

EMPOWER : practical course : integrate a new sensor with Raspberry PI and monitoring chain

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PLEASE DON'T TAKE A DEFINITIVE SEAT, WE WILL FORM TEAMS



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Before all

- Welcome and thank you to be here.
- Please everybody speak in english.
- Limit your vocabulary and speak slowly :-)
- Easier for your brain : think in english.
- Rythm of the day.

Introduction

- Objectives of the day
 - HAVE FUN
 - Discover the free software monitoring chain.
 - Do and learn some nice things by the practice !
- Now what ?
 - You are in my place.
 - You have to integrate a new sensor to the monitoring system (get data in database and graph it).

HOWTO and begin

- Teams forming and names
- Discover the HOWTO paper (explain <>)
- Login to the Raspberry PI

Sensor choice

- Simple example : Temperature sensor
- Already choosen, based on :
 - accuracy
 - atability
 - price
 - physical interface
 - drivers and ability to get data from the Raspberry PI

Sensor link to the Raspberry PI

- Electronic data bus : 1-wire
- Already soldered and connected to the RPI
- Now how we get the data ????
- Tutorial on the Internet, forum digging, leads to :
 - Add 'dtoverlay=w1-gpio' to /boot/config.txt file and reboot
 - You should have a file like that :
/sys/bus/w1/devices/<something beginig by 28→/w1_slave
 - Data is in this file.

Sensor reading from the Raspberry PI

- Now we will try to get the data from standard linux tools :
 - `find /sys/bus/w1/devices/ -name "28-*`
 - `find /sys/bus/w1/devices/ -name "28-*" -exec cat {}/w1_slave \;`
 - `find /sys/bus/w1/devices/ -name "28-*" -exec cat {}/w1_slave \; | grep "t="`
 - `find /sys/bus/w1/devices/ -name "28-*" -exec cat {}/w1_slave \; | grep "t=" | awk -F "t=" '{print $2/1000}'`

Monitoring agent : Zabbix-Agent

- Explanation (zabbix agent, item key)
- Configuration
 - Edit Zabbix agent sub-configuration file :
 - `nano /etc/zabbix/zabbix_agentd.conf.d/empower.conf`
 - `UserParameter=<name of item key>,<linux command>`
 - Example : `UserParameter=custom.mythermometer,find /sys/bus/w1/devices/ -name "28-*" -exec cat {}/w1_slave \; | grep "t=" | awk -F "t=" '{print $2/1000}'`
 - Restart Zabbix Agent :
 - `sudo systemctl stop zabbix-agent`
 - `sudo systemctl start zabbix-agent`

Data transmission to Zabbix Server

- Already installed and configured :
 - Uplink (RPI to Zabbix Server)
 - Downlink (Zabbix Server to RPI)
 - Through an SSH tunnel (secured and encrypted link)
 - Via autossh which maintains the links
 - In plus : downlink from management server !
 - All that done 'automagically' by Ansible : automation and configuration management system.

Zabbix Server : login

- <http://lorientdl-graph.liberasys.com/zabbix/>
- Login : your team name
- Password : empower2017

Zabbix Server : discover

- RQ : Please play only with your host :-)
- Take a tour of the Zabbix Server interface
- Discover the items
- Discover the triggers

Zabbix Server : add your item !

- Create a new item
- The name you like
- The key you configured on the RPI
- Better : unit, refresh, history

Zabbix Server : play with your sensor !

- Now the sensor data is read by the RPI
- The RPI Zabbix Agent sends it to the Zabbix Server
- The Zabbix server stores it on a database
- The Zabbix server refresh it
- ⇒ Let's see it !
- ⇒ Watch it live !

Now that the chain is OK...

- Minimal technical goal : OK
- Questions ?

Now that the chain is OK...

Going further ?

- Beautiful graphs and custom screens ?
- Overview data / graphs ?
- Triggers (receive a mail if you are $> 37,2^{\circ}\text{C}$:-) ?
- Architecture of the monitoring chain ?
- Installation and configuration automation demo ?
- QUESTIONS ?

Conclusion

- Thank you for your attention.
- I spent a bit of my evenings and WEs in order to prepare. At last did you have fun ? :-)
- Thank you for having given me the opportunity to share this project with you.