

# WORKING EV3-DEV

## CONTENTS

Get basics in Linux .....	2
Connect EV3 to PC via USB .....	2
To share our Internet connection with the EV3 .....	2
Find the IP address of your ev3 .....	3
Connect to EV3 thru SSH.....	4
Do the following update.....	5
Install EV3 C Development Kit - EV3 Debian C library cd .....	5
Set your path to the C libraries.....	6
Installing CPP libraries .....	6
Installing I2c Tool chain .....	6
If you want to do debugging on EV3 .....	6
Want to do development on Windows instead .....	7

# GET BASICS IN LINUX

[Go here to learn basics in :](#)

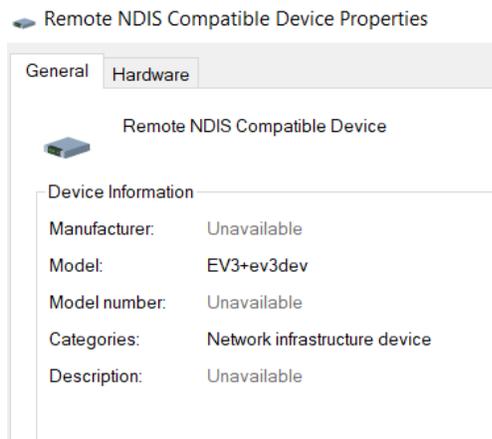
1. Linux file system
2. Most commonly used commands
3. Using an editor
4. Writing basic script.

## CONNECT EV3 TO PC VIA USB

- Control panel >> Devices and printers
- Unknown devices will show up ... it may vary by various system. Thus, one way to find out is to unplug and plug it back to find out.



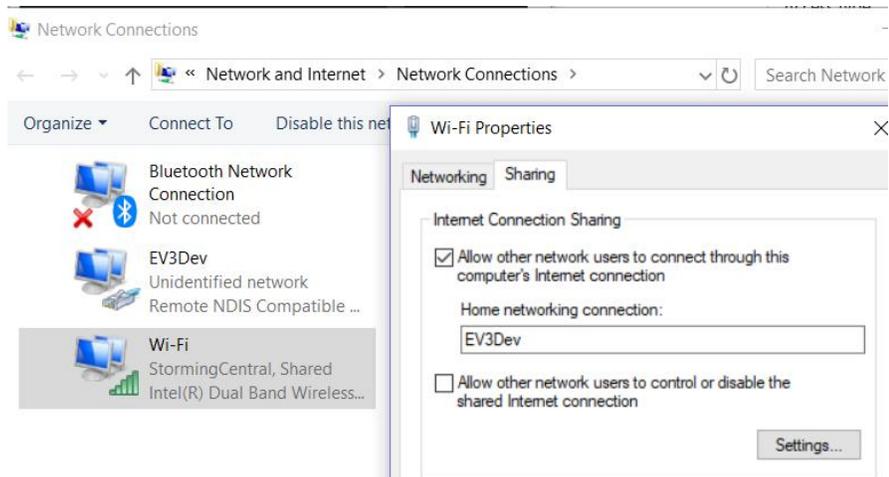
- In my case, it looks like this:
- 
- Double click on it, you should see:



- 
- Need to change the adaptor settings – rename the connection in order to make it easier to recognize, such as Ev3-Dev
- Optional: If you want to change the icon to something like a EV3, [go here](#).

## TO SHARE OUR INTERNET CONNECTION WITH THE EV3

- double-click the Internet network connection that you noted earlier (not the one we just renamed). This will show the connection status.
- Sample: if your PC connects to the internet via Wi-Fi:



- Caution: this will allow any connection named EV3Dev to use your internet connection.

### FIND THE IP ADDRESS OF YOUR EV3

- Bare fundamentals about the IP Address:

- A 32-bit numeric address written as four numbers separated by periods:
- 1<sup>st</sup>8bit . 2<sup>nd</sup>8bit . 3<sup>rd</sup>8bit . 4<sup>th</sup> 8bit      such as: 192.168.42.100.
- 1<sup>st</sup> to 3<sup>rd</sup> or 1<sup>st</sup> to 2<sup>nd</sup> : network identification
- 3<sup>rd</sup> to 4<sup>th</sup> or 4<sup>th</sup> : host identification
- Each part must range from 0 to 255

Different sets of IP ranges are allocated to particular networks, geographic areas, companies etc. The table below shows several examples of IP ranges and the uses that they have been put to:

IP range	Description	Example
192.168._____ 172.16._____- 172.31._____ 10._____-_____ 41._____-_____ 102._____-_____ 105._____-_____	Private networks, e.g. intranets	192.168.1.23
81._____-_____ 217._____-_____ 62._____-_____	AfriNIC allocations for IP addresses in Africa	102.43.1.65
200._____-_____ 9._____-_____ 17._____-_____	European allocations for IP addresses	81.202.17.89
	Latin America and the Caribbean	200.100.50.25
	IBM	9.1.2.3
	Apple	17.19.23.29

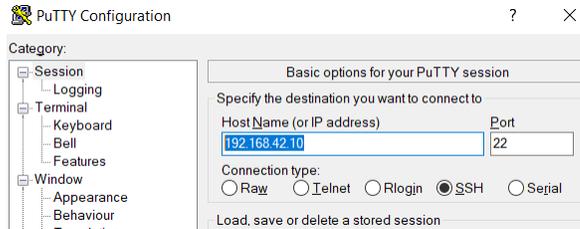
[From en.wikibooks.org](http://en.wikibooks.org)

- On your EV3, click thru the menus to "All Network and Connections"
- Select Wired (since you connect the EV3 to your PC using USB)
- Select it to "connect". It will then go thru configuration mode (it might take about 30 seconds)

- After it said, "State: Connected", go to Ip4 to see the IP address. Do note that if the display of the address may wrap around to the next line
- Write this down, as you will need this when you try to connect to EV3 via SSH.

## CONNECT TO EV3 THRU SSH

- [Install putty](#)
- To start: (assuming the IP address of your EV3 is 192.168.42.10)



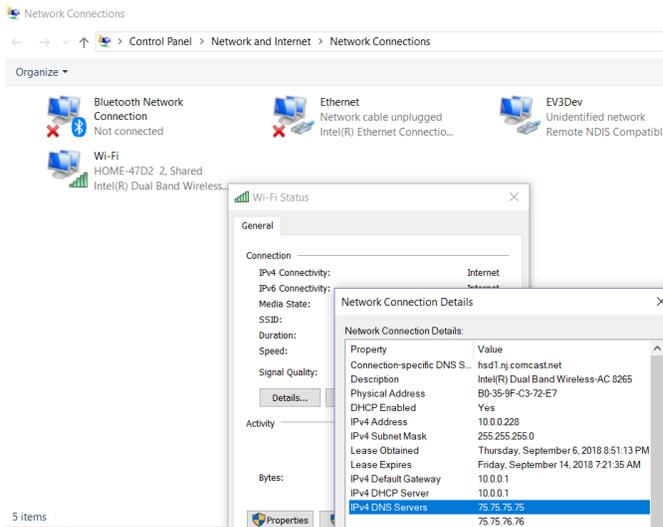
- You will need to update the name server at the EV3:
  - o Look up the DNS # from your PC:
    - a. command prompt method : `Ipconfig` :

```
DNS Servers . . . . . : 2001:558:feed::1
                      : 2001:558:feed::2
                      : 75.75.75.75
                      : 75.75.76.76
```



or

### b. window gui method:



- o `sudo vi /etc/resolv.conf` (at the EV3)
- o edit this: `nameserver 75.75.75.75`
- o to test it: ping [www.google.com](http://www.google.com)
- o more permanent change:

`sudo vi dhclient.conf`

```
#prepend domain-name-servers 127.0.0.1;
prepend domain-name-servers 75.75.75.75;
```

To understand more about networking on EV3Dev : : <https://www.ev3dev.org/docs/networking/>

#### DO THE FOLLOWING UPDATE

- Basic update:

```
sudo apt-get update
sudo apt-get upgrade
sudo apt-get dist-upgrade
sudo apt-get install net-tools
sudo apt-get install pip3
```

- Install compilers

```
sudo apt-get install build-essential
sudo apt-get install ev3dev-lang-c
sudo apt-get install ev3dev-lang-cpp
sudo apt-get install linux-image-ev3dev-ev3
sudo apt-get install ev3dev-lang-python
sudo apt-get install git
```

- add the new path to your system path. Such as adding the following in your .profile:

```
if [ -d "$HOME/bin" ] ; then
    PATH="$HOME/bin:$PATH;/sbin:"
fi
```

- to enable this change now: `source .profile`

#### INSTALL EV3 C DEVELOPMENT KIT - EV3 DEBIAN C LIBRARY CD

```
git clone --recursive git://github.com/ev3dev/ev3devKit
git clone https://github.com/in4lio/ev3dev-c.git
cd ev3dev-c
git submodule update --init --recursive
```

Compile and install static and shared libraries:

(the following will take a while.)

```
cd source/ev3/
make
sudo make install
```

```
make shared
sudo make shared-install
```

Set your path to the C libraries

```
export C_INCLUDE_PATH=/home/robot/ev3dev-c/source/ev3
export LIBRARY_PATH=/home/robot/ev3dev-c/lib
or
put these in your .profile
```

INSTALLING CPP LIBRARIES

```
git clone https://github.com/ddemidov/ev3dev-lang-cpp.git
```

INSTALLING I2C TOOL CHAIN

```
Sudo apt-get install i2c-tools
```

Ref: [tutorial about how to use i2cdetect tool](#)

**Now you are ready!!!!**

IF YOU WANT TO DO DEBUGGING ON EV3

```
sudo apt-get install gdbserver
sudo apt-get install gdb
```

Learn how to use gdb.: <http://www.gdbtutorial.com/tutorial/commands>

References:

<https://www.ev3dev.org/docs/tutorials/>

## WANT TO DO DEVELOPMENT ON WINDOWS INSTEAD

You will need to install docker - [very good online documentation](#).