Experiment Number 02

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Subject ::   Privacy & Security lab   CODE ::   CSD-431
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1. Aim :

The objective is to Receive data from cloud using a remote login and Lab VIEW to our remote system using secure concept of API

2. Task :

1. Create thingspeak account

2. Create a telemetric channel in thingspeak

3. Make channel created as public

4. Write Lab VIEW code for cloud interfacing

5. Run lab view code

6. Examine the data Received on LabVIEWinterface

3. Theory :

Security is important an aspects for data being sent over HTTP Page. Below you will find some of API best practices and some preventative measures to secure data.The cloud API provides application-ready software modules that act as blueprints for original equipment manufacturers (OEMs) to develop their own applications, removing complexity and creating a smart path to connect all types

of sensor networks to any cloud platform.Data is transmitted into the cloud via predefined interfaces on LabVIEW and decision processes, at the same time normalising data measurements and checking that received data is meaningful. Thingspeak.com as a Cloud Storage Service is used basically to store the data that we need to store. With the use of this platform we don't need to worry about web programming, services, or hire a experienced programmer to start our application to the cloud and focus on our embedded device.

Token-based Authentication

Unlike traditional server-based authentication, where a username and password need to be sent in every request (constantly exposing them to potential attackers), token-based authentication assigns a signed token after the first request, which can then be used for sub-sequent requests. This is how the token-based authentication takes place:

1. Client requests a security token using an API Key

2. Our Application validates the API Key

3. Our Application provides a signed token back to the client

4. Client stores that token and sends it along with every request

5. Server verifies token and accepts requests

6. If Client doesn't use the token for more than 6 hours, then it will need to request a new token using the API key.

Token-based authentication has become the standard for web API'

Cloud computing
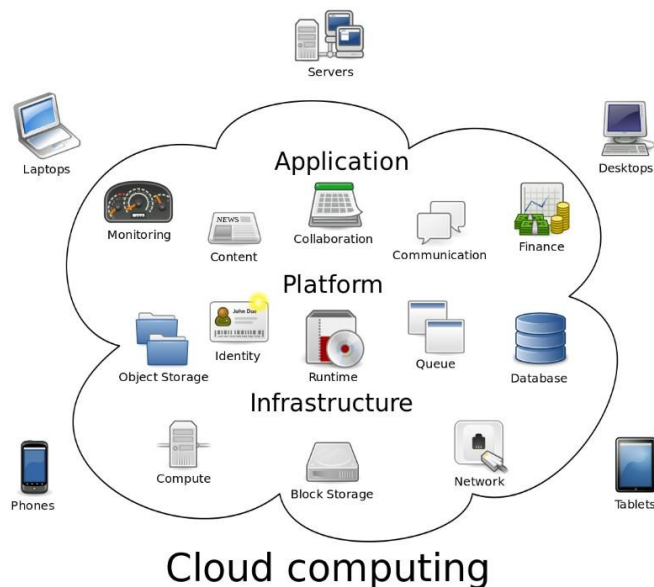
LabVIEW BASED CODE

Token in the HTTP headers

An alternative means for authentication is by specifying the Token in the URL as a parameter in the form of "token=". We enabled this to help you build faster prototypes as some devices might require extra coding to set HTTP headers, making it simpler to just use the Token in the URL. However, for production purpose, "X-Auth-Token" HTTP header field rather than the "token=" query parameter is recommended, as it provides an added level of security.

4. Steps :
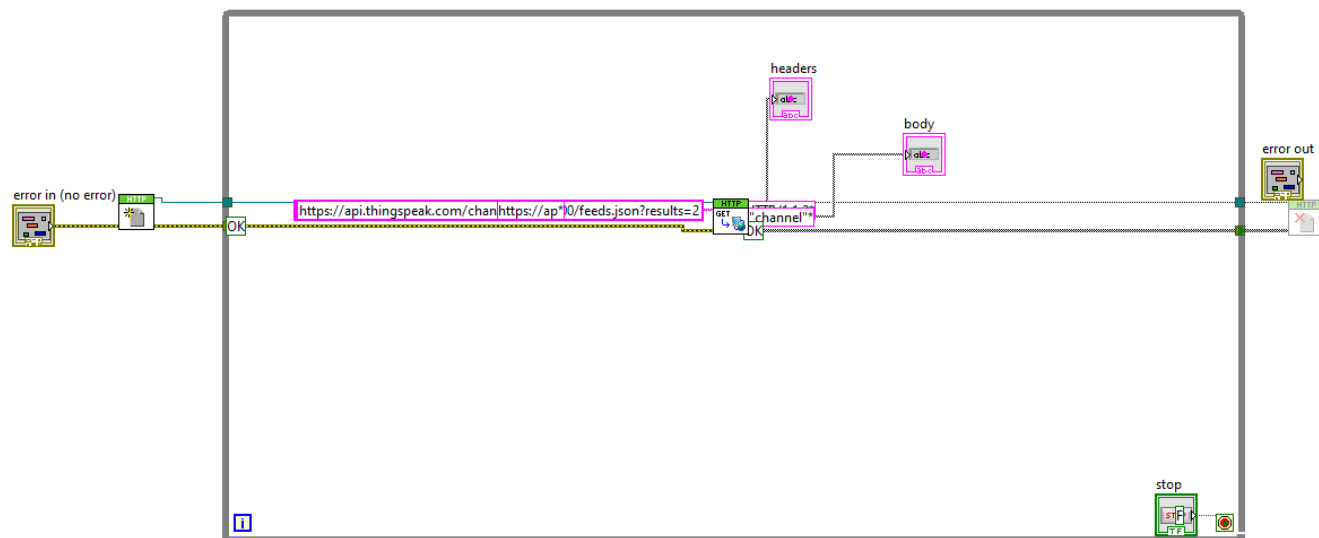
LabVIEW™ Evaluation Software

error in (no error)
status code
d0
source

stop
STOP

error out
status code
d0
source

headers

```
HTTP/1.1 200 OK
Date: Sun, 12 Sep 2021 11:07:04 GMT
Content-Type: application/json; charset=utf-8
Transfer-Encoding: chunked
Connection: keep-alive
Status: 200 OK
X-Frame-Options: SAMEORIGIN
Access-Control-Allow-Origin: *
Access-Control-Allow-Methods: GET, POST, PUT, OPTIONS, DELETE, PATCH
Access-Control-Allow-Headers: origin, content-type, X-Requested-With
Access-Control-Max-Age: 1800
Cache-Control: max-age=7, private
ETag: W/"716de8185c9331b369570645f0e899ae"
X-Request-Id: 4898f6bb-7086-4684-8419-98976018fc2e
```
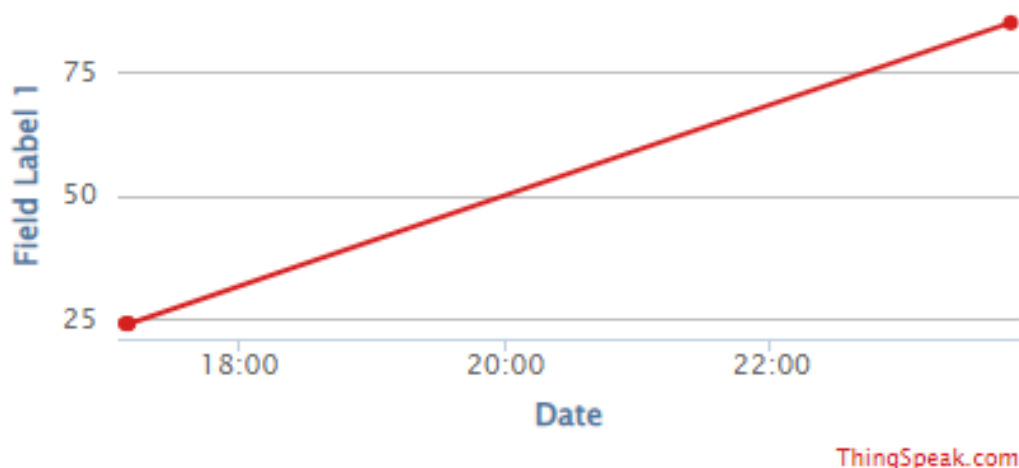
body

{"channel":{"id":1479113,"name":"FireDetectInForestArea","description":"Fire in forest area is major concern these days","latitude":"30.6917665193","longitude":"76.7946597313","field1":"Tempearture","created_at":"2021-08-18T06:12:03Z","updated_at":"2021-09-10T16:20:19Z","last_entry_id":null},"feeds":[]}

Learning Outcomes :

- I have learnt how to create I'd on ThingSpeak.
- I have learnt how to establish connection between several protocols.
- I have learnt how to code on LabVIEW.
- I have learnt how to do interface LabVIEW on cloud ThingSpeak.

S. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			