PROJECT DEVELOPMENT PHASE

SPRINT 1

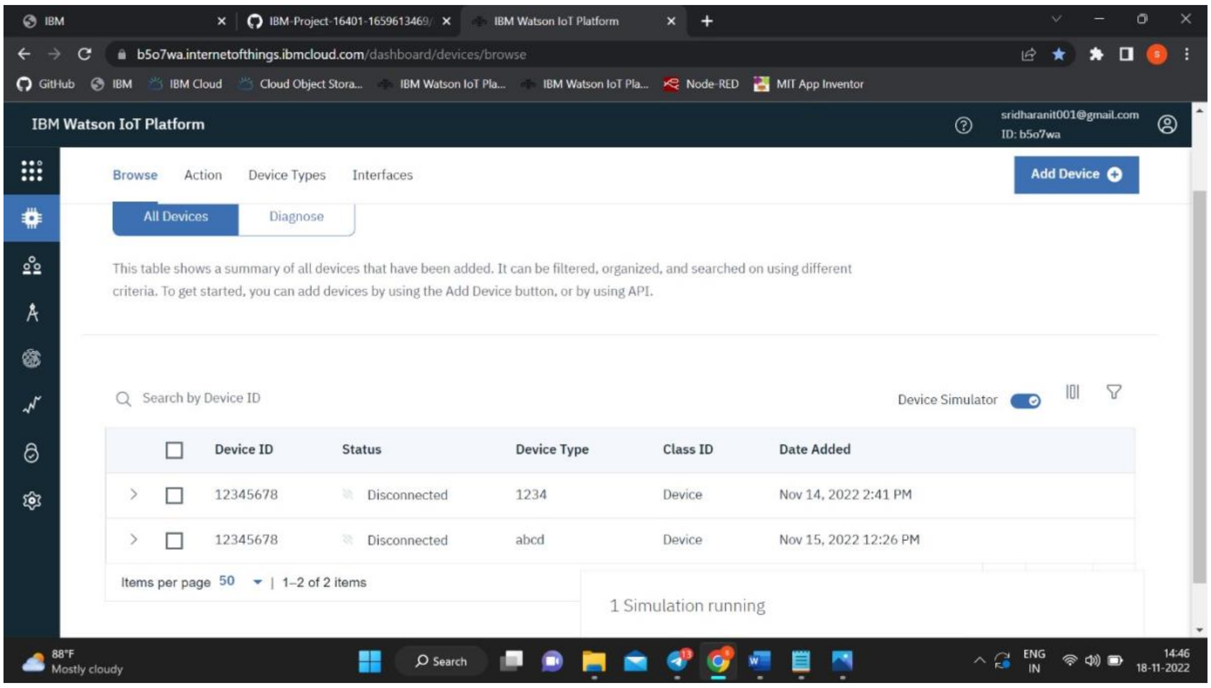
TEAM ID	PNT2022TMID13971
TITLE	IOT BASED SMART CROP PROTECTION FOR AGRICULTURE

Develop the python code for connecting Watson device’s

```
import random
import ibmiotf.application
import ibmiotf.device from
time import sleep import
sys
#IBM Watson Device Credentials.
organization = "op701j" deviceType = "1234" deviceId =
"12345678" authMethod = "token" authToken =
"I4&t_V+SNywRBM+voT" def
myCommandCallback(cmd):  print("Command received:
%s" % cmd.data['command'])
status=cmd.data['command']
 if status=="sprinkler_on":
print ("sprinkler is ON")  else :
        print ("sprinkler is OFF")
#print(cmd)
try:
 deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method":
authMethod, "auth-token": authToken}  deviceCli = ibmiotf.device.Client(deviceOptions)
except Exception as e:
   print("Caught exception connecting device: %s" % str(e))
sys.exit()
#Connecting to IBM watson.
deviceCli.connect() while
True:
#Getting values from sensors.
 temp_sensor = round( random.uniform(0,80),2)
PH_sensor = round(random.uniform(1,14),3)
 camera = ["Detected","Not Detected","Not Detected","Not Detected","Not Detected","Not
Detected",]  camera_reading = random.choice(camera)
 flame = ["Detected","Not Detected","Not Detected","Not Detected","Not Detected","Not
Detected",]  flame_reading = random.choice(flame)  moist_level =
round(random.uniform(0,100),2)  water_level = round(random.uniform(0,30),2)
#storing the sensor data to send in json format to cloud.
 temp_data = { 'Temperature' : temp_sensor }
PH_data = { 'PH Level' : PH_sensor }  camera_data
= { 'Animal attack' : camera_reading}  flame_data
= { 'Flame' : flame_reading }  moist_data = {
'Moisture Level' : moist_level}  water_data = {
'Water Level' : water_level}
# publishing Sensor data to IBM Watson for every 5-10 seconds.
 success = deviceCli.publishEvent("Temperature sensor", "json", temp_data, qos=0)
sleep(1)
if success:
   print (" ...........................publish ok............................ ")
 print ("Published Temperature = %s C" % temp_sensor, "to IBM Watson")
success = deviceCli.publishEvent("PH sensor", "json", PH_data, qos=0)
sleep(1)  if success:
   print ("Published PH Level = %s" % PH_sensor, "to IBM Watson")
success = deviceCli.publishEvent("camera", "json", camera_data, qos=0)
sleep(1)  if success:
   print ("Published Animal attack %s " % camera_reading, "to IBM Watson")
success = deviceCli.publishEvent("Flame sensor", "json", flame_data, qos=0)
sleep(1)  if success:
   print ("Published Flame %s " % flame_reading, "to IBM Watson")  success =
deviceCli.publishEvent("Moisture sensor", "json", moist_data, qos=0)  sleep(1)
if success:
    print ("Published Moisture Level = %s " % moist_level, "to IBM Watson")
success = deviceCli.publishEvent("Water sensor", "json", water_data, qos=0)
sleep(1)  if success:
   print ("Published Water Level = %s cm" % water_level, "to IBM Watson")
 print ("")
 #Automation to control sprinklers by present temperature an to send alert message to IBM
Watson.
 if (temp_sensor > 35):
   print("sprinkler-1 is ON")
 success = deviceCli.publishEvent("Alert1", "json",{ 'alert1' : "Temperature(%s) is high, sprinkerlers
are turned ON" %temp_sensor }
, qos=0)
 sleep(1)
if success:
   print( 'Published alert1 : ', "Temperature(%s) is high, sprinkerlers are turned ON"
%temp_sensor,"to IBM Watson")
 print("") else:
 print("sprinkler-1 is OFF")
print("")
```

```
 #To send alert message if farmer uses the unsafe fertilizer to crops.
if (PH_sensor > 7.5 or PH_sensor < 5.5):
    success = deviceCli.publishEvent("Alert2", "json",{ 'alert2' : "Fertilizer PH level(%s) is not
safe,use other fertilizer" %PH_sensor } , qos=0)
 sleep(1)
if success:
    print('Published alert2 : ' , "Fertilizer PH level(%s) is not safe,use other fertilizer"
%PH_sensor,"to IBM Watson")
 print("")
 #To send alert message to farmer that animal attack on crops.
if (camera_reading == "Detected"):
    success = deviceCli.publishEvent("Alert3", "json", { 'alert3' : "Animal attack on crops detected" },
qos=0)
 sleep(1)
if success:
    print('Published alert3 : ' , "Animal attack on crops detected","to IBM Watson","to IBM Watson")
 print("")
 #To send alert message if flame detected on crop land and turn ON the splinkers to take
immediate action.  if (flame_reading == "Detected"):
    print("sprinkler-2 is ON")
 success = deviceCli.publishEvent("Alert4", "json", { 'alert4' : "Flame is detected crops are in
danger,sprinklers turned ON" }, qos=0)
 sleep(1)
if success:
    print( 'Published alert4 : ' , "Flame is detected crops are in danger,sprinklers turned ON","to IBM
Watson")
 #To send alert message if Moisture level is LOW and to Turn ON Motor-1 for irrigation.
if (moist_level < 20):
    print("Motor-1 is ON")
 success = deviceCli.publishEvent("Alert5", "json", { 'alert5' : "Moisture level(%s) is low, Irrigation
started" %moist_level }, qos=0)  sleep(1)  if success:
   print('Published alert5 : ' , "Moisture level(%s) is low, Irrigation started" %moist_level,"to IBM Watson" )
 print("")
 #To send alert message if Water level is HIGH and to Turn ON Motor-2 to take water out.
if (water_level > 20):     print("Motor-2 is ON")
 success = deviceCli.publishEvent("Alert6", "json", { 'alert6' : "Water level(%s) is high, so motor is ON to take water out " %water_level }, qos=0)  sleep(1)  if success:
   print('Published alert6 : ' , "water level(%s) is high, so motor is ON to take water out " %water_level,"to IBM Watson" )
   print("")
 #command recived by farmer
deviceCli.commandCallback = myCommandCallback #
Disconnect the device and application from the cloud
deviceCli.disconnect()
```

OUTPUT



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.

Device ID	Status	Device Type	Class ID	Date Added
12345678	Disconnected	1234	Device	Nov 14, 2022 2:41 PM
12345678	Disconnected	abcd	Device	Nov 15, 2022 12:26 PM

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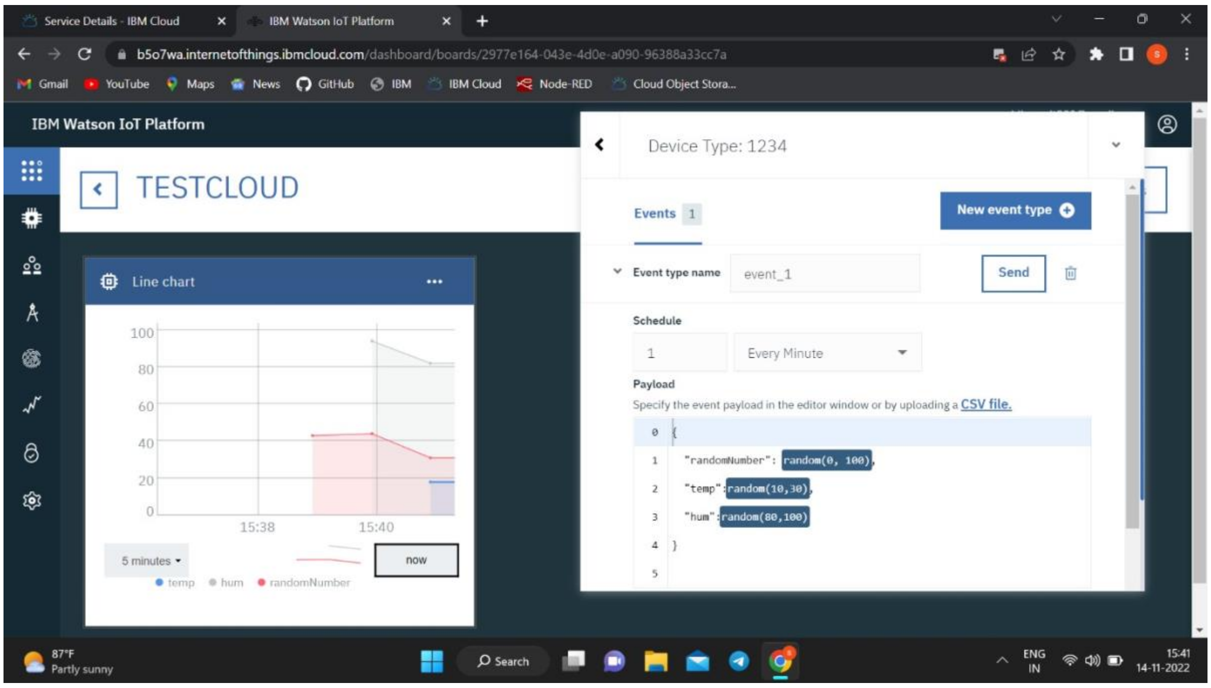
1 Simulation running



Device Type: 1234

Events 1

New event type

Event type name: event_1

Send

Schedule: 1 Every Minute

Payload

Specify the event payload in the editor window or by uploading a CSV file.

```
{
  "randomNumber": random(0, 100),
  "temp":random(10,30),
  "hum":random(80,100)
}
```