

# Azure IOT for WLSOM Full Bring-Up Instructions

1-25-2023

## Section1. Building Image with Script













### 1. Quick Instructions:

- In a new Mint21 environment, first create a folder for the build.
- Navigate to the build folder and clone the repo with the following commands:

```
sudo apt install git-core
```

```
git clone https://github.com/k-mchp/azure-wlsom-1-1.git
```

- The files in the azure-wlsom-1-1 folder should look like the following:

-  extra scripts
-  wlsom\_home\_folder\_files
-  0001-Fix-GCC-11-header-dependency.patch
-  0002-llvm-allow-env-override-of-exe-path.patch
-  az.bbayers.conf
-  az.local.conf
-  az.rebuild
-  az.rust-llvm.inc
-  Azure for WLSOM.pdf
-  azure-build
-  COPYING.MIT
-  README.md

- Run the build script with the following command

```
. azure-build
```

(You will be prompted for your password one time, this is your login password)

(Note - If you would like to build manually, just follow the commands in azure-build script)

### 2. Prerequisites:

- The scripts in the azure-wlsom-mint21 folder were tested on a new Mint21 machine.  
(Testing other Linux Distributions now)

### 3. Description:




























- The script downloads everything needed, places it all in the correct directories and builds the final image

Notes:

This document is based on documents written by Swapna Gurumani, John Haroian and Matt Wood

## Section2. Installing Image on WLSOM

-After the build is finished, locate wic file(~3.5GB) in poky/build-microchip/tmp/deploy/images/sama5d27-wlsom-ek-sd/

k	build01	azure-wlsom-1-1	poky	build-microchip	tmp	deploy	images	sama5d27-wlsom1-ek-sd
Name								
 at91bootstrap.bin								
 at91bootstrap-sama5d27_wlsom1_ek.bin								
 at91-sama5d27_wlsom1_ek.dtb								
 at91-sama5d27_wlsom1_ek--5.15+gitAUTOINC+839c6e99b0-r0-sama5d27-wlsom1-ek-sd-20230123144708.dtb								
 at91-sama5d27_wlsom1_ek-sama5d27-wlsom1-ek-sd.dtb								
 azure-demo.env								
 azure-demo-sama5d27-wlsom1-ek-sd.manifest								
 azure-demo-sama5d27-wlsom1-ek-sd.tar.gz								
 azure-demo-sama5d27-wlsom1-ek-sd.testdata.json								
 azure-demo-sama5d27-wlsom1-ek-sd.wic								
 azure-demo-sama5d27-wlsom1-ek-sd-20230123144708.rootfs.manifest								
 azure-demo-sama5d27-wlsom1-ek-sd-20230123144708.rootfs.tar.gz								
 azure-demo-sama5d27-wlsom1-ek-sd-20230123144708.rootfs.wic								
 azure-demo-sama5d27-wlsom1-ek-sd-20230123144708.testdata.json								
 BOOT.BIN								
 modules--5.15+gitAUTOINC+839c6e99b0-r0-sama5d27-wlsom1-ek-sd-20230123144708.tgz								
 modules-sama5d27-wlsom1-ek-sd.tgz								
 sama5d27_wlsom1_ek.itb								
 sama5d27_wlsom1_ek.its								
 sama5d27_wlsom1_ek-sdboot-uboot-4.0.3+gitAUTOINC+1d9e673698.bin								
 u-boot.bin								
 uboot.env								
 u-boot-sama5d27-wlsom1-ek-sd.bin								
 u-boot-sama5d27-wlsom1-ek-sd-v2022.01-at91+gitAUTOINC+2911ae8b22-r0.bin								
 zImage								
 zImage--5.15+gitAUTOINC+839c6e99b0-r0-sama5d27-wlsom1-ek-sd-20230123144708.bin								
 zImage-sama5d27-wlsom1-ek-sd.bin								

-If using a VM, Copy this file to Windows host machine using shared folder or removable storage

-Use Balena etcher or other SD card writer program to copy the wic image onto an SD card(8GB or larger)

-See instructions on creating an SD card here: <https://www.linux4sam.org/bin/view/Linux4SAM/DemoSD>

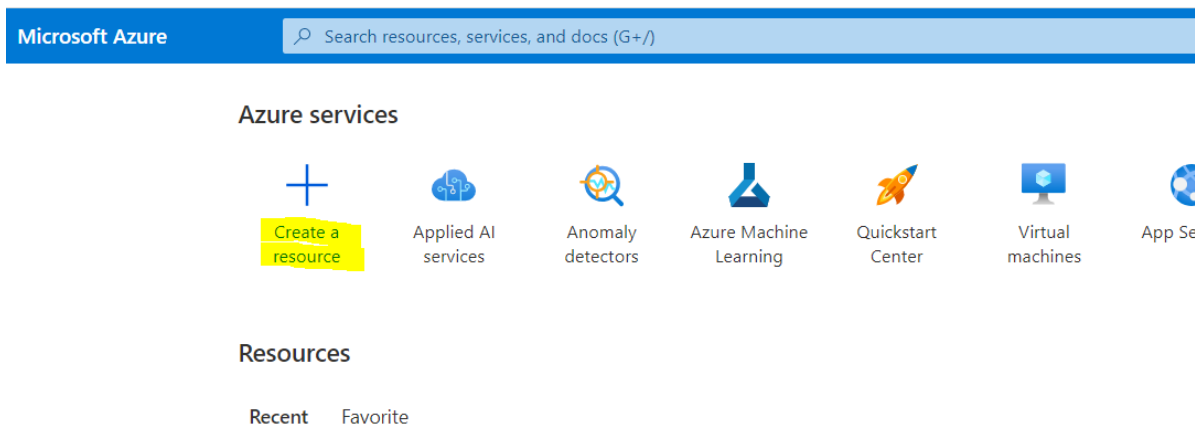
-Insert SD card into WLSOM

## Section3. Create IOT Edge Device and Module

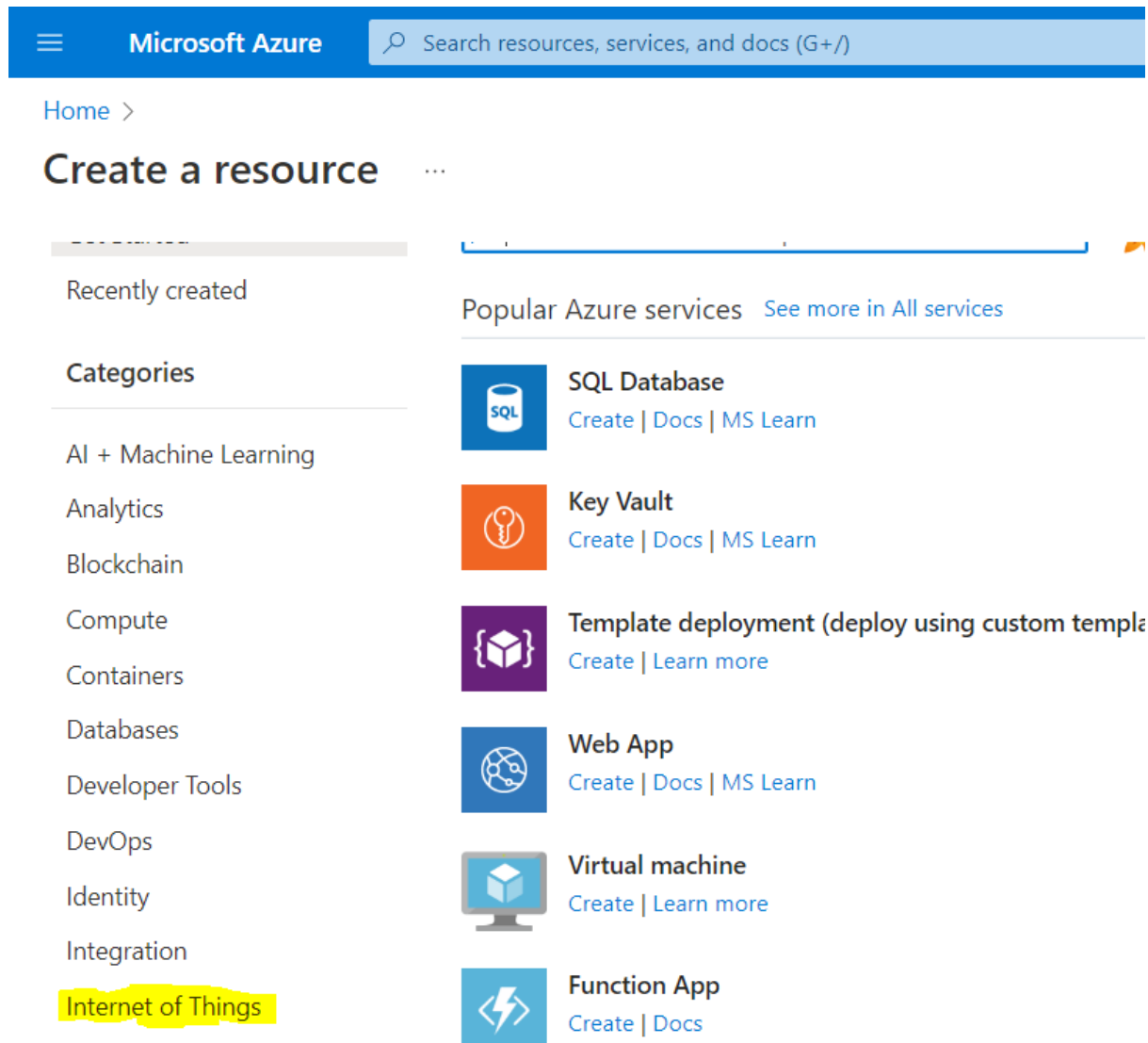
1. Sign in to your [Azure portal](#) and navigate to your IoT Hub

If you need to create a new IoT Hub, please follow the instructions [here](#)

2. Click Create a resource:



3. Click Internet of things:



4. Then create under IoT Hub:

## Create a resource ...

Popular Azure services [See more in this category](#)

Categories	
AI + Machine Learning	
Analytics	
Blockchain	
Compute	
Containers	
Databases	
Developer Tools	
DevOps	
Identity	
Integration	
Internet of Things	
IT & Management Tools	
...	

**IoT Hub**  
[Create](#) | [Docs](#) | [MS Learn](#)

**IoT Central application**  
[Create](#) | [Learn more](#)

**Azure Digital Twins**  
[Create](#) | [Learn more](#)

**Time Series Insights**  
[Create](#) | [Docs](#) | [MS Learn](#)

**IoT Hub Device Provisioning Serv**  
[Create](#) | [Docs](#) | [MS Learn](#)

**Azure Stack Edge**  
[Create](#) | [Learn more](#)

**Event Grid Topic**

5. Select a subscription or create on, name the device and select your pricing tier:

[Home](#) > [Create a resource](#) >

## IoT hub ...

Microsoft

[Basics](#) [Networking](#) [Management](#) [Add-ons](#) [Tags](#) [Review + create](#)

Create an IoT hub to help you connect, monitor, and manage billions of your IoT assets. [Learn more](#)

### Project details

Choose the subscription you'll use to manage deployments and costs. Use resource groups like folders to help you organize and manage resources.

Subscription * ⓘ	<div>WLS_WG_Azure IoT</div>
Resource group * ⓘ	<div>IOTC</div> <div><a href="#">Create new</a></div>

### Instance details

IoT hub name * ⓘ	<div>wlsom2</div>
Region * ⓘ	<div>East US</div>
Tier *	<div>Standard (most popular)</div> <div><a href="#">Compare tiers</a></div>
Daily message limit * ⓘ	<div>400,000 (\$24.8/month)</div> <div><a href="#">See all options</a></div>



6. The newly created IOT hub resource should show up in the portal. Click on it:

### Azure services





### Resources


Recent Favorite


Name	Type
 IOTC	Resource group
 wlsom02	IoT Hub


[See all](#)


7. After selecting the newly created IoT Hub, select IoT Edge on the left then select Add IoT Edge Device:


 **wlsom02 | IoT Edge**  ...  
IoT Hub


 Overview

 Activity log


 Access control (IAM)


 Tags


 Diagnose and solve problems


 Events


**Device management**


 Devices

 **IoT Edge**

 Configurations + Deployments

 Updates

 Queries

 Now, view and manage all devices from the new [Devices](#) page.





**IoT Edge Devices**

IoT Edge Deployments

Deploy Azure services and solution-specific code to on-premises devices. Use IoT Edge

Device name

**Find devices**

 Add IoT Edge Device  Refresh  Assign tags  Delete

<input type="checkbox"/>	Device ID	Runtime Response
--------------------------	-----------	------------------

8. Type in the **Device ID(choose any name)** and keep the other configurations as default, then save:

- a. Authentication Type: **Symmetric Key**
- b. Auto-Generate Keys: **Enabled**
- c. Connect this device to an IoT Hub: **Enable**

[Home](#) > [wlsom02 | IoT Edge](#) >



## Create a device ...

Find Certified for Azure IoT devices in the Device Catalog

Device ID \*

wlsom02-edge

☒ IoT Edge Device

Authentication type

**Symmetric key** X.509 Self-Signed

Auto-generate keys



Connect this device to an IoT hub

**Enable** Disable

Parent device

**No parent device**

[Set a parent device](#)

Child devices







0

[Choose child devices](#)



**Save**


9. Once you click Save, select the newly created IoT Edge Devices from the list

 Search <<

-  Overview
-  Activity log
-  Access control (IAM)
-  Tags
-  Diagnose and solve problems
-  Events

#### Device management

-  Devices
-  **IoT Edge**
-  Configurations + Deployments

 Now, view and manage all devices from the new [Devices](#) page.

#### IoT Edge Devices





#### IoT Edge Deployments

Deploy Azure services and solution-specific code to on-premises devices. [Learn more](#)

Device name

*enter device ID*

**Find devices**

 Add IoT Edge Device  Refresh  Assign tags  Delete



Device ID







Runtime Response




wlsom02-edge


406 -- The device is offline

#### 10. Select **Set Modules**


 Save  **Set modules**  Manage child devices  Troubleshoot  Device twin  Refresh

Device ID 


wlsom02-edge

Primary key 

.....

Secondary key 

.....

Primary connection string 

.....

Secondary connection string 

.....

11. Click **Add** and then select **IoT Edge Module** to add a new module

[Home](#) > [wlsom02 | IoT Edge](#) > [wlsom02-edge](#) >

# Set modules on device: wlsom02-edge ...

wlsom02

**Modules**   Routes   Review + create

## Container Registry Credentials

You can specify credentials to container registries hosting module images. Listed creden Agent will report error code 500 if it can't find a container registry setting for a module.

NAME	ADDRESS
<input type="text" value="Name"/>	<input type="text" value="Address"/>

## IoT Edge Modules

IoT Edge modules are Docker containers deployed to IoT Edge devices. They can commu Modules on devices count toward IoT Hub quota limits based on tier and units. For exar other updates are happening in the IoT Hub.

+ Add

+ IoT Edge Module

+ Marketplace Module

+ Azure Stream Analytics Module

Runtime Settings

DESIRED STATUS
----------------

Send usage data to Microsoft to help improve our products and services.



12. Configure the module with the following settings and click **Save**:

- a. Name: **SimulatedTemperatureSensor**
- b. Image URI: **mcr.microsoft.com/azureiotedge-simulated-temperature-sensor:1.1.11-linux-arm32v7**

[Home](#) > [wlsom02 | IoT Edge](#) > [wlsom02-edge](#) > [Set modules on device: wlsom02-edge](#) >

## Update IoT Edge Module ...

wlsom02

IoT Edge module settings. [Learn more](#)

Module name \*

SimulatedTemperatureSensor

**Settings**

Environment Variables

Container Create Options

Module Twin Settings

Image URI \*

mcr.microsoft.com/azureiotedge-simulated-temperature-sensor:1.1.11-linux-arm32v7

Restart Policy \*

always

Desired Status \*

running

Image Pull Policy

Startup Order

200

13. Click **Runtime Settings**, Change the image value of **Edge Hub** and **Edge Agent** like these, then **Save** it.

- c. Edge Hub Image URI - **mcr.microsoft.com/azureiotedge-hub:1.1.11-linux-arm32v7**
- d. Schema Version – **1.1**
- e. Edge Agent Image - **mcr.microsoft.com/azureiotedge-agent:1.1.11-linux-arm32v7**
- f. Schema Version – **1.1**

Home > wlsom02 | IoT Edge > wlsom02-edge >

## Set modules on device: wlsom02-edge

wlsom02

Modules Routes Review + create

### Container Registry Credentials

You can specify credentials to container registries hosting module images. The Edge Agent will report error code 500 setting for a module.

NAME	ADDRESS	USER
<input type="text" value="Name"/>	<input type="text" value="Address"/>	<input type="text" value="User"/>

### IoT Edge Modules

IoT Edge modules are Docker containers deployed to IoT Edge devices. They can receive data from the IoT Edge runtime or send data to the IoT Edge runtime. Modules on devices count as units. For example, for S1 tier, modules can be set 10 times per second. The number of modules can be set in the IoT Hub.

+ Add

NAME	DESIRED STATUS
SimulatedTemperatureSensor	

Review + create

< Previous

Next >

## Runtime Settings

wlsom02

Edge Agent Edge Hub

Image URI \*

mcr.microsoft.com/azureiotedge-agent:1.1.11-linux-arm32v7

Schema version

1.1

Image Pull Policy

### Environment Variables

Environment variables provide supplemental information to a configuration process.

NAME	TYPE	VALUE
<input type="text" value="SendRuntime..."/>	<input type="text" value="True/False"/>	<input type="text" value="False"/>
<input type="text" value="Variable name"/>	<input type="text" value="Text"/>	<input type="text" value="Variable value"/>

### Container Create Options

Create options direct the creation of the IoT Edge module Docker container.

1

Apply

Cancel

14. Click **Apply**, then **Review + create** to review deployment settings.

15. Click **Create** to deploy it. (It may take a few minutes for the device to show up after creating)

16. Go back to your created IoT Edge Device and copy the **Primary Connection String** with the icon on the right (This will be needed to add to the config.yaml file on the WLSOM later)

Home > wlsom02 | IoT Edge >

## wlsom02-edge

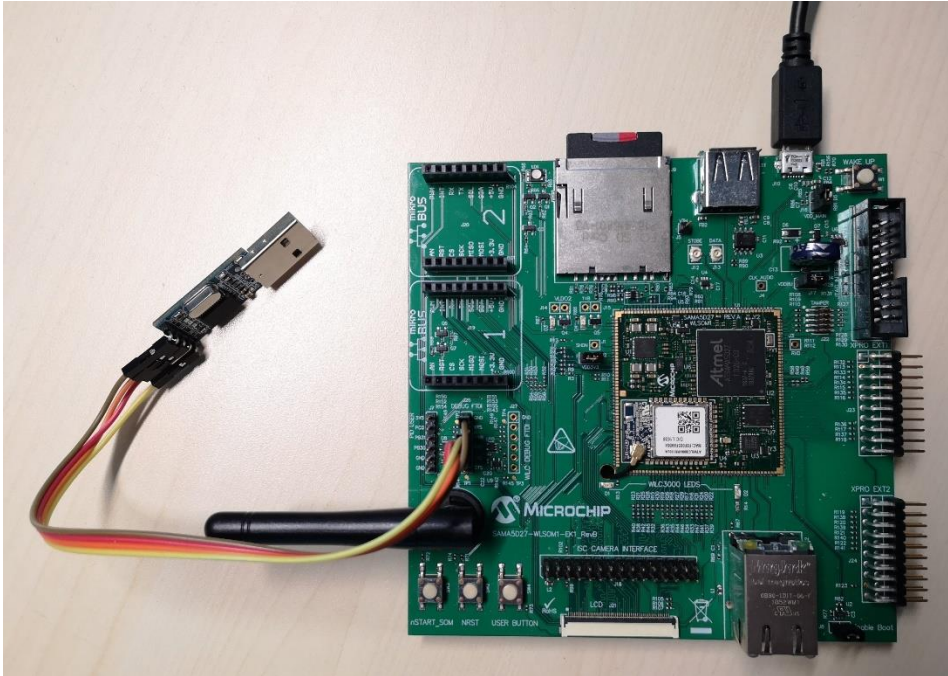
wlsom02

Device ID ⓘ	wlsom02-edge	<input type="button" value="Copy"/>
Primary key ⓘ	..... <input type="button" value="Copy"/>	<input type="button" value="Copy"/>
Secondary key ⓘ	..... <input type="button" value="Copy"/>	<input type="button" value="Copy"/>
Primary connection string ⓘ	..... <input type="button" value="Copy"/>	<input type="button" value="Copy"/>
Secondary connection string ⓘ	..... <input type="button" value="Copy"/>	<input type="button" value="Copy"/>

## Section 4. Bringing Up Image

### 1. Start and Login:

- Connect 5V supply into J10 connector
- Connect a USB-serial adapter to the debug connector J26 of the WLSOM and USB port of computer
- Connect ethernet cable to J6 on WLSOM and other end to a running Access Point  
(For WiFi - see Appendix 1 - Setting Up WiFi )



-Open serial terminal program of choice and connect to USB adapter serial port with settings: 115200 bps 8-N-1

-Press “nSTART\_SOM” button on the WLSOM (There should be messages appearing on the screen)

-When messages are finished enter “root” to login:

```
login as: root
Last login: Tue Aug 16 21:25:46 2022 from 192.168.1.144
root@sama5d27-wlsom1-ek-sd:~#
```

For all of the lines that mention commands must be run on each startup or only run once, there exist shell script files to make this easier. “azurt\_start.sh”, and “azure\_restart.sh” exist to run the proper commands to start Azure properly from root login of the WLSOM. Copy these files to /root/home/ Then the command “./azure\_start.sh” only needs to run one time, while “./azure\_restart.sh” must be run on startup after.

## 2. Setting up swap drive:

-Enter the following commands:

```
sudo fallocate -l 1G /swapfile
```

```
sudo chmod 600 /swapfile
```

```
sudo mkswap /swapfile
```

```
sudo swapon /swapfile (only this command has to be run on each restart, all others on first time start)
```

## 3. Change ownership of iotedge files **(These commands must be run every restart):**

-Enter the following commands:

```
chown iotedge:iotedge /var/run/iotedge/
```

```
chown iotedge:iotedge /var/lib/iotedge/
```

## 4. Modify iotedge configuration file(This only needs to be done once):

-Type the following command to edit the config.yaml file

```
vi /etc/iotedge/config.yaml
```

-Paste the primary connection string into the config file (located towards the beginning of the file)

```
Manual provisioning configuration|
provisioning:
  source: "manual"
  device_connection_string: "<ADD DEVICE CONNECTION STRING HERE>"
```

-Change the value of hostname, listen.management\_uri and listen.workload\_uri (located towards the end of the file)

```
hostname: "sama5d27-wlsom1-ek-sd"|
listen:
  management_uri: "unix:///var/run/iotedge/mgmt.sock"
  workload_uri: "unix:///var/run/iotedge/workload.sock"
```

## 5. Starting IoT Edge **(Must be run on each restart):**

-Enter the following command to start IoT edge on the WLSOM:

(May take up to 5 minutes for an error-free connection to be made to the portal)

```
systemctl restart iotedge
```

-(Optional) Enter the following command to watch log of iotedge:

(Some warnings/errors may show up, but eventually fix themselves upon pulling image and updating)

```
journalctl -u iotedge -f
```

On first startup, messages pulling image tempsensor and edge running shows good connection to Azure cloud(may take up to 30min for a complete connection on first startup):

```
Oct 17 03:40:59 sama5d27-wlsom1-ek-sd iotedged[502]: 2022-10-17T03:40:59Z [INFO]
- Pulling image mcr.microsoft.com/azureiotedge-simulated-temperature-sensor:1.1
.11-linux-arm32v7...
Oct 17 03:41:49 sama5d27-wlsom1-ek-sd iotedged[502]: 2022-10-17T03:41:49Z [INFO]
- Checking edge runtime status
Oct 17 03:41:50 sama5d27-wlsom1-ek-sd iotedged[502]: 2022-10-17T03:41:50Z [INFO]
- Edge runtime is running.
```



On any other restart, messages that show successful logs for the tempsensor indicates a good connection to Azure cloud (may take up to 15min for a complete connection on other startups):

```
Oct 17 04:49:43 sama5d27-wlsom1-ek-sd iotedged[468]: 2022-10-17T04:49:43Z [INFO]
- Querying system resources...
Oct 17 04:49:44 sama5d27-wlsom1-ek-sd iotedged[468]: 2022-10-17T04:49:44Z [INFO]
- [mgmt] - - - [2022-10-17 04:49:44.564915349 UTC] "GET /modules?api-version=20
20-07-07 HTTP/1.1" 200 OK 1767 "-" "-" auth_id(-)
Oct 17 04:49:44 sama5d27-wlsom1-ek-sd iotedged[468]: 2022-10-17T04:49:44Z [INFO]
- Getting logs for module tempsensor...
Oct 17 04:49:44 sama5d27-wlsom1-ek-sd iotedged[468]: 2022-10-17T04:49:44Z [INFO]
- Successfully got logs for module tempsensor
Oct 17 04:49:44 sama5d27-wlsom1-ek-sd iotedged[468]: 2022-10-17T04:49:44Z [INFO]
- [mgmt] - - - [2022-10-17 04:49:44.642813886 UTC] "GET /modules/tempsensor/log
s?api-version=2020-07-07&follow=false&since=15m&tail=1500 HTTP/1.1" 200 OK - "-"
auth_id(-)
```


## Section 6. Verify WLSOM Data in the Cloud


1. Sign in to your [Azure portal](#) and navigate to your IoT Hub
2. Click on the device name of the IOT Edge device(200 -- OK should be showing if the device is connection):

[Home](#) > [wlsom02](#)


 **wlsom02 | IoT Edge**  ...  
IoT Hub


 Search

 Now, view and manage all devices from the new [Devices](#) page.


 Overview

 Activity log

 Access control (IAM)


 Tags


 Diagnose and solve problems

 Events

Device management

 Devices

 IoT Edge

 Configurations + Deployments


**IoT Edge Devices**


IoT Edge Deployments

Deploy Azure services and solution-specific code to on-premises devices. the cloud. [Learn more](#)

Device name

**Find devices**

 Add IoT Edge Device

 Refresh

 Assign tags

 Delete

☐

Device ID

Runtime Response

☐

**wlsom02-edge**

200 -- OK



5. Select the running link next to the temperature Sensor module:



Home > wlsom02 | IoT Edge >


wlsom02-edge

wlsom02

Save Set modules Manage child devices Troubleshoot Device twin Refresh

Primary connection string ⓘ   


Secondary connection string ⓘ   

IoT Edge runtime response ⓘ  

Tags [\(edit\)](#) No tags

Enable connection to IoT Hub ⓘ ☒ Enable ☐ Disable

Parent device ⓘ 

No parent device 

Modules IoT Edge hub connections Deployments and Configurations




Name	Type	Specified in Deployment	Reported by Device	Runtime Status
<a href="#">\$edgeAgent</a>	IoT Edge System Module	✓ Yes	✓ Yes	<a href="#">running</a>
<a href="#">\$edgeHub</a>	IoT Edge System Module	✓ Yes	✓ Yes	<a href="#">running</a>
<a href="#">SimulatedTemperatureSensor</a>	IoT Edge Custom Module	✓ Yes	✓ Yes	<a href="#">running</a>

6. The simulated temperature data sent from the wlsom should show up in the log:

Home > wlsom02 | IoT Edge > wlsom02-edge >

Troubleshoot

wlsom02

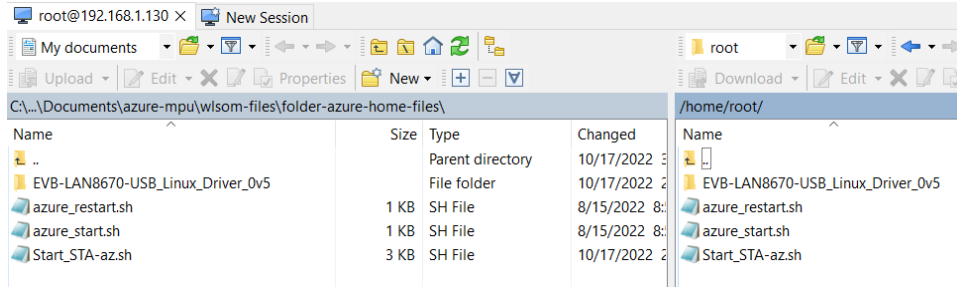
 Restart SimulatedTemperatureSensor  Refresh  Download

Time range: Since 15 minutes Find: Not specified

01/25/2023 23:37:20> Sending message: 84, Body: [{"machine":{"temperature":59.330773874805665,"pressure":5.366797023712038},"ar  
01/25/2023 23:37:25> Sending message: 85, Body: [{"machine":{"temperature":59.59957150712123,"pressure":5.397419538785963},"am  
01/25/2023 23:37:30> Sending message: 86, Body: [{"machine":{"temperature":60.61349409288423,"pressure":5.51292970678428},"amb  
01/25/2023 23:37:35> Sending message: 87, Body: [{"machine":{"temperature":61.290055911541,"pressure":5.590006369669228},"ambi  
01/25/2023 23:37:40> Sending message: 88, Body: [{"machine":{"temperature":61.972007215009995,"pressure":5.667697024494809},"ar  
01/25/2023 23:37:45> Sending message: 89, Body: [{"machine":{"temperature":62.48813773889007,"pressure":5.726496704430514},"am  
01/25/2023 23:37:50> Sending message: 90, Body: [{"machine":{"temperature":63.151595461252874,"pressure":5.802080495585771},"ar  
01/25/2023 23:37:55> Sending message: 91, Body: [{"machine":{"temperature":63.71844897650574,"pressure":5.866658744158881},"am  
01/25/2023 23:38:00> Sending message: 92, Body: [{"machine":{"temperature":64.36248442873473,"pressure":5.940029871628007},"am  
01/25/2023 23:38:05> Sending message: 93, Body: [{"machine":{"temperature":64.17099182280757,"pressure":5.918214258294532},"am  
01/25/2023 23:38:10> Sending message: 94, Body: [{"machine":{"temperature":64.96583538780258,"pressure":6.008766056838269},"am  
01/25/2023 23:38:15> Sending message: 95, Body: [{"machine":{"temperature":66.00388607621176,"pressure":6.127165275782252},"am

## Appendix 1. - Setting Up WiFi

All of these steps have been put into a script called Start\_STA-Azure.sh. It will just prompt you for your routers ssid and password then setup the WiFi automatically. You can find this script in a folder called "home\_folder\_files". This folder contains this shell script for bringing up wifi as well as scripts for bringing up azure iotedge. Just copy the files onto the wlsom in /root/home/ directory. You can use an SCP program, like WinSCP to connect over the eth0 to your PC for transferring files back and forth.



This example was tested on WAP with a default gateway 192.168.1.1 (The user must select an IP address that is within the same subnet as the gateway and rest of the network. 192.168.1.xxx

1. Update wlan0 information in /etc/network/interfaces, if this file doesn't exist, create it

```
root@sama5d27-wlsom1-ek-sd:~# cat /etc/network/interfaces

# /etc/network/interfaces -- configuration file for ifup(8), ifdown(8)

# The loopback interface
auto lo
iface lo inet loopback

# Wireless interfaces
auto wlan0
iface wlan0 inet dhcp
    wireless_mode managed
    wireless_essid YOUR_SSID
    wireless_key YOUR_PSK
    wpa-driver wext
    wpa-conf /etc/wpa_supplicant.conf

iface atm10 inet dhcp
```

2. Update /etc/wpa\_supplicant.c with your routers ssid and password:

```
/etc/wpa_supplicant.conf - root@192.168.1.130 - Edito

ctrl_interface=/var/run/wpa_supplicant
ctrl_interface_group=0
update_config=1

network={
    ssid="your_ssid"
    psk="your_password"
}
```



### 3.Reboot the board

```
root@sama5d27-wlsom1-ek-sd:~# reboot
```

### 4. Start wpa supplicant:

The following command silences the flood of debug messages that you may see when you turn the wifi on. If you want to see these messages then just omit the following command. It is optional.

```
echo 0 > /sys/kernel/debug/wilc/wilc_debug_region
```

The next commands allows the wlan0 to turn on:

```
rfkill unblock all
```

```
wpa_cli terminate
```

This command uses the previously modified file to read your routers SSID and password:

```
wpa_supplicant -B -iwlan0 -Dnl80211 -c /etc/wpa_supplicant.conf &
```

```
echo 0 > /sys/kernel/debug/wilc/wilc_debug_region
Debug region set to 0
root@sama5d27-wlsom1-ek-sd:~# rfkill unblock all
power up request for already powered up source Wifi
Device already up. request source is Wifi
root@sama5d27-wlsom1-ek-sd:~# wilc_wlan_cfg_indicate_rx: Scan Notification Received
wilc_wlan_cfg_indicate_rx: Info message received
wilc_update_mgmt_frame_registrations setup authframe
wilc_wlan_cfg_indicate_rx: Scan Notification Received
wilc_wlan_cfg_indicate_rx: Info message received
IPo6: ADDRCONF(NETDEV_CHANGE): wlan0: link becomes ready
wilc_wlan_cfg_indicate_rx: Scan Notification Received
wilc_wlan_cfg_indicate_rx: Scan Notification Received
wpa_supplicant -B -iwlan0 -Dnl80211 -c /etc/wpa_supplicant.conf &
[1] 362
root@sama5d27-wlsom1-ek-sd:~# Successfully initialized wpa_supplicant
nl80211: kernel reports: Match already configured
nl80211: kernel reports: Match already configured
```

### 5.Start DHCP client, which allows the router to issue an IP address:

```
udhcpc -i wlan0 &
```



7. Verify whether network can be connected to external sites: