

Project Development Phase

Sprint -1

Date	12 November 2022
Team ID	PNT2022TMID34928
Project Name	IOT BASED SMART CROP PROTECTION SYSTEM

Python Code:

```
import time

import sys

import ibmiotf.application
import ibmiotf.device

import random

#Provide your IBM Watson Device Credentials

organization = "2ldaf5"

deviceType1 = "Sensor"

deviceId1 = "DHT"

authMethod = "token"

authToken1 = "NeVIAy2K16H)d9sXvz"


deviceType2 = "Sensor1"

deviceId2 = "Soil_moisture"

authToken2= "zwr247qk1Xca0w?QEs"


deviceType3 = "Actuator"

deviceId3 = "Water_pump"

authToken3= "Pze?D!@FjZeAtfMB4q"
```

```

# Initialize GPIO

def myCommandCallback(cmd):

    print("Command received: %s \n" % cmd.data['command'])

    status=cmd.data['command']

    if status=="Waterpump_on":

        print ("Water Pump is Turned ON \n")

    else :

        print ("Water Pump is Turned OFF \n")

try:

    deviceOptions1 = {"org": organization, "type": deviceType1, "id": deviceId1, "auth-
method": authMethod, "auth-token": authToken1}

    deviceCli1 = ibmiotf.device.Client(deviceOptions1)

    #.....

    deviceOptions2 = {"org": organization, "type": deviceType2, "id": deviceId2, "auth-
method": authMethod, "auth-token": authToken2}

    deviceCli2 = ibmiotf.device.Client(deviceOptions2)

    #.....

    deviceOptions3 = {"org": organization, "type": deviceType3, "id": deviceId3, "auth-
method": authMethod, "auth-token": authToken3}

    deviceCli3 = ibmiotf.device.Client(deviceOptions3)

    #.....

except Exception as e:

    print("Caught exception connecting device: %s" % str(e))

    sys.exit()

deviceCli1.connect()

deviceCli2.connect()

deviceCli3.connect()

while (True):

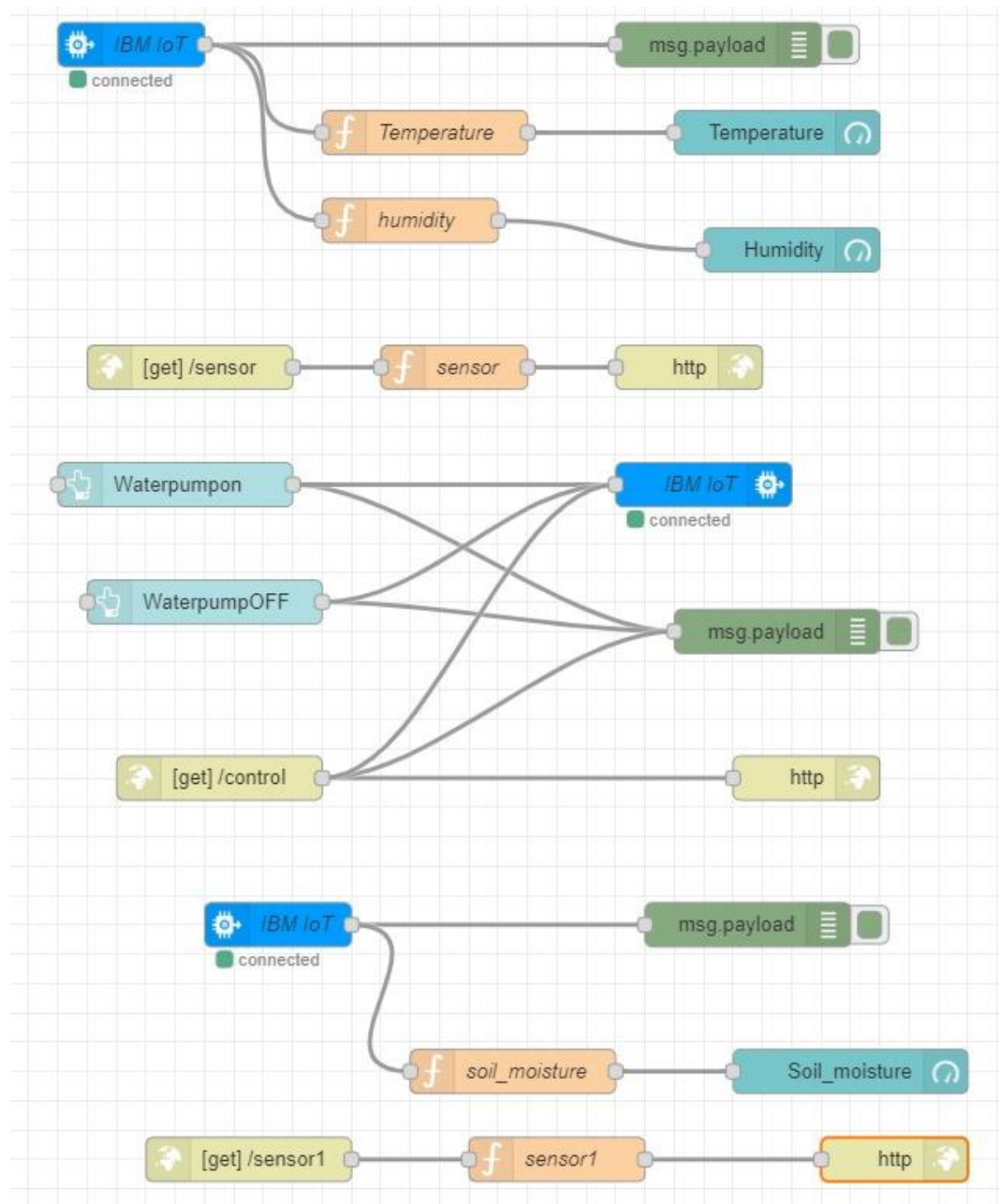
```

```

#Get Sensor Data from DHT11
temp=random.randint(0,45)
Humid=random.randint(0,100)
data1 = { 'Temperature' : temp , 'Humidity': Humid}
def myOnPublishCallback1():
    print ("Published Temperature  = %s C" % temp, "Humidity  = %s %" % Humid,
"to IBM Watson \n")
    success1 = deviceCli1.publishEvent("DHT Sensor", "json", data1, qos=0,
on_publish=myOnPublishCallback1)
    if not success1:
        print("Not connected to IoTF\n")
        time.sleep(1)
#Get Sensor Data from SOIL Moisture
Soil_moisture=random.randint(0,100)
data2 = { 'Soil_moisture' : Soil_moisture}
def myOnPublishCallback2():
    print ("Published Soil_moisture =  %s %" % temp, "to IBM Watson")
    success2 = deviceCli2.publishEvent("Soil Moisture Sensor", "json", data2, qos=0,
on_publish=myOnPublishCallback2)
    if not success2:
        print("Not connected to IoTF")
        time.sleep(1)
    deviceCli3.commandCallback = myCommandCallback
# Disconnect the device and application from the cloud
deviceCli1.disconnect()
deviceCli2.disconnect()

```

Node Red Flow :



Python Output :

```
*Python 3.7.0 Shell*
File Edit Shell Debug Options Window Help

Published Soil_moisture = 4 % to IBM Watson
Published Temperature = 45 C Humidity = 57 % to IBM Watson

Published Soil_moisture = 45 % to IBM Watson
Published Temperature = 5 C Humidity = 19 % to IBM Watson

Published Soil_moisture = 5 % to IBM Watson
Published Temperature = 26 C Humidity = 36 % to IBM Watson

Published Soil_moisture = 26 % to IBM Watson
Published Temperature = 10 C Humidity = 85 % to IBM Watson

Published Soil_moisture = 10 % to IBM Watson
Published Temperature = 18 C Humidity = 56 % to IBM Watson

Published Soil_moisture = 18 % to IBM Watson
Published Temperature = 42 C Humidity = 32 % to IBM Watson

Published Soil_moisture = 42 % to IBM Watson
Command received: Waterpump_on

Water Pump is Turned ON

Published Temperature = 30 C Humidity = 65 % to IBM Watson

Published Soil_moisture = 30 % to IBM Watson
Published Temperature = 3 C Humidity = 90 % to IBM Watson

Published Soil_moisture = 3 % to IBM Watson
Command received: Waterpump_off

Water Pump is Turned OFF

Published Temperature = 31 C Humidity = 11 % to IBM Watson

Published Soil_moisture = 31 % to IBM Watson
Published Temperature = 35 C Humidity = 2 % to IBM Watson

Published Soil_moisture = 35 % to IBM Watson
Published Temperature = 36 C Humidity = 4 % to IBM Watson

Published Soil_moisture = 36 % to IBM Watson
Published Temperature = 33 C Humidity = 69 % to IBM Watson

Published Soil_moisture = 33 % to IBM Watson
```

IBM Watson Screen Shots :

IBM Watson IoT Platform

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Browse

Action

Device Types

Interfaces

All Devices

Diagnose

This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.

Q Search by Device ID

Device Simulator ☐

<input type="checkbox"/>	Device ID	Status	Device Type	Class ID	Date Added	Descriptive Location
> <input type="checkbox"/>	962819106039	Disconnected	device962819106039	Device	Oct 22, 2022 5:04 PM	
> <input type="checkbox"/>	DHT	Connected	Sensor	Device	Nov 6, 2022 10:29 PM	
> <input type="checkbox"/>	Soil_moisture	Connected	Sensor1	Device	Nov 6, 2022 10:51 PM	
> <input type="checkbox"/>	Water_pump	Connected	Actuator	Device	Nov 6, 2022 10:44 PM	

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Device Drilldown - DHT

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
DHT Sensor	{"Temperature":20,"Humidity":70}	json	a few seconds ago
DHT Sensor	{"Temperature":22,"Humidity":73}	json	a few seconds ago
DHT Sensor	{"Temperature":0,"Humidity":18}	json	a few seconds ago
DHT Sensor	{"Temperature":26,"Humidity":23}	json	a few seconds ago
DHT Sensor	{"Temperature":23,"Humidity":5}	json	a few seconds ago

State

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Device Drilldown - Soil_moisture

Connection Information

Recent Events

State

Device Information

Metadata

Diagnostics

Connection Logs

Device Actions

Client Address: 106.195.36.61 SecureToken

Recent Events

The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
Soil Moisture...	{"Soil_moisture":9}	json	a few seconds ago
Soil Moisture...	{"Soil_moisture":0}	json	a few seconds ago
Soil Moisture...	{"Soil_moisture":74}	json	a few seconds ago
Soil Moisture...	{"Soil_moisture":21}	json	a few seconds ago
Soil Moisture...	{"Soil_moisture":38}	json	a few seconds ago