SORACOM Hands On
Internet of Things Workshop

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Please provide us your feedback at a **Post-Workshop Survey** and get a coupon!!

SORACOM Overview

SORACOM provides cloud-native connectivity with a platform designed for IoT. Much of what we'll use in this session will leverage the platform's components, including hardware (the SIM), connectivity (transmitting the data from the device over the air), and visualization (software).

SORACOM is the platform of choice to connect software developers looking to leverage the cloud's agility, scalability, and economics to their physical IoT deployments with over 7,000 worldwide customers. Developers can count on pay-as-you-go, take-what-you-need self-service and a low-cost connectivity SIM (**$0.06** keep-alive per-day fee, and **$0.08** per 1 MB of data transmitted) to get their projects off the ground and out into the field, with maximum ROI.

Reference (Optional Information)

[Soracom Overview] Slide: Google Slides / PowerPoint

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Social Media, we'd love it if you follow us and tweet about your experience

- ❏ **Soracom Blog: blog.soracom.io**
- ❏ **Soracom Facebook: facebook.com/soracom.io**
- ❏ **Soracom Twitter: @SoracomIOT #Soracom**

Reference (Materials & Resources)

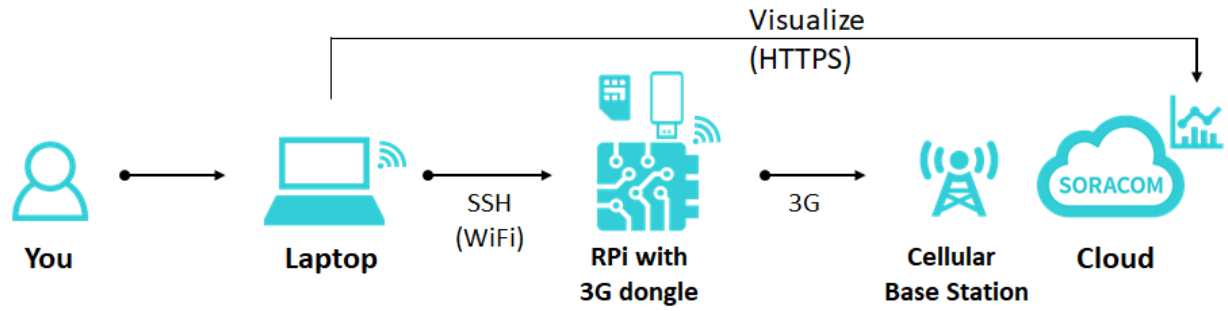
- ❏ **Developer Link: SORACOM Dev Site**

Please tweet with hash **#SORACOM** !!

Scenario 1: Cellular connected Raspberry Pi

In this scenario, you will use your laptop to configure Raspberry Pi with 3G dongle via SSH over WiFI, and collect data using Ultrasonic sensor and visualize data on Cloud using SORACOM Harvest

Raspberry Pi with SORACOM Air SIM



Pre-requirement

Receive the Cellular IoT Workshop Kit:

1-1: Using SORACOM Web Console

In this section, you learn how to use SORACOM web console with pre-registered SIM.

✅ Steps (Please go to github link below):
https://github.com/soracom/handson/wiki/1.1.-Using-SORACOM-User-Console-(Pre-Registered)

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1-2: Connecting to Raspberry Pi via SSH

In this section, you will use SSH over WiFi from your laptop to connect to your Raspberry Pi.

✅ Steps (Please go to github link below):
https://github.com/soracom/handson/wiki/1.2:-Connecting-to-Raspberry-Pi-via-SSH

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1-3: USB Dongle (Huawei MS 2131) Setting

In this section, you establish 3G (cellular) connectivity from Raspberry Pi using the 3G Dongle

✅ Steps (Please go to github link below):
https://github.com/soracom/handson/wiki/1.3.-USB-Dongle-configuration-tutorial-(SIM-pre-registered)

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1-4: Ultrasonic Sensor + SORACOM Harvest

In this section, you will learn how to send data over the connection you established via the cellular 3G network from an Ultrasonic sensor and visualize it in Cloud using SORACOM Harvest.

✅ Steps (Please go to github link below):
https://github.com/soracom/handson/wiki/1.4.-Ultrasonic-Sensor---Harvest-tutorial-(Pre-registered)

If you finish Scenario 1 during the workshop, you should proud of yourself !!

Before you proceed with Advanced Scenarios, or wrap up for today, please provide us your feedback at a **Post-Workshop Survey** and get a free Global SIM and a coupon!!

Scenario 2: Advanced Cellular connected Raspberry Pi

✅Pre-requirement

- ❏ Recommended to complete the previous scenarios.
- ❏ Receive **LED Kit** (LED and wires)

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2-1: SORACOM Beam (Basic)

In this scenario, you will learn how to send data using the SORACOM Beam service.

✅Steps (Please go to github link below):

https://github.com/soracom/handson/wiki/2.1.-SORACOM-Beam-(Basic)

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2-2: SORACOM Beam (Advanced) - MQTT bidirectional

In this scenario, you will learn how to control your device remotely and securely, by using SORACOM Beam and the cloud-standard MQTT communication protocol.

✅Steps (Please go to github link below):

https://github.com/soracom/handson/wiki/2.2.-SORACOM-Beam-(Advanced)---MQTT-bidirectional

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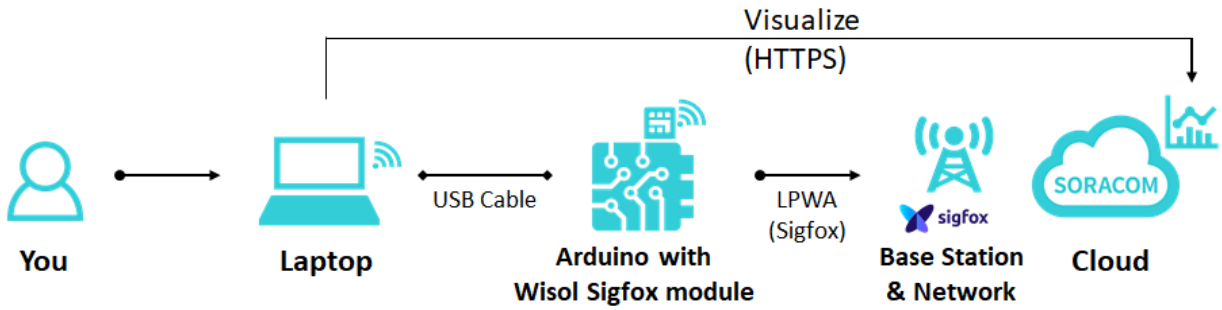
Scenario 3: Sigfox connected Arduino

3-1 Temperature Sensor + SORACOM Harvest

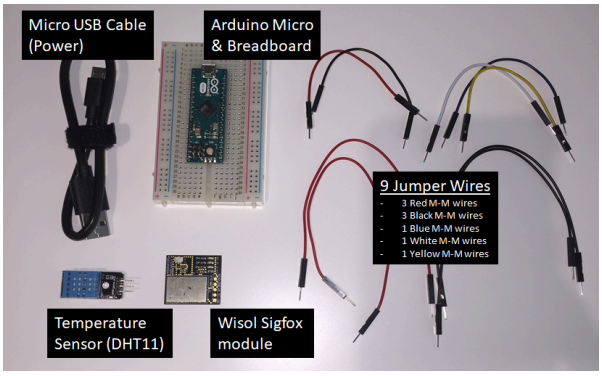
In this scenario, you will learn how to send data over the connection you established via the Sigfox LPWA network from a temperature sensor, and visualize it in the cloud using SORACOM Harvest.

Arduino with Sigfox Network and SORACOM Harvest



✅ Pre-requirement

- ❑ Receive Sigfox IoT Starter Kit



✅ Steps (Please go to github link below):

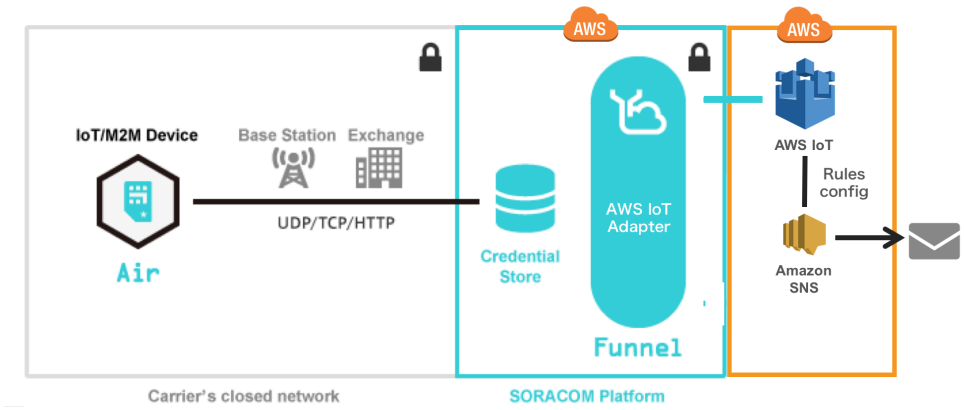
US Kit:
https://github.com/soracom/handson/wiki/3.1.-%5BSigfox%5D-Temperature-Sensor-with-SORACOM-Harvest

EU Kit: **https://github.com/soracom/handson/wiki/Sigfox-EU-MKRFOX1200**

Scenario 4: Advanced SORACOM Cloud Adapter

In this scenario, you will learn how to use the SORACOM Funnel adapter to aggregate data on the cloud.

Pre-requirement **Recommended to complete all previous scenarios.**



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4-1: SORACOM Funnel Kinesis Firehose adapter

Steps (Please go to DevSite link below):

https://dev.soracom.io/en/start/funnel_console/

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4-2: SORACOM Funnel AWS IoT adapter

Steps (Please go to DevSite link below):

https://dev.soracom.io/en/start/funnel_aws_iot/

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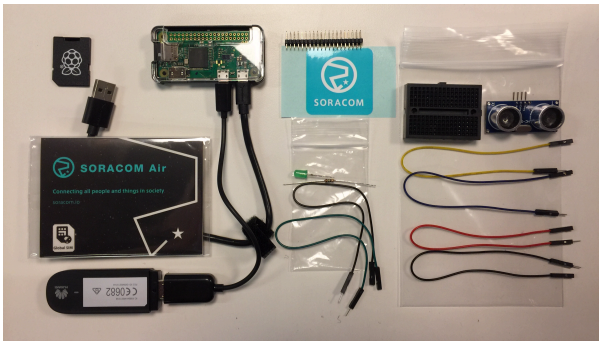
Appendix: How to set up a SORACOM Starter Kit

This scenario explains how to get started using SORACOM Starter Kit.

Pre-requirement

- ❏ **SORACOM Starter Kit <Zero>**



- Raspberry Pi Zero Wireless Board
- 8 GB Class 10 MicroSD Card
- Raspberry Pi Zero Case
- 2×20 0.1″ male GPIO header
- 1ft Micro USB Cables Male to Micro B
- Female to Micro B Male Adapter Cable
- 70 Points Solderless Breadboard
- 6 x Jumper Wires Premium 200mm M/F Male-to-Female
- Ultrasonic Sensor HC-SR04
- 1 LED x 15 Ohm Resistor
- Huawei Dongle [MS2131]
- SORACOM Air SIM for Global
- SORACOM Sticker

Step 1: Installing Raspbian OS in Micro SD

1. Go to raspberrypi.org to download Raspbian Jessie Lite file image from here.
2. Unzip the image.
3. Load Micro SD card in your computer (Win/Mac/Linux) using SD Card Reader (this is not included in the kit)
4. Burn Image in Micro SD Card using Etcher

Step 2: Pre-configure WiFi SSID and Password

5. Load Read Micro SD card in your computer (Win/Mac/Linux)
6. Create two files in “boot” directory of the SD card:
    a. An empty file with filename “ssh”
    b. A text file with filename “wpa_supplicant.conf” containing the following text*:
    **change to your network configuration*

```
network={
    ssid="soracom-event"
    psk="soracom7"
    key_mgmt=WPA-PSK
}
```

7. Remove SD Card from your computer (Win/Mac/Linux), insert the Micro SD into Raspberry Pi and power on.
8. Your Raspberry Pi should be connected to the WiFi network

✅ Step 3: Connecting via SSH to your Raspberry Pi

9. Open browser on your computer (Win/Mac/Linux)
10. Type 192.168.1.1 (Gateway) and access Router.
11. Check Router connected devices and find the device called “raspberrypi”
12. Find the IP address of “raspberrypi”
13. Use the IP address to access via SSH

✅ Step 4: Creating SORACOM account:

https://github.com/soracom/handson/wiki/0.-How-to-create-SORACOM-Global-Account

✅ Step 5: Register and Manage Air SIM using SORACOM User Console:

https://github.com/soracom/handson/wiki/1.1.-Manage-Air-SIM-using-SORACOM-User-Console

Appendix: Hands-On Wrap up

When you leave the workshop

Please run the following **cleanup script** on RPi (copy after $ and paste to your terminal):

```
pi@raspberrypi:~ $

sudo rm /etc/NetworkManager/dispatcher.d/90.set_ppp_route_metric; sudo nmcli connection delete soracom; sudo apt-get remove --purge network-manager; sudo apt-get remove --purge python-requests; sudo rm -rf /home/pi/*
```

Note: This will reset the changes you made on RPi during the workshop.

Please provide us a feedback at a **Post-Workshop Survey** and get a coupon! (See how to apply coupon next page)

Then, please **return the devices** (RPi, USB Dongle, etc.).

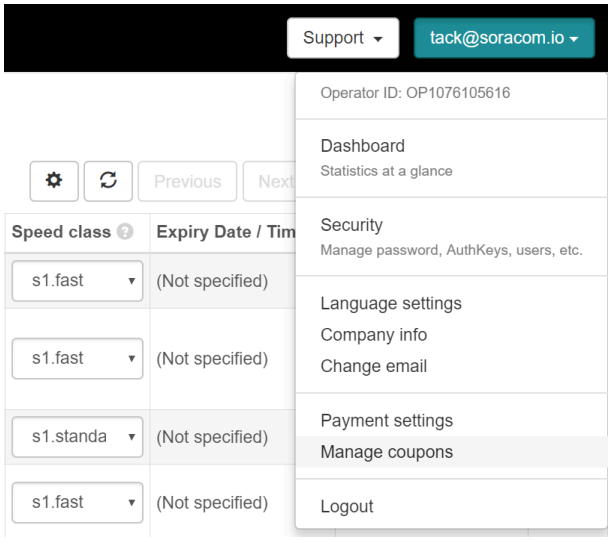
How to apply a Coupon

Please provide us a feedback at a **Post-Workshop Survey** and get a coupon!

If you have a coupon given to you by one of the SORACOM employees as a thank-you for completing our online feedback survey regarding your views on today's workshop, you can apply that coupon to your account by following these steps:

(1) Login to console.soracom.io

(2) Click the top-right corner at "SIM Management Screen"



(3) Select "Manage coupons"

(4) Select "Register a coupon" and Enter the code to apply to this account.