Webserver and Rpis

To initialize the system there are two necessary steps: making the IP of the device public and connecting it to the MySQL server.

For the first script we provide a public DNS name to the Pi so that it can be seen over any network and the server can talk to it. We provided a DNS name from a free service and update the IP address on that DNS.

For the second step we update the MySQL database server setup containing tables having the details of the Pi like the user, registering time, IP address and MAC address. There is a PHP script on the server that is called by the Pi to input the data in the database. We run a Node.js server that collects the necessary information on the Pi and calls the PHP script on the server. The PHP script decodes the Node.js call that is a JSON array and adds the data in the database.

Now all the active devices that will be involved in the network are registered on the server. You can monitor the devices on the server. At this point each device is unaware of the other active device in its vicinity. So we run another Node.js script that extracts the IP addresses of the other active devices in the vicinity and stores them in a text file.

Once this is done the master will the middleware Python TCP server script that takes in the IP addresses of the active devices and call the application script which is defined by the user. The other devices are listening through a Python TCP client server. And once they get a particular message or data they will perform different tasks defined by the user.

A scenario to exemplify this part can be as follows: You have a camera interfaced with a Raspberry Pi and the system is placed at your doorstep. It is detecting if you have any intruders. The Pi is device is running a human figure detection algorithm (Hog detection quote). So as soon as it detects the contour of a human body it can notify a Pi interfaced with a speaker placed in the bedroom to sound an alarm and notify the owner about the intruder. Another example of the usage of this system is in case of a fire at sensitive areas. If one Pi detects fire then it can notify other Pis which are interfaced with sprinklers to start the sprinklers and pacify the fire.