

Bonus
EV3 Programming
Lessons



LEGO MINDSTORMS EV3Dev
and Raspberry Pi Communicator



Objectives

- Learn how to make send commands from an EV3 to a Raspberry Pi using ev3dev

- **Prerequisites:**
 - *Must be comfortable using a Raspberry Pi (Unix/Linux commands) and some basic Python*
 - *Must be familiar with ev3dev*
 - *Complete the EV3Lessons Introduction of ev3dev Lesson*

Materials

- Raspberry Pi (Tested on Model B Edition 1 using Raspbian)
- EV3 brick
- USB WIFI for EV3 (or another way of connecting to the internet)
- Ethernet/WIFI for Raspberry Pi
- Micro SD card with ev3dev on it (Insert into EV3's microSD slot)



Step 1: Setup

- You will need to be a root/admin user on both devices
- Install software on the Raspberry Pi
 - `sudo raspi-config`
 - *Enable SSH* → *Yes*
- Install software on the EV3 (you will need to ssh the EV3)
The paramiko software will allow you to use ssh from inside python on the EV3.
 - `sudo apt-get install python-pip`
 - `sudo pip install paramiko`

Step 3: Base Code

- The code below is run on the EV3
 - *This will send a command to the Raspberry Pi*
 - *This assumes that your Pi's full hostname is `raspberrypi.home`*
 - *This assumes that your username is `pi` and password `raspberry`*
- Replace `COMMAND_HERE` below with the command you want to execute on the Pi

```
import paramiko #import software

client = paramiko.SSHClient() #start ssh
client.set_missing_host_key_policy(paramiko.AutoAddPolicy()) #do not give warnings
client.connect('raspberrypi.home', username='pi', password='raspberry') #connect to pi
stdin, stdout, stderr = client.exec_command('COMMAND_HERE') #send a command
for line in stdout:
    print line.strip('\n') #print output

client.close() #disconnect from pi
```

- **CHALLENGE:** write a program to list files on the Pi using the EV3

Challenge: Solution

```
import paramiko #import software

#start ssh
client = paramiko.SSHClient()

#do not give warnings
client.set_missing_host_key_policy(paramiko.AutoAddPolicy())

#connect to pi
client.connect('raspberrypi.home', username='pi', password='raspberry')

#send a command
stdin, stdout, stderr = client.exec_command('ls')

for line in stdout:          #collect command output lines
    print line.strip('\n')   #print output

client.close()   #disconnect from pi
```

CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan from Droids Robotics.
- More lessons are available at www.ev3lessons.com
- Author's Email: team@droidsrobotics.org
- Credits: ev3dev.org



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