



# ThingSpeak

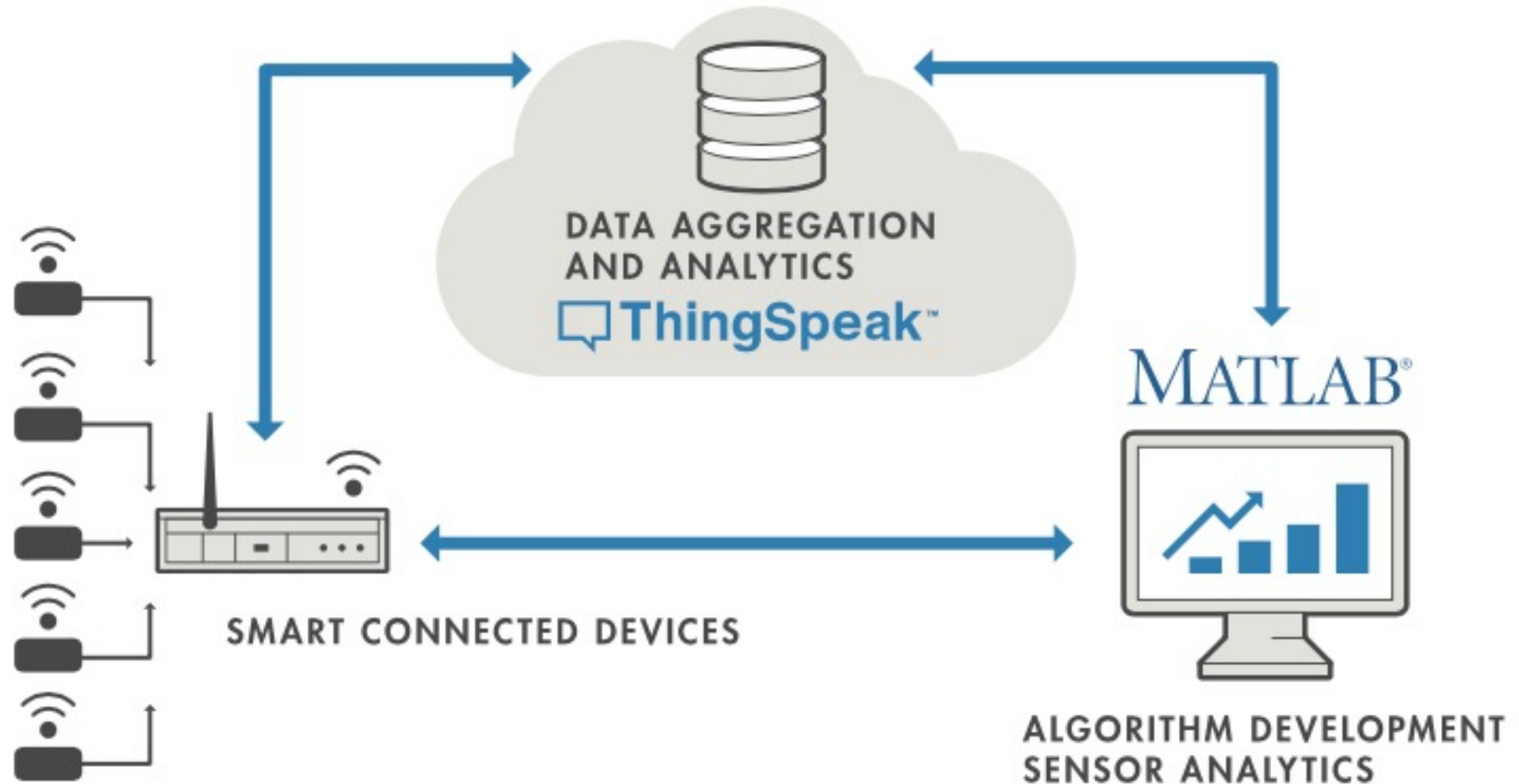
# ThingSpeaks

- ThingSpeak is a Web Service (REST API) that lets you collect and store sensor data in the cloud and develop Internet of Things applications.
- It works with Arduino, Raspberry Pi and MATLAB (premade libraries and APIs exists).
- But it should work with all kind of Programming Languages, since it uses a REST API and HTTP.

<https://thingspeak.com>

\* ThingSpeak is free for small non-commercial projects

# ThingSpeak



# ThingSpeak

- ThingSpeak is an IoT analytics platform service that lets you collect and store sensor data in the cloud and develop Internet of Things applications.
- The ThingSpeak service also lets you perform online analysis and act on your data. Sensor data can be sent to ThingSpeak from any hardware that can communicate using a REST API
- ThingSpeak is a Web Service (REST API) that lets you collect and store sensor data in the cloud and develop Internet of Things applications.

<https://thingspeak.com>

# What is ThingSpeak?



### Collect

Send sensor data privately to the cloud.



### Analyze

Analyze and visualize your data with MATLAB.



### Act

Trigger a reaction.

#### ThingSpeak Features

- Collect data in private channels
- Share data with public channels
- RESTful and MQTT APIs
- MATLAB® analytics and visualizations
- Alerts
- Event scheduling
- App integrations
- Worldwide community

#### Works With

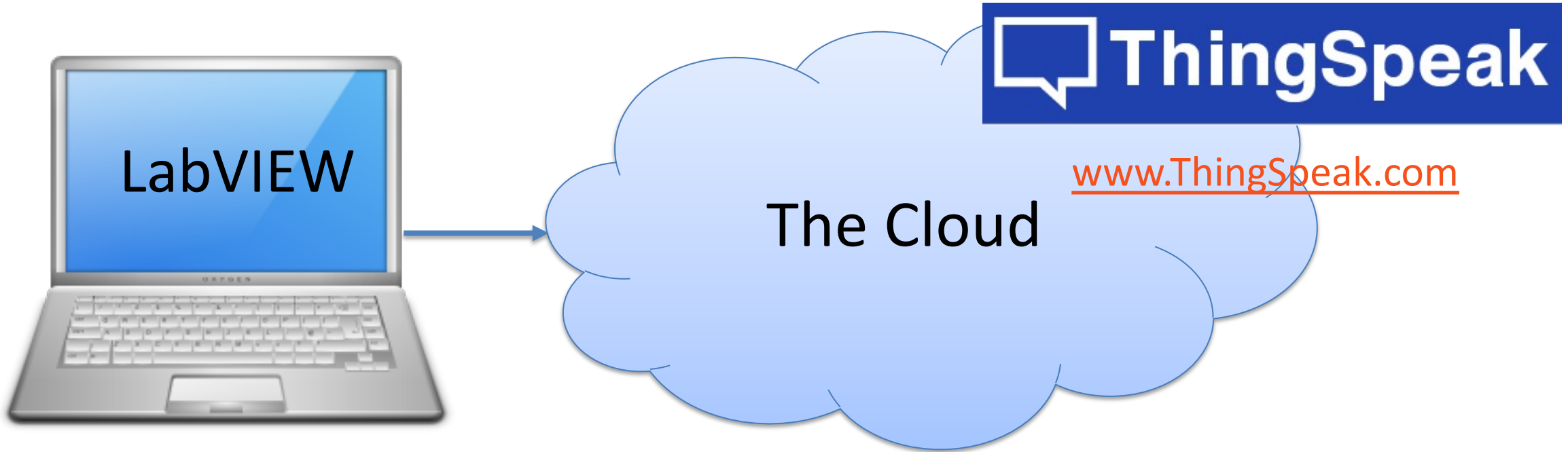
- Arduino®
- Particle Photon and Electron
- ESP8266 Wifi Module
- Raspberry Pi™
- Mobile and web apps
- Twitter®
- Twilio®
- MATLAB®

<https://se.mathworks.com/videos/introduction-to-thingspeak-107749.html>



# ThingSpeak + LabVIEW

# ThingSpeak + LabVIEW



# Configuration and Settings

## Work

Channel ID: 270011  
Author: [redacted]  
Access: Public

temperature

Private View Public View Channel Settings Sharing API Keys Data Import / Export

### Channel Settings

Percentage complete	65%
Channel ID	270011
Name	<input type="text" value="Work"/>
Description	<input type="text"/>
Field 1	<input type="text" value="Temperature B-"/> <input checked="" type="checkbox"/>
Field 2	<input type="text" value="Temperature B-"/> <input checked="" type="checkbox"/>
Field 3	<input type="text" value="Temperature B-"/> <input checked="" type="checkbox"/>

### Help

Channels store all the data that a ThingSpeak application collects. Each channel includes eight fields that can hold any type of data, plus three fields for location data and one for status data. Once you collect data in a channel, you can use ThingSpeak apps to analyze and visualize it.

### Channel Settings

- **Channel Name:** Enter a unique name for the ThingSpeak channel.
- **Description:** Enter a description of the ThingSpeak channel.
- **Field#:** Check the box to enable the field, and enter a field name. Each ThingSpeak channel can have up to 8 fields.
- **Metadata:** Enter information about channel data, including JSON, XML, or CSV data.
- **Tags:** Enter keywords that identify the channel. Separate tags with commas.
- **Latitude:** Specify the position of the sensor or thing that collects



Temperature [Celsius]

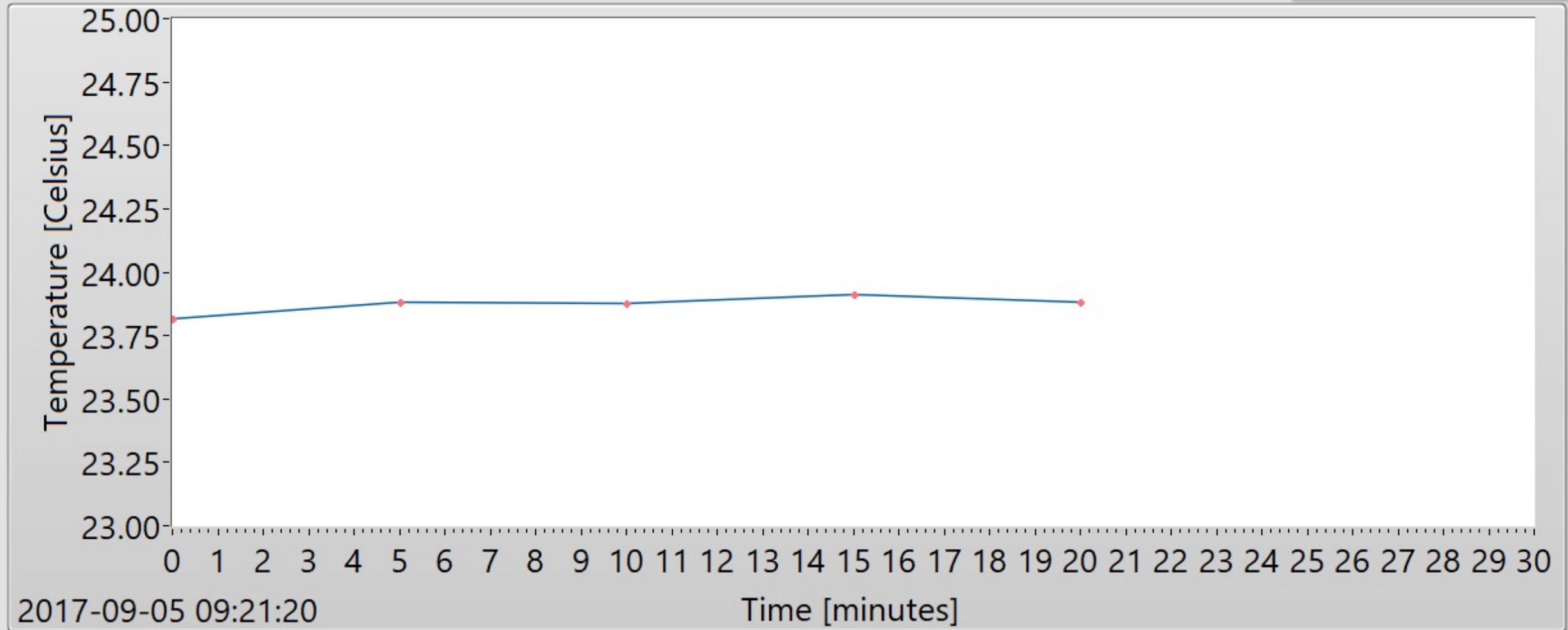
2017-09-05 09:40:48

23.88

Temperature



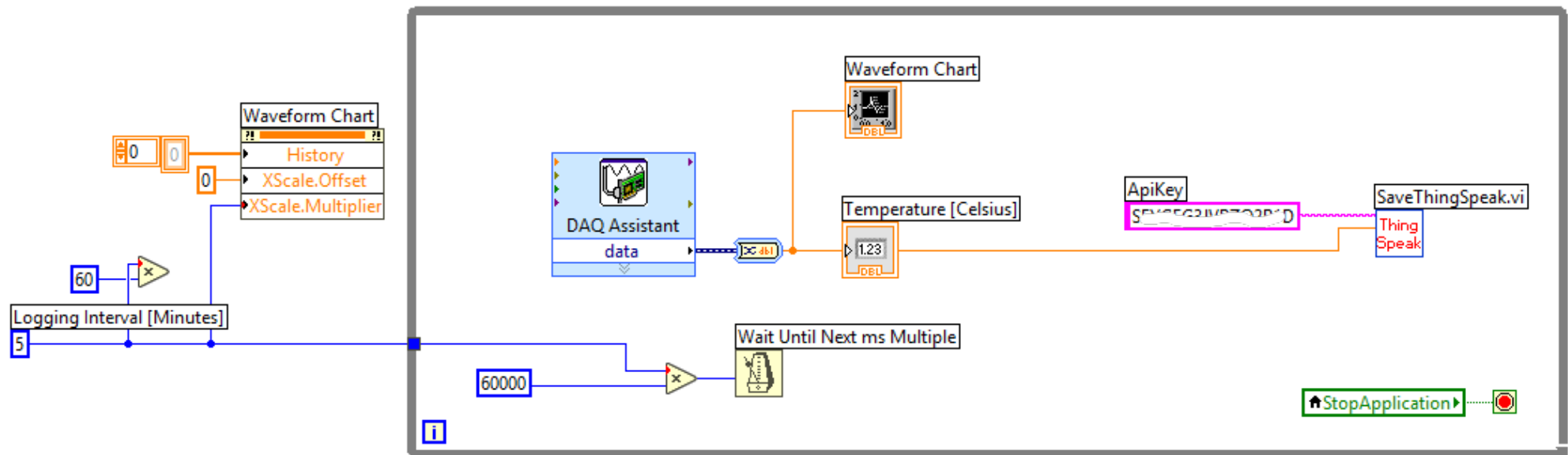
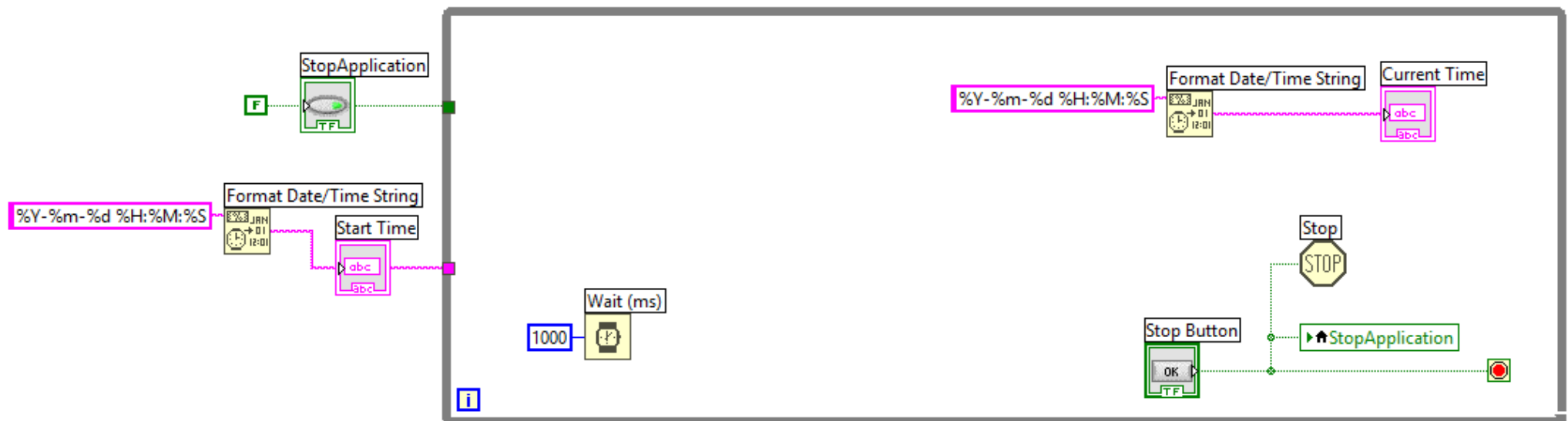
Waveform Chart

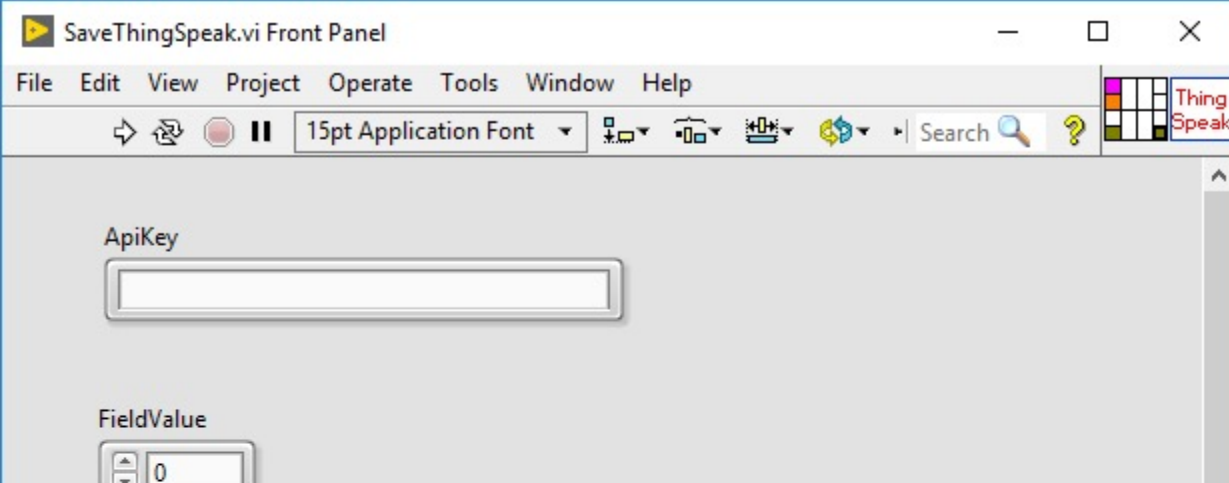


2017-09-05 09:21:20

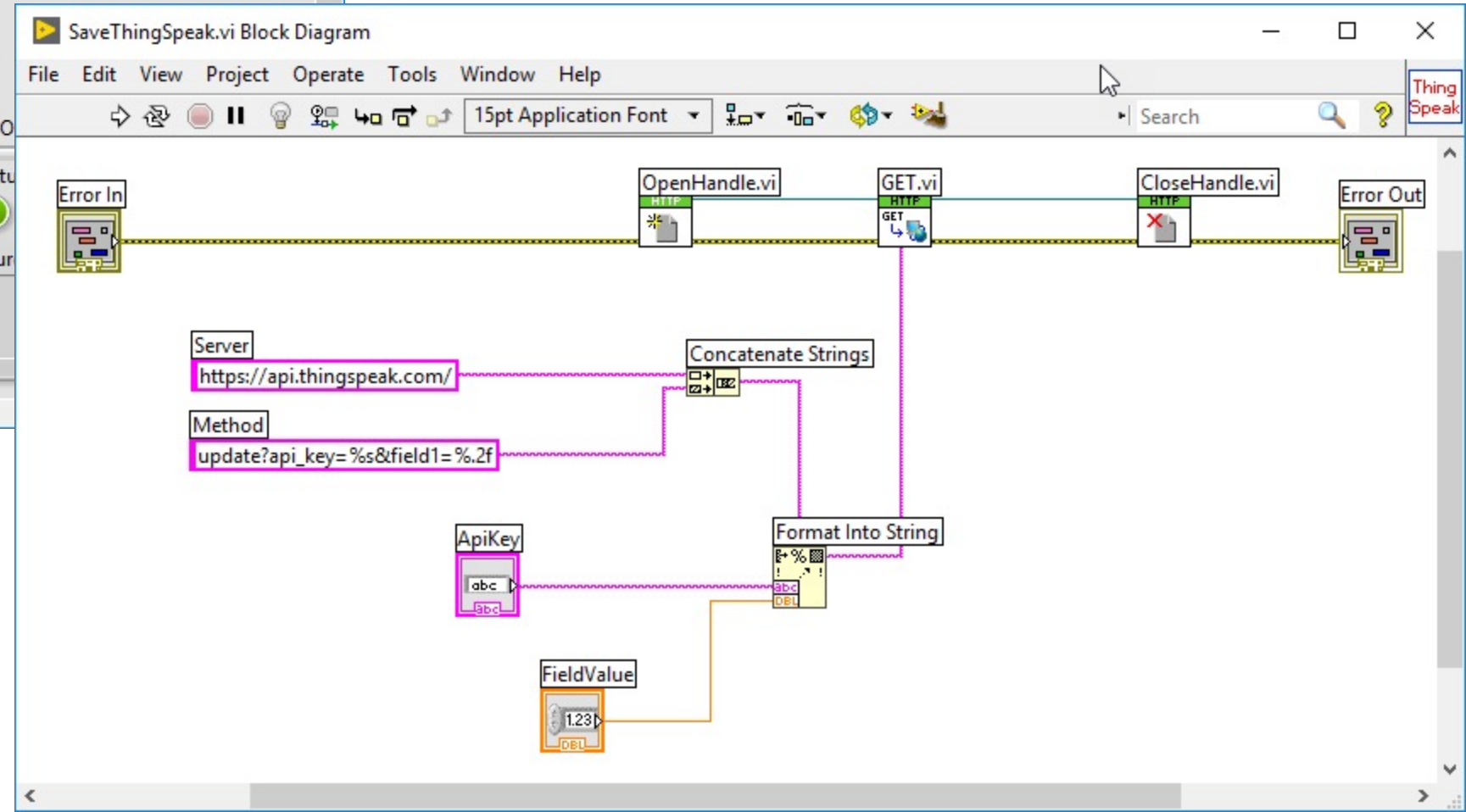
Time [minutes]

■ Stop





# SubVI



# Work

Channel ID: 237a

Author: h...

Access: Public

 temperature

Private View


Public View

Channel Settings

Sharing

API Keys

Data Import / Export

 Add Visualizations

 Data Export

 More Information

MATLAB Analysis

MATLAB Visualization

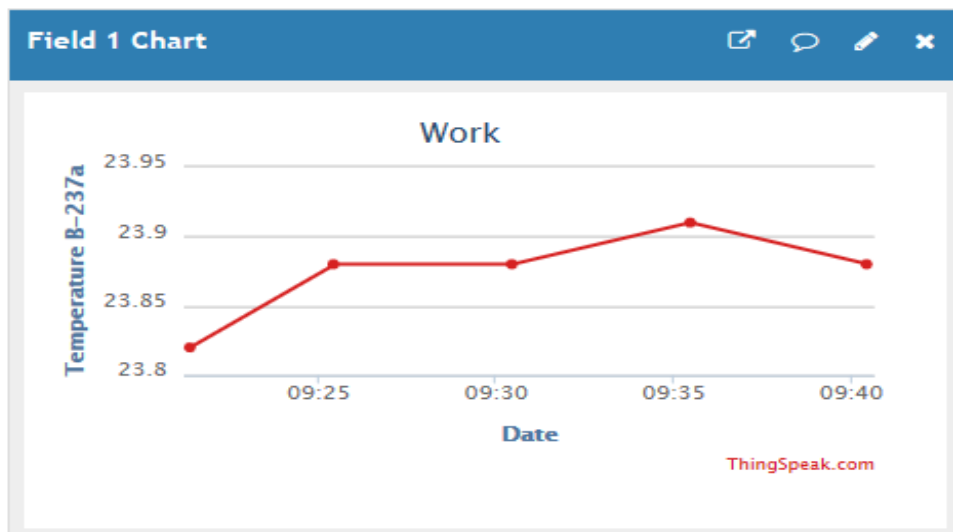
## Channel Stats

Created: 3 months ago

Updated: 8 minutes ago

Last entry: 8 minutes ago

Entries: 1498





# ThingSpeak + Web Browser

# ThingSpeak + Web Browser

- We can use a standard Web Browser in order to put data to ThingSpeak or to get data from ThingSpeak

Write Data Example:

[https://api.thingspeak.com/update?api\\_key=<WriteKey>&field3=2](https://api.thingspeak.com/update?api_key=<WriteKey>&field3=2)

Read Data Example:

<https://api.thingspeak.com/channels/<ChannelId>/fields/3/last.json?key=<ReadKey>>

Private View

Public View

Channel Settings

Sharing

API Keys

Data Import / Export

## Write API Key

Key

[Generate New Write API Key](#)

## Read API Keys

Key

Note

[Save Note](#)[Delete API Key](#)[Generate New Read API Key](#)

## Help

API keys enable you to write data to a channel or read data from a private channel. API keys are auto-generated when you create a new channel.

## API Keys Settings

- **Write API Key:** Use this key to write data to a channel. If you feel your key has been compromised, click **Generate New Write API Key**.
- **Read API Keys:** Use this key to allow other people to view your private channel feeds and charts. Click **Generate New Read API Key** to generate an additional read key for the channel.
- **Note:** Use this field to enter information about channel read keys. For example, add notes to keep track of users with access to your channel.

## API Requests

### Update a Channel Feed

```
GET https://api.thingspeak.com/update?api_key=5FV65623V45&field1=0
```

### Get a Channel Feed

```
GET https://api.thingspeak.com/channels/23041/feeds.json?results=2
```

### Get a Channel Field

```
GET https://api.thingspeak.com/channels/23041/fields/1.json?results=2
```

### Get Channel Status Updates

```
GET https://api.thingspeak.com/channels/23041/status.json
```

# Set and Read Values using a Web Browser



Field 3

## Set Kp Remotely Example:

Enter the following in a Web Browser (or from a Programming Language like LabVIEW, MATLAB, etc)

We set Kp=2

[https://api.thingspeak.com/update?api\\_key=<WriteKey>&field3=2](https://api.thingspeak.com/update?api_key=<WriteKey>&field3=2)

## Read Kp Remotely Example:

<https://api.thingspeak.com/channels/<ChannelId>/fields/3/last.json?key=<ReadKey>>

Response in Browser: {"created\_at":"2017-06-26T07:41:54Z","entry\_id":1270,"field3":"2"}

We read Kp=2





# ThingSpeak + MATLAB

## ThingSpeak Support from Desktop MATLAB

Prototype Internet of Things (IoT) applications using ThingSpeak and MATLAB

[Arduino Support from MATLAB](#)

[Arduino Support from Simulink](#)

[Raspberry Pi Support from Simulink](#)

[Raspberry Pi Support from MATLAB](#)

[ThingSpeak Support from Desktop MATLAB](#)

[BeagleBone Black Support from Embedded Coder](#)

### Capabilities and Features

The ThingSpeak support toolbox lets you use desktop MATLAB to analyze and visualize data stored on ThingSpeak.com or on private installations of ThingSpeak.



[Explore gallery \(3 images\)](#)

Specifically, you can perform the following tasks with MATLAB and the ThingSpeak support toolbox:

- Acquire most recent data from public and private ThingSpeak channels
- Simultaneously acquire data from all eight fields in a ThingSpeak channel
- Acquire channel and field data over a specified time period, or acquire a specified number of data points
- Write data from desktop MATLAB to a ThingSpeak channel

#### Getting Started Resources

[Expand all](#)

▼ Videos

[Introduction to ThingSpeak \(3:13\)](#)

> Examples

> Community

> Solutions

MathWorks Requirements 

Third-Party Requirements 

Don't see the hardware  
you're looking for?

[Request new hardware support](#)

# ThingSpeak + MATLAB

The “ThingSpeak Support Toolbox” lets you use desktop MATLAB to analyze and visualize data stored on ThingSpeak.com

ThingSpeak Support from Desktop MATLAB:

<http://se.mathworks.com/hardware-support/thingspeak.html>

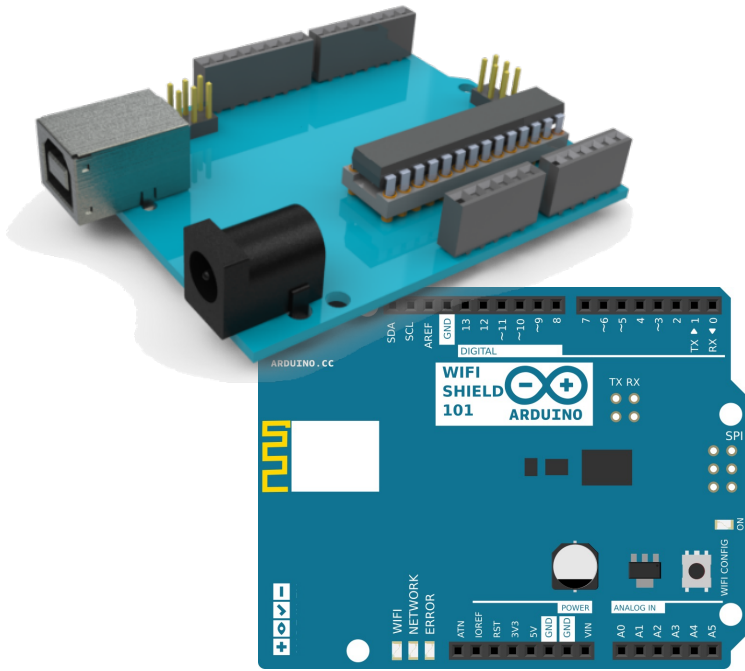


# ThingSpeak + Arduino

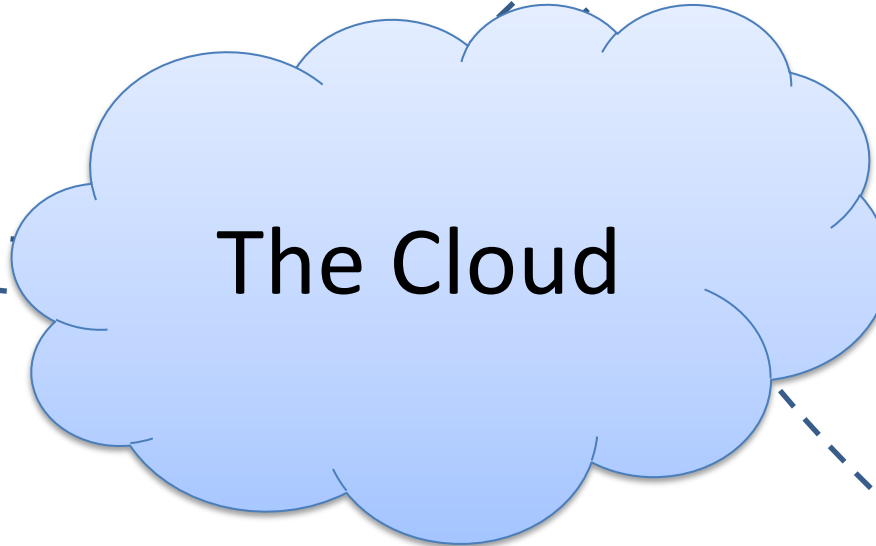
Data Collection



[www.ThingSpeak.com](http://www.ThingSpeak.com)

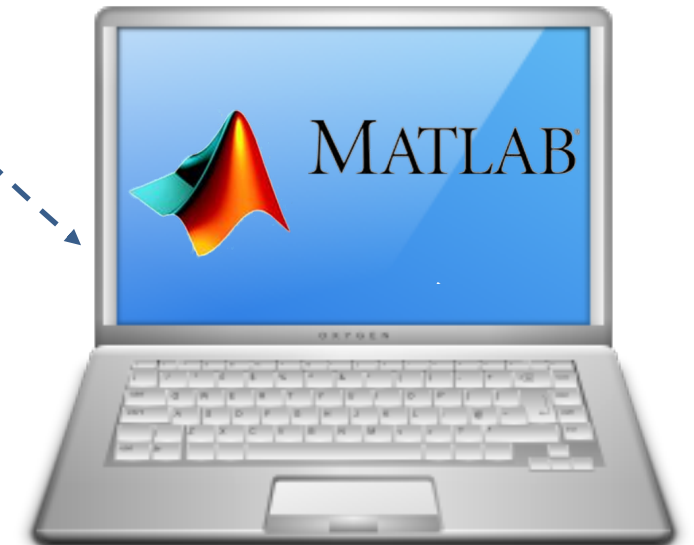


Arduino + Wi-Fi Shield



The Cloud

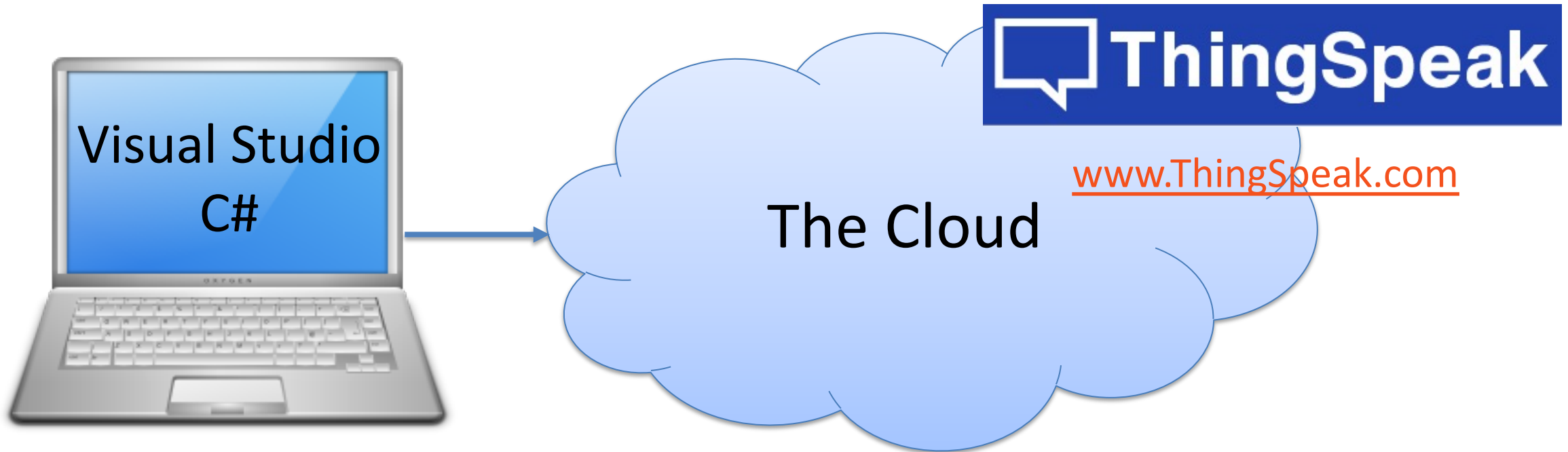
Data Analysis





# ThingSpeak + C#

# ThingSpeak + Visual Studio/C#



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TC-01 Logging with Timer

Sensor Name:

Data Rate:  seconds

Measurement Value:

TimeStamp:

```
void SaveMeasurementData()
{
    string apiKey;
    double tagValue;

    string server = "https://api.thingspeak.com/";
    string webMethod;
    string uri;

    var webclient = new WebClient();

    apiKey = "xxxxxxxxxxxxxxxxxxxxxx";

    tagValue = Convert.ToDouble(txtMeasurementValue.Text);

    webMethod = "update?api_key=" + apiKey + "&field1=" + tagValue;

    uri = server + webMethod;

    webclient.UploadString(uri, "POST", "");

}
```

# Hans-Petter Halvorsen

University of Southeast Norway

[www.usn.no](http://www.usn.no)

E-mail: [hans.p.halvorsen@usn.no](mailto:hans.p.halvorsen@usn.no)

Web: <http://www.halvorsen.blog>

