC Viewer

IP Scanner
- Network Scanner

Find the IP Address of the Pi

Use Angry IP Scanner to find the IP assigned to the Pi
- Set the IP range
- Change the preferences to only display alive hosts
- Click the Start button

Windows ICS uses the subnet

Because the Pi's address is dynamic, you should check it each time you reboot the Pi or your laptop

192.168.137.1 is reserved as the gateway address, so the Pi will have an address in the 192.168.137.2 – 255 range

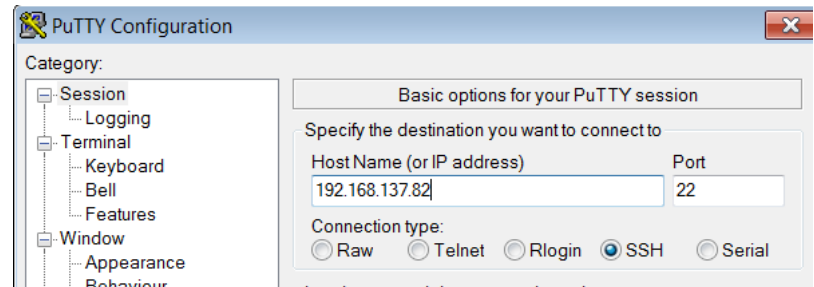IP ADDRESS ASSIGNED TO THE PI 192.168.137.82
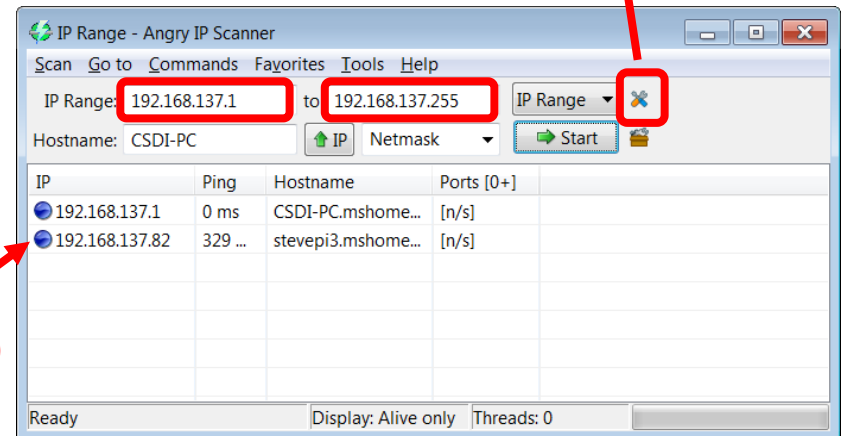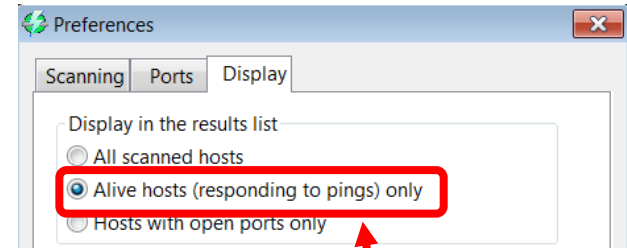
Connect to the Pi using Putty

Enter the Pi's IP Address, set the port to 22, and connection type to SSH

Click Open to connect to the Pi

Click Yes if presented with the PuTTY Security Alert prompt

The default username is 'pi' and the default password is 'raspberry'

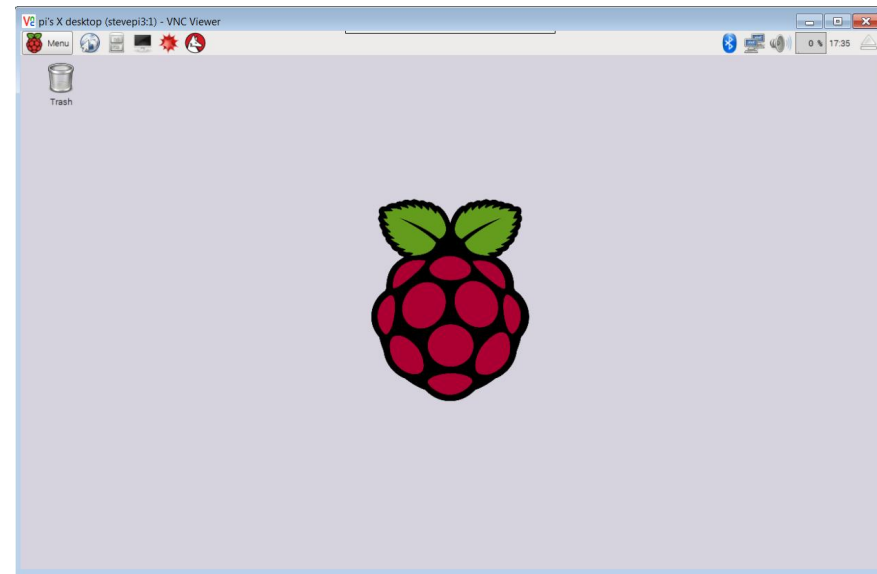# Connect to the Pi using VNC Client

After completing the Pi Setup, the VNC server should be running on the Pi

Enter the Pi's IP Address

Click Connect to connect to the Pi

Click Continue if presented with the VNC Unencrypted Connection Warning

The default username is 'pi' and the default password is 'raspberry'
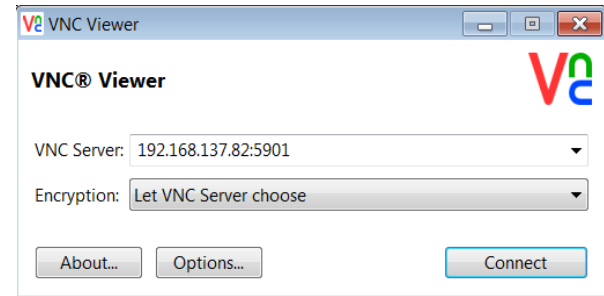
Shutdown the Pi

From a PuTTY SSH session, type 'sudo shutdown –h'

Wait about a minute, and then the Pi will have completed it's shutdown and you can disconnect the power cable

Configure WiFi on the Pi (Optional-Basic)

After the initial configuration, the Pi can be connected to a wireless network using the network connection icon on the desktop

To find the IP Address of the Pi on the wireless network, use Angry IP Scanner to scan the wireless network's subnet, or consult your wireless router client list

Keep in mind on a public network, anyone can access your Pi, so make sure to change the default password to something secure

If the Pi will always connect by WiFi, then ICS and the firewall rules can be disabled/deleted since they will no longer be needed
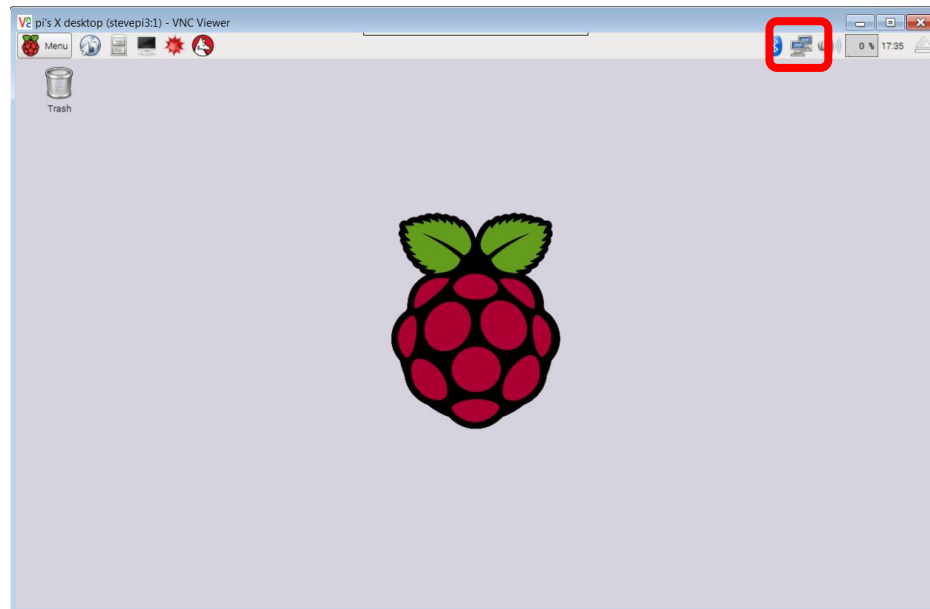
Using a Static IP address (Optional-Advanced)

Configuring the Pi
- Before editing any files, create copies of the originals in case you need to revert back to them
- Make sure to choose an address in the subnet of the network the Pi will use to connect to the internet
- For ICS, choose an address in the 192.168.137.2-255 range (e.g. 192.168.137.100)

If using ICS, the DHCP address range needs to be restricted to the single IP address assigned to the Pi
- Backup the registry and create a restore point
- See this Microsoft KB article for guidance on configuring ICS in Windows 7
- Set the host IP address (the ScopeAddress) to be higher than then IP assigned to the Pi (e.g. 192.168.137.101)
- Note, customizing ICS in this manner is not officially supported by Microsoft

Configuring your router, if not using ICS
- Consult your router's manual or online help for instructions on how to configure a static IP address for a client

See this helpful guide

Troubleshooting

Insufficient power

- Make sure to power the Pi with sufficient power (1A@5V). An AC wall adapter with the proper output rating is the best option. Plugging the USB cable into your laptop may not supply sufficient power which will cause the Pi to act erratically at best.

Forgotten Pi password

- See this guide to reset a lost password, or this article for steps that can be done remotely (but require access to another linux system)

Other Helpful Resources

PiBakery.org
  - Easy to use application to setup a Pi

Network World Articles
  - 7 ways to make your IoT-connected Raspberry Pi smarter
  - 9 Raspberry Pi programming tools bundled with Raspbian

Video: Configuring the Raspberry Pi

Raspberry Pi Headless Setup on Mac

Raspberry Pi Display Setup

- http://www.opentechguides.com/how-to/article/raspberry-pi/28/raspi-display-setting.html

- https://www.raspberrypi.org/documentation/configuration/config-txt/README.md

Raspberry Pi Official Website
  - Forums
  - Help