IOT and the Various Platforms Use

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Abstract:--- **The Internet of Things is currently the hottest topic worldwide. It can be seen in various fields be it smart home, smart city, smart roads, smart lighting, smart parking, smart agriculture, and many more. It is the current topic of discussion worldwide by both the press and media. Companies are currently switching their focus to IOT as it offers capabilities beyond understanding. New discoveries continue to be made and new applications of Iot develop every day. There are many IOT platforms which offer Internet enabled applications like Thingworx, Thing speak, Grovestreams, Temboo, Xively, IBM Bluemix and many more. In this research paper, we have tried to explain what IoT basically means and the two platforms that we have worked on. Both the platforms have been explored partially as they provide a lot of sub applications from tweeting to monitoring via an app on smart phones to MATLAB simulation. In both platforms we have tried to upload the soil moisture sensor values for remote monitoring on the Internet with the view for enabling automatic irrigation using these platforms.**

*Index Terms:—***IOT, Arduino, Thing speak, Grovestreams, Twitter.**

I. INTRODUCTION

The large-scale implementation of IOT devices in virtually all fields promises to transform our way of life. The new IOT products which are Internet-enabled like health monitoring devices, home automation and street light automation are revolutionizing our way of living and moving us towards a "smart" future. In the field of modern wireless telecommunication IOT concept is rapidly gaining prominence. The tremendous growth of Radio-Frequency Identification(RFID) tags, sensors, actuators, smartphones with unique addressing schemes have facilitated the growth of diverse IOT applications and continue to do so with huge benefits for people and industry as shown in Fig 1[1]. Practically all fields from medical, to domestic, industrial are using IOT nowadays providing a smarter outlook to life and opening up new business opportunities for operators and enterprises, spanning many sectors like public safety, healthcare, smart parking, water management, gas leakage management, smart cities and many more.

II. INTERNET OF THINGS

"Internet of Things" semantically means "a world-wide network of interconnected objects uniquely addressable, based on standard communication protocols". The Internet of Things is a concept in which the virtual world of information technology integrates seamlessly with the real world of things. The real world becomes more accessible through computers and networked devices in business as well as everyday scenarios[2]. The Internet of Things describes a world in which everyday objects are connected to a network so that data can be shared. But it is really as much about people as the inanimate objects[3]. IOT technology is currently transforming agriculture, industry, and energy production and distribution by increasing the availability of information along the value chain of production using networked sensors. While there are many IOT platforms which require payment

Fig. 1: ''Internet of Things'' paradigm as a result of the convergence of different visions.

For users to use their services, some offer partial use of their services for free or monthly trials.

III. THING SPEAK

Thing Speak is an application platform providing users with Internet of Things applications. It is an open source "Internet of Things" application and uses API to store and retrieve data from sensors using HTTP over the Internet or via a Local Area Network connection. With Thing speak, the user can create sensor logging applications, location tracking applications, and a social network of things with status updates like in Twitter. The features of Thing speak include: real-time data collection, data processing, visualizations, apps, and plugins as given on their website. Thing speak enables sensors, instruments, and websites to send data to the

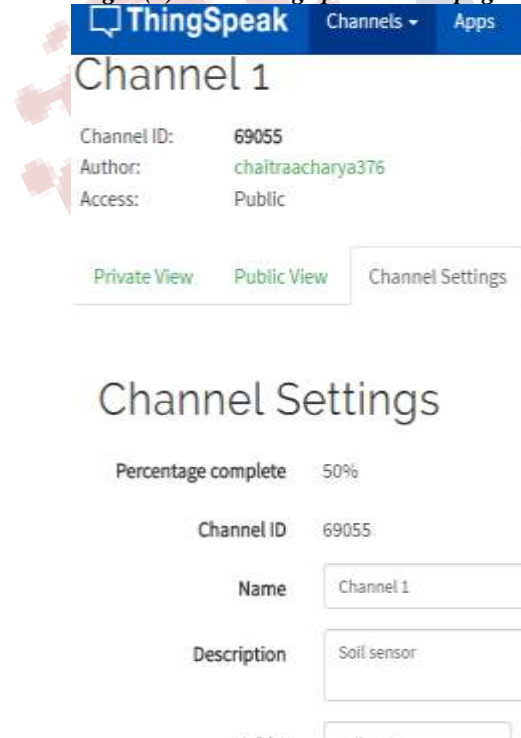*Fig. 2(a): The Thing speak Home page.*

Fig. 2(b): Channel creation on Thing speak.

Cloud to be stored in a channel. The channel must be created by the user once they create an account on Thing speak by signing in as shown in Fig 2(a) and (b).

Once the channel settings have been saved, the Write API Key is automatically generated and the user can notice it on clicking the API Keys tab beside the Channel Settings. The website also allows user to generate a new Write API Key if the user desires as shown in Fig 3. The key is needed while uploading sensor values to the Thing speak platform. The code for uploading the sensor values for temperature and humidity using Arduino microcontroller is available on GitHub and can be modified to load other sensor values. The website also allows the user a Read API Key.
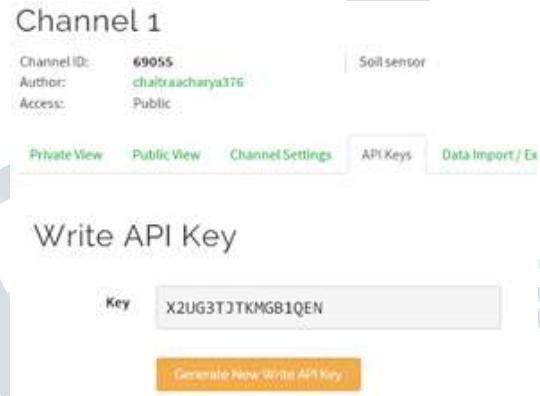

Fig. 3: Write API key generated on Thing speak.

Once the code in Arduino(borrowed from GitHub) has been uploaded to the Thing speak Website[4], we can see the graph on the website displaying the soil moisture values along with the date, time and time zone under channel stats as shown in Fig 4.

We can also add visualizations like channel location, channel video like the channel stats and field 1 chart as shown in Fig 5. The channel location displays the current location of the user using Google maps.


Fig. 4: Uploaded values on Thing speak.

Fig. 5: Current location displayed on Thing speak

Fig. 6: Linking Twitter account to Thing speak using thing tweet API Key.

The website also allows the user to see updates on their Twitter account by linking their twitter account to Thing speak using the thing tweet API key as shown in Fig 6.

A sample program taken from Git Hub to display "My thing is social @Thing speak" is given below in Fig 7 and the resultant tweet is displayed in Fig 8.

Fig. 7: Sample code from Git Hub to display tweet.

Fig. 8: Tweet "My thing is social @Thing speak" displayed.

The Thing Tweet is just one of the sub applications provided by Thing speak. The rest include: MATLAB Analysis, MATLAB visualizations, Plugins, Tweet Control, React, Time Control, Talk Back and Thing HTTP as shown in Fig 9.

Fig. 9: Various sub applications provided by Thing speak.

IV. GROVESTREAMS

Grove Streams is one of the most powerful platforms in the cloud providing near real-time decision making capabilities to millions of users and devices. Grove Streams is a young, but clear-headed IOT analytics vendor whose technology was designed to solve the ease-of-deployment problem from the get-go. The aim of Grove Streams is to minimize deployment times by having an integrated, end-to-end, IOT-specific analytics platform that handles data ingestion, analytic calculation definition and analytics visualization and doesn't require writing script or code. . Grove Streams is also designed to handle the

volume and breadth of streaming data that is common within IOT systems. In particular, it can aggregate hundreds or thousands of event streams and then display them in a few graphical metrics to provide top-level views of complex system operation. The platform can store up to 80 million data points per raw input stream, so longitudinal analytics have a lot of headroom. An account needs to be created before the uploading of data is allowed. Users can start with a free account as shown in Fig 10[5]. Once the account is created, user needs to create a new organization unlike channel in Thing speak. By default only one organization can be freely created as shown in Fig 11. In case user needs to create more, then payment is required.


Fig. 10: Creating a free account on Grove streams.
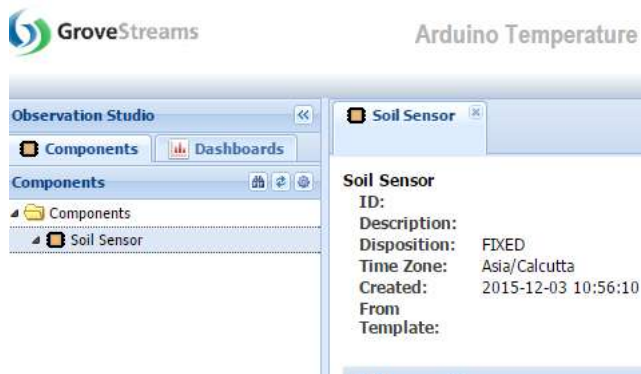
Fig. 11: Organization named Arduino Temperature created to display soil sensor values.

We can also display the current location of the user by editing the component's location by right-click on the component and the location with latitude and longitude will be displayed as shown in Fig 12.
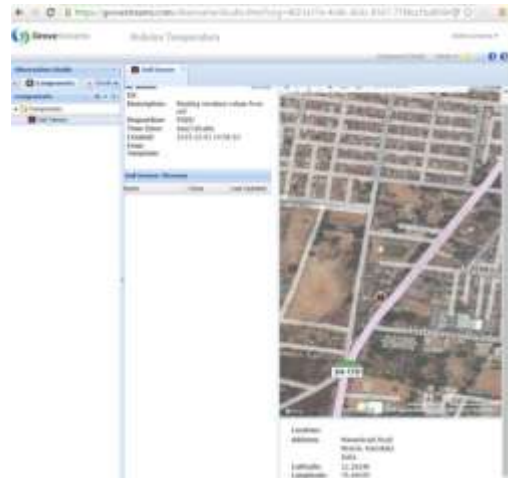
Fig. 12: Current location displayed on Grovestreams
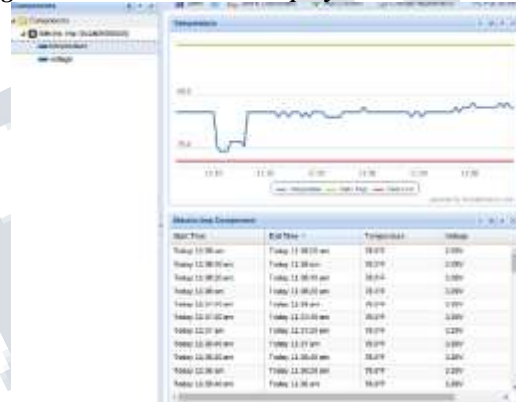
Fig. 13: Temperature values displayed.

The next step is to create a Grove Streams Quick Start Smart App which will then display the values as shown in below example in Fig 13.

VII. CONCLUSIONS

Internet of Things is a vital part of our life. It offers us many benefits and interconnects devices over internet preventing user interference and making devices function automatically. There are multiple IOT platforms in use today. Some charge for the use of their services while most offer a part of their services for free or under trial. Many projects have been created using IOT with a variety of platforms and softwares ranging from microcontrollers to Arduino to Raspberry-pi. Some platforms allow creation of apps where we can monitor sensor values thus making information available anytime and anyplace at the touch of a button.

REFERENCES

[1]https://www.researchgate.net/publication/222571757_The_ Internet_ of_Things_A _Survey.pdf.

[2] http://vs.inf.ethz.ch/publ/papers/Internet-of-things.pdf.

[3]https://www.gov.uk/government/uploads/system/upload s/ attachment_data/file/409774/14-1230-internet-of-things-review.pdf.

[4] https://github.com/iobridge/Thing speak-Arduino-Examples/ blob/ master/Ethernet/Arduino_to_Thing speak.ino.

[5]https://grovestreams.com/developers/getting_started_sm art things. htrml.