IoT to Improve Modern Day Life

Documentation/Readme

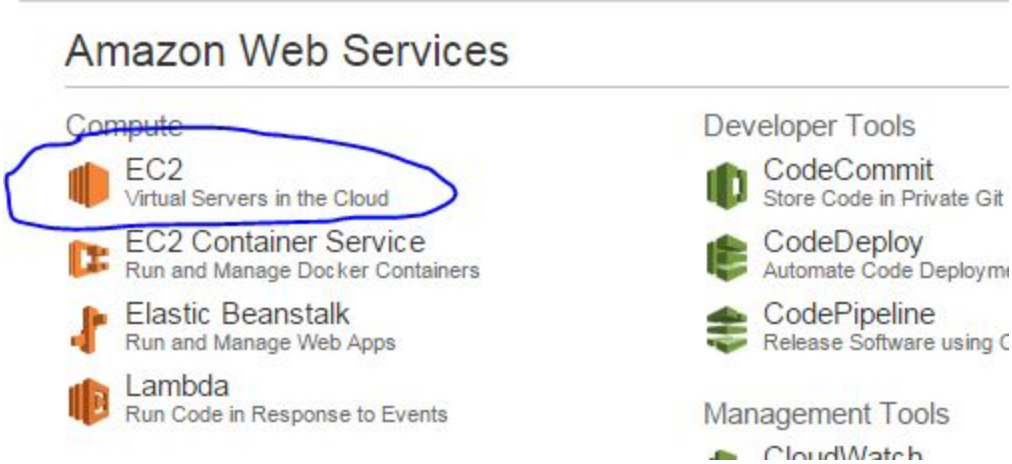
By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba

Amazon Web Server (AWS)

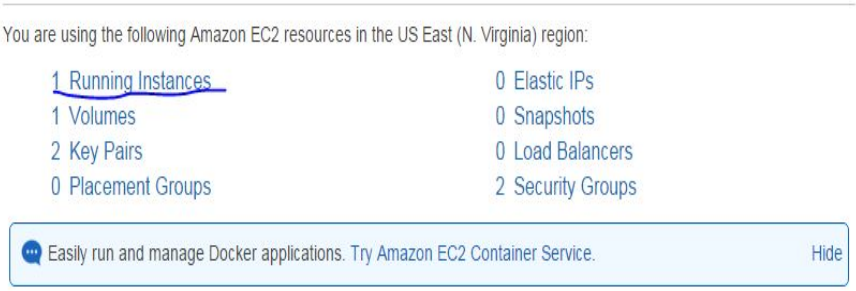
To access the AWS server

1. Go to www.aws.amazon.com and login using
   Username: ***
   Password: ****

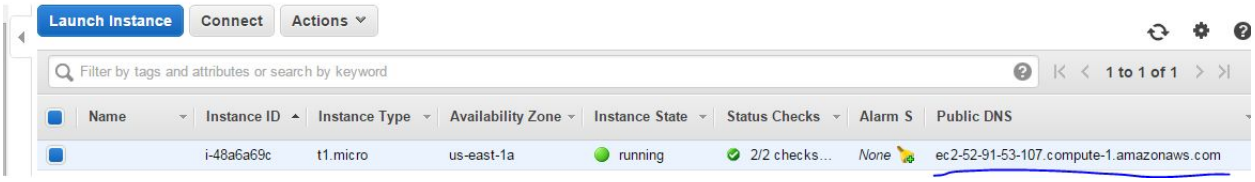
2. Go to EC2 near the top under compute.



3. Next click on running instance.



4. Now, obtain the public DNS address.



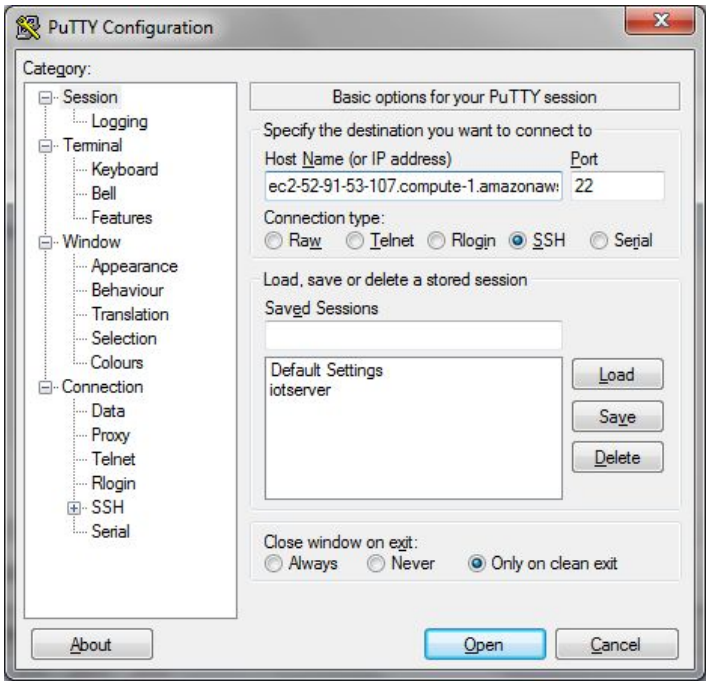
IoT to Improve Modern Day Life

Documentation/Readme

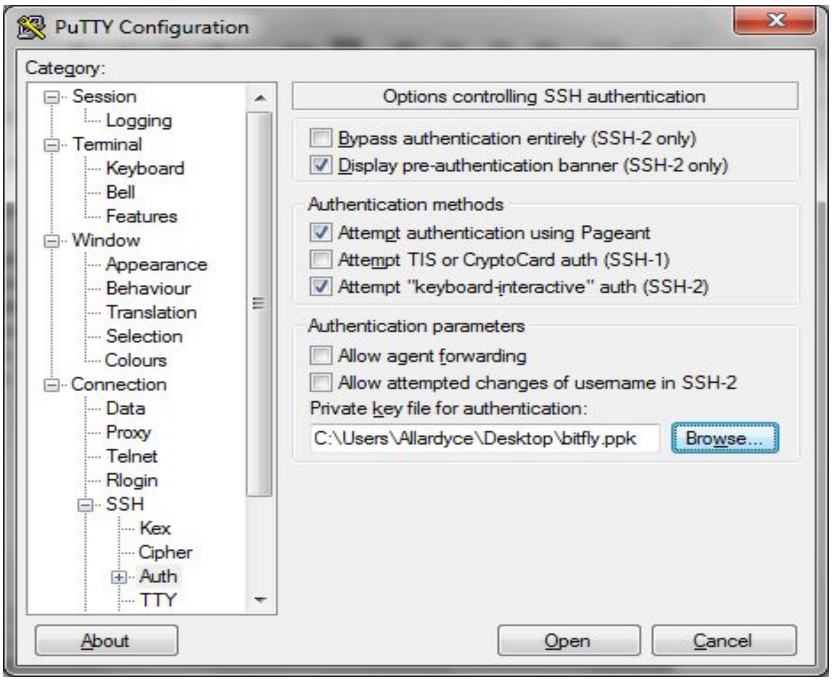
By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba

5. Once address is obtained, Download Putty from http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html.

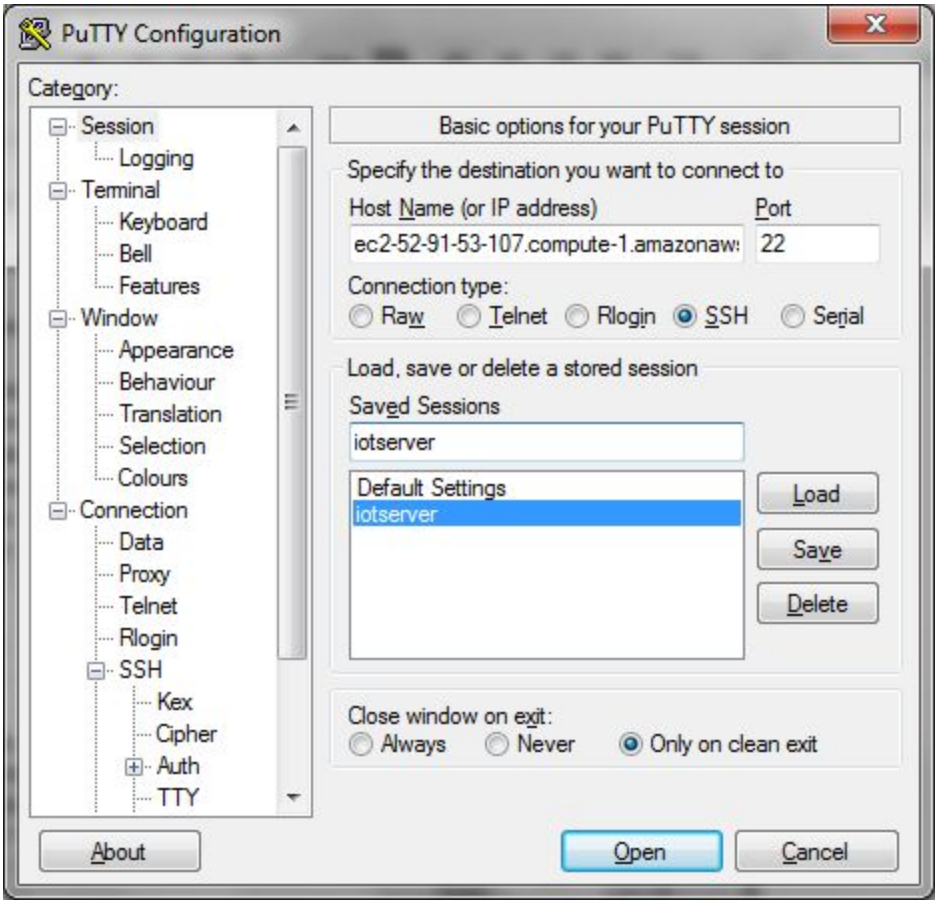
6. Open up Putty and put the address into Host Name (or IP address).



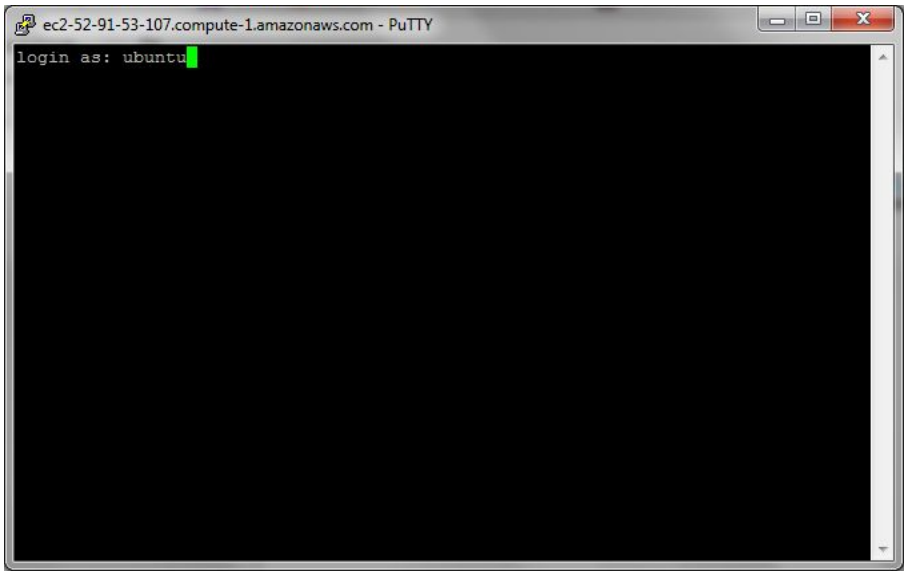
7. Expand the “Connection” category and from there, expand SSH sub category. In the SSH category, click on Auth. From there, Under the private key for authentication, click browse and choose the iotkeypair.ppk file included in the zip file.



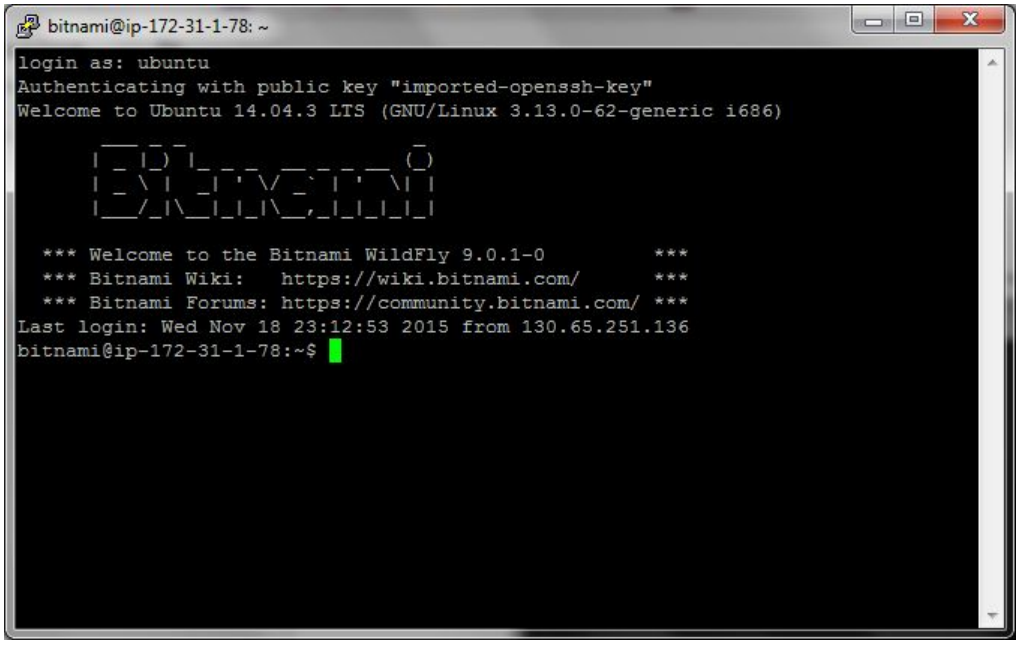
8. Once completed, return to session category and choose a name for the settings and click save.



9. Now click open, For login as: put “ubuntu” and hit enter



10. Now we have access to the server.



Installing software onto server

1. Once access is granted to the server, different software has to be added to the server like PHP, Apache, and MySQL
2. First in the terminal, write “sudo apt-get update”
3. By entering these commands in the terminal, Apache, PHP, and MySQL will be installed on the server. For Apache use the command “sudo apt-get install apache2”, MySQl use “sudo apt-get install mysql-server”, and for PHP use “sudo apt-get install php5 libapache2-mod-php5.”
4. After installing all of these, Apache need to be restarted with the command “sudo /etc/init.d/apache2 restart”

Creating MySQL database

1. To enter MySQL through the terminal, enter the command “mysql -u root -p” and enter the same password as the AWS account.
2. Now to create a database, use the command “Create database iot”.
3. The database will be created and can be used by using the command “use iot”.
4. Now table can be created using the template “create table tablename(columnname datatype(size), columnname2 datatype(size), ...).
5. Create the tables listed below with their names,datatypes and primary keys.

IoT to Improve Modern Day Life

Documentation/Readme

By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba

```
mysql> describe changelog;
+-----------+-------------+------+-----+---------------------+-------+
| Field     | Type        | Null | Key | Default             | Extra |
+-----------+-------------+------+-----+---------------------+-------+
| device    | varchar(20) | NO   | PRI |                     |       |
| status    | varchar(30) | YES  |     | NULL                |       |
| timestamp | datetime    | NO   | PRI | 0000-00-00 00:00:00 |       |
+-----------+-------------+------+-----+---------------------+-------+
3 rows in set (0.00 sec)

mysql> describe connection
    -> ;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| id    | int(11)     | NO   | PRI | 0       |       |
| name  | varchar(20) | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> describe cs;
+-----------+-------------+------+-----+---------+----------------+
| Field     | Type        | Null | Key | Default | Extra          |
+-----------+-------------+------+-----+---------+----------------+
| id        | int(11)     | NO   | PRI | NULL    | auto_increment |
| status    | varchar(30) | YES  |     | NULL    |                |
| timestamp | varchar(30) | YES  |     | NULL    |                |
+-----------+-------------+------+-----+---------+----------------+
3 rows in set (0.00 sec)

mysql> describe login;
+-----------+--------------+------+-----+---------+-------+
| Field     | Type         | Null | Key | Default | Extra |
+-----------+--------------+------+-----+---------+-------+
| username  | varchar(10)  | NO   | PRI |         |       |
| timestamp | datetime     | YES  |     | NULL    |       |
| password  | varchar(256) | YES  |     | NULL    |       |
+-----------+--------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> describe options;
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| id        | varchar(10) | NO   | PRI |         |       |
| status    | varchar(10) | YES  |     | NULL    |       |
| timestamp | datetime    | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> describe photocell;
+-----------+-------------+------+-----+---------+----------------+
| Field     | Type        | Null | Key | Default | Extra          |
+-----------+-------------+------+-----+---------+----------------+
| id        | int(11)     | NO   | PRI | NULL    | auto_increment |
| status    | varchar(30) | YES  |     | NULL    |                |
| timestamp | varchar(30) | YES  |     | NULL    |                |
+-----------+-------------+------+-----+---------+----------------+
3 rows in set (0.01 sec)
```

```
mysql> describe relay;
+-----------+-------------+------+-----+---------+----------------+
| Field     | Type        | Null | Key | Default | Extra          |
+-----------+-------------+------+-----+---------+----------------+
| id        | int(11)     | NO   | PRI | NULL    | auto_increment |
| status    | varchar(30) | YES  |     | NULL    |                |
| timestamp | datetime    | YES  |     | NULL    |                |
+-----------+-------------+------+-----+---------+----------------+
3 rows in set (0.00 sec)
```

IoT to Improve Modern Day Life

Documentation/Readme

By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba

Running the server python modules

1. From the terminal, type in “screen -S relay1” to create a screen session for the relay 1 module.
2. From the terminal type sudo python /var/www/html/relay_server1.py
3. Press CTRL + ALT+ D to detach from the session.
4. From the terminal, type in “screen -S relay2” to create a screen session for the relay 2 module.
5. From the terminal type sudo python /var/www/html/relay_server2.py
6. Press CTRL + ALT+ D to detach from the session.
7. From the terminal, type in “screen -S relay3” to create a screen session for the relay 3 module.
8. From the terminal type sudo python /var/www/html/relay_server3.py
9. Press CTRL + ALT+ D to detach from the session.
10. From the terminal, type in “screen -S powersave” to create a screen session for the powersave module.
11. From the terminal type sudo python /var/www/html/powersave_server.py
12. Press CTRL + ALT+ D to detach from the session.
13. From the terminal, type in “screen -S contactswitch” to create a screen session for the contactswitch module.
14. From the terminal type sudo python /var/www/html/contactswitch.py
15. Press CTRL + ALT+ D to detach from the session.
16. To access any of the previous screen, type “screen -r ‘name_of_screen’” to reattach any of the previous screens.
17. The server already has all these session created already. However, if the need to troubleshoot the server or close the previous sessions arise, the previous steps will allow users to access and run the python modules.

Powering the Raspberry Pi Code

1. First connect the Raspberry Pi to a power source using a usb to microusb connection.
2. Connect the Raspberry Pi to a monitor/laptop using the hdmi connection.
3. Connect a mouse and keyboard to the raspberry through usb.
4. The Raspberry Pi should be powered on after completing these steps.

Installing device hardware

1. Install the door sensor by screwing in the magnetic contacts to the door.
2. Turn on the switch on the back of the door sensor box.
3. Plug in the three relay receivers to three separate power outlets.
4. Plug in desired devices onto the relay receivers.

IoT to Improve Modern Day Life

Documentation/Readme

By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba

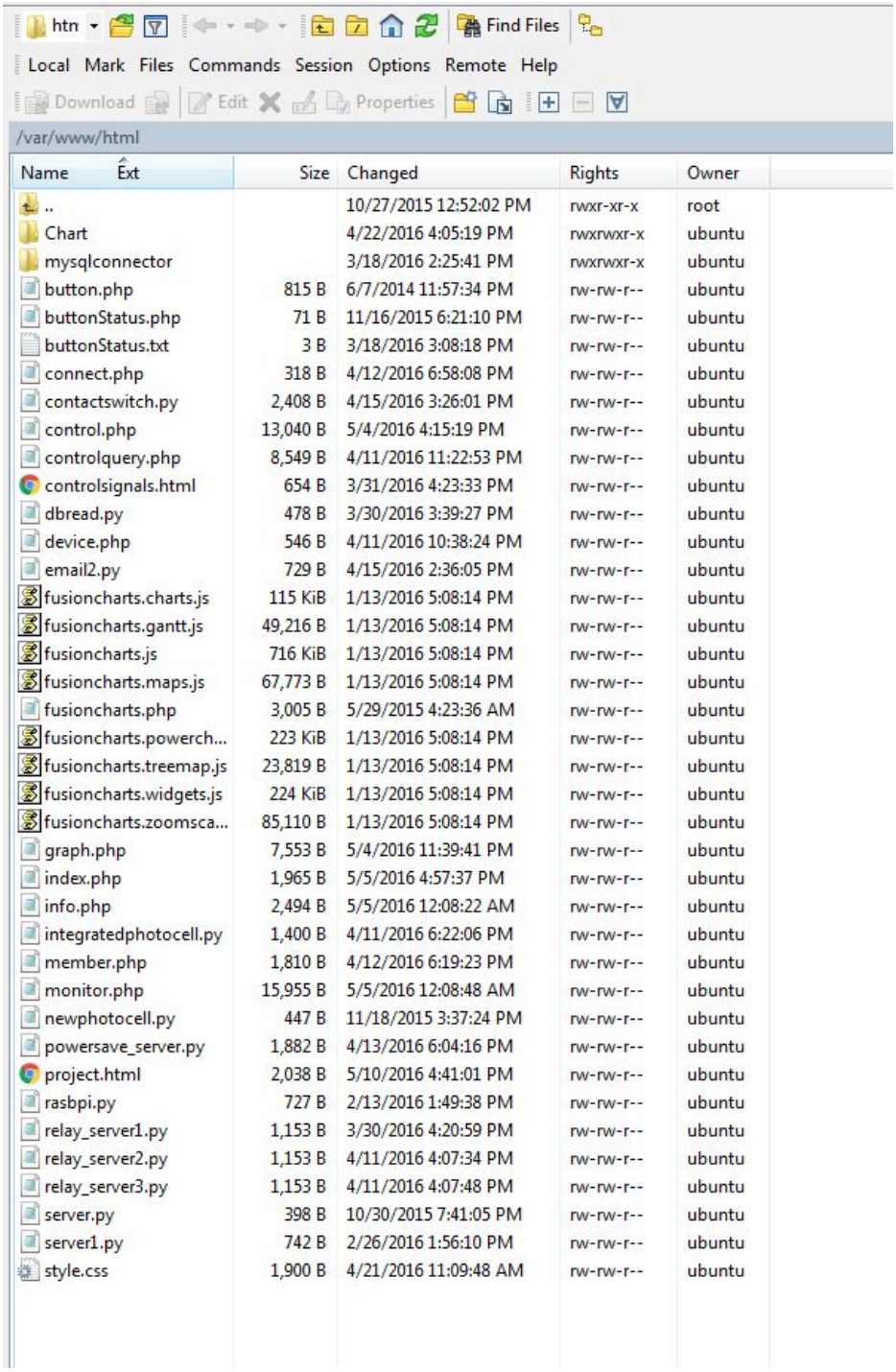
Adding files to AWS server

1. First install the WinSCP software at https://winscp.net/eng/download.php
2. Open the WinSCP software and click on the “Tools” button
3. From there click on “Import from site”,select putty, and then select the AWS putty info.
4. Login into the server and navigate to /var/www/html, which will be used to store the files for the website.
5. Add the given files in the “Website Code” folder to this location.

IoT to Improve Modern Day Life

Documentation/Readme

By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba



Name	Ext	Size	Changed	Rights	Owner
..			10/27/2015 12:52:02 PM	rwxr-xr-x	root
Chart			4/22/2016 4:05:19 PM	rwxrwxr-x	ubuntu
mysqlconnector			3/18/2016 2:25:41 PM	rwxrwxr-x	ubuntu
button.php		815 B	6/7/2014 11:57:34 PM	rw-rw-r--	ubuntu
buttonStatus.php		71 B	11/16/2015 6:21:10 PM	rw-rw-r--	ubuntu
buttonStatus.txt		3 B	3/18/2016 3:08:18 PM	rw-rw-r--	ubuntu
connect.php		318 B	4/12/2016 6:58:08 PM	rw-rw-r--	ubuntu
contactswitch.py		2,408 B	4/15/2016 3:26:01 PM	rw-rw-r--	ubuntu
control.php		13,040 B	5/4/2016 4:15:19 PM	rw-rw-r--	ubuntu
controlquery.php		8,549 B	4/11/2016 11:22:53 PM	rw-rw-r--	ubuntu
controlsignals.html		654 B	3/31/2016 4:23:33 PM	rw-rw-r--	ubuntu
dbread.py		478 B	3/30/2016 3:39:27 PM	rw-rw-r--	ubuntu
device.php		546 B	4/11/2016 10:38:24 PM	rw-rw-r--	ubuntu
email2.py		729 B	4/15/2016 2:36:05 PM	rw-rw-r--	ubuntu
fusioncharts.charts.js		115 KiB	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.gantt.js		49,216 B	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.js		716 KiB	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.maps.js		67,773 B	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.php		3,005 B	5/29/2015 4:23:36 AM	rw-rw-r--	ubuntu
fusioncharts.powerch...		223 KiB	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.treemap.js		23,819 B	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.widgets.js		224 KiB	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
fusioncharts.zoomsca...		85,110 B	1/13/2016 5:08:14 PM	rw-rw-r--	ubuntu
graph.php		7,553 B	5/4/2016 11:39:41 PM	rw-rw-r--	ubuntu
index.php		1,965 B	5/5/2016 4:57:37 PM	rw-rw-r--	ubuntu
info.php		2,494 B	5/5/2016 12:08:22 AM	rw-rw-r--	ubuntu
integratedphotocell.py		1,400 B	4/11/2016 6:22:06 PM	rw-rw-r--	ubuntu
member.php		1,810 B	4/12/2016 6:19:23 PM	rw-rw-r--	ubuntu
monitor.php		15,955 B	5/5/2016 12:08:48 AM	rw-rw-r--	ubuntu
newphotocell.py		447 B	11/18/2015 3:37:24 PM	rw-rw-r--	ubuntu
powersave_server.py		1,882 B	4/13/2016 6:04:16 PM	rw-rw-r--	ubuntu
project.html		2,038 B	5/10/2016 4:41:01 PM	rw-rw-r--	ubuntu
rasbpi.py		727 B	2/13/2016 1:49:38 PM	rw-rw-r--	ubuntu
relay_server1.py		1,153 B	3/30/2016 4:20:59 PM	rw-rw-r--	ubuntu
relay_server2.py		1,153 B	4/11/2016 4:07:34 PM	rw-rw-r--	ubuntu
relay_server3.py		1,153 B	4/11/2016 4:07:48 PM	rw-rw-r--	ubuntu
server.py		398 B	10/30/2015 7:41:05 PM	rw-rw-r--	ubuntu
server1.py		742 B	2/26/2016 1:56:10 PM	rw-rw-r--	ubuntu
style.css		1,900 B	4/21/2016 11:09:48 AM	rw-rw-r--	ubuntu

IoT to Improve Modern Day Life

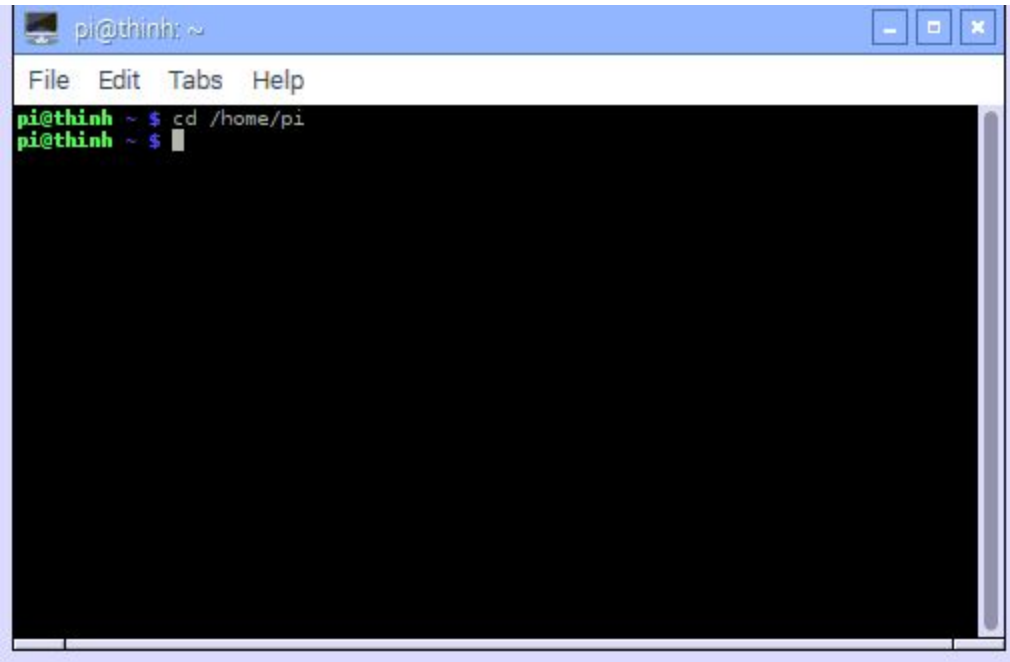
Documentation/Readme

By Gary Lai, Phi Lam, Thinh Phan, Allardyce Suba

6. The website can now be access through http://www.iottoimprovemoderndaylife.com/ with the info:
   Username: iot
   Password: 195iotllps2016

Executing the code on the Raspberry Pi

1. To run the code, make sure that newphotocell.py is in a directory.
2. Open the terminal on the raspberry pi by clicking the computer screen image near the top of the menu.
3. In the terminal navigate to the correct directory of the codes using the "cd" command as shown in the following figure.



4. Once in the correct directory, type sudo python relay_client1.py to execute the code for the first relay..
5. Repeat steps 2-3 and type sudo python relay_client2.py to execute the code for the 2nd relay.
6. Repeat steps 2-3 and type sudo python relay_client3.py to execute the code for the 3rd relay.
7. Repeat steps 2-3 and type sudo python powersave.py to execute the code for the powersave function.
8. Repeat steps 2-3 and type sudo python rfbase.py to execute the code for the door sensor notification.

9. For our project, these codes should be running automatically as soon as the raspberry pi boots. However, if there are any issues and the code does not run, it can simply be ran manually by following these instructions.

Video and Demo Playlist

- https://www.youtube.com/playlist?list=PLX5SkmurP7tpe9ebclR6eJdgXaUIGapX1