M015 Uf1 IoT

TheThingsNetwork 1

Curs: 2019-20

CFGS: DAM2

Alumne : Arnau Subirós Puigarnau

Data : 03-02-2020
(versió 3 a partir de la pàgina 18)

Nom i Cognoms

Arnau Subirós Puigarnau

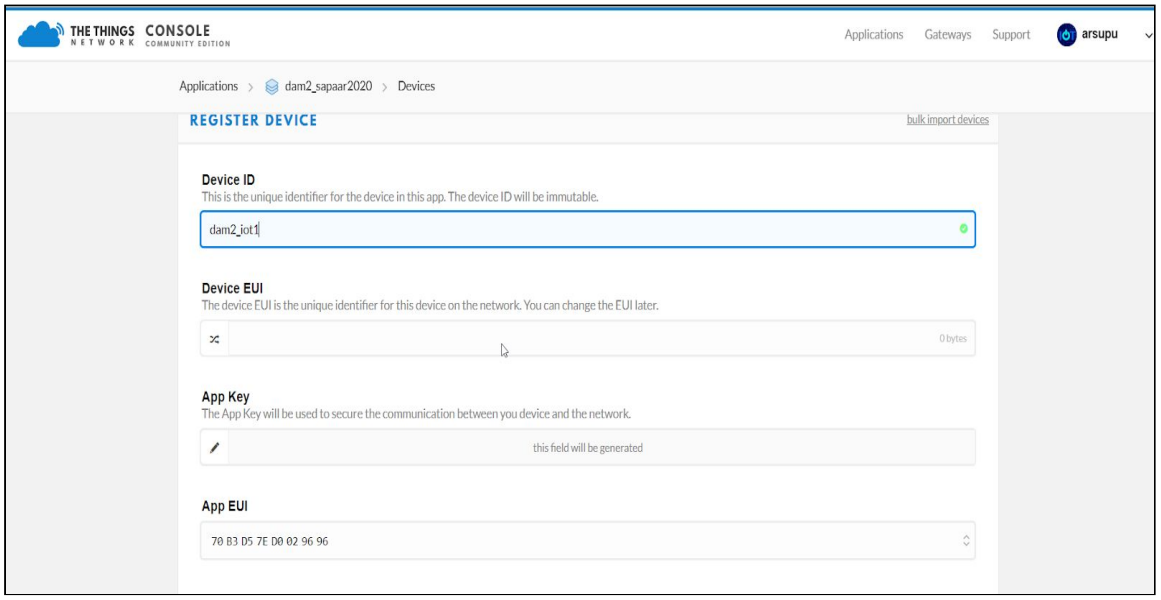
Data

10-02-2020

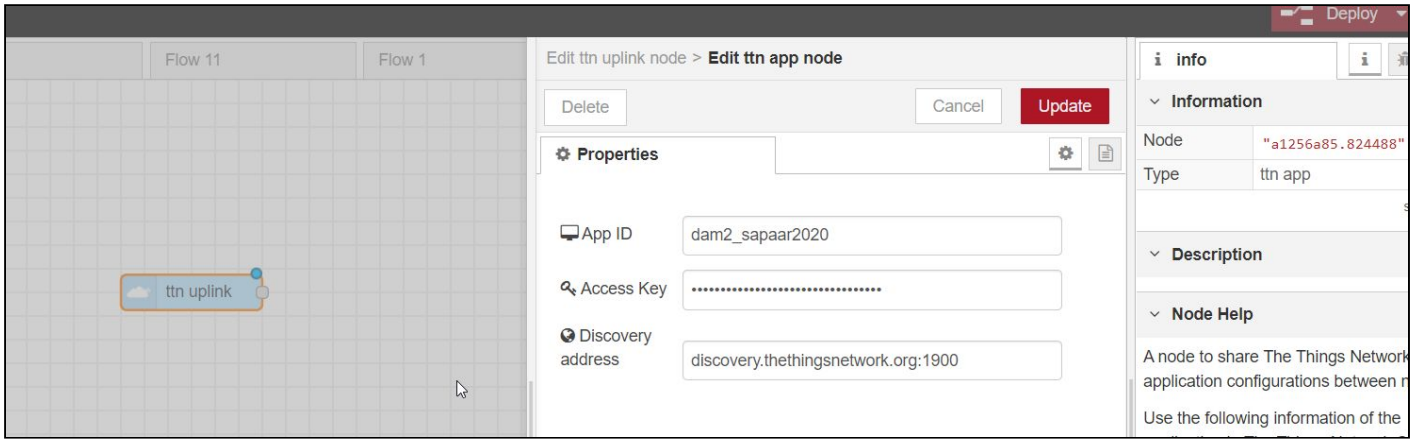
Accedim a https://www.thethingsnetwork.org/

Creacio d'un dispositiu

DEVICES :dam2_iot1



- Afegim les credencials del dispositu al Node-Red



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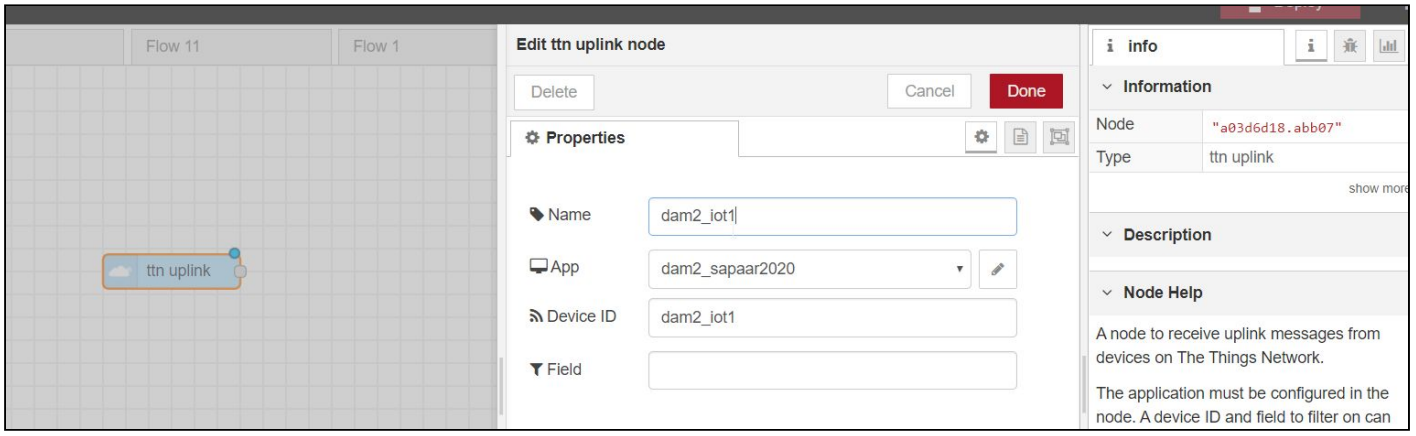
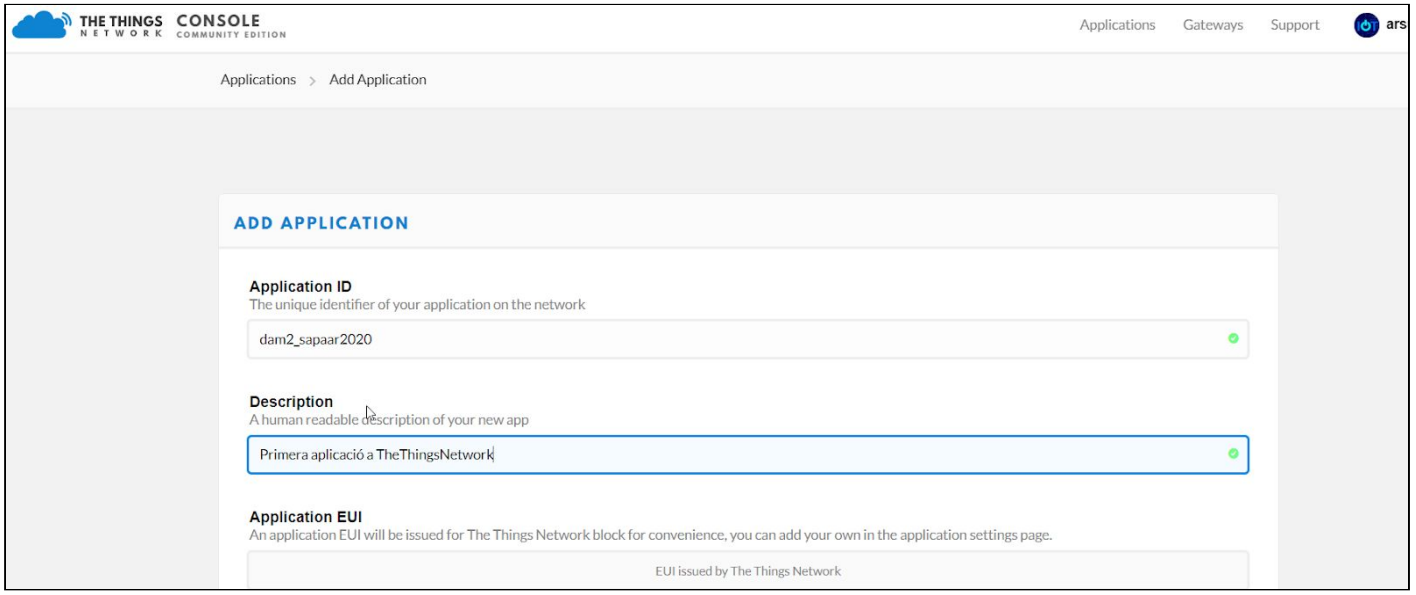


Application ID : dam2_sapaar2020



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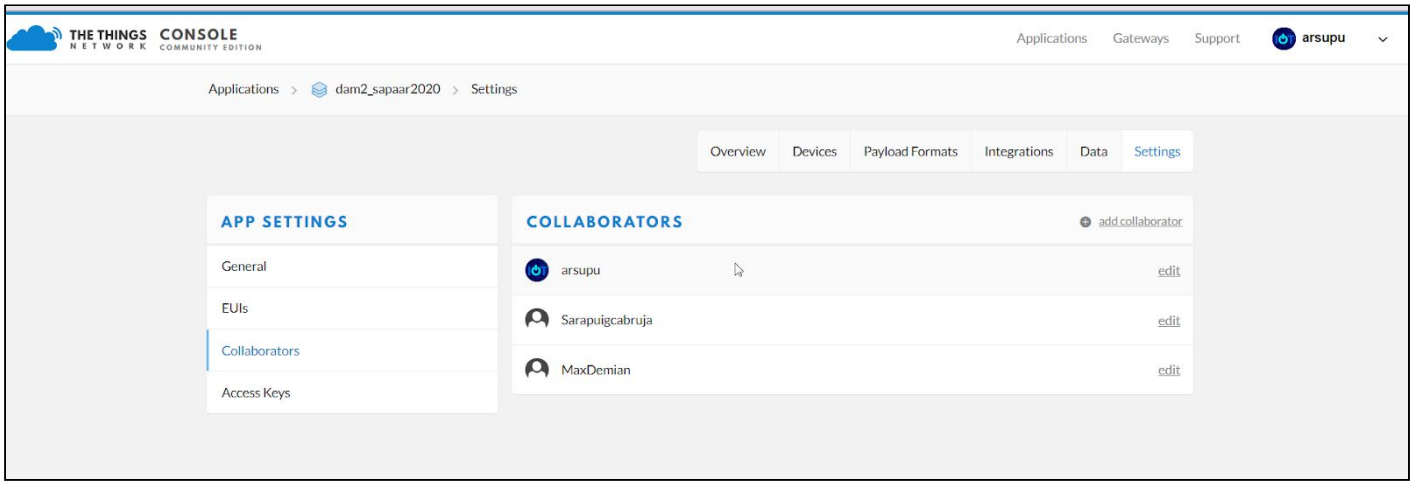
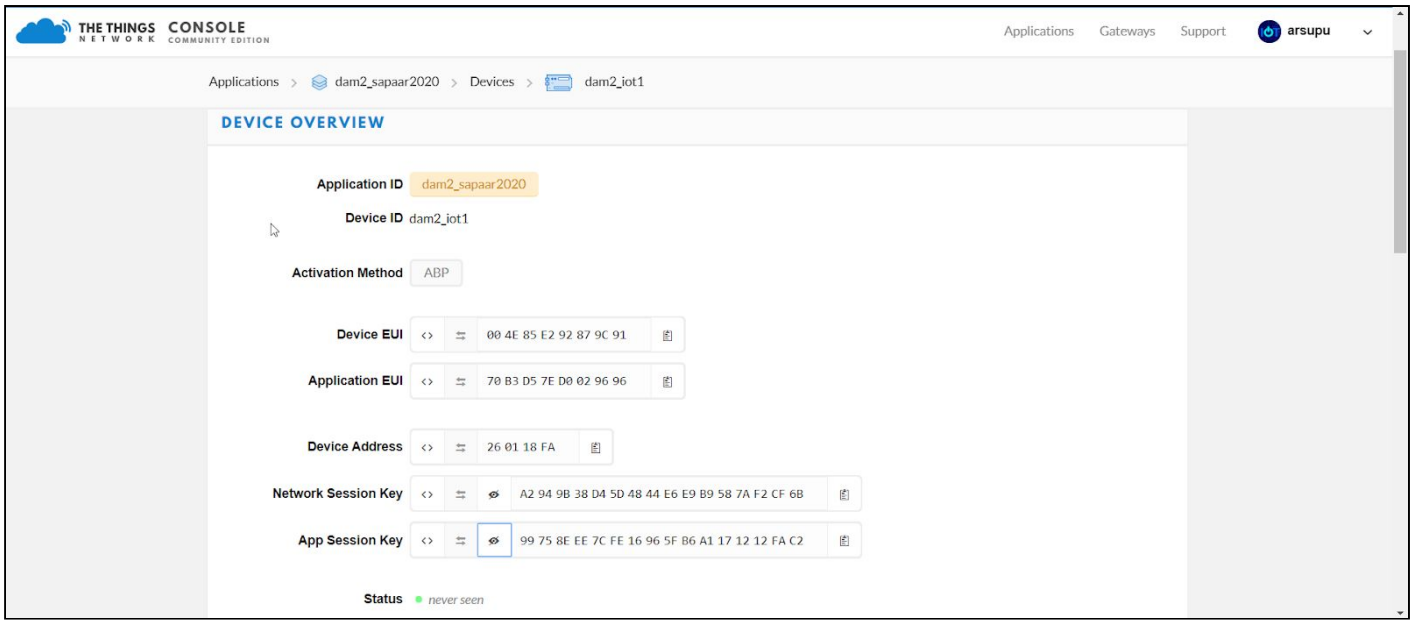
Afegim els col·aboradors:



Anotem les seguents dades :

- Device Address : **260118FA**
- Network Session Key: { 0xA2, 0x94, 0x9B, 0x38, 0xD4, 0x5D, 0x48, 0x44, 0xE6, 0xE9, 0xB9, 0x58, 0x7A, 0xF2, 0xCF, 0x6B }
- App Session Key : { 0x99, 0x75, 0x8E, 0xEE, 0x7C, 0xFE, 0x16, 0x96, 0x5F, 0xB6, 0xA1, 0x17, 0x12, 0x12, 0xFA, 0xC2 }



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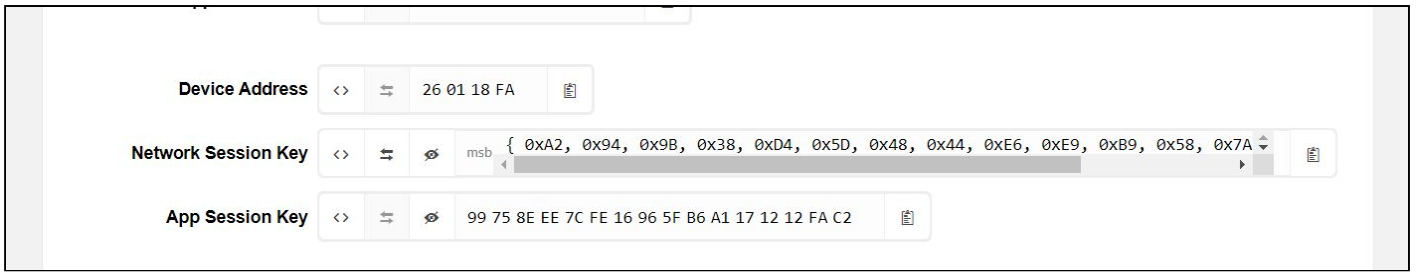
- Codi font per a actualitzar amb els valors de The Things Network:
  - https://github.com/jordibinefa/arduino-IDE-codes/tree/master/esp32_lorawan_ttnEsp32_ttgo_multichannel_02b
  - Anotem el codi al Arduino IDE i afegim els valors de Network Session Key y App Key

esp32_lorawan_ttnEsp32_ttgo_multichannel_02b | credentials.h § | pinMapping.h

```
#define LORA_MODE_ABP    0
#define LORA_MODE_OTAA   1

#define LORA_MODE LORA_MODE_ABP

#if LORA_MODE == LORA_MODE_ABP
  /* NWKSKEY, APPSKEY and DEVADDR should by modifed by your actual values */
  //static const PROGMEM u1_t NWKSKEY[16] = { 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00 };
  //static const u1_t PROGMEM APPSKEY[16] = { 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00 };
  //static const u4_t DEVADDR = 0x00000000 ;

  static const PROGMEM u1_t NWKSKEY[16] = {0xA2, 0x94, 0x9B, 0x38, 0xD4, 0x5D, 0x48, 0x44, 0xE6, 0xE9, 0xB9, 0x58, 0x7A, 0xF2, 0xCF, 0x6B};
  static const u1_t PROGMEM APPSKEY[16] = {0x99, 0x75, 0x8E, 0xEE, 0x7C, 0xFE, 0x16, 0x96, 0x5F, 0xB6, 0xA1, 0x17, 0x12, 0x12, 0xFA, 0xC2 };
  static const u4_t DEVADDR = 260118FA ;

#endif

#if LORA_MODE == LORA_MODE_OTAA
    // De moment no és operatiu a aquesta versió
    const char *appEui = "";
    const char *appKey = "";
#endif
```



Hem d'afegir la placa ESP-32

https://randomnerdtutorials.com/installing-the-esp32-board-in-arduino-ide-windows-instructions/

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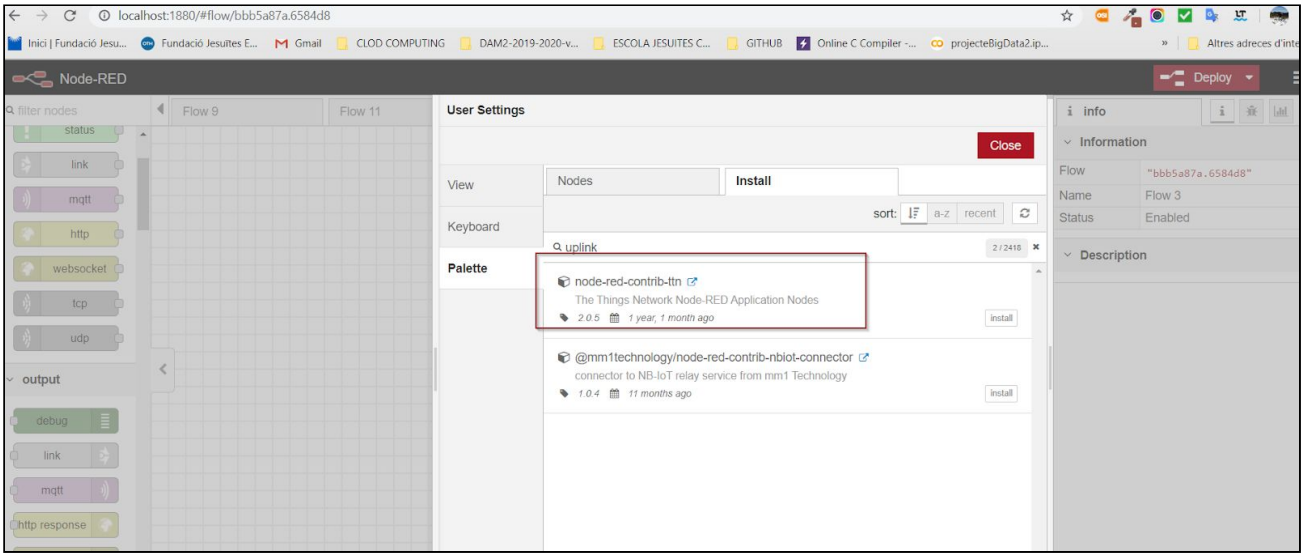
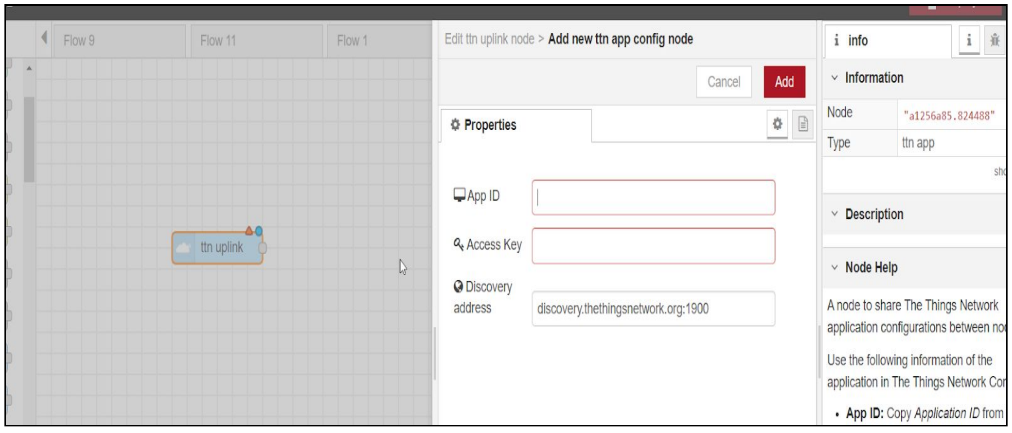
- Obrim el NODE-RED i afegim el següent node node-red-contrib-ttn



- configurem el node uplink



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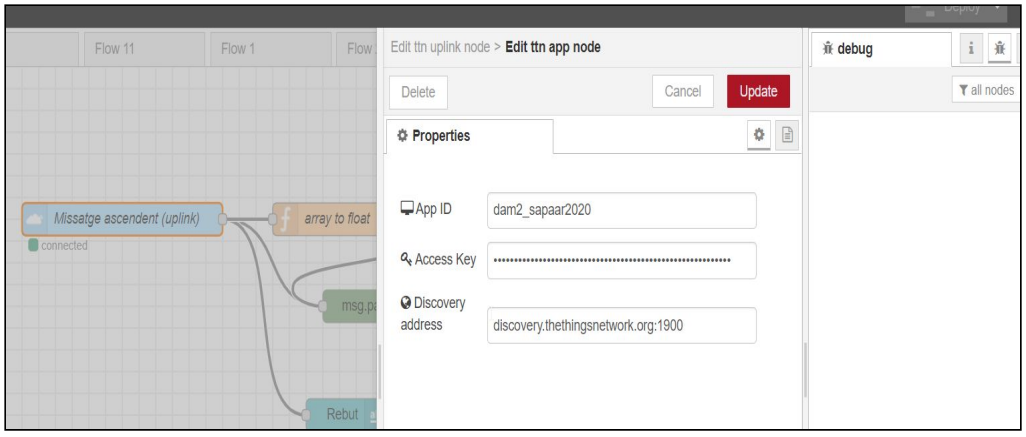
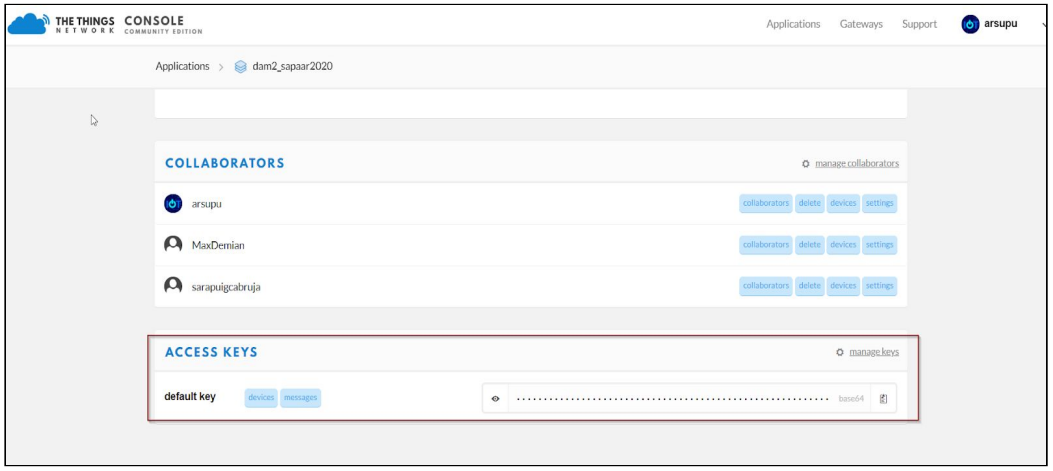


Al NODE-RED hem d'afegir l'acces key



- Arduino IDE i utilitzem el següent codi _https://github.com/jordibinefa/arduino-IDE-codes/tree/master/esp32_lorawan_ttnEsp32_ttgo_multichannel_02b

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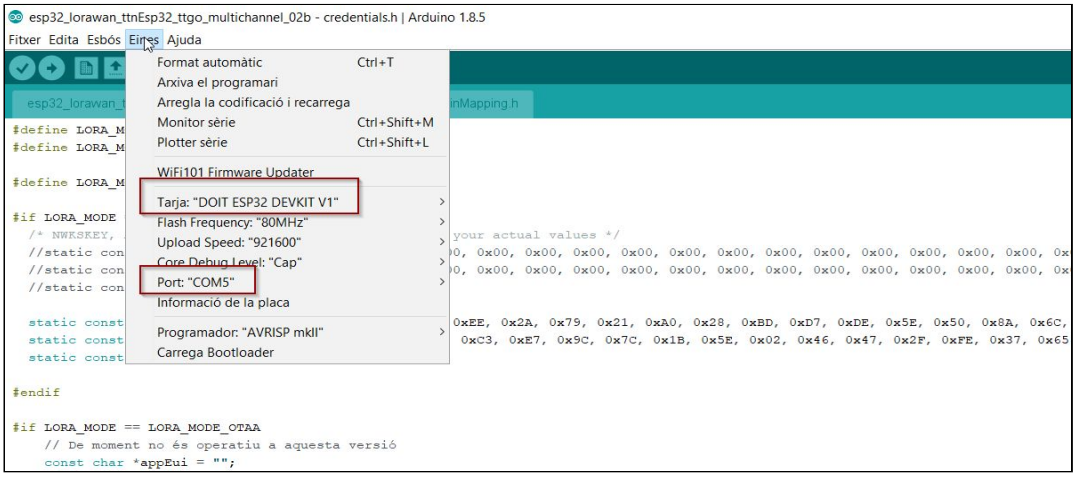
- Anotem les credencials



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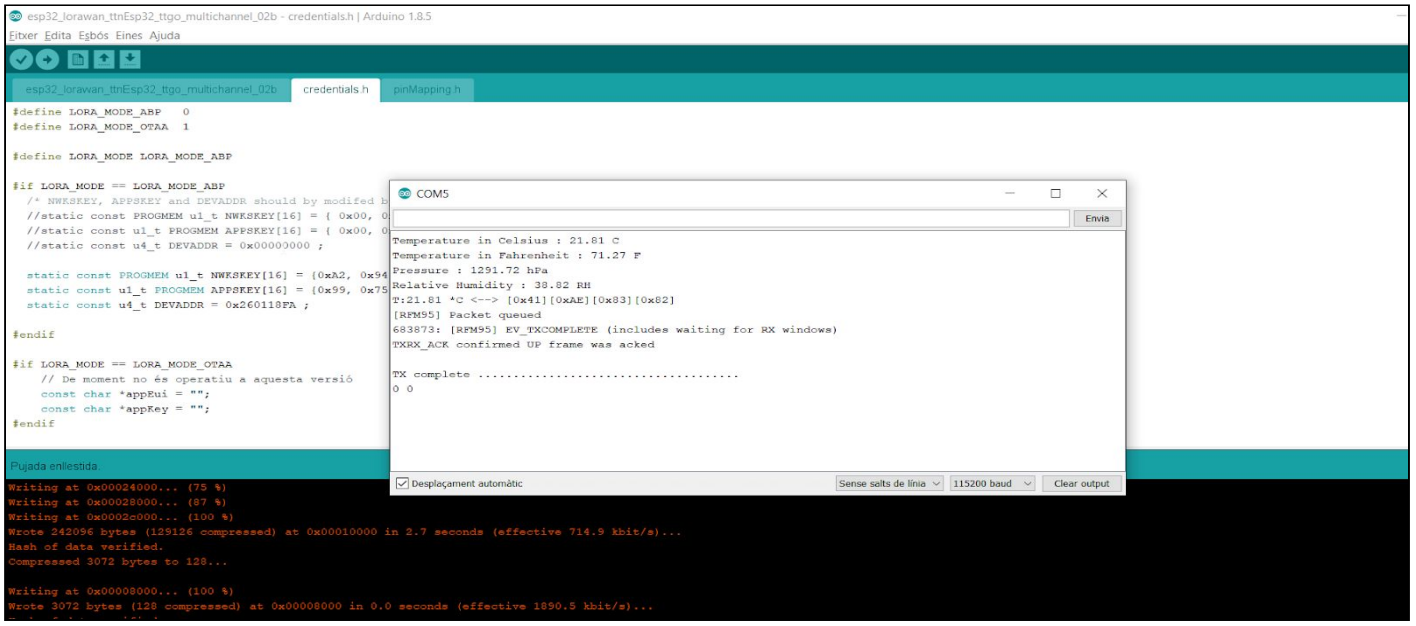
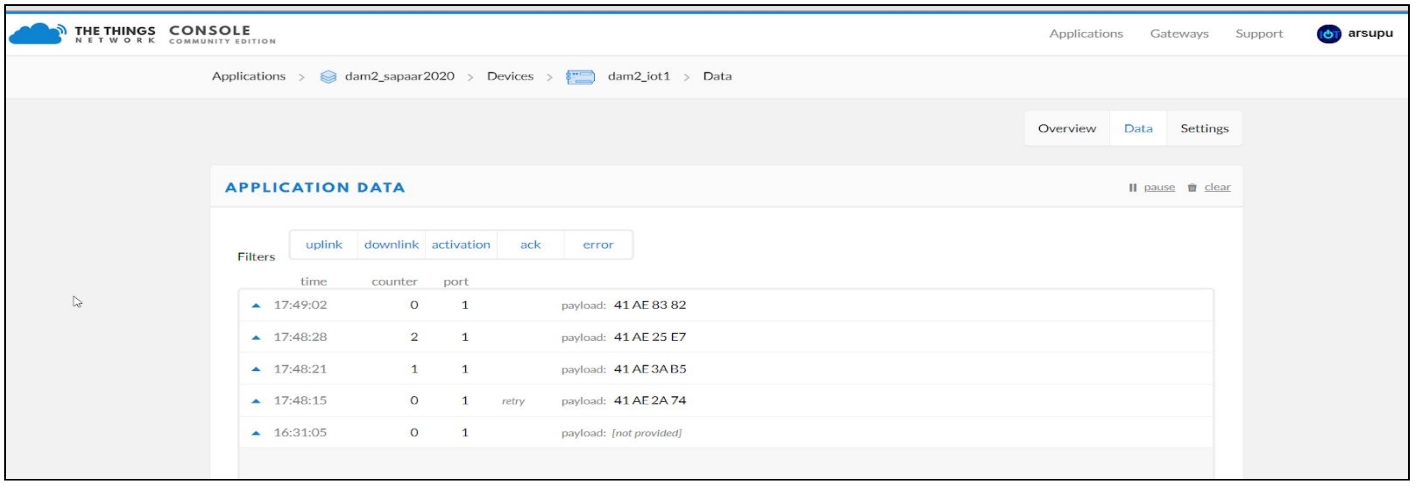
- Apretem el botó de la placa ESP-32



- Accedim com usuari registrat a https://www.thethingsnetwork.org/ , seleccionem l'opció "*console"* i seleccionem l'aplicació creada, posteriorment escollim "aplication data" on es confirmem que està reben dades de la placa esp-32.



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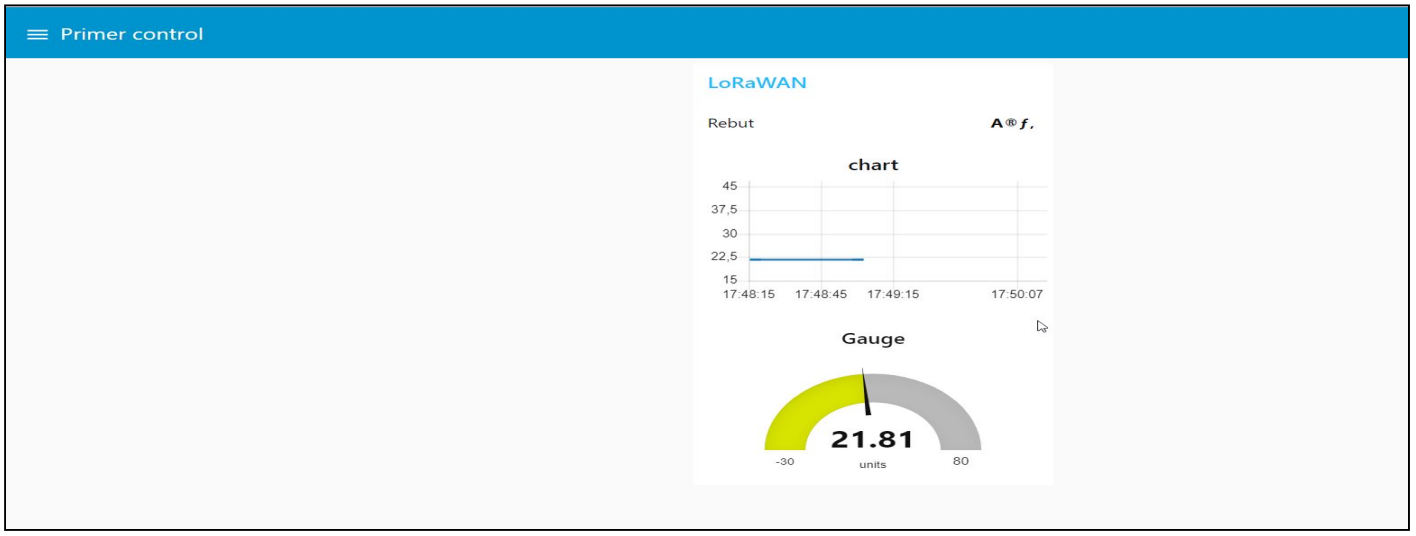
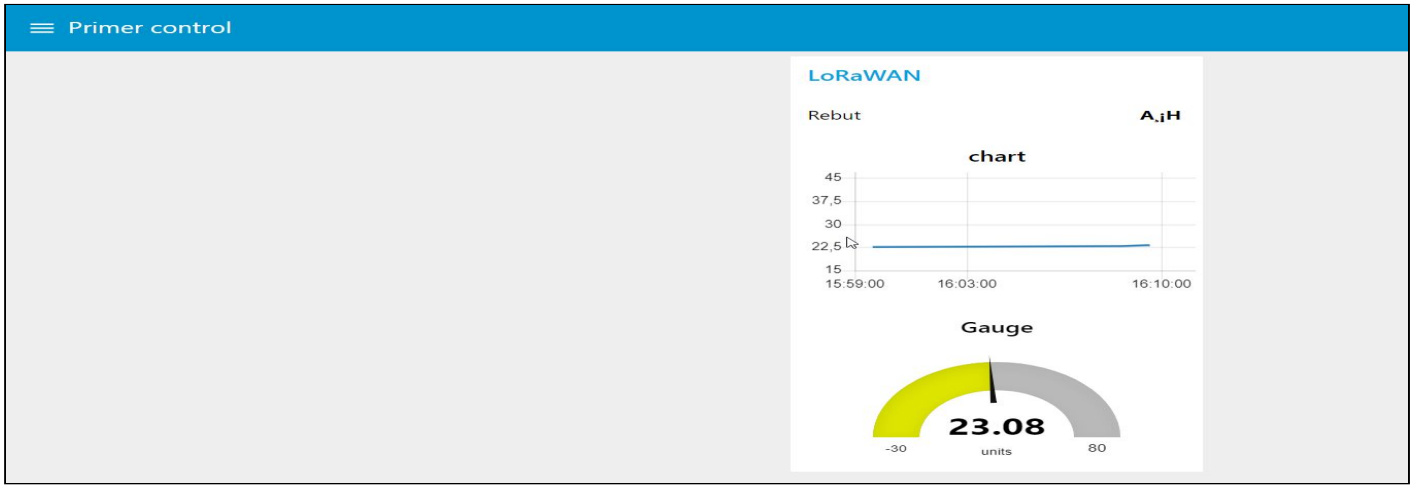
- Visualitzem en el Dashboard de Node-Red





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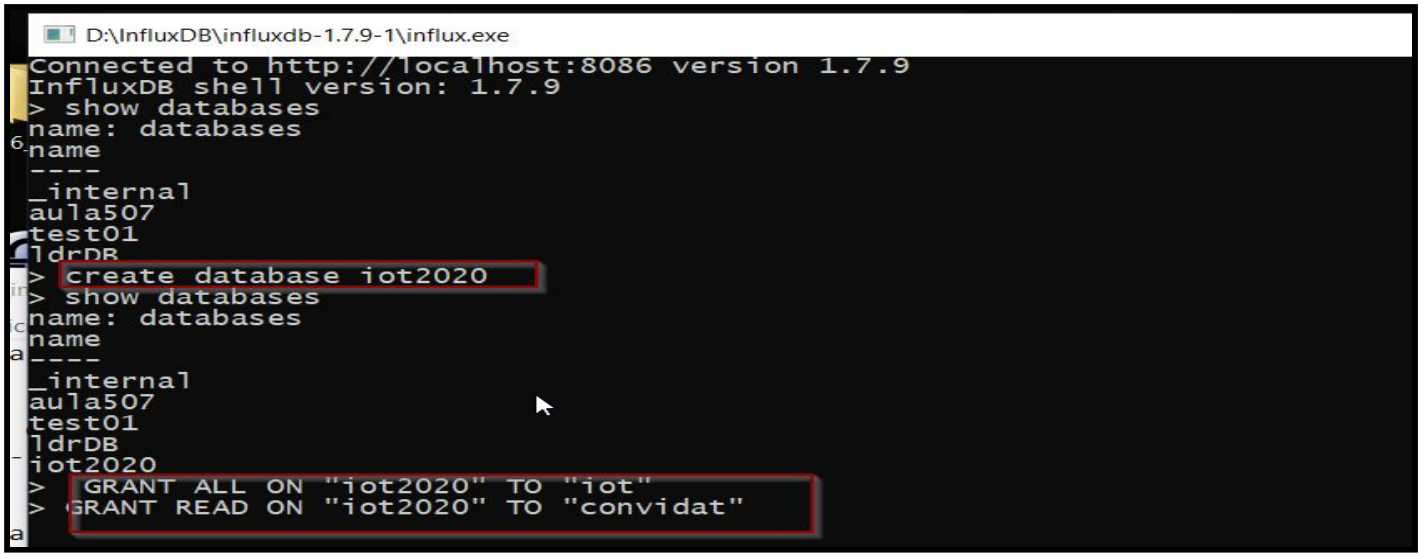
Ampliació 28/01/2020

- Afegim les dades al INFLUXDB .
    - Windows 10 - Primer de tot activem el servidor

- Accedim al usuari iot



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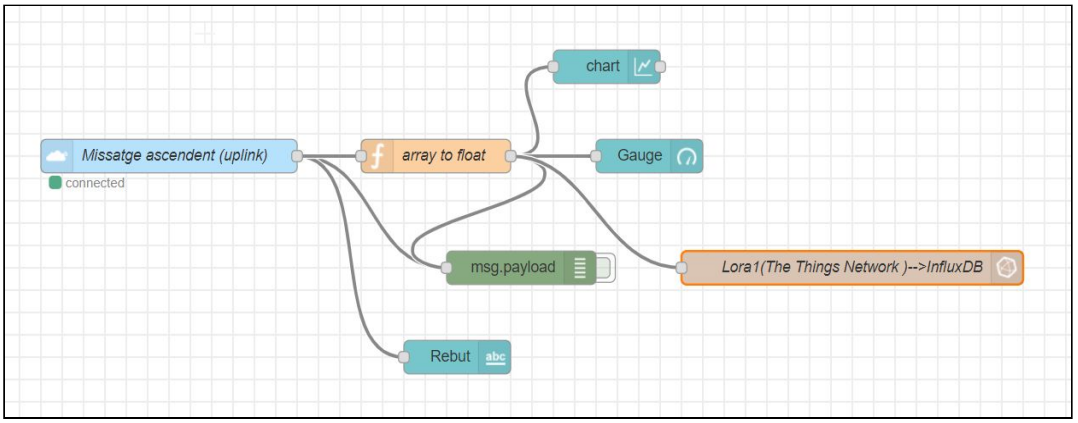
- Afegim un node per emmagatzemar les dades a InfluxDB



- Accedim a InfluxDB com usuari iot i visualizem les dades de la base de dades iot2020

```
Indicador d'ordres - influx -username iot -password iot

D:\InfluxDB\influxdb-1.7.9-1>dir
 El volumen de la unidad D es Data
 El número de serie del volumen es: 1453-DA8F

 Directorio de D:\InfluxDB\influxdb-1.7.9-1

12/01/2020  18:41    <DIR>          .
12/01/2020  18:41    <DIR>          ..
27/10/2019  23:32        56.042.496 influx.exe
12/01/2020  18:41               768 influx.exe drecera.lnk
27/10/2019  23:32        67.971.072 influxd.exe
12/01/2020  18:40               773 influxd.exe drecera.lnk
12/01/2020  18:38            21.309 influxdb.conf
27/10/2019  23:32        19.516.416 influx_inspect.exe
27/10/2019  23:32        11.612.160 influx_stress.exe
27/10/2019  23:32        21.034.496 influx_tsm.exe
               8 archivos    176.199.490 bytes
               2 dirs  460.523.868.160 bytes libres

D:\InfluxDB\influxdb-1.7.9-1>influx -username iot -password iot
Connected to http://localhost:8086 version 1.7.9
InfluxDB shell version: 1.7.9
> show databases
name: databases
name
----
_internal
aula507
test01
ldrDB
iot2020
> use iot2020
Using database iot2020
>
```

Nom i Cognoms	Data
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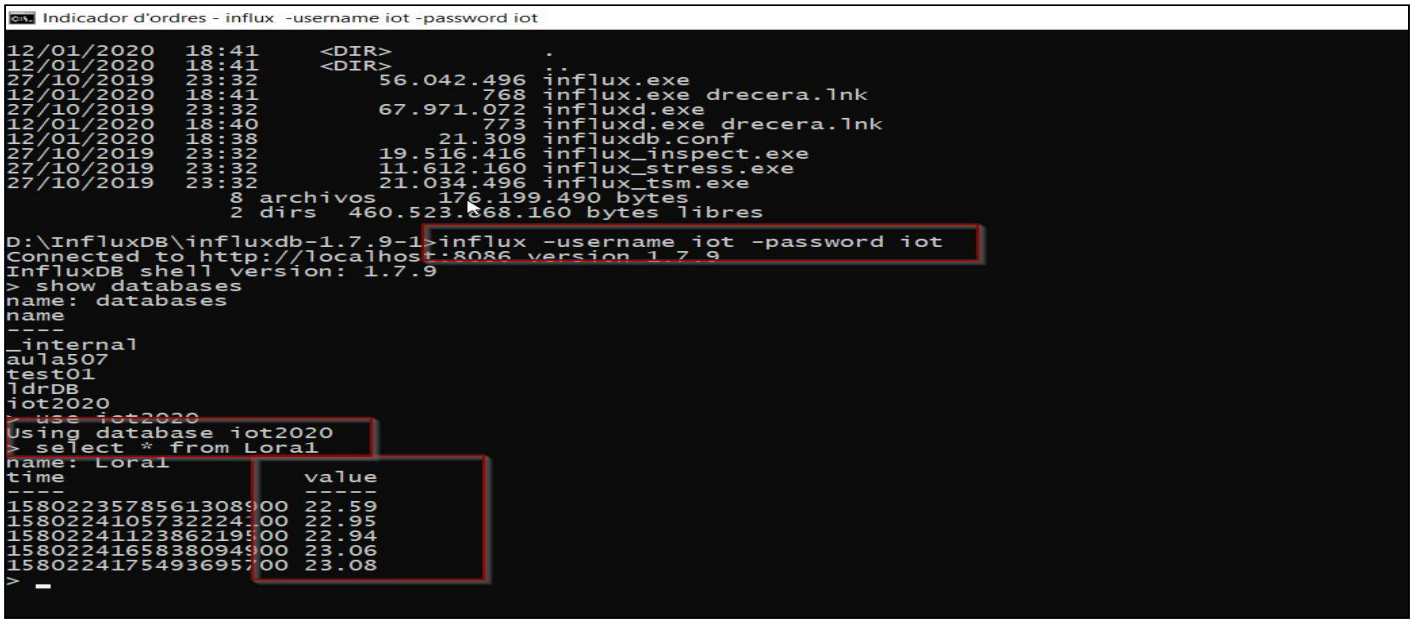
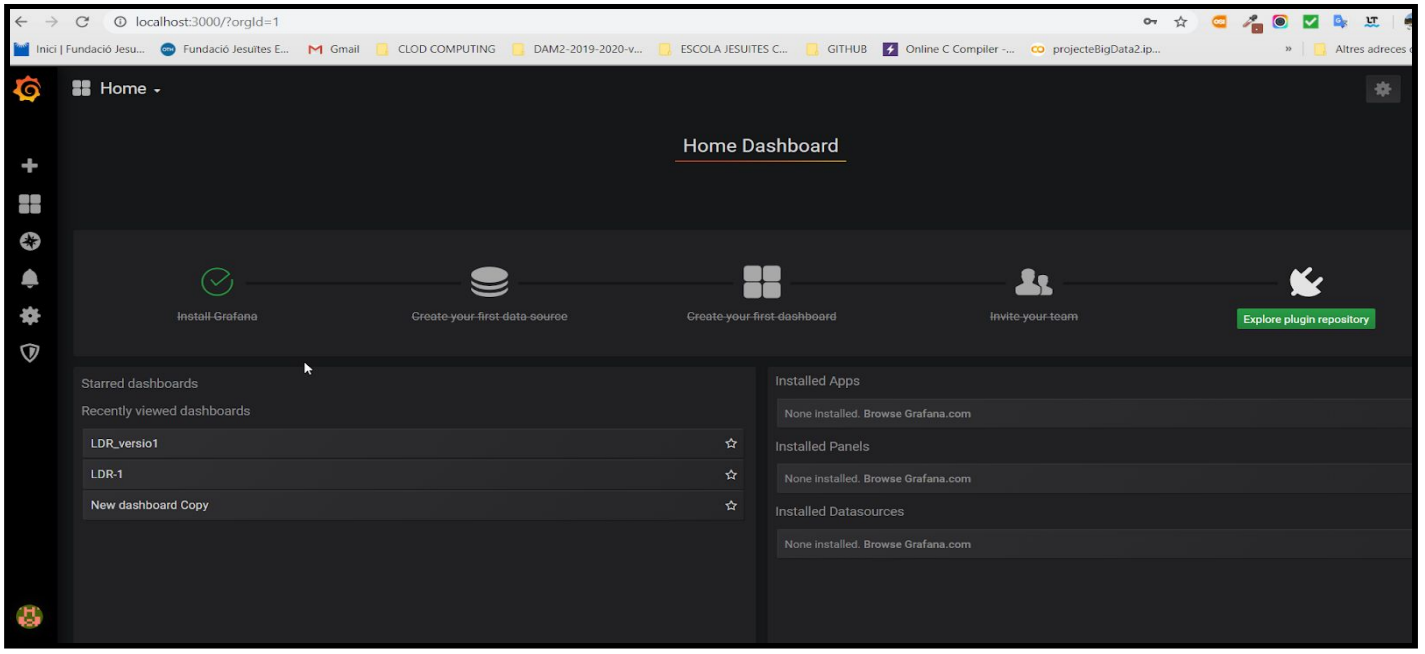


- Accedim a Grafana com usuari admin



Nom i Cognoms	Data
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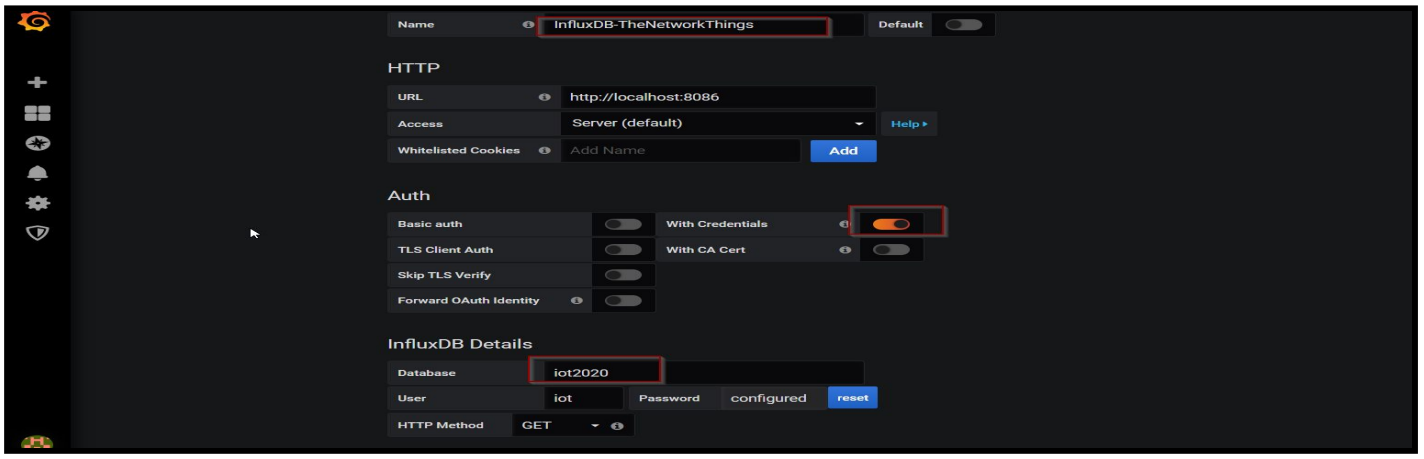
- Configurem la base de dades(anteriorment hem seleccionat que faríem servir InfluxDB)

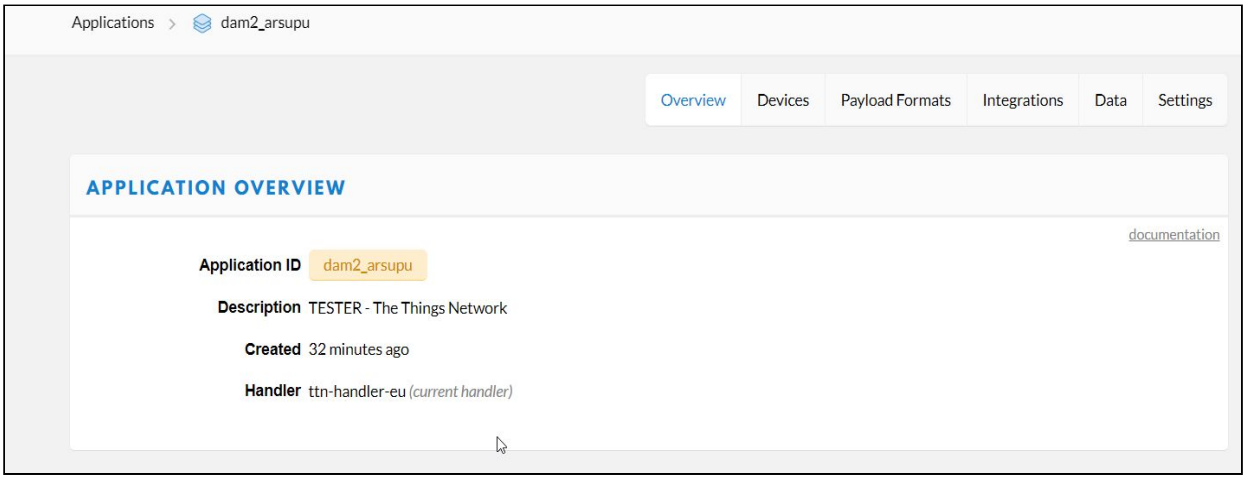


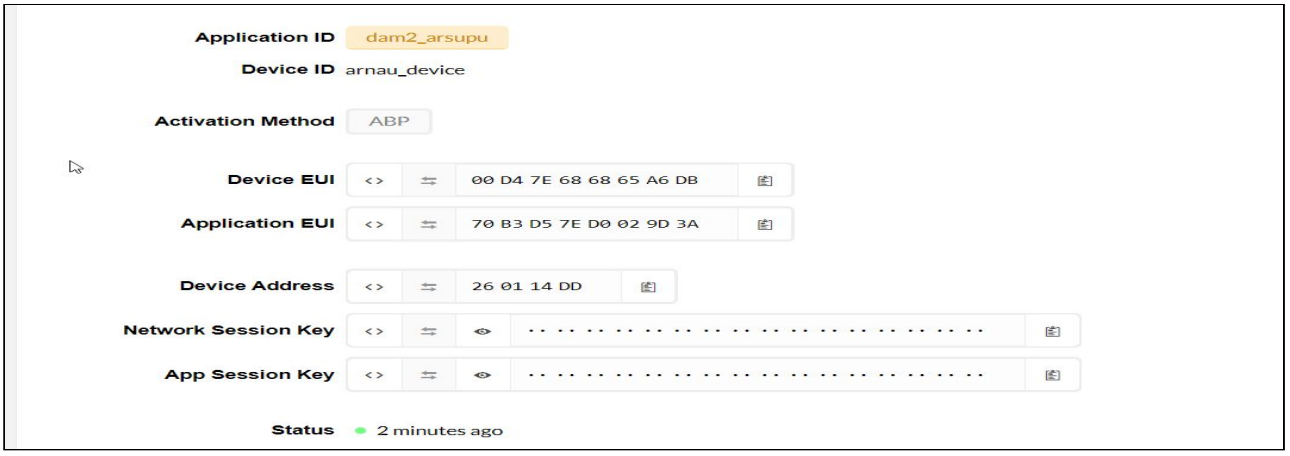
- Confirmem que s'ha configurat correctament

Nom i Cognoms	Data
Arnau Subirós Puigarnau	10-02-2020

Ampliació 03/02/2020

- _Per repassar, hem creat un nou dispositu, ja que per error el dispositiu de la pràctica es va eliminar.





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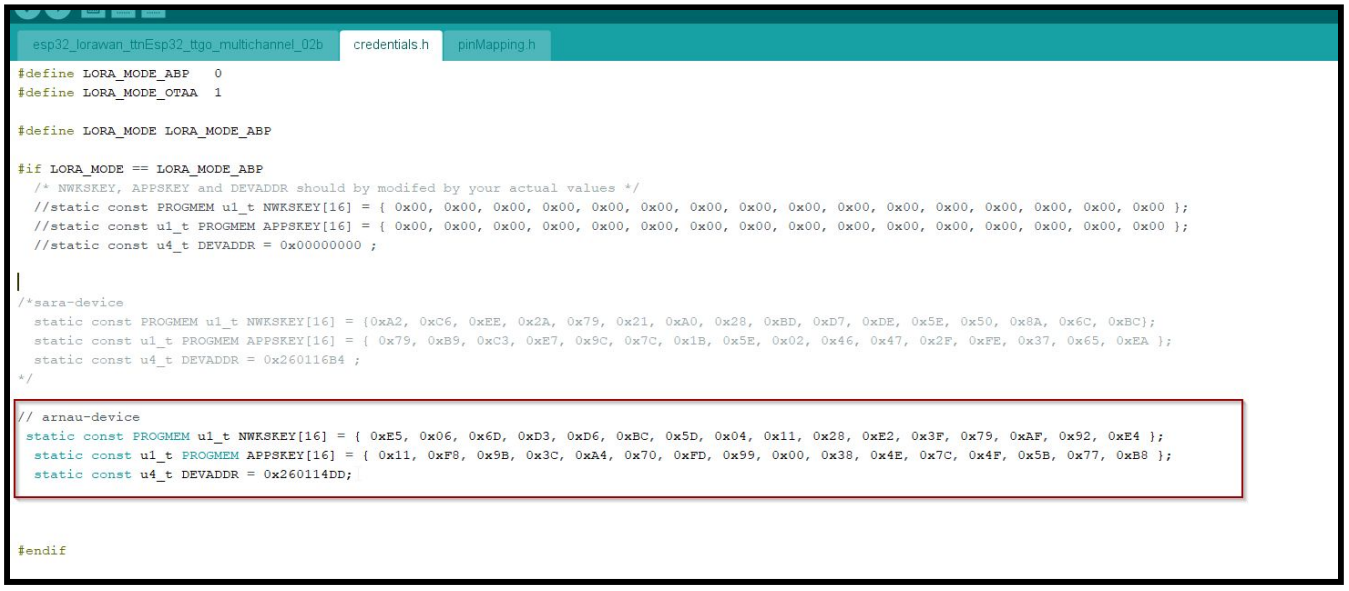
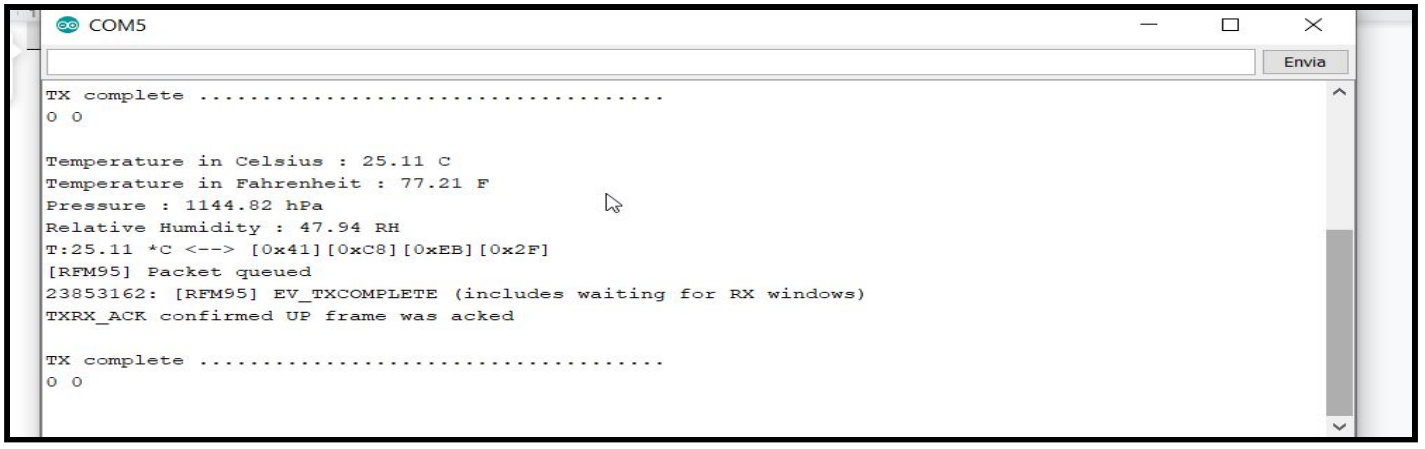
- El el arduino IDE hem d'afegir les claus del dispositiu : Device Address, Network Key, App Session Key



- Apretem el boto de la placa esp-32



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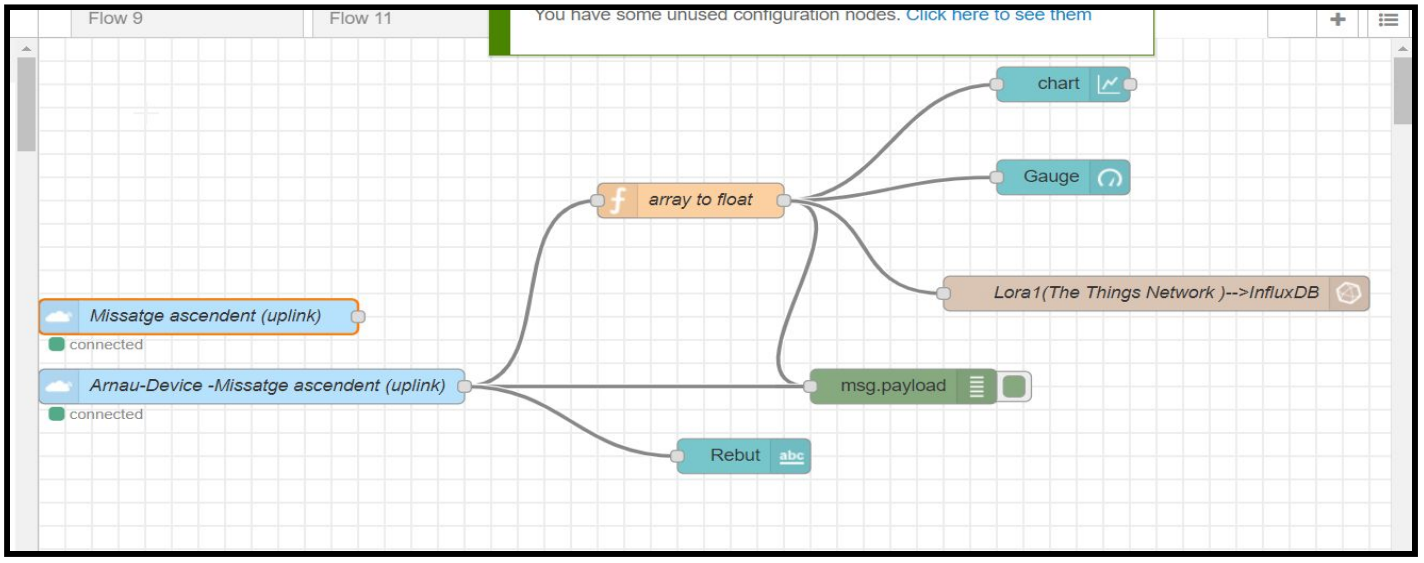
- Configuració al Node-Red



- He tingut un problema al node-red, ja que el nom del dispostiu dam2_arsupu ja estaba (el dispostiu que es va eliminar) , s'han eliminat i s'ha tornat a fer, solucionant el problema.

- Volem reflexar l'humitat i la pressió haurem de modificar el codi en el Arduino IDE

```
esp32_lorawan_ttnEsp32_ttgo_multichannel_02b § | credentials.h | pinMapping.h
09   // Prepare buffer
10   unsigned char data[4];
11   float fTc, fTf, fP, fRH;
12   //data[0] = (autoincrement >> 24) & 0xFF;
13   //data[1] = (autoincrement >> 16) & 0xFF;
14   //data[2] = (autoincrement >>  8) & 0xFF;
15   //data[3] = (autoincrement >>  0) & 0xFF;
16   //float2Bytes(fT,data);
17   vReadBME280(&fTc, &fTf, &fP, &fRH);
18   if (fTc > -10.f && fTc < 90.) {
19     Serial.print("T:");
20     Serial.print(fTc);
21     Serial.print(" *C <--> ");
22     float2Bytes(fTc, data);
23     for (int i = 0; i < 4 ; i++) {
24       Serial.print("[0x");
25       Serial.print(data[i], HEX);
26       Serial.print("]");
27     }
28     Serial.println();
29
30     // Prepare upstream data transmission at the next possible time.
31     // Parameters are port, data, length, confirmed
32     LMIC_setTxData2(1, data, 4, 0);
33
34     Serial.println(F("[RFM95] Packet queued"));
35   }
```

Nom i Cognoms	Data
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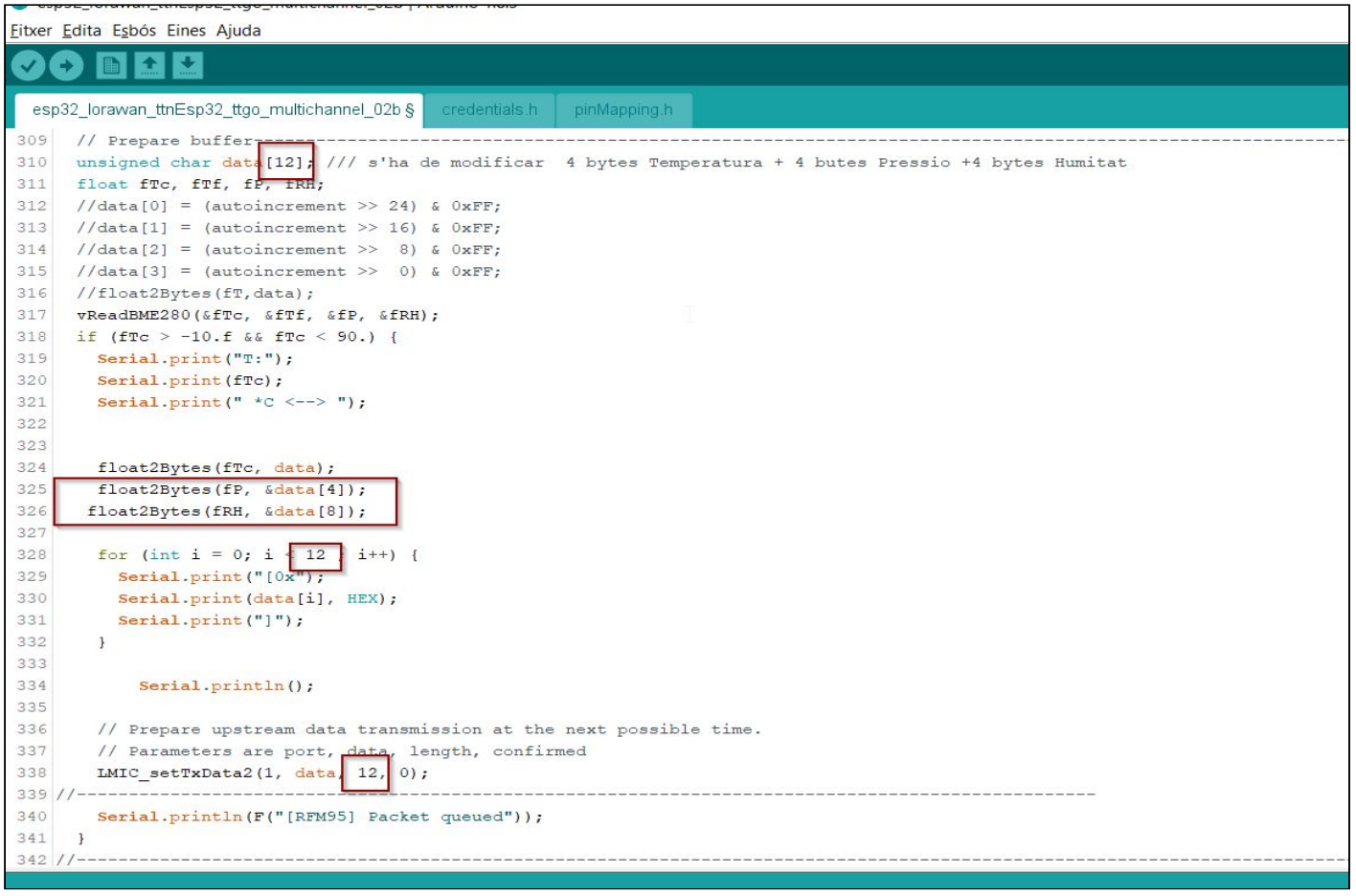

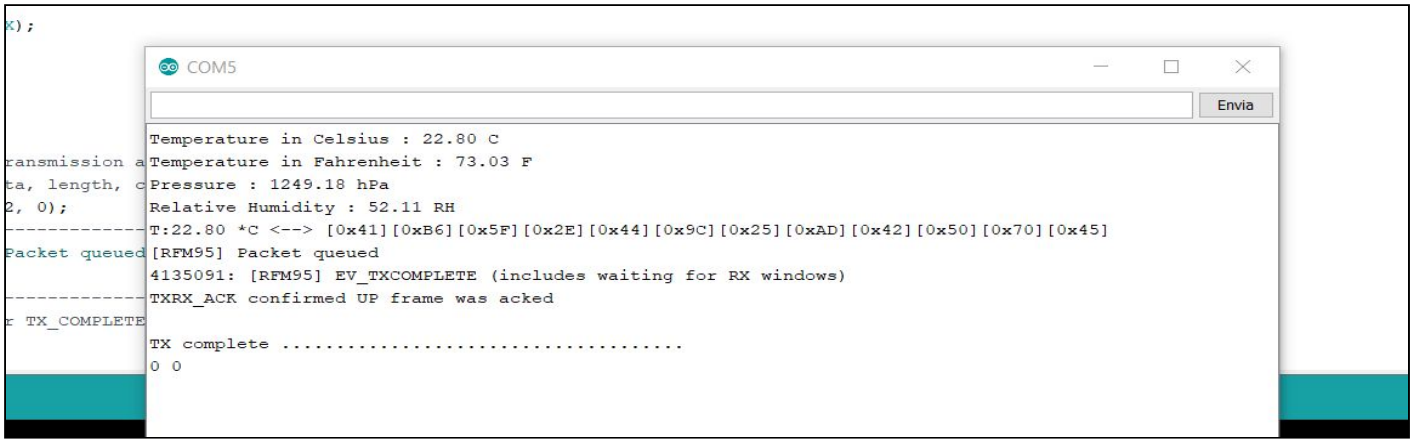

Nom i Cognoms	Data
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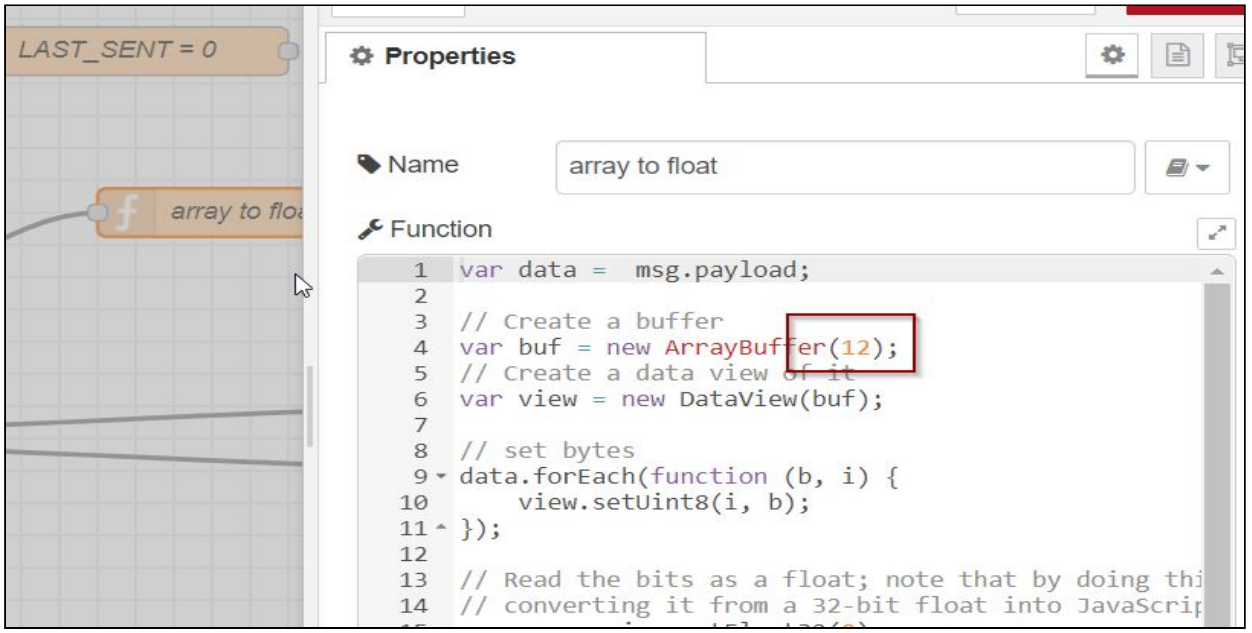
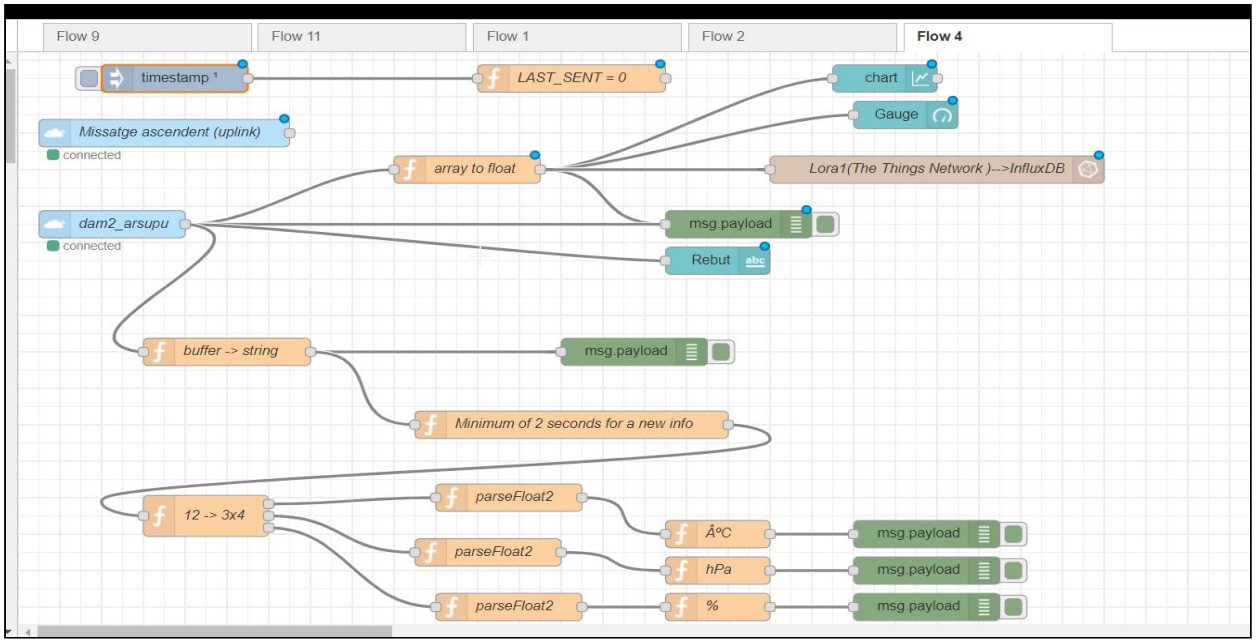
- En el NODE-RED basant-nos en el codi https://wiki.binefa.cat/index.php?title=Trametre_3_floats_en_12_bytes_i_visualitzar-los_al_NodeRED
  - Farem una sèrie de modificacions per poder visualitzar les tres variables





Nom i Cognoms **Data**

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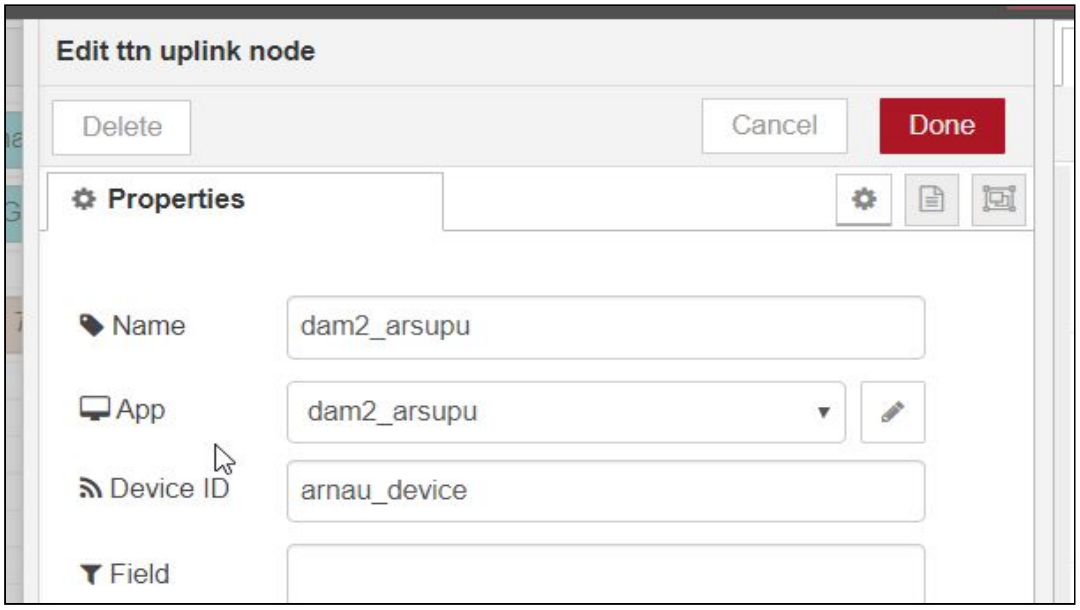
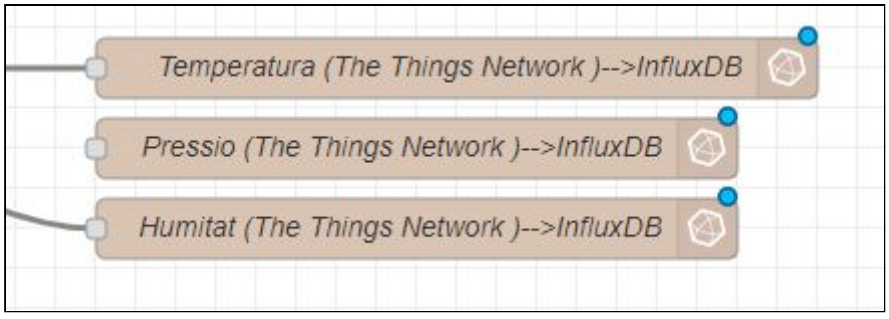


- Crearem 3 taules a la base de dades iot2020 ,anteriorment hi havia Lora1 per fer proves.



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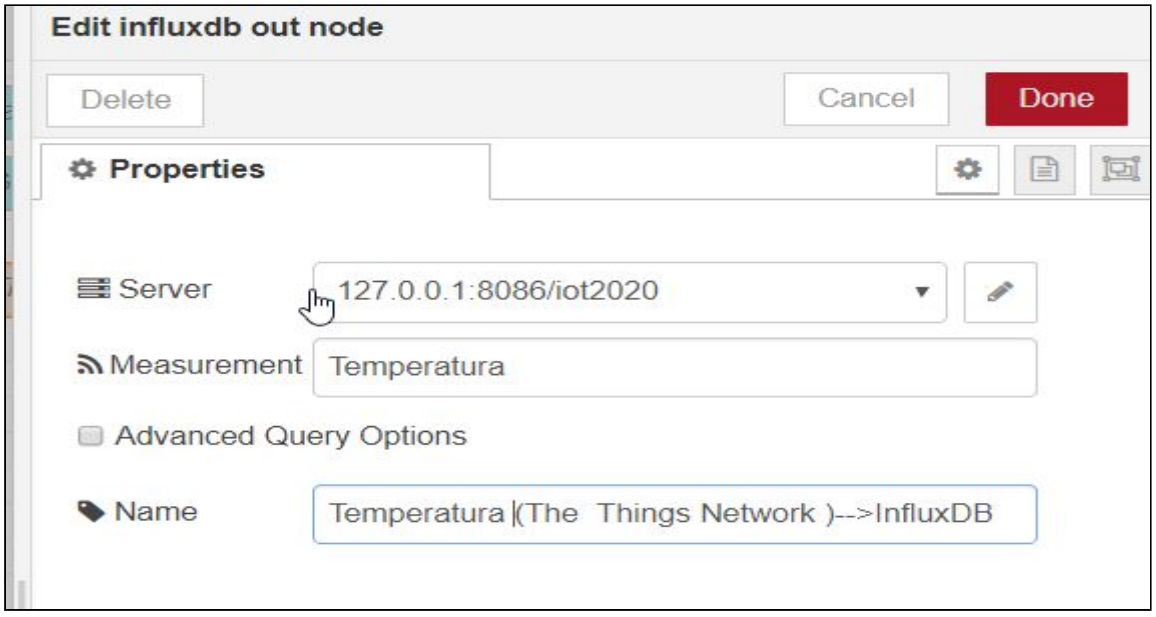

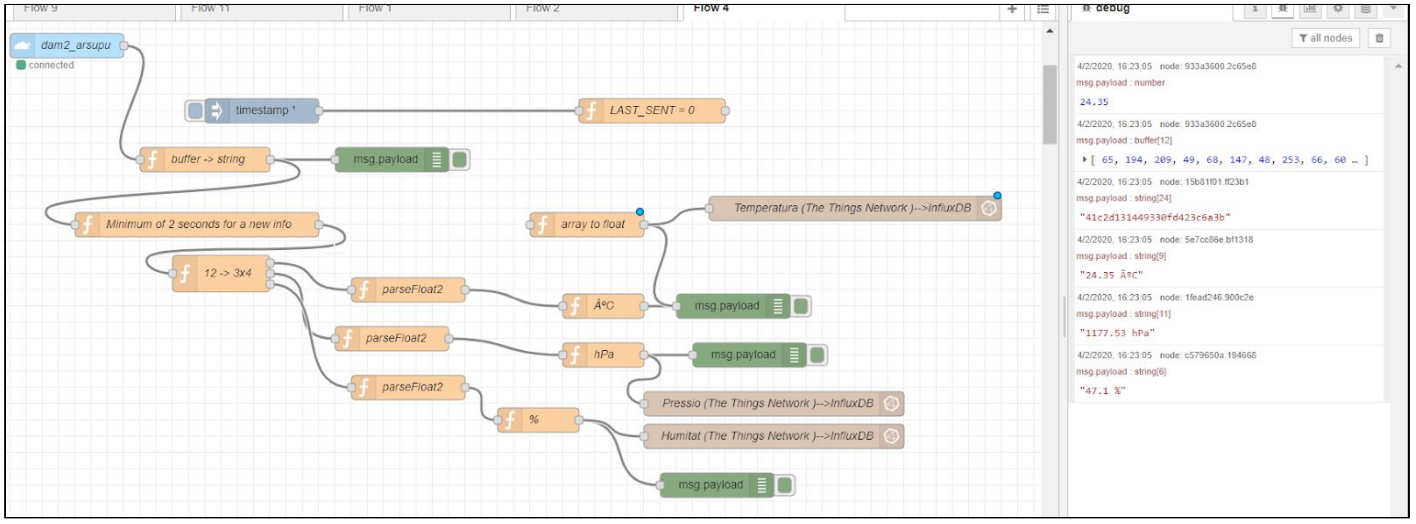

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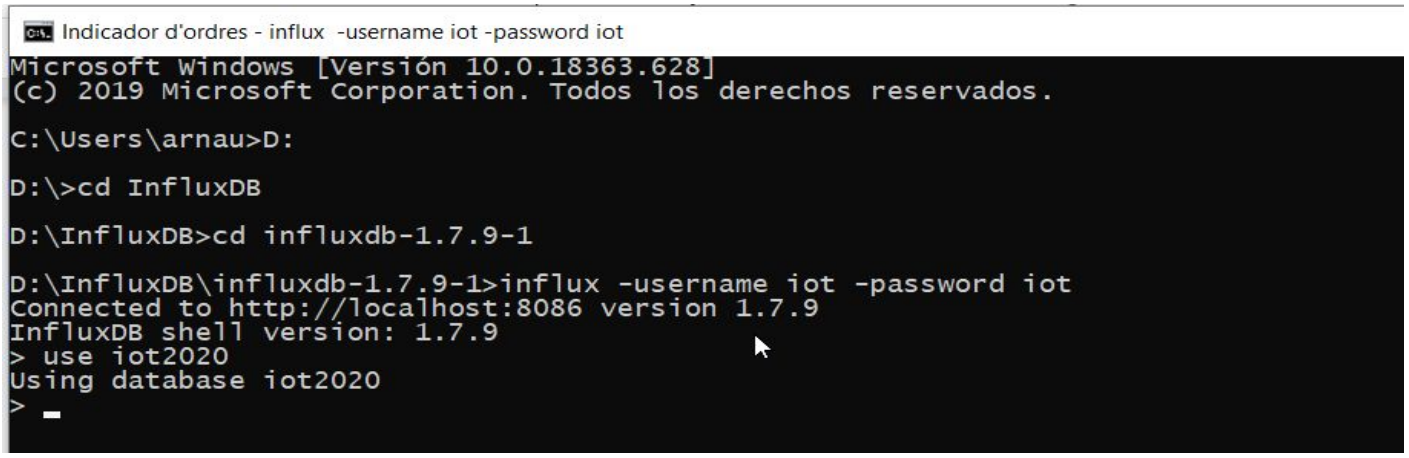
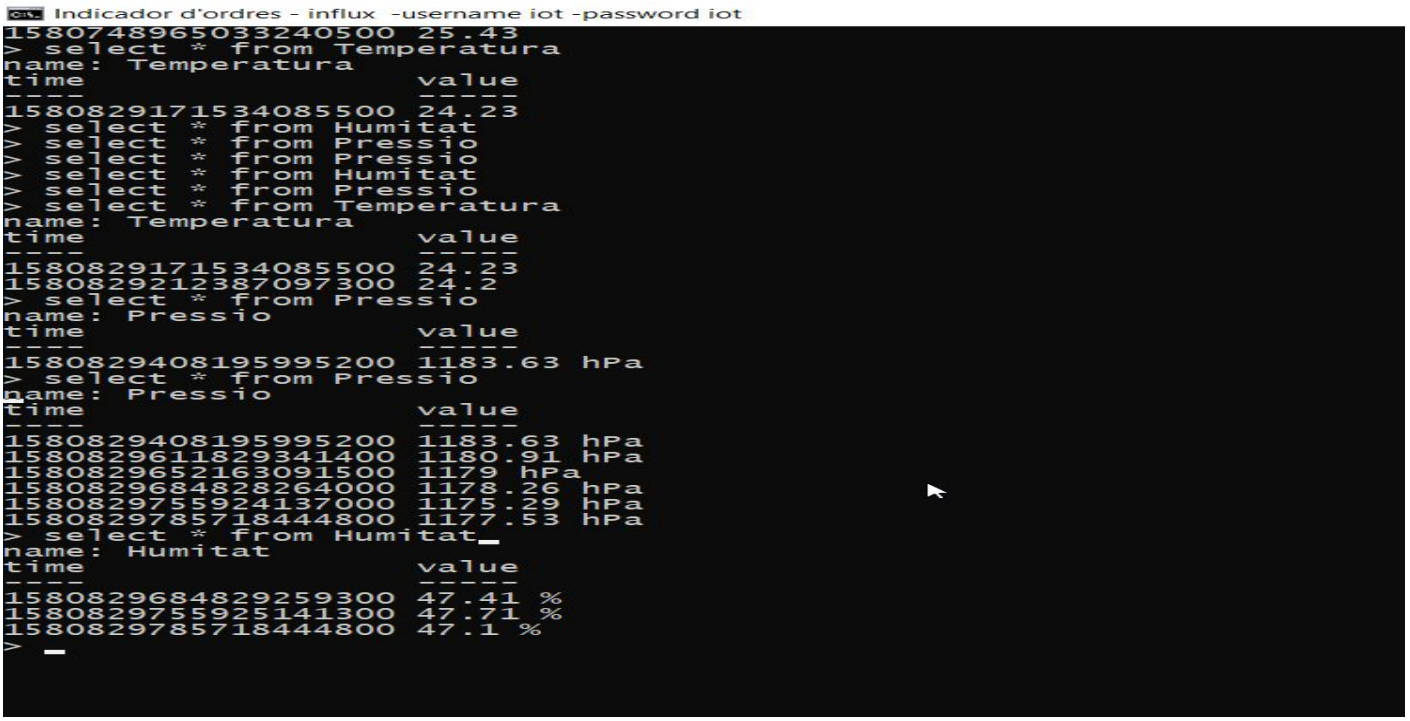
- Accedim al InfluxDB com usuari iot per veure les dades emmagatzemades de temperatura, pressió i humitat





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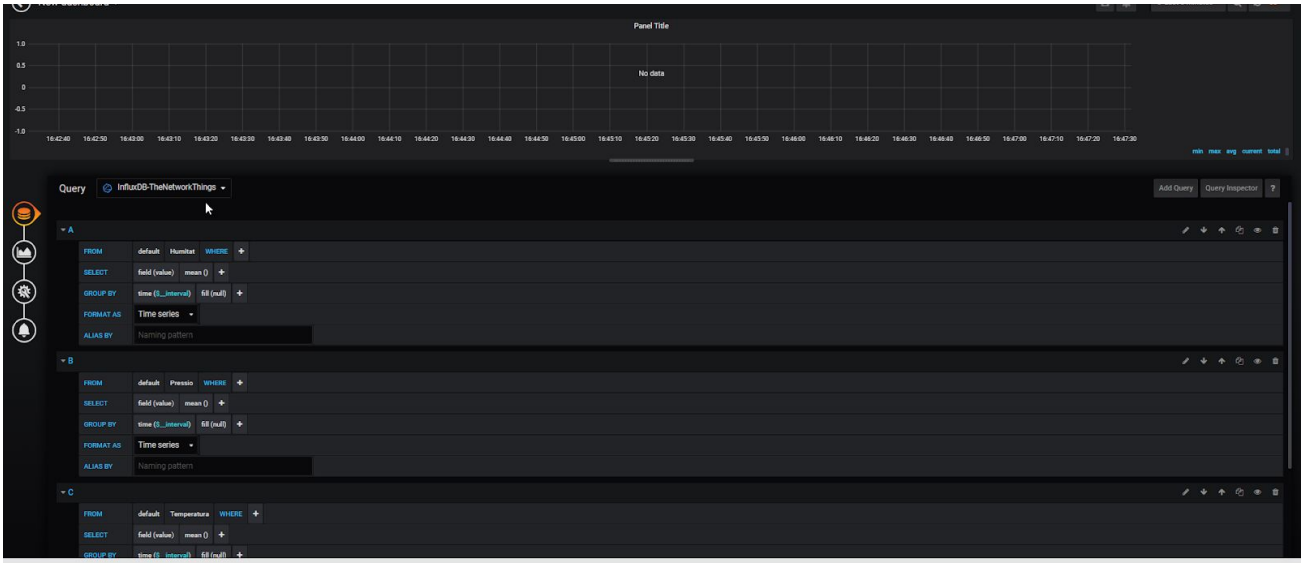
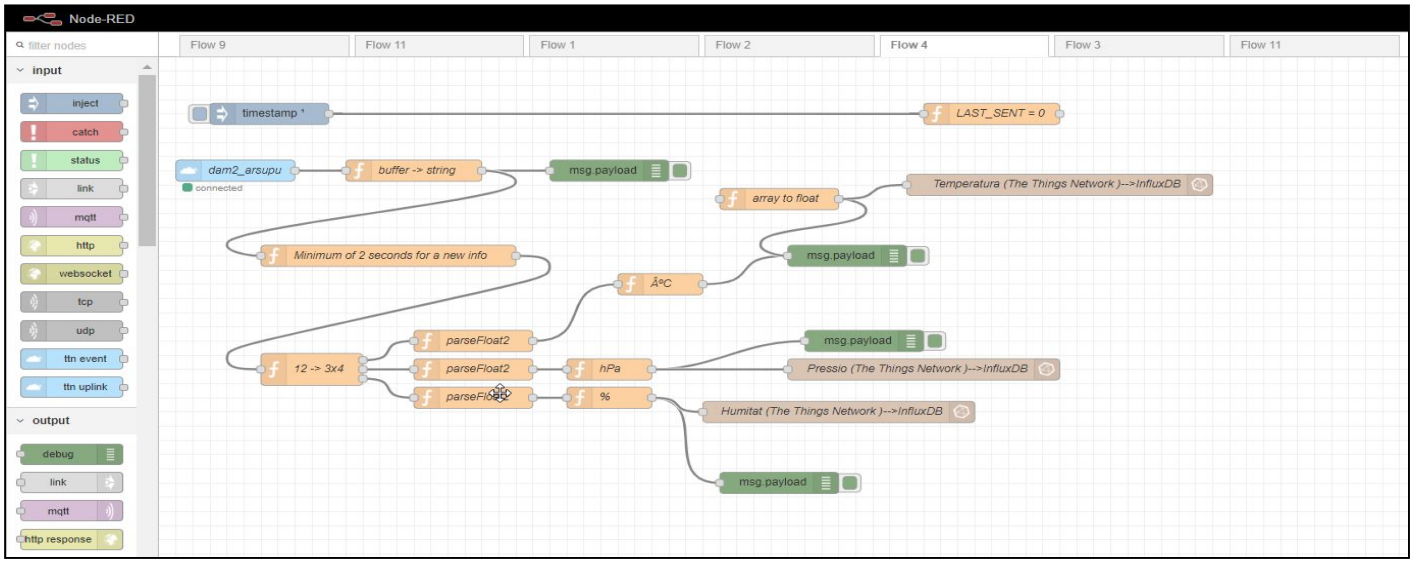
- Errors per visualotzar-ho al Dashboard del Node-Red
- S'ha creat un Dashboard a grafana ja que l'InfluxDB hem aconseguit emmagatzemar les variables però de moment no em funciona



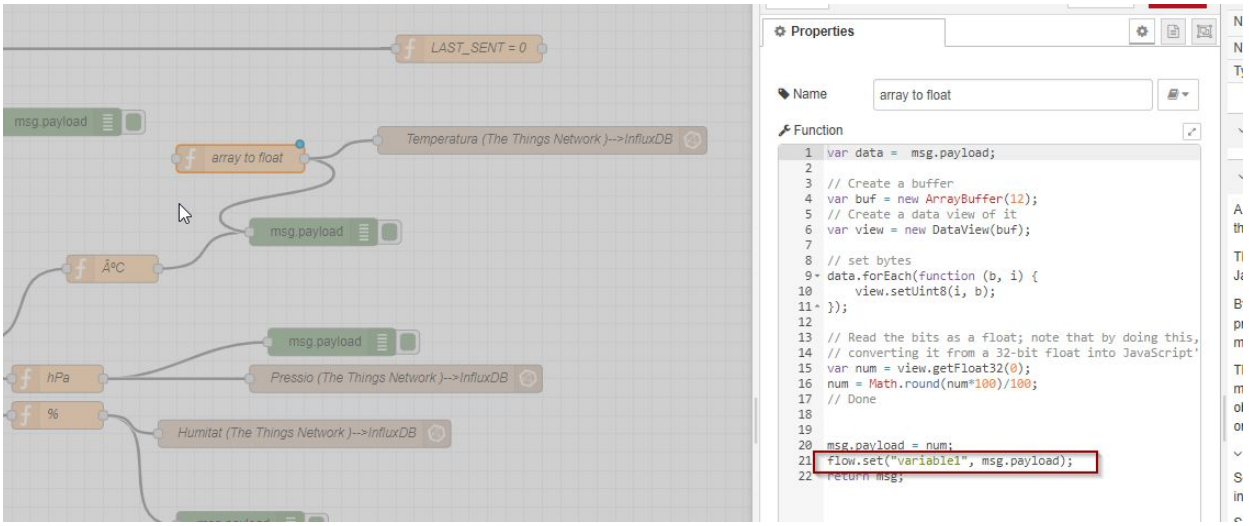
Nom i Cognoms **Data**

Arnau Subirós Puigarnau 10-02-2020

Ampliació 10/2/2020



- Modifiquem el node funcio : array to float afegim un setter



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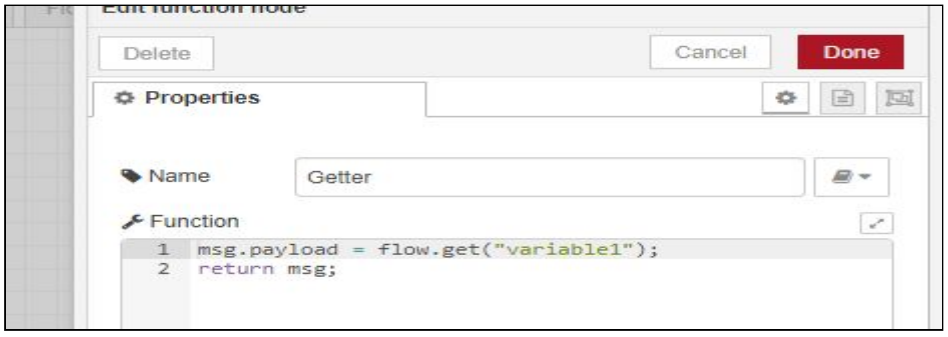
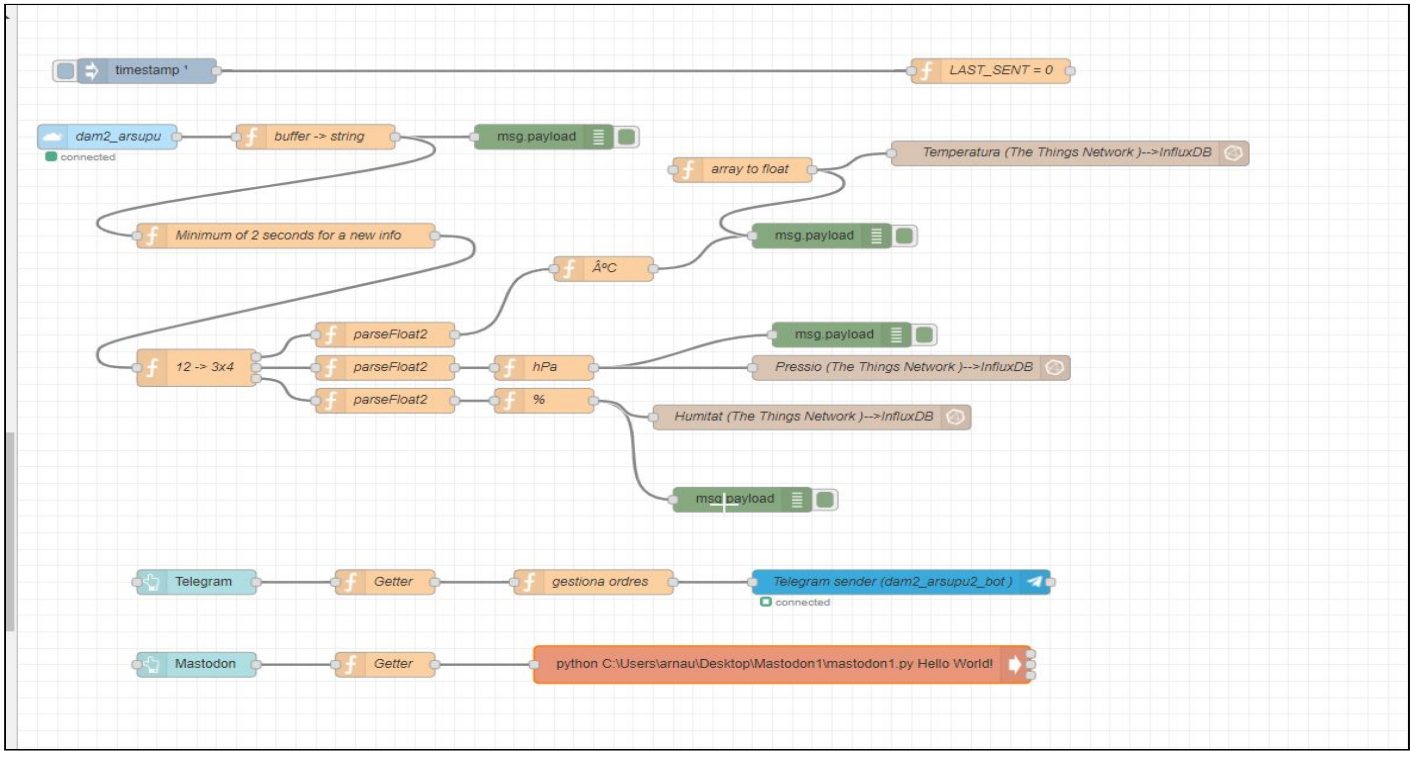
- Crearem 2 botons(Telegram i Mastodon) , pel Dash Board de Node -Red un node ,utilitzant la variable anterior , crearem una funcio getter on:
  - (Telegram) la vinculem a : un node funcio on especificarem el id del chat (del bot o del grup) i ho enviarem al node “Telegram sender”
  - (Mastodon): la vinculem a un node exec on s’executa un programa amb llenguatge python on li pases un argument i s’envia a la compte ja configurada de Mastodon)





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