

A series of overlapping, semi-transparent geometric shapes in shades of blue, green, and purple on the left side of the slide.

Irem Info Bordeaux Node-Red pour IoT

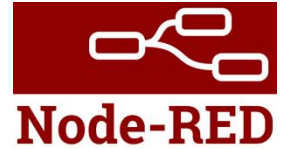
A vertical bar composed of three thin, parallel lines in blue, orange, and light blue.

(via Raspberry Pi)

Christie Vassilian - 13 janvier 2021

A series of overlapping, semi-transparent geometric shapes in shades of grey on the right side of the slide.

Planning Présentation



1

Node-Red, c'est quoi ?
architecture & fonctionnement

2

Montage Simple mais Efficace
premiers flows IoT pour comprendre

3

Mini-Projet plus élaboré
exemples intéressants IoT

4

Node-Red, une communauté
où trouver des explications ou du matériel sur Node-Red

**QUESTIONS
ECHANGES
AU FIL DE
L'H2O**



c'est quoi Node-Red

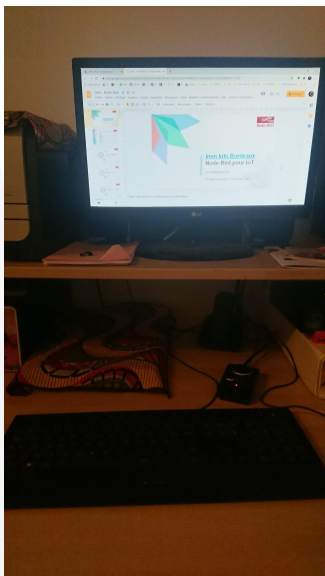
- Pi à distance : RealVNC
- architecture Node-Red
- fonctionnement sous Pi

Prise à distance du Pi

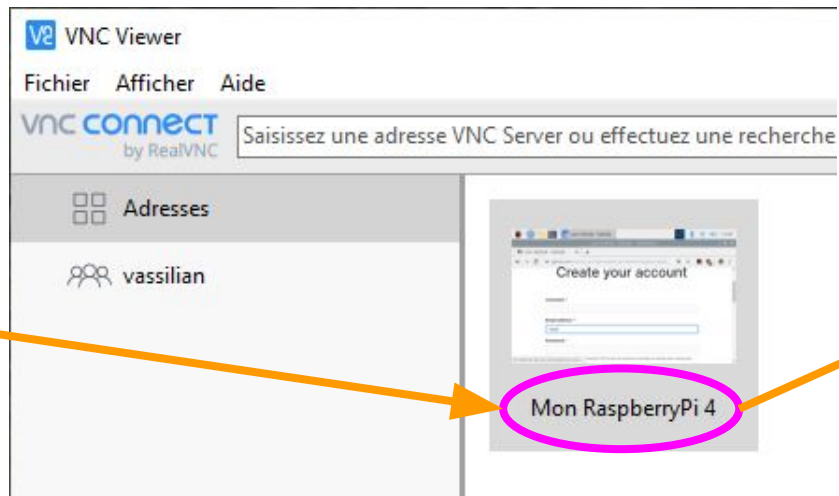
via [RealVNC](#)



ORDI FIXE

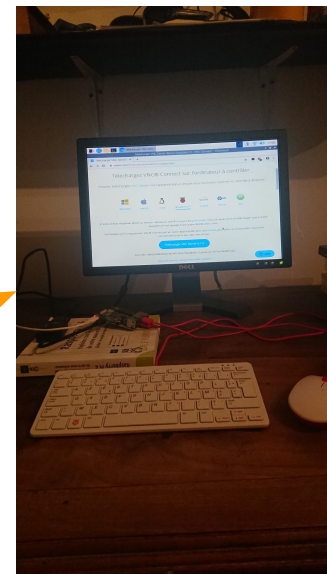


[VNC Viewer](#)



utile pour piloter le pi
(qui peut être sans écran)

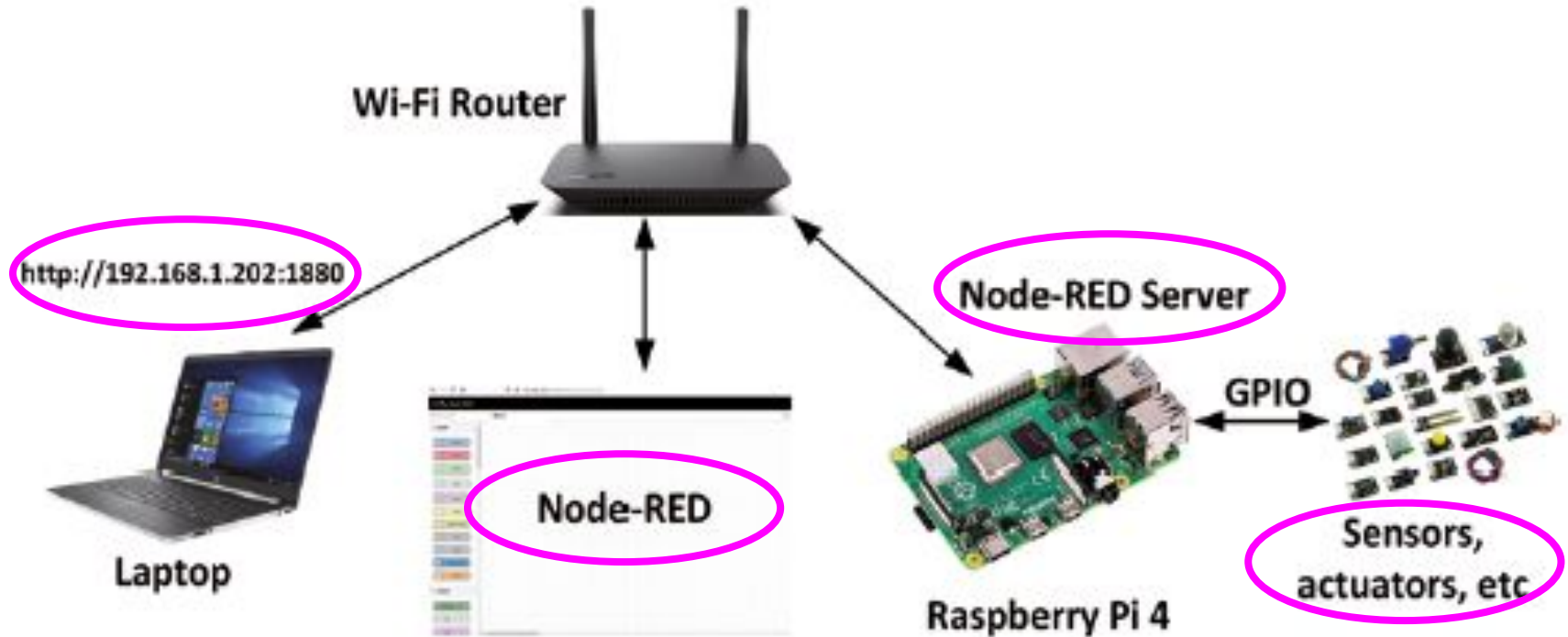
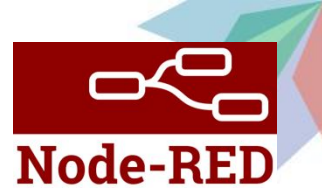
Rasp. Pi



[VNC Connect](#)

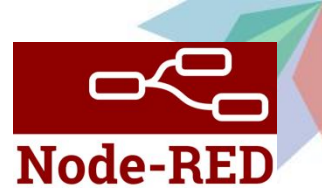
architecture Node-Red

concept / fonctionnement

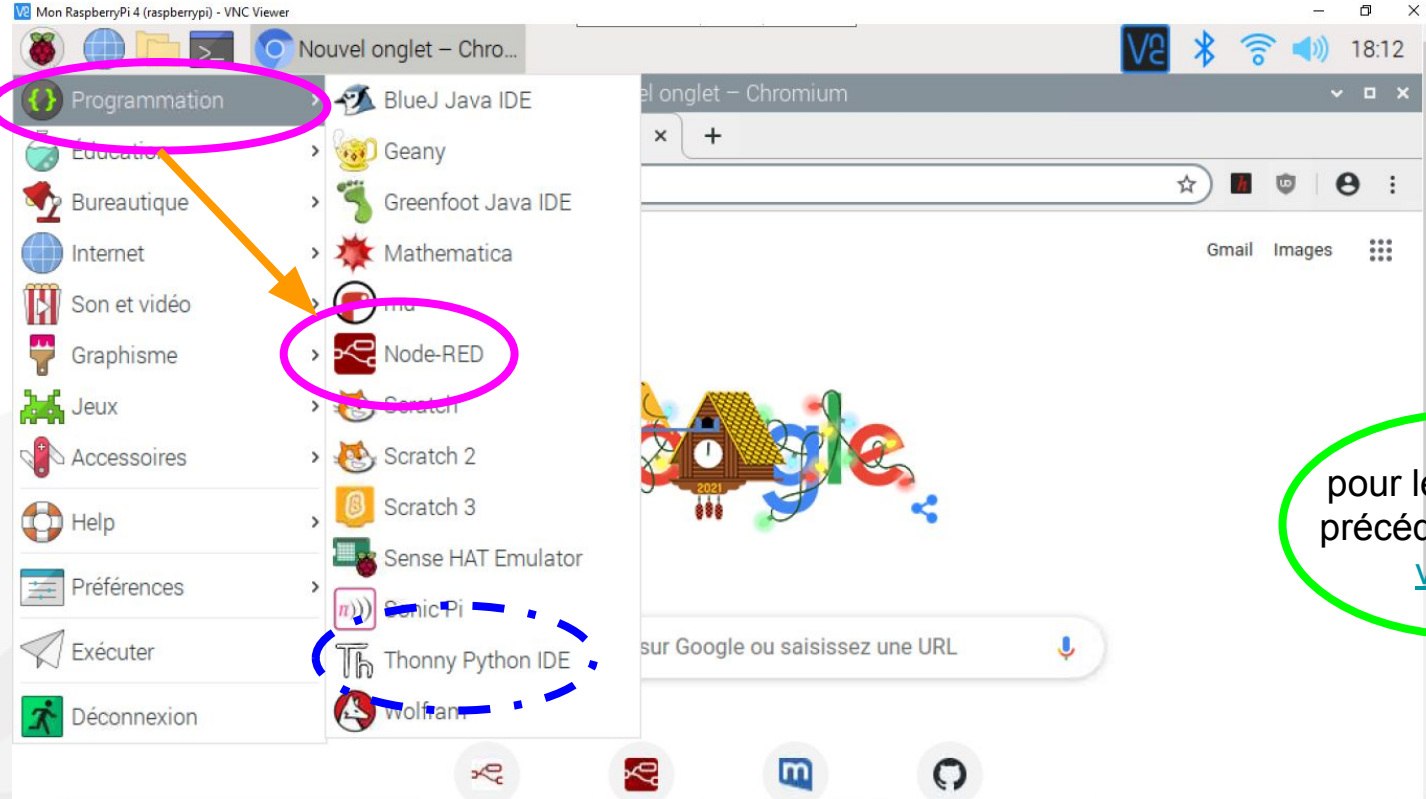


Lancement de Node-Red

sur le Pi 4



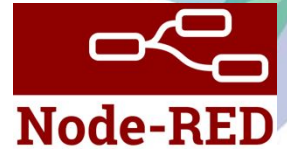
menu du Pi 4



pour les versions
précédentes de pi
[voir ici](#)

Node-Red flow

prog. graphique sur le Pi (puis deployed sur internet)



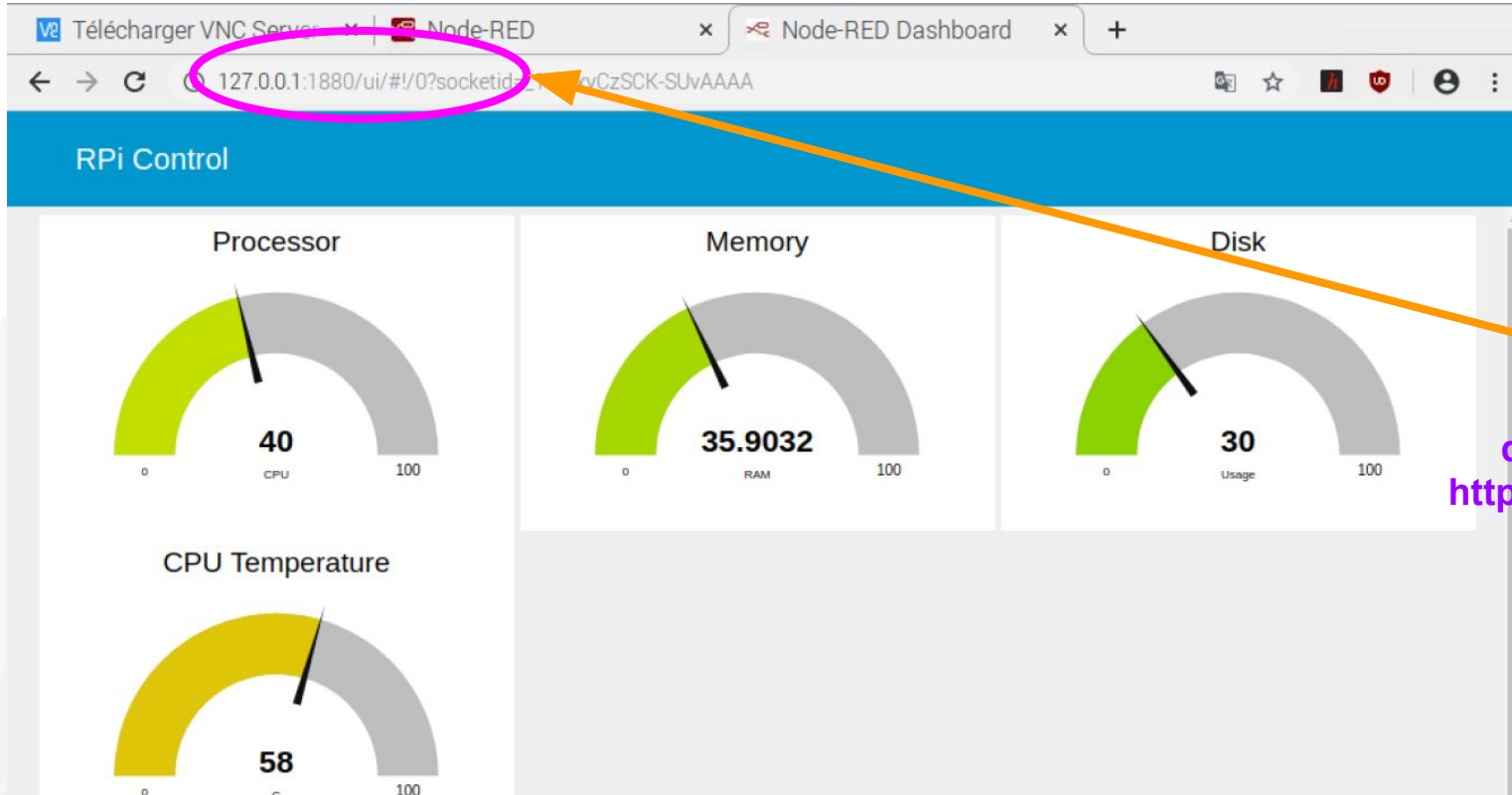
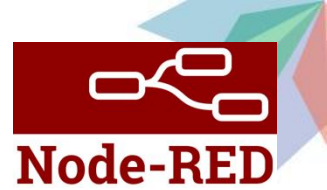
A screenshot of a web browser displaying the Node-RED interface. The browser's address bar shows the URL "127.0.0.1:1880/#flow/ec2f6191...". The interface includes a left sidebar with a "filter nodes" search bar and a list of common nodes like "inject", "debug", "complete", "catch", "status", "link in", "link out", and "comment". The main workspace shows a flow titled "Dashboard CPU - Disk" with two parallel paths. The top path starts with a "timestamp" node, followed by three sensor nodes: "RPi Temp.", "CPU Load" (with "pid:15183" below it), and "Free Memory". These are connected to a function node "f", which then feeds into three output nodes: "CPU Temperature", "chart", and "Processor". The bottom path starts with another "timestamp" node, followed by a "Disk Usage" sensor node, a function node "f", and a "Disk" output node. A "Deploy" button is visible in the top right corner of the workspace.

enregistrer
le travail

affiche
dans le bowser
http://mon_ip:1880

Node-Red user interface

ex de résultat sur internet



affiche
dans le bowser
http://mon_ip:1880/ui

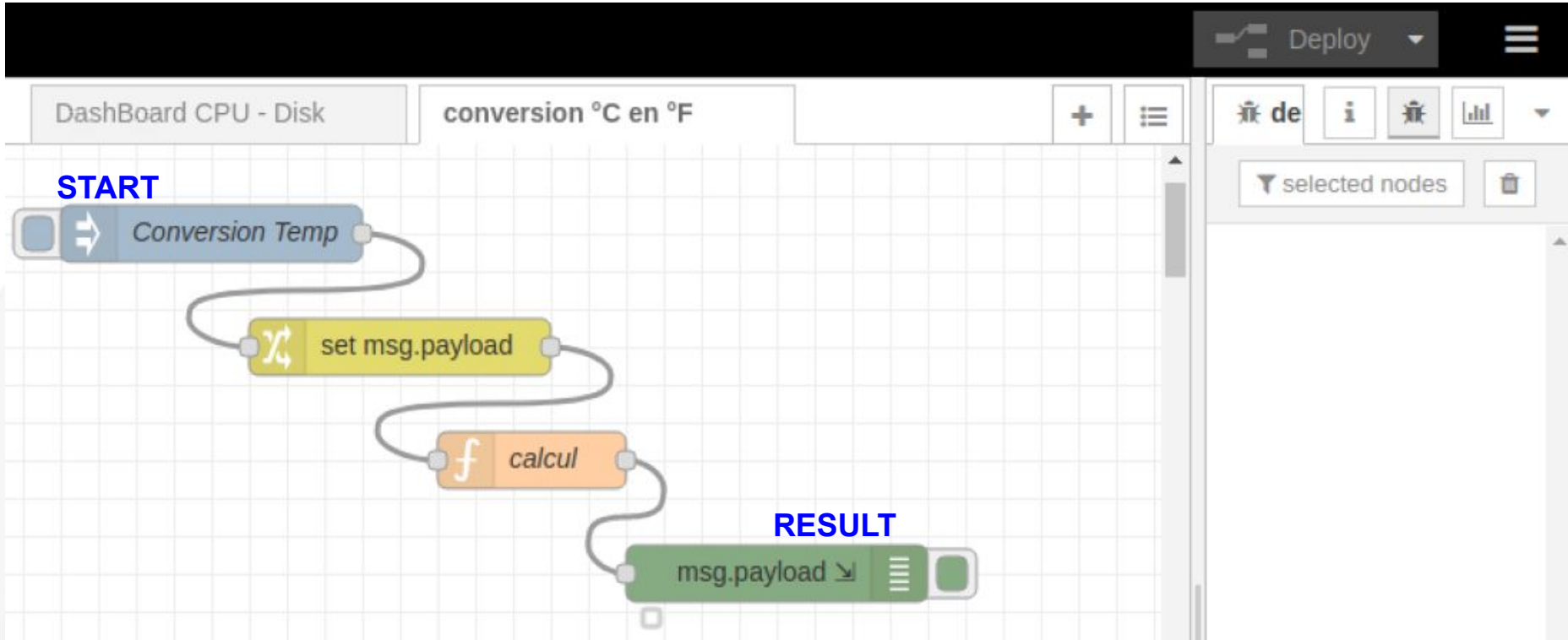
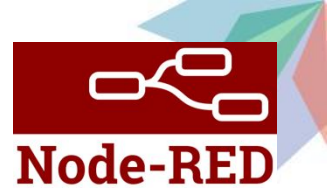


Montage simple

- 1er flow : conversion température
- 2ème flow : get/send on internet
- importer un flow (puis le modifier)

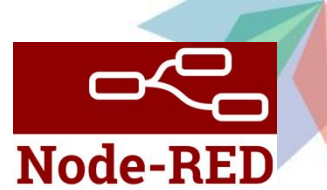
1er flow

conversion température °C -> °F



1er flow

conversion température °C -> °F



START

Edit inject node

Delete Cancel Done

Properties

Payload ▼ timestamp

Topic

Inject once after seconds, then

Repeat none ▼

Name Conversion Temp

RESULT

Edit debug node

Delete Cancel Done

Properties

Output ▼ msg. payload

To debug window
 system console
 node status (32 characters)

Name Name

1er flow

conversion température °C -> °F

Edit change node

Delete Cancel Done

Properties

Name

Rules

Set

msg. payload

to a₂ 10

VALUE

Edit function node

Delete Cancel Done

Properties

Name calcul

Function

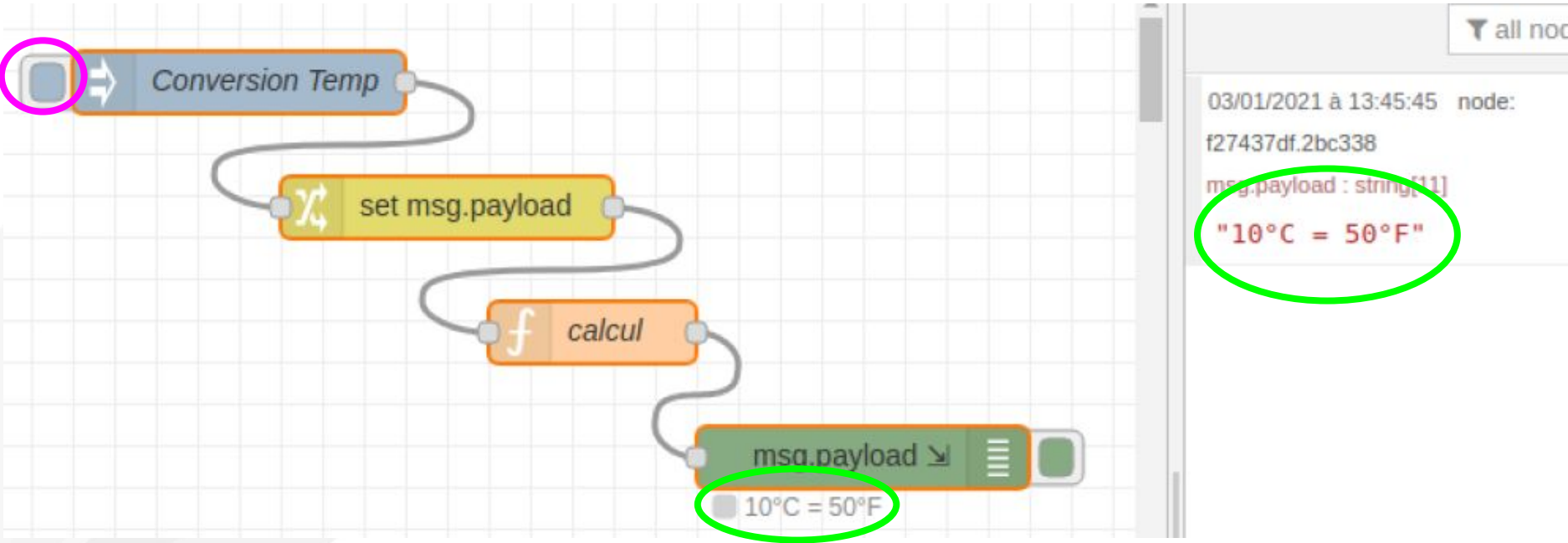
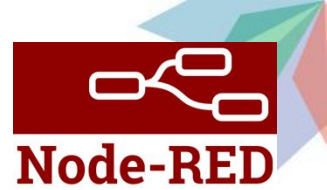
```
1 var C =msg.payload;
2 var F = C*1.8+32;
3 msg.payload = C + "°C = " + F.toString() + "°F";
4 return msg;
```

PREVIOUS NODE

NEXT NODE

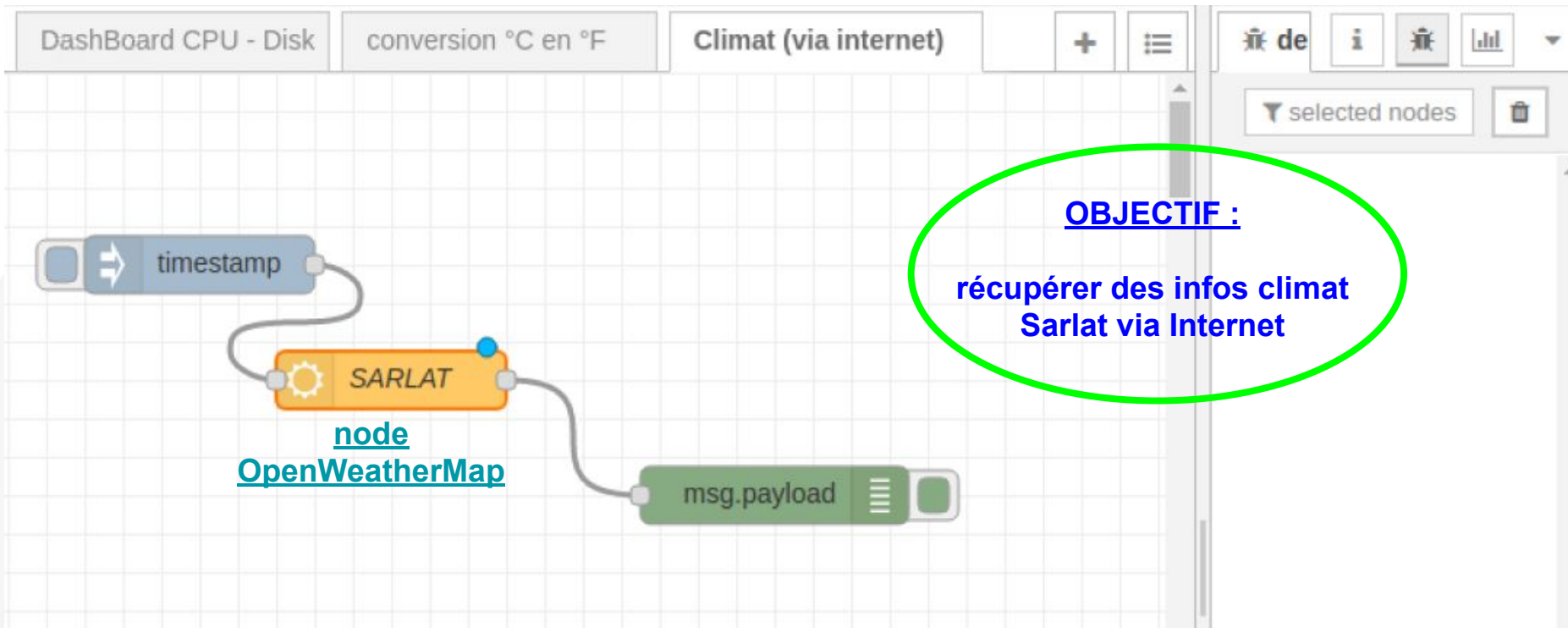
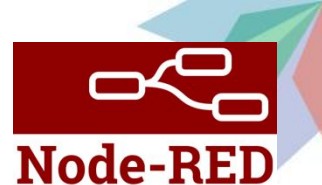
1er flow

conversion température °C -> °F



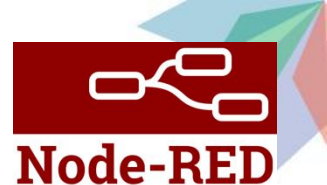
2ème flow

get/send info on internet



2ème flow

get/send info on internet



Edit openweathermap node

Delete Cancel Done

Properties

API Key [REDACTED]

Language French

Current weather for

Location Coordinates

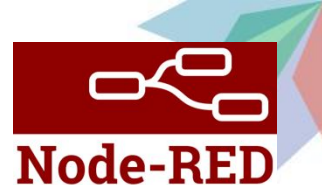
Latitude 44.890891

Longitude 1.217292

Name SARLAT

2ème flow

get/send info on internet



DashBoard CPU - D conversion °C en °F Climat ▶ + ☰

TOUTE L'INFO en VRAC

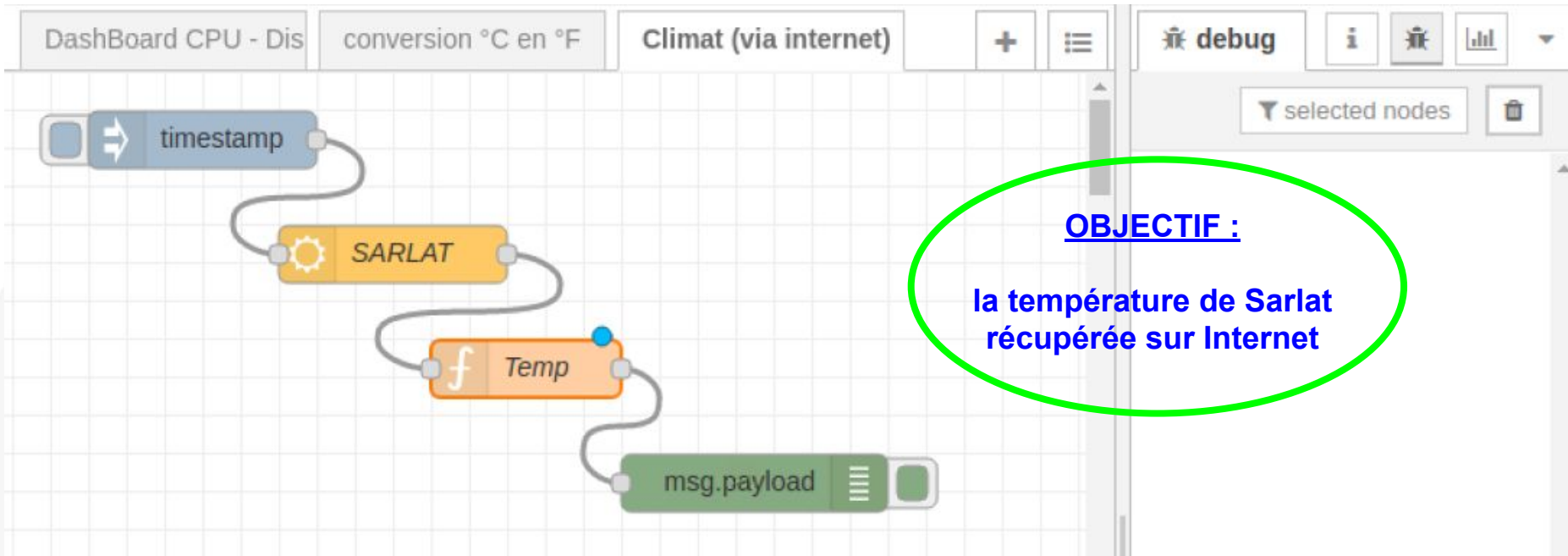
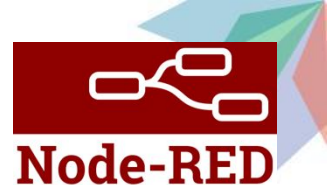
The image shows a Node-RED flow on a grid. It starts with a 'timestamp' node (blue), followed by a 'SARLAT' node (orange), and ends with a 'msg.payload' node (green). A pink circle highlights the 'timestamp' node. An orange arrow points from the 'msg.payload' node to the debug console. The debug console shows a message object with the following structure:

```
02/01/2021 à 15:06:58 - Node: 29e21bc0.ac0c04  
msg.payload : Object  
  ▶ { id: 804, weather: "Clouds", detail:  
    "couvert", icon: "04d", tempk: 275.37 ... }
```

A green oval highlights the object structure in the debug console.

2ème flow

get/send info on internet

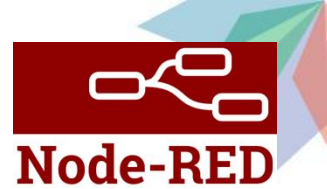


OBJECTIF :

la température de Sarlat
récupérée sur Internet

2ème flow

get/send info on internet



Edit function node

Delete Cancel Done

⚙ Properties

🔑 Name Temp

[node OpenWeatherMap](#)

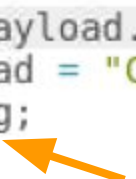
🔧 Function

```
1 var T;  
2 T = msg.payload.tempc;  
3 msg.payload = "Current temperature= "+T+ " Degrees C";  
4 return msg;
```

PREVIOUS NODE

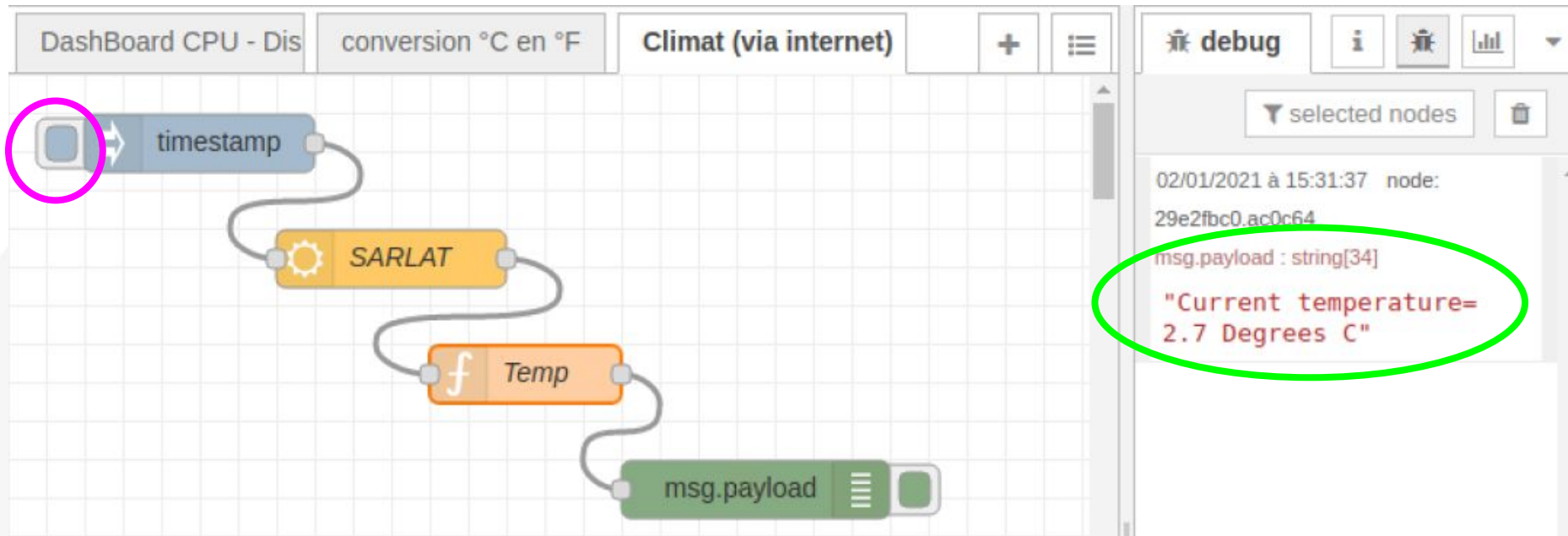
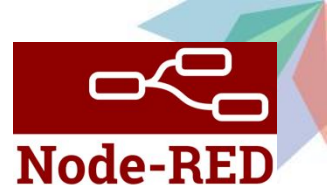


NEXT NODE



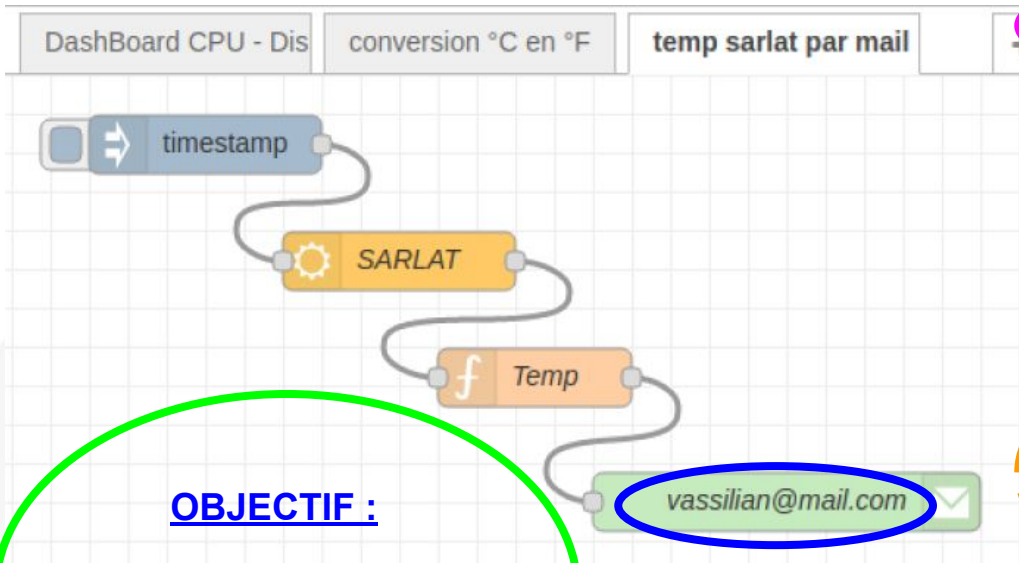
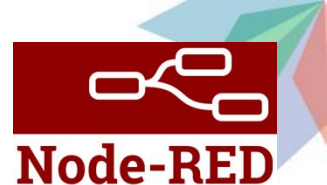
2ème flow

get/send info on internet



2ème flow

get/send info on internet



OBJECTIF :
récupérer la temp de Sarlat
et la renvoyer par mail

Edit email node

Delete Cancel Done

Properties

To vassilian@mail.com **TO**

Server smtp.mail.com

Port 465 Use secure connection.

Userid vassilian@mail.com **FROM**

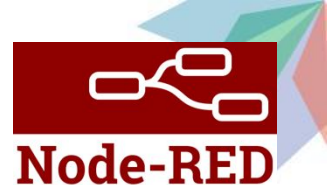
Password

Use TLS?

Name vassilian@mail.com

2ème flow

get/send info on internet



- E-mail
- Compose E-mail

Organizational Tools

- Contacts
- Organizer
- Cloud
- Online Office

Hello Christie Vassilian
vassilian@mail.com Last Login: 1/2/21 1:49 PM

1 Unread e-mail 0 New e-mails in your spamfolder

1 New e-mail Cloud

vassilian@mail.com **Current Weather Information** 3:52 PM

Show all unread e-mails

mail.com Home E-mail Contacts Organizer Cloud

Compose E-mail

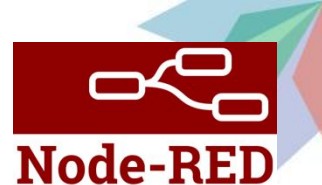
Delete Spam Reply Forward Move

Current Weather Information

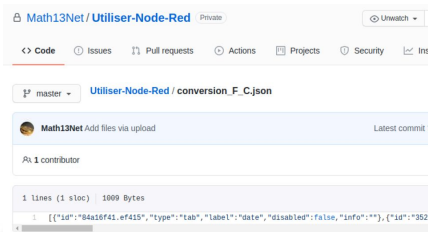
From: vassilian@mail.com

Current temperature= 2.2 Degrees C

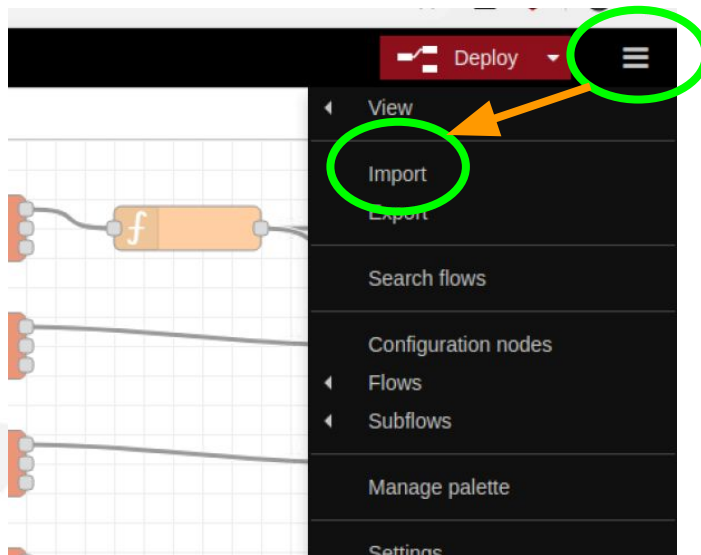
Importer un flow 1/2



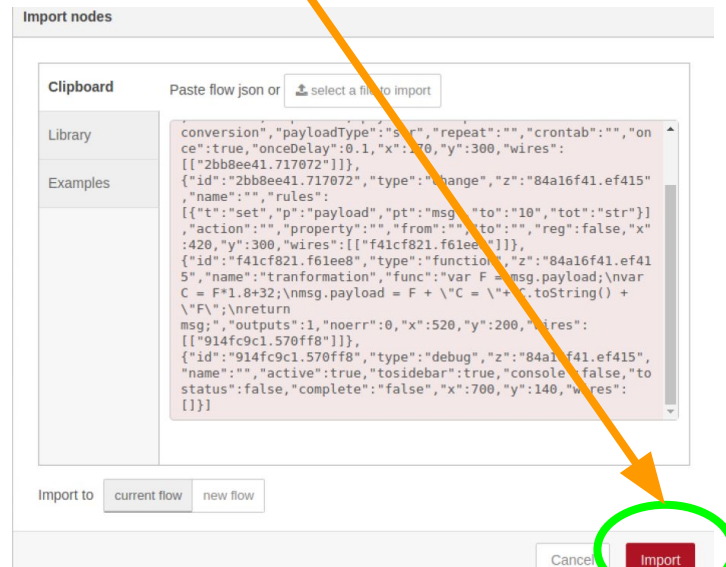
trouver 1 flow sur le net
ctrl + C



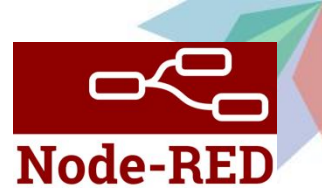
choisir import



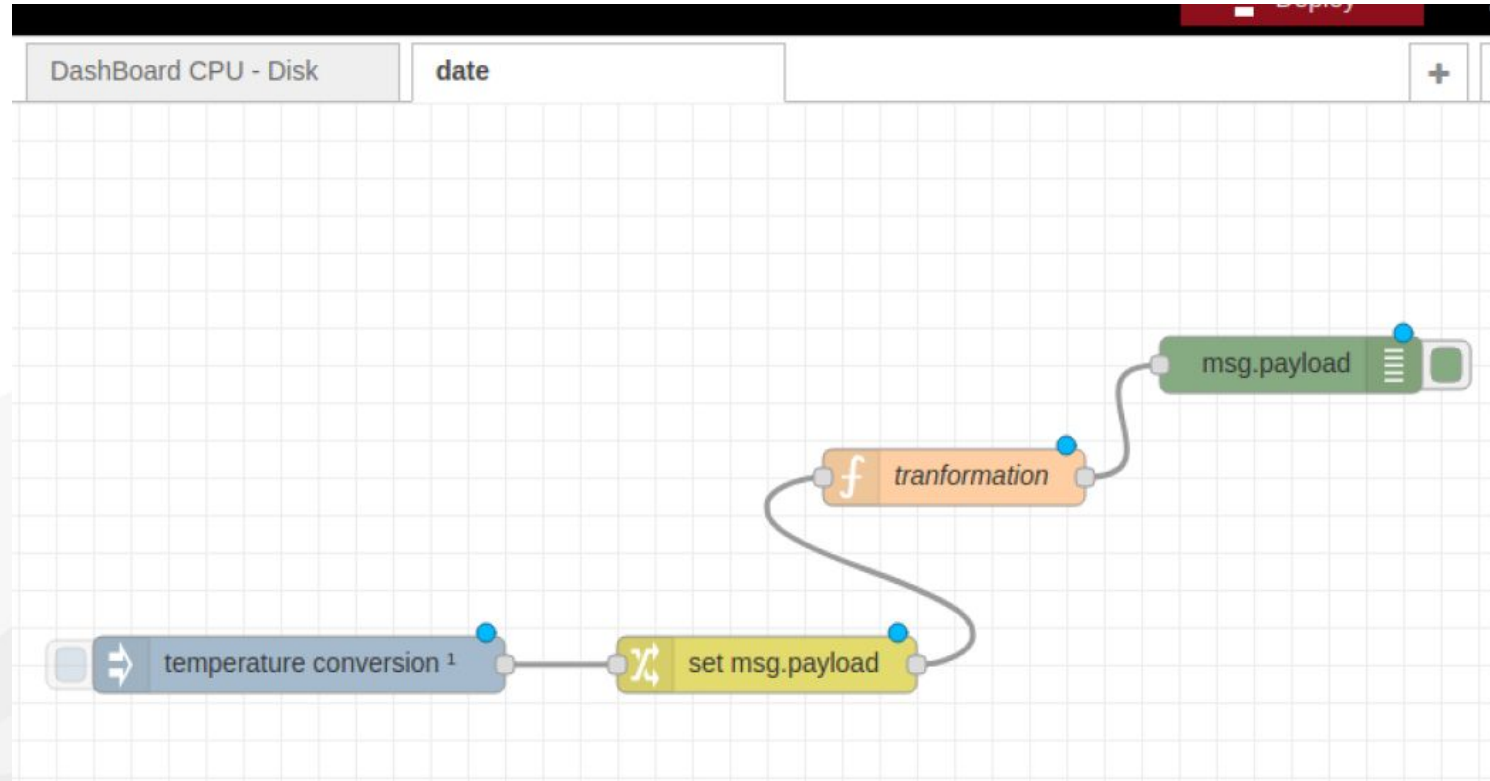
ctrl + V
appuyer sur import



Importer un flow 2/2



résultat de l'import



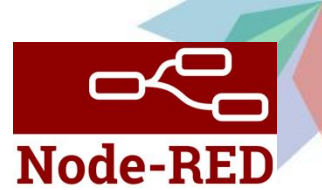


petit projet Node-Red

- alarme piloter à distance
- affichage sur écran I2 C LCD
- radar AV/AR voiture -> BUZZER
- dashboard sur internet

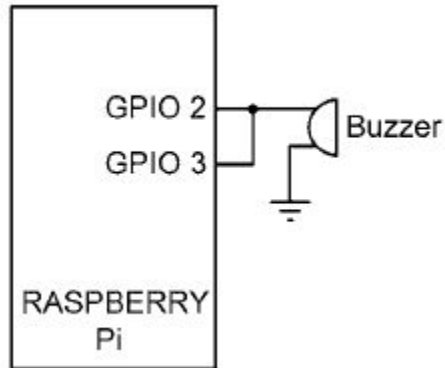
miniprojet : buzzer

GPIO on Pi

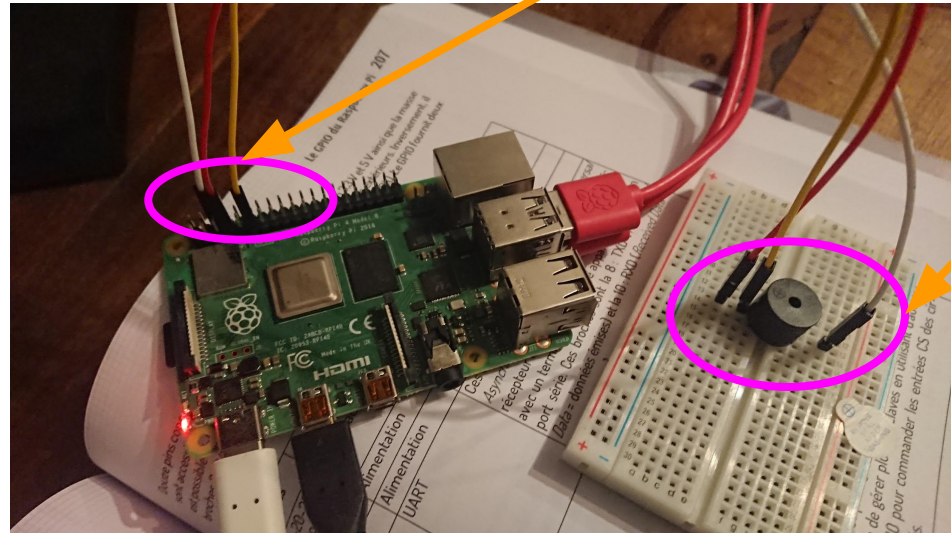


OBJECTIF :

1. envoyer un mail d'alerte au Pi
2. le Pi déclenche un buzzer
3. renvoyer 1 mail de confirmation



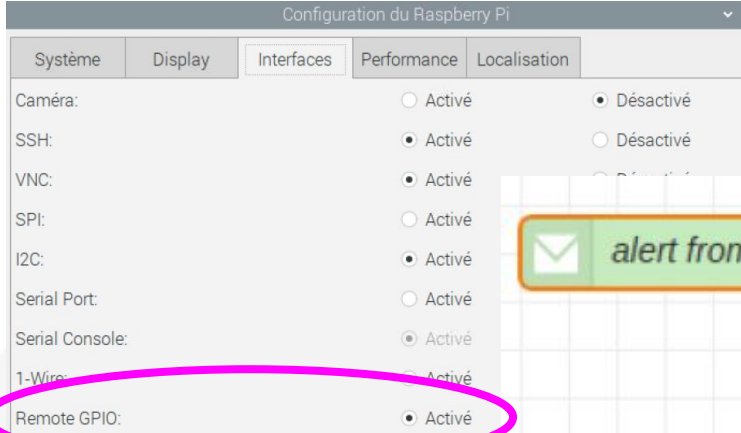
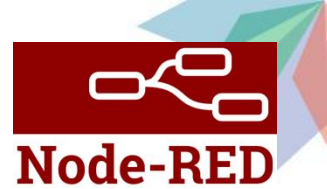
GPIO du Pi
port 4 et 17



BUZZER

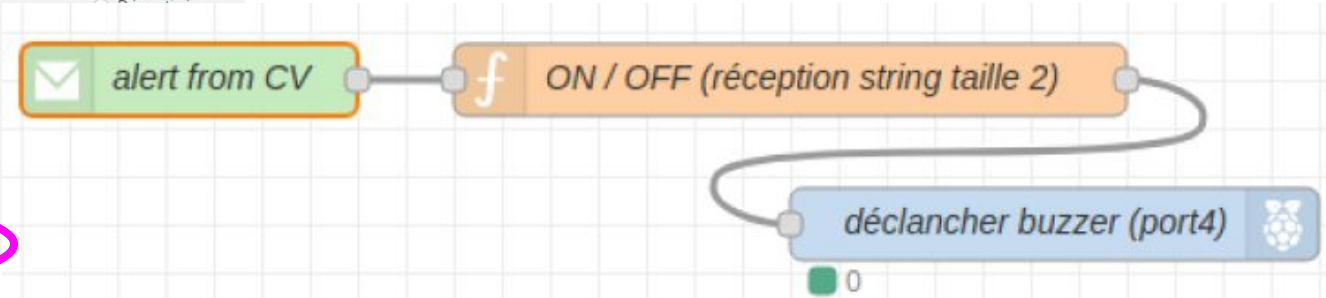
miniprojet : buzzer

GPIO on Pi

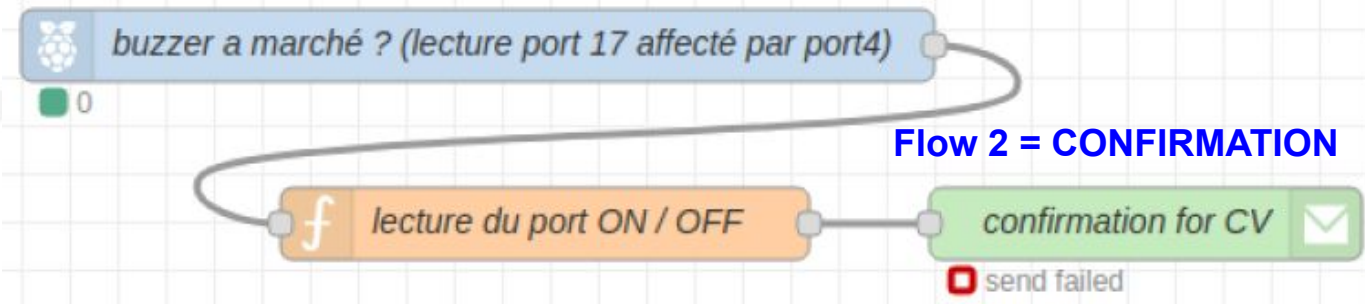


GPIO du Pi = ON

Flow 1 = ENVOI ALERTE

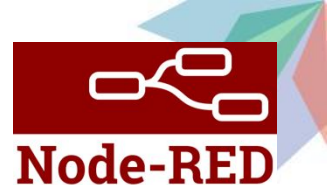


Flow 2 = CONFIRMATION



miniprojet : buzzer

GPIO on Pi



Edit email node

Delete Cancel Done

⚙ Properties

🕒 Get mail automatically every 10 seconds

✉ Protocol IMAP

🔒 Use SSL?

🌐 Server imap.mail.com

🔌 Port 993

👤 Userid vassilian@mail.com

🔒 Password

📁 Folder INBOX

mail.com Search mail.com Help

🏠 | Email | Contacts | Organizer | Cloud | Mobile App

Server Status: Everything is running fine
In case you are experiencing any issues with your mail.com account, please

[mail.com](#) > [mail.com Help Center](#) > [Premium](#) > [Using the IMAP protocol](#) >

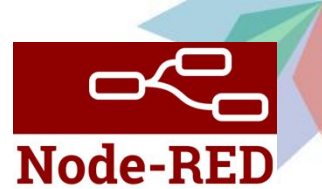
IMAP Server Data

Here you can find the relevant information for the server data to synchronize your m

	Incoming (IMAP)	Outgoing (SMTP)	Outgoing (SMTP)
Server	imap.mail.com	smtp.mail.com	smtp.mail.com
Port	993	587	465
Encryption	SSL or encryption	STARTTLS or encryption	SSL/TLS

miniprojet : buzzer

GPIO on Pi



Edit function node

Delete Cancel Done

⚙ Properties

Name ON / OFF (réception string taille 2)

🔑 Function

```
1 var cmd = msg.payload.substr(0,2);
2 var On = {payload: "1"};
3 var Off = {payload: "0"};
4
5 if(cmd == "ON")
6   return On;
7 else if(cmd == "OF")
8   return Off;
9
10 return msg;
```

Edit rpi-gpio out node

Delete Cancel Done

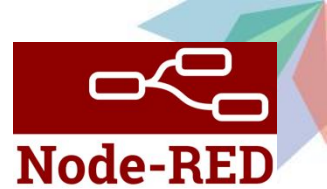
⚙ Properties

● Pin

3.3V Power - 1	2 - 5V Power
SDA1 - GPIO02 - 3	4 - 5V Power
SCL1 - GPIO03 - 5	6 - Ground
GPIO04 - 7	8 - GPIO14 - TxD
Ground - 9	10 - GPIO15 - RxD
GPIO17 - 11	12 - GPIO18
GPIO27 - 13	14 - Ground
GPIO22 - 15	16 - GPIO23
3.3V Power - 17	18 - GPIO24
MOSI - GPIO10 - 19	20 - Ground
MISO - GPIO09 - 21	22 - GPIO25
SCLK - GPIO11 - 23	24 - GPIO8 - CE0
Ground - 25	26 - GPIO7 - CE1
SD - 27	28 - SC
GPIO05 - 29	30 - Ground
GPIO06 - 31	32 - GPIO12
GPIO13 - 33	34 - Ground

miniprojet : buzzer

GPIO on Pi



Edit rpi-gpio in node

Delete

Cancel

Done

⚙ Properties

● Pin

3.3V Power - 1	2 - 5V Power
SDA1 - GPIO02 - 3	4 - 5V Power
SCL1 - GPIO03 - 5	6 - Ground
GPIO04 - 7	8 - GPIO14 - TxD
Ground - 9	10 - GPIO15 - RxD
GPIO17 - 11	12 - GPIO18
GPIO27 - 13	14 - Ground
GPIO22 - 15	16 - GPIO23
3.3V Power - 17	18 - GPIO24
MOSI - GPIO10 - 19	20 - Ground
MISO - GPIO09 - 21	22 - GPIO25
SCLK - GPIO11 - 23	24 - GPIO8 - CE0
Ground - 25	26 - GPIO7 - CE1
SD - 27	28 - SC
GPIO05 - 29	30 - Ground

Edit function node

Delete

Cancel

Done

⚙ Properties

👉 Name

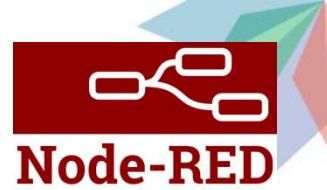
lecture du port ON / OFF

🔧 Fonction

```
1 if(msg.payload == "1")
2   msg.payload = "Buzzer is ON"
3 else
4   msg.payload = "Buzzer is OFF"
5   return msg;
```

miniprojet : buzzer

GPIO on Pi



Edit email node

Delete

Cancel

Done

Properties



vassilian@mail.com



smtp.mail.com



465

Use secure connection.



vassilian@mail.com



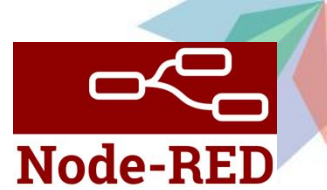
.....



confirmation for CV

miniprojet : buzzer

GPIO on Pi



Compose E-mail

activer le buzzer

Search

Unread E-mails

Favorites

Inbox

From "Christie Vassilian" <vassilian@mail.com>

To Mr VASSILIAN

Subject activer le buzzer

B I U More Stationery abc

ON



Send

Cc/Bcc

Format Options



mail.com Home E-mail Contacts Organizer

Compose E-mail

Delete Spam Reply Forward

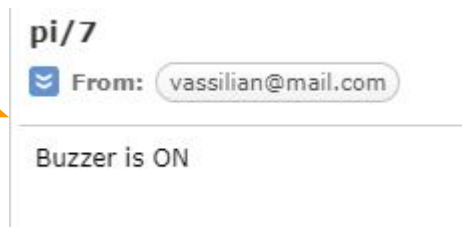
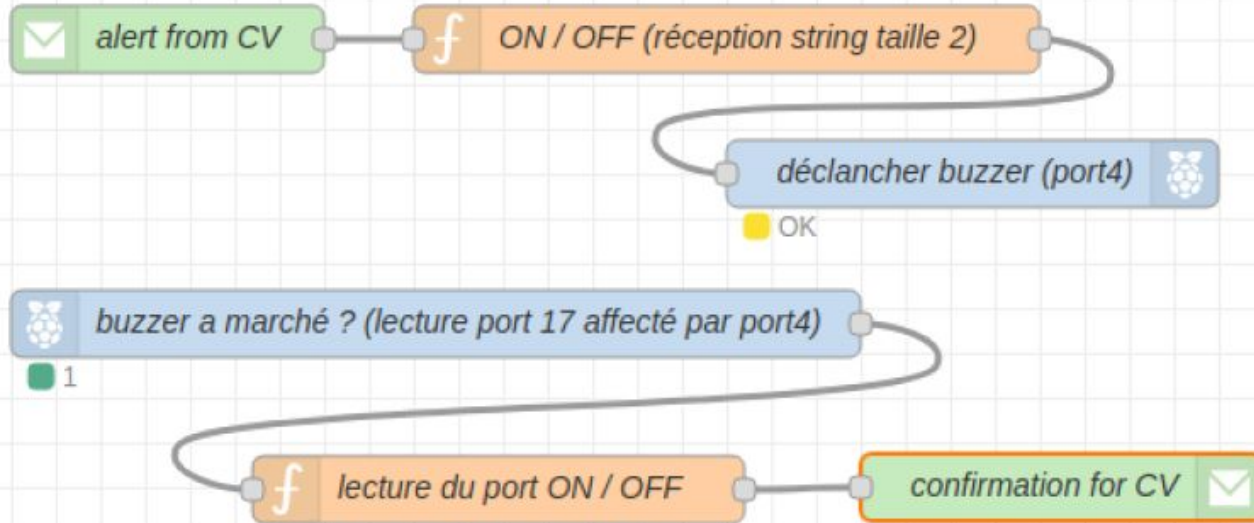
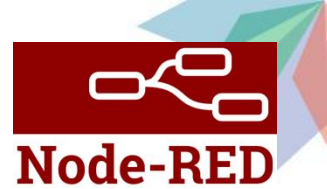
ionos.fr MyWebsite Now Ad

Christie Vassilian 5:17 PM activer le buzzer

vassilian@mail.com 3:52 PM Current Weather Information

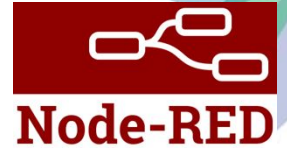
miniprojet : buzzer

GPIO on Pi



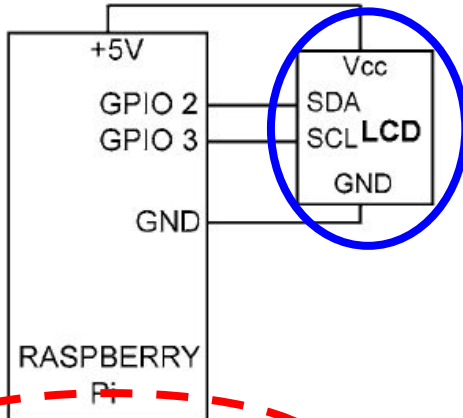
miniprojet : I2C LCD

GPIO on Pi

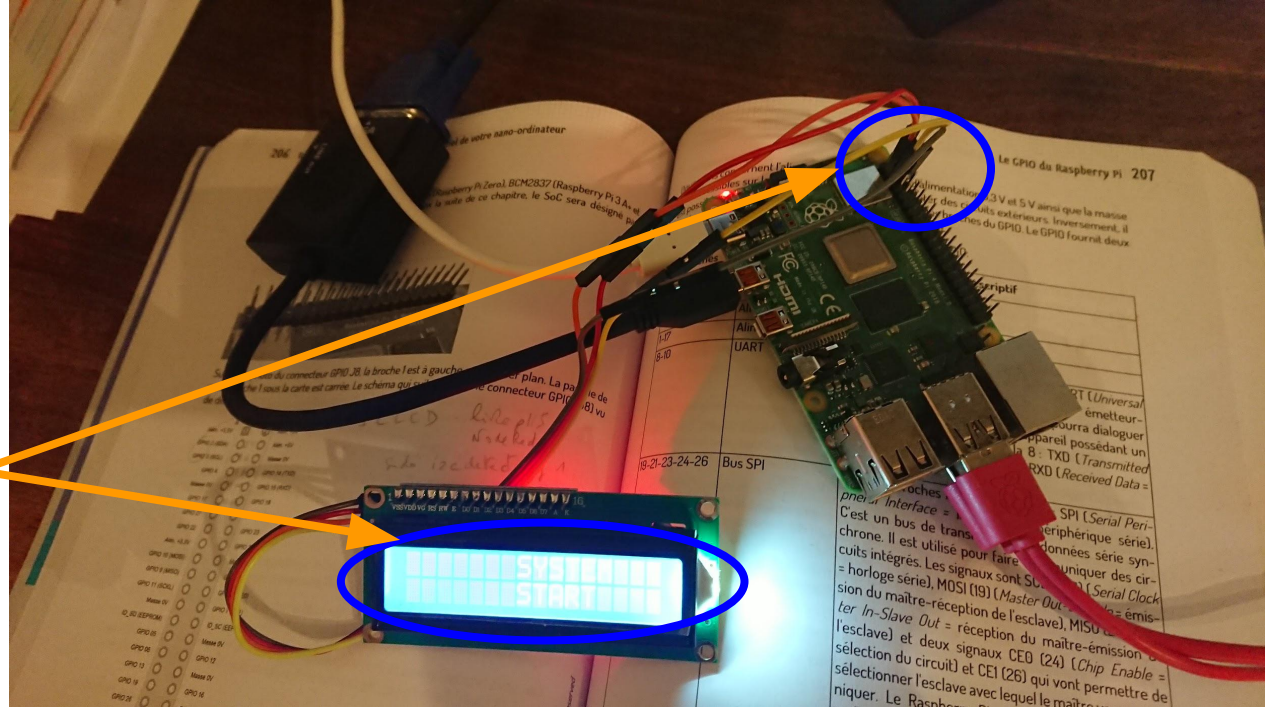


OBJECTIF :

1. récupérer la temp à Sarlat sur internet
2. l'afficher sur écran LCD via la GPIO du Pi

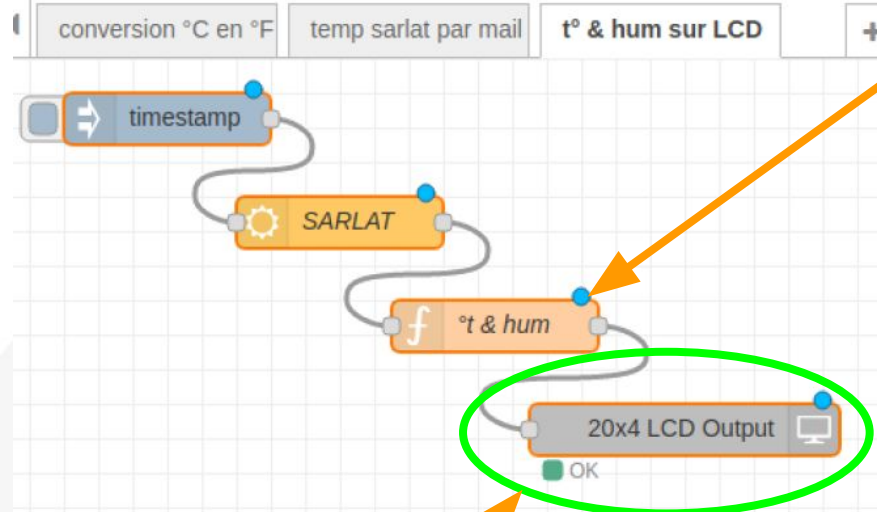
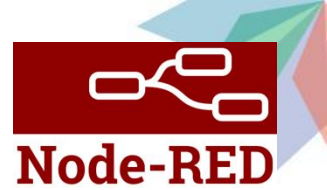


activer I2C sur le Pi



miniprojet : I2C LCD

GPIO on Pi



Edit function node

Delete

Properties

Name

°t & hum

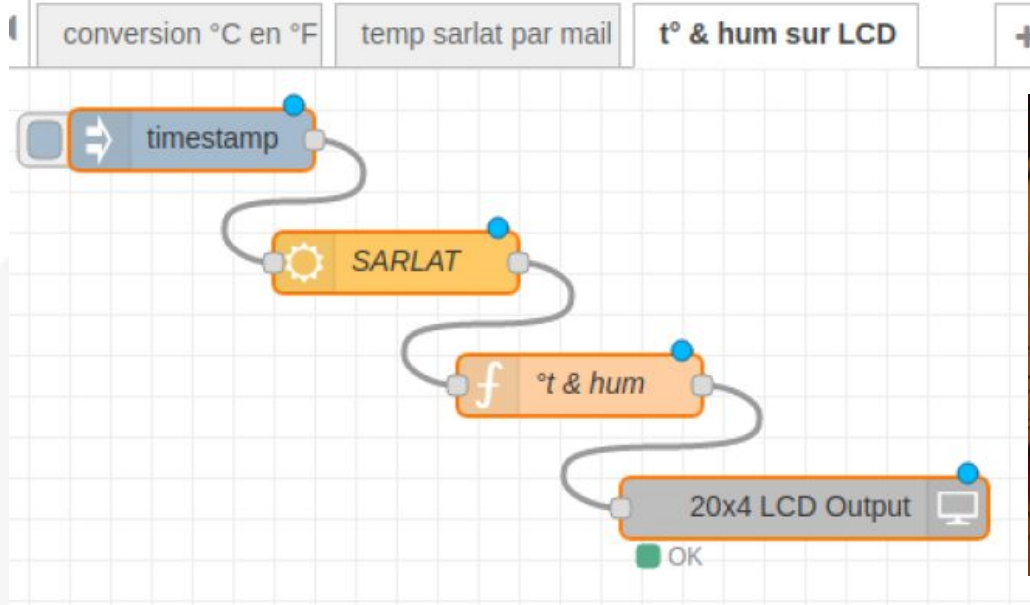
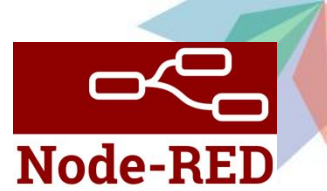
Function

```
1 var Temp = "T°C=" + msg.payload.tempc;
2 var Hum = "Hum=" + msg.payload.humidity;
3 msg.payload={msgs:[
4   {msg:"Current T & Hum"},
5   {msg:Temp + " " +Hum, pos:1}
6 ]};
7 return msg;
```

RIEN A FAIRE !!

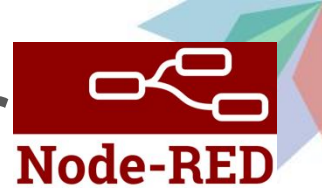
miniprojet : I2C LCD

GPIO on Pi



miniprojet : radar -> buzzer

GPIO on Pi



OBJECTIF :

1. véhicule se gare dans 1 parking
2. radar AV et radar AR de distance
3. buzzer se déclenche si trop prêt



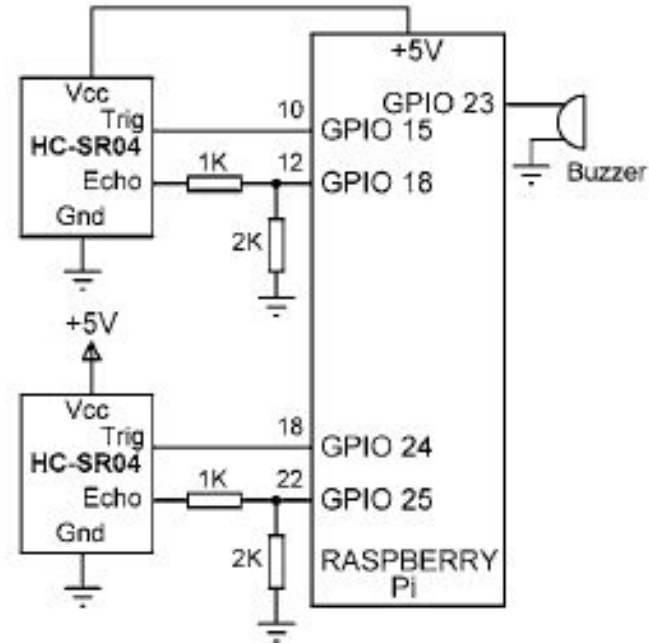
Ultrasonic Distance Sensor Modules



RASPERRY PI 4

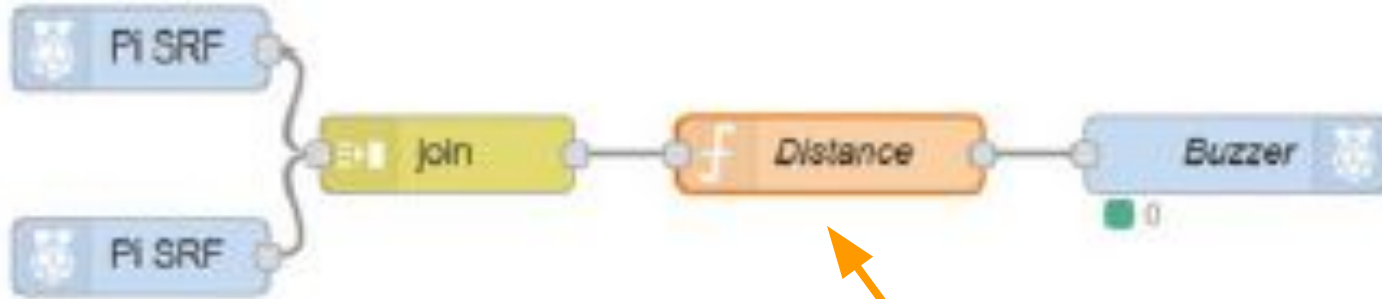
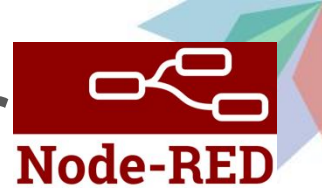


Buzzer



miniprojet : radar -> buzzer

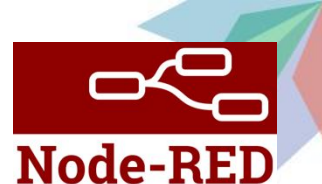
GPIO on Pi



```
var Distance1 = msg.payload[0];
var Distance2 = msg.payload[1];
if(Distance1 < 20 || Distance2 < 20)
  msg.payload = 1;
else
  msg.payload = 0;
return msg;
```

miniprojet : dashboard

affichage d'info en ligne



OBJECTIF :

1. faire fonctionner le Pi sur 1 tâche (prog Python par ex)
2. mesurer des informations du Pi (°C, mémoire, ...)
3. afficher l'info graphiquement en direct sur internet

Problème du Rendu Monnaie :

analyse empirique de la **complexité**

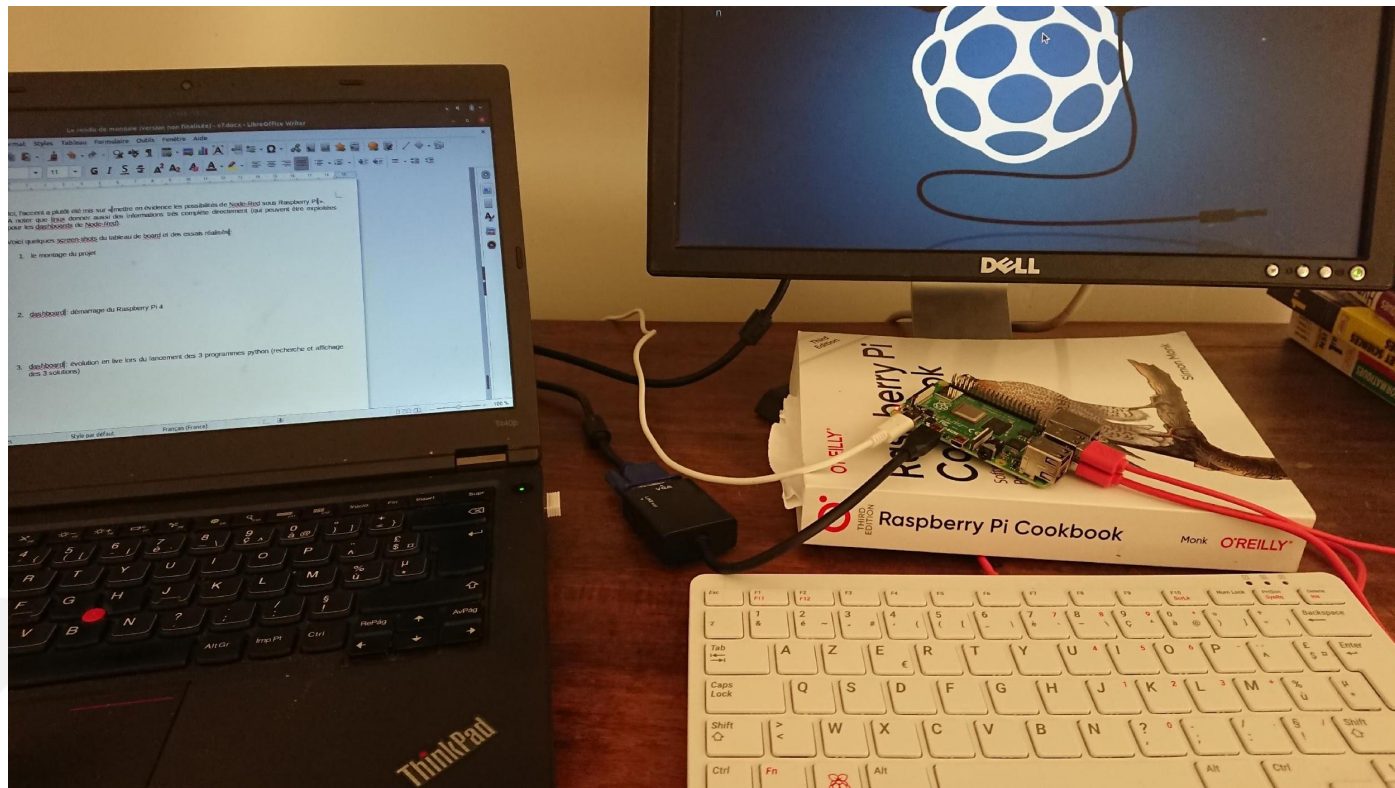
1. algo glouton - récursif - dynamique
2. faire tourner les prog python sur des jeux d'essais
3. mesurer et afficher les mesures

miniprojet : dashboard

affichage d'info en ligne

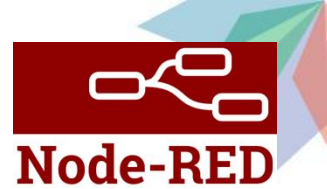


LE MONTAGE :



miniprojet : dashboard

affichage d'info en ligne

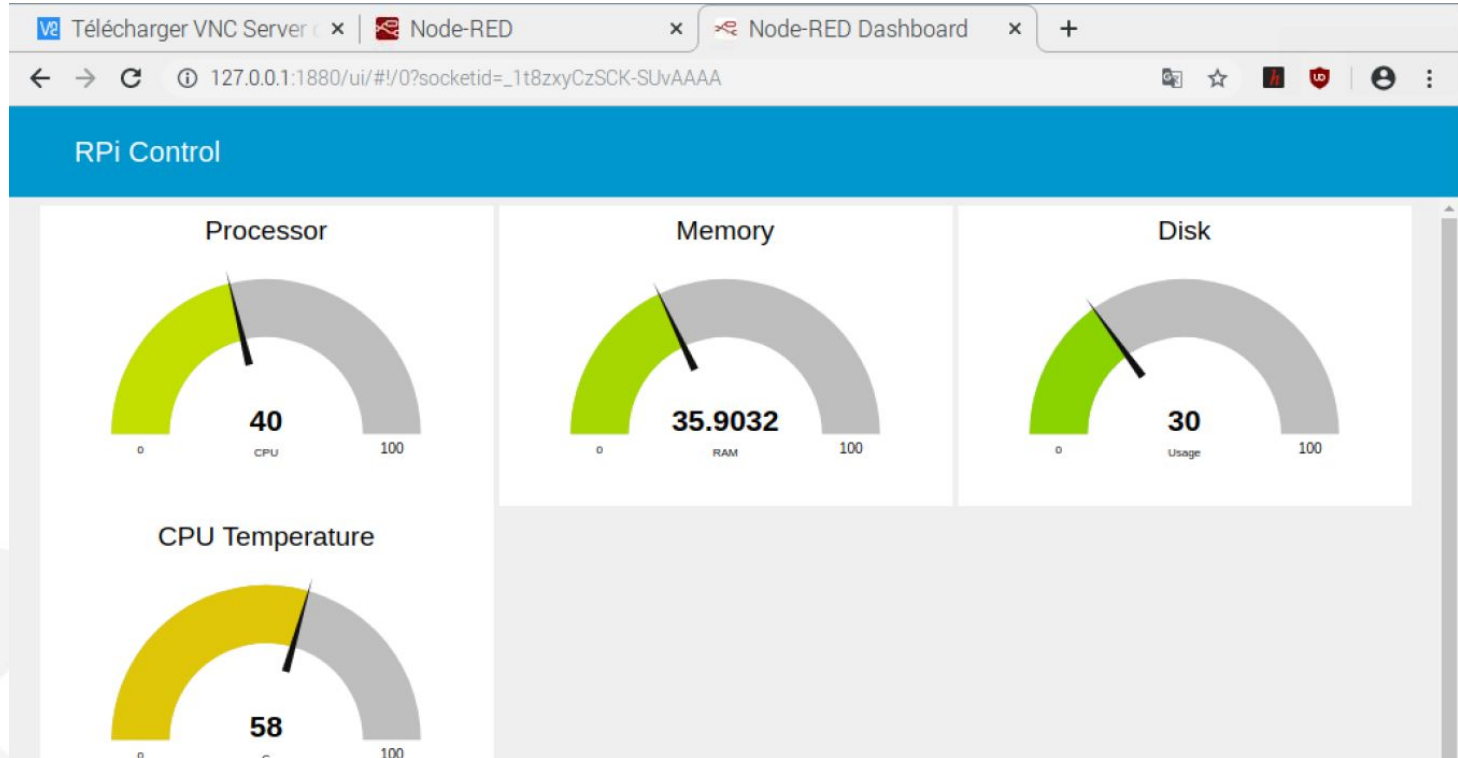
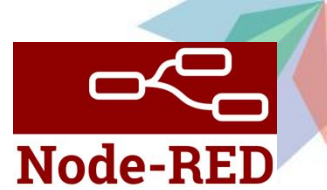


A screenshot of the Node-RED web interface. The browser tabs show "Télécharger VNC Server", "Node-RED", and "Node-RED Dashboard". The address bar shows "127.0.0.1:1880/#flow/ec2f6191.5be7a". The interface title is "Node-RED" with a "Deploy" button. The main workspace is titled "DashBoard CPU - Disk". On the left, a "filter nodes" search bar is above a "common" category containing nodes like inject, debug, complete, catch, status, link in, link out, and comment. The main workspace contains two parallel flows. The top flow starts with a "timestamp" node, which branches into three paths: "RPi Temp.", "CPU Load", and "Free Memory". "RPi Temp." connects to a function node "f", which then connects to "CPU Temperature" and "chart". "CPU Load" connects to "Processor". "Free Memory" connects to "Memory". The bottom flow starts with another "timestamp" node, which connects to "Disk Usage", then a function node "f", and finally "Disk".

LE FLOW :

miniprojet : dashboard

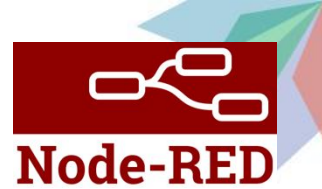
affichage d'info en ligne



LE DASHBOARD :

miniprojet : dashboard

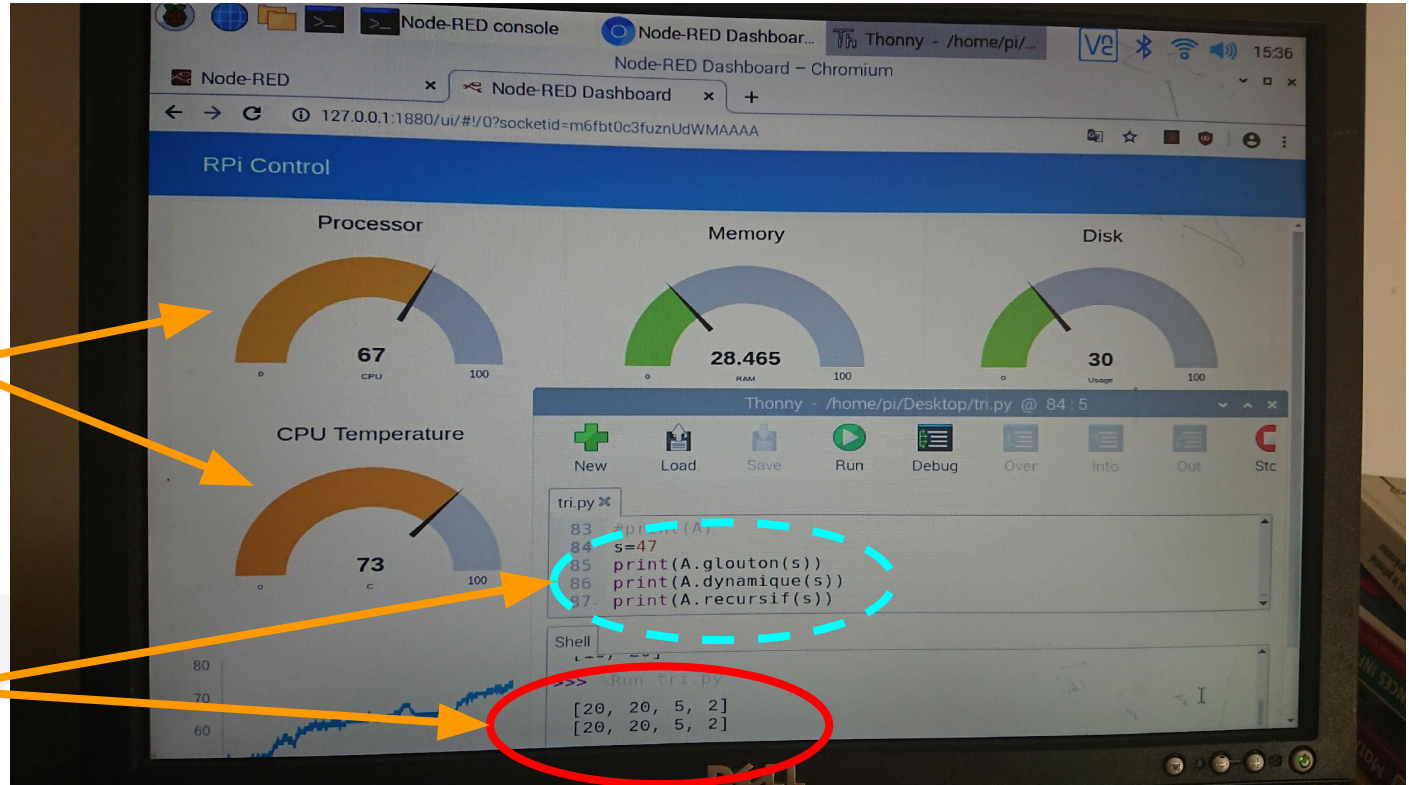
affichage d'info en ligne



L'EXPERIENCE :

CA CHAUFFE !

ON ATTEND TOUJOURS LE RECURSIF !



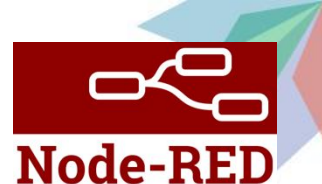


ressource Node-Red

- site et forum
- vidéo en ligne
- livre, vidéo, formation (payant)
- mon site petitfuté.com

ressource Node-Red

la communauté du node



Site et Forum :

1. [node-red](#)
2. [node-red prog](#)
3. inscrivez-vous sur le forum de [node-red](#)
4. ma page perso : petitfuté.com/nodered

Pour bien démarrer :

[un petit projet bien ficelé](#)
[2 flows faciles](#)

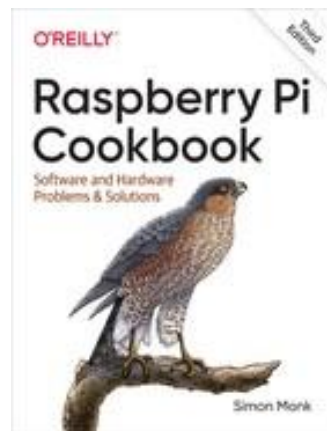
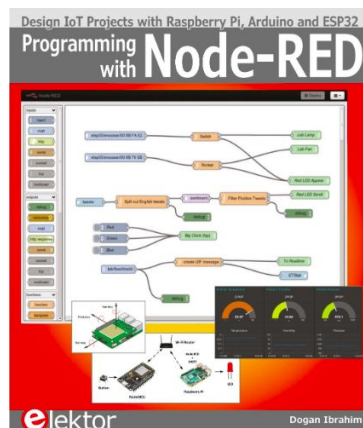
Livres pour poursuivre :

1. [programming with node-red](#)
2. [rapberry pi cookbook](#)

Ne pas oublier les vidéos (youtube ...) et les formations (udemy ...)

Vidéo et Formation :

1. [node-red channel](#) sur youtube
2. pleins d'autres chaînes (souvent plus simples) sur youtube
3. quelques formations pas cher sur udemy



Thank you

take care !

