Smart Relay for Monitoring and Controlling the Systems

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Abstract—The proposed system is evolved with the help of Twitter, an online social communication network which is used to send direct-messages to the AtmegaArduino Unowhich enacts a task accordingly by perusing the messages. The project proposes an efficient implementation for Internet of Thingsused for monitoring and controlling the home appliances via World Wide Web. They can communicate with any network on the Internet, by means of even Wireless protocols like Wi-Fi. The System comprises of Three important modules: The Twitter Account Credentials, The Python Code and The AtmegaArduino Uno. The extra Layer of security is given by the python-twitter API itself, which is an Open access librarymodules that is already put together that enables us to access the Information on the Twitter account. The Algorithm that controls the various Devices through Twitter is coded in Python. A simple AND logic gate can be used to control a single appliance. However, for Multiple Devices and complex operations, we use an AtmegaArduino Uno. The system has beendemonstrated to be structured and LED's can be used to Compare the conduct of the system and results affirm this conclusion.

Keywords—IoT,Python,Arduino,Twitter,API,Secure,open-source,World Wide Web

I.INTRODUCTION

Imagine a world in which every device in the house, workarea and vehicle are coupled. A Society where the Electric and electronic gadgets automatically turn on when the vehicle approaches the driveway, the cappuccinostarts brewing when the morning alarm go away off and the entrancegate automatically unbars when reached by a member of the household, but stays locked when a stranger arrives on the front step. This was the type of world the Internet of Things can influence. Internet of Things is a wide area network of things that are attached to the Internet, therefore they have their own IP address and can connect to each other to automate simple tasks responses.

Create cool applications that integrate with Twitter.

Fig 1. Twitter Developers

II.TWITTER

Twitter is an internet related social network service where clientsuprights and link with contents, "tweets," restricted to 140 characters. Registered users can post tweets, but those who are unregistered can only read them. Clientsapproaches Twitter through its website interface, SMS or a mobile device app. Internet consumers can tweet via the Twitter network, compatible external applications like personal digital assistants, or by Short Message Serviceavailable in certain countries.

Users may subscribe to other users' tweets—this is known as "following" and subscribers are known as "followers" or "tweeps", a portmanteau of Twitter and peeps.In a social communication network, Twitter spins around the principle of followers. When one choose to follow another Twitter consumer, that user's tweets appear in reverse chronological order on the main Twitter page.

Individual tweets has been forwarded by other customers to their own feed, a process named as a "retweet". Users can also "like" (formerly "favorite") individual tweets. Twitter authorisesclients to reforms their datathrough their mobile gadgetseither by text messaging or by apps released for certain smart phones and tablets.

II.SECURITY

Arbitrator Twitter approaches have been required to use OAuth, an authentication method that does not needscustomers to enter their password authentication into the authenticating features. This is to expands the security authenticity and refines the user experience.

OAuth is an open access standard for authorization, commonly cast offs as a way for Internet clients to authorize their access to websites to approaches their content on other websites but without giving them the authentication. This mechanism is used by companies like Twitter to permit the users to share information about their accounts with third party applications or websites[5,6].

III.DEVELOPERS

Twitter is recognized for having one of the most open and powerful developer APIs of any major technology company. Developer interest in Twitter began immediately following its launch, prompting the company to release the first version of its public API in September 2006. The API quickly became iconic as a reference implementation for publicREST APIs and is widely cited in programming tutorials.From 2006 until 2010, Twitter's developer platform experienced strong growth and a highly favorable reputation. Developers built upon the public API to create the first Twitter mobile phone clients as well as the first URL shortener.

IV.THE TWITTER-PYTHON API

This library provides a pure Python interface for the Twitter API. It works with Python 2.7+ and Python 3.

Twitter provides a service that allows people to connect via the web, IM, and SMS. Twitter exposes a web services API and this library is intended to make it even easier for Python programmers to use[1,4].

A. Setting Up Twitter

Since wInterfacing with twitter used to be easy, all One had to do was put the Username and password into the code and it would work. Now twitter has taken user info more seriously using oAuth, and as a result now the app must be registered with twitter to get an API key[1,2].

Registering the app on dev.twitter.com will enable to grab fourImportant pieces of Information:

-ACCESS KEY
-ACCESS TOKEN SECRET
-CONSUMER KEY
-CONSUMER TOKEN SECRET

These keys will be needed in the python code later to interface with the twitter API.

B. Getting the Application Token

In order to use the python-twitter API client, one first need to acquire a set of application tokens. These will be the consumer_key and consumer_secret, which get passed to twitter.Api() when starting the application[11,12].

C. Program Coding

```
##authenticate with twitter
api = twitter.Api(
consumer_key='*Consumer Key here*',
consumer_secret='*Consumer secret Here*',
access_token_key=’*Access Token Key Here*’,
access_token_secret='*Access Token  Secret  Here*'
)

##set to the serial port
ser = serial.Serial(port='COM5')
ser.baudrate = 19200

## check serial port
    def CheckFun():
            ser.flushInput()
            time.sleep(3)
            line=ser.readline()
            time.sleep(3)

            if line == ' ':
                    line=ser.readline()
                    print ('here')



            status = []
            x = 0
            status =
api.GetUserTimeline('FishinGrapes') ##grab
latest statuses

            Str_Tweet = [s.text for s in status] ##put
status in an array

            the_tweet = Str_Tweet[0].split() ##split
first tweet into words

            ## check for match and write to serial if
match
            if the_tweet[0] == '#Tweeter':
                    print ('Tweet Recieved, Turning
on’)
                    ser.write('1'.encode())

            elif the_tweet[0] == '#Tweeterstop':
##break if done
                    ser.write('0'.encode())
                    print ('stopped, awaiting
instructions.')
            else:
                    ser.write('0'.encode())
                    print ('Awaiting Tweet')

            while 1:
                    tweetfun() ## call tweetfun
function
                    time.sleep(15) ## sleep for 15
seconds
```

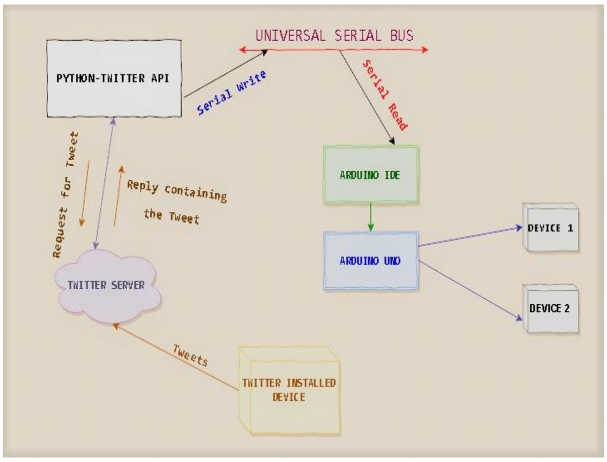


Fig.2. Block Diagram

V. ARDUINO UNO

A program for AtmegaArduino Uno may be written in any programming language for a compiler that produces binary machine code for the target processor. The AtmegaArduino Uno IDE supports the languages C and C++ using special rules of code structuring.

The AtmegaArduino Uno IDE supplies a software library from the Wiring project, which provides many common input and output procedures[7].

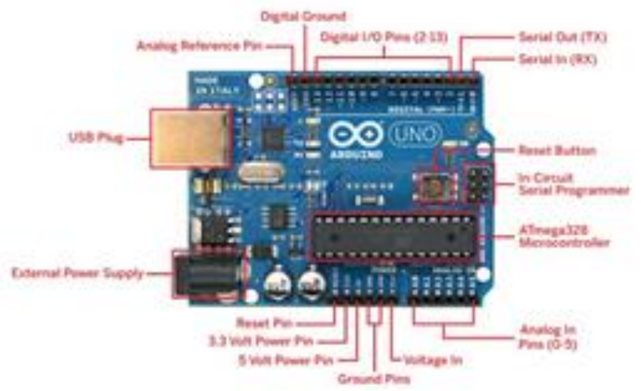


Fig 3.Arduino Pin Description

User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution[5].

The Arduino IDE employs the program avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware[10].

A. Program Coding

// the loop() method runs over and over again,
// as long as the Arduino has power

```
void loop()
{

if (Serial.available() > 0)
{
   incomingByte = Serial.read();
Serial.println(incomingByte);

   if (incomingByte> 10)
   {
digitalWrite(relayPin, HIGH);
       }

else {
digitalWrite(relayPin, LOW);
       }:

Serial.print("I received: ");
Serial.println(incomingByte, DEC);
            }
   }
```

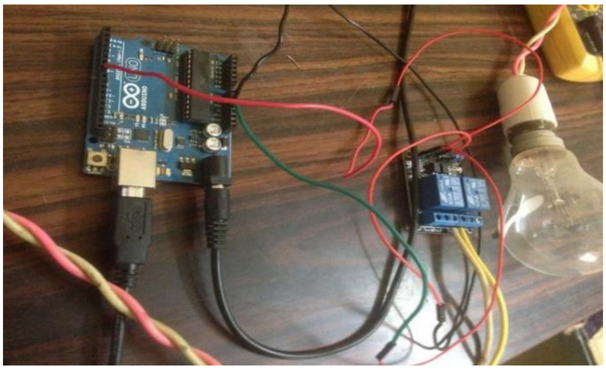


Fig 4. Experimental Setup

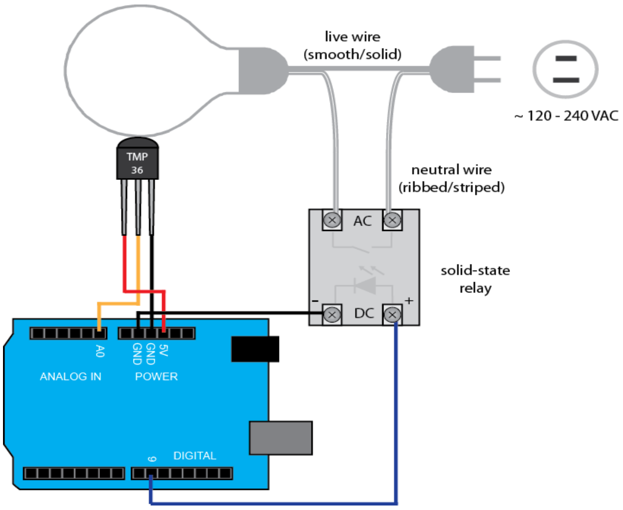
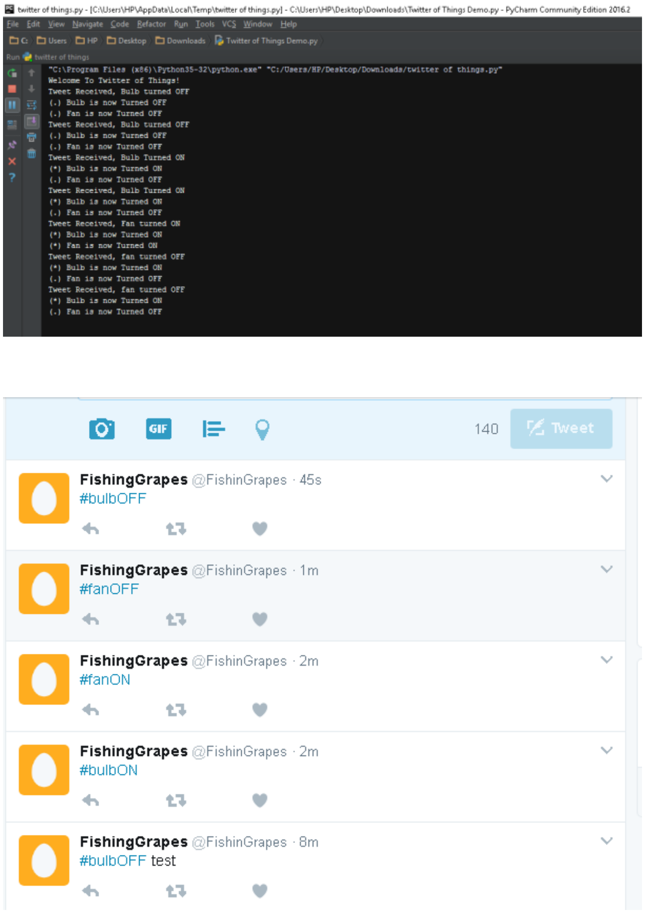


Fig 5. Schematics

VI. RESULTS AND CONCLUSION

Thus, Internet of Things (IoT) has the potential to encompass and instrument an enormous range of connected devices—including home appliances and utilities, wearable, homes and corporate buildings, industrial processes, medical devices, law-enforcement devices, military equipment, and other connected applications that today might be barely imaginable. In the present context, "Things" are simply those computerized and networked devices that become part of the IoT. Some of those Things will be directly accessible over the Internet, whereas others would be supposedly hidden in local networks behind firewalls and address-translating routers[9,12].

There are already many risks recognizably associated with the IoT. Some risks are old and well known, but exacerbated by the unprecedented scale of the IoT; estimates for the next few years suggest tens of billions of Things.


twitter of things.py - [C:\Users\HP\AppData\Local\Temp\twitter of things.py] - C:\Users\HP\Desktop\Downloads\Twitter of Things Demo.py - PyCharm Community Edition 2016.2
File Edit View Navigate Code Refactor Run Tools VCS Window Help
C: Users HP Desktop Downloads Twitter of Things Demo.py
Run twitter of things

```
"C:\Program Files (x86)\Python35-32\python.exe" "C:/Users/HP/Desktop/Downloads/twitter of things.py"
Welcome To Twitter of Things!
Tweet Received, Bulb turned OFF
(.) Bulb is now Turned OFF
(.) Fan is now Turned OFF
Tweet Received, Bulb turned OFF
(.) Bulb is now Turned OFF
(.) Fan is now Turned OFF
Tweet Received, Bulb Turned ON
(*) Bulb is now Turned ON
(.) Fan is now Turned OFF
Tweet Received, Bulb Turned ON
(*) Bulb is now Turned ON
(.) Fan is now Turned OFF
Tweet Received, Fan turned ON
(*) Bulb is now Turned ON
(*) Fan is now Turned ON
Tweet Received, fan turned OFF
(*) Bulb is now Turned ON
(.) Fan is now Turned OFF
Tweet Received, fan turned OFF
(*) Bulb is now Turned ON
(.) Fan is now Turned OFF
```

FishingGrapes @FishinGrapes · 45s
#bulbOFF

FishingGrapes @FishinGrapes · 1m
#fanOFF

FishingGrapes @FishinGrapes · 2m
#fanON

FishingGrapes @FishinGrapes · 2m
#bulbON

FishingGrapes @FishinGrapes · 8m
#bulbOFF test

Fig 6. Output Screen

Other risks may be new, stemming from the nature of how these Things are designed, what they are used for, how they are deployed and managed (or not managed), and how market forces will influence the development.

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