

LOW-COST LORA GATEWAY: WEB ADMIN INTERFACE



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CONTENTS

- ❑ This tutorial presents the web admin interface which is an add-on to the low-cost gateway
- ❑ Please read first the "Low-cost LoRa gateway: a step-by-step tutorial" to understand the gateway configuration
- ❑ Note that the SD card image has everything needed, including the web admin interface installed, so you may skip the installation procedure
- ❑ Let's get started...

GATEWAY WEB ADMIN INTERFACE (1)

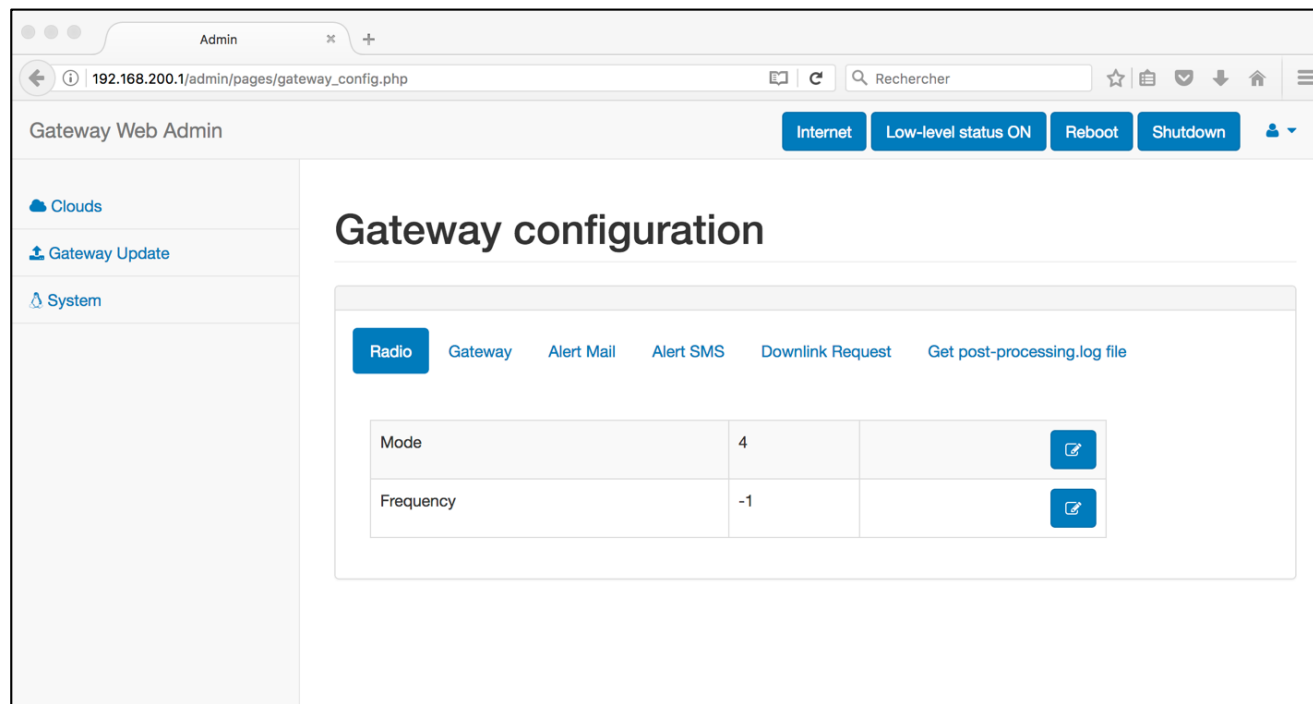
- ❑ A gateway web admin interface has been added to the latest version
- ❑ To install the web admin interface, check if you have the `gw_web_admin` folder in your `lora_gateway` folder
- ❑ If you don't, then update to the latest version
- ❑ Then, go into `gw_web_admin` and run the `install.sh` script
 - ❑ `cd gw_web_admin`
 - ❑ `sudo ./install.sh`

GATEWAY WEB ADMIN INTERFACE (2)

□ <http://192.168.200.1/admin>

□ Login: admin

□ Password: loragateway

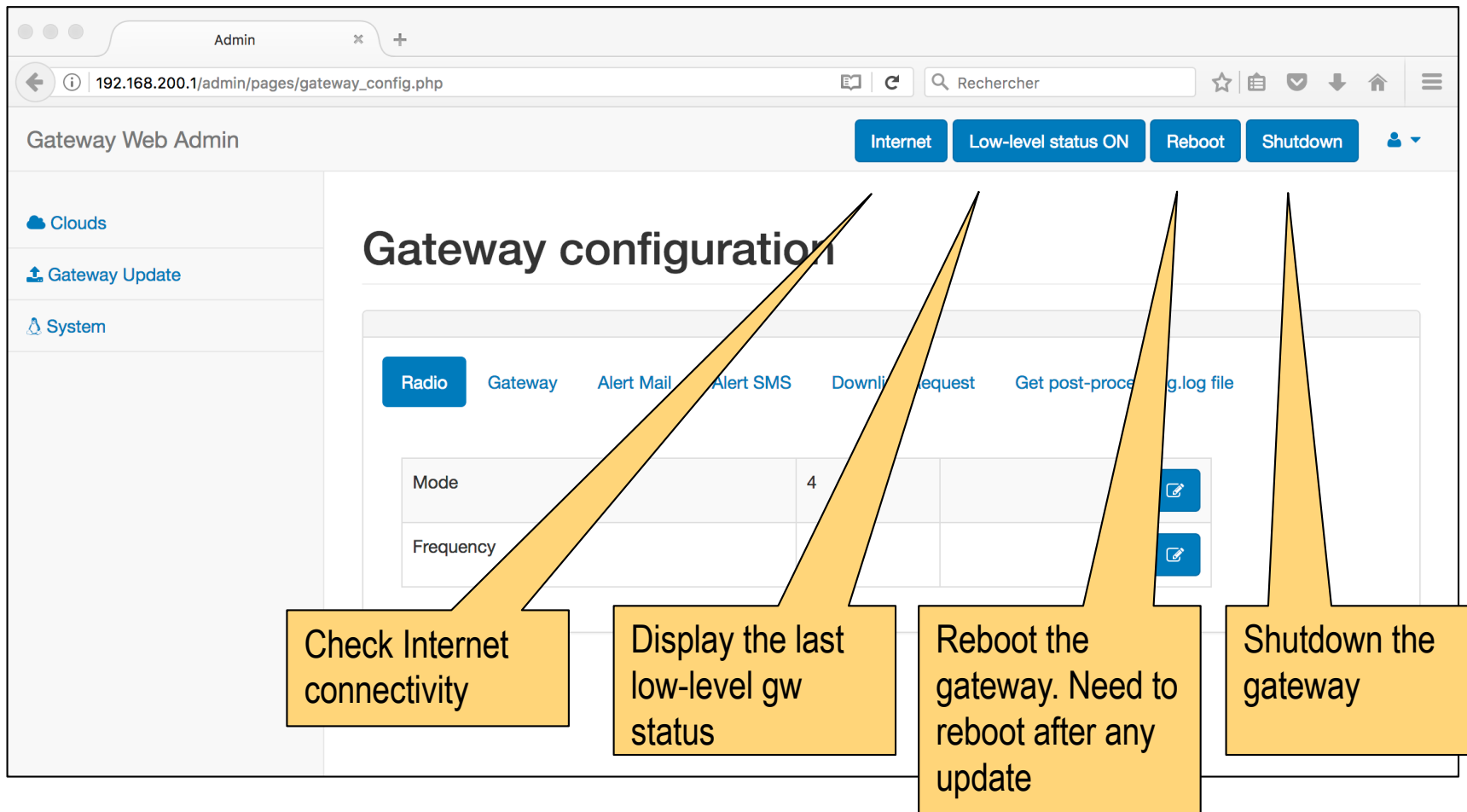


WEB ADMIN FEATURES

- ❑ Currently, you can use the web admin to:
 - ❑ Update your gateway with the latest github version and perform the basic configuration procedure. You can preserve your configuration files
 - ❑ Configure the gateway as WiFi client to connect to a WiFi network
 - ❑ Test Internet connectivity
 - ❑ Easily reboot and shutdown your gateway
 - Be carefull, if you shut down the gateway, you need to physically access the gateway to power it it on again
 - ❑ Change LoRa mode and frequency
 - ❑ Set your gateway id and configure alerting system (mail, SMS)
 - ❑ Change the WiFi SSID and password
 - ❑ Enable/Disable local AES decryption
 - ❑ Enable/Disable ThingSpeak and WAZIUP Orion cloud
 - ❑ For ThingSpeak, you can specify a new write key
 - ❑ For WAZIUP Orion, you can specify the project name, the organization name and the service tree
 - Fiware-service=project_name
 - sensor_name=organization_name+"_Sensor"
 - Fiware-servicePath='/' + organization_name + service_tree

GATEWAY MAIN PAGE

□ Gateway main page (configuration page)

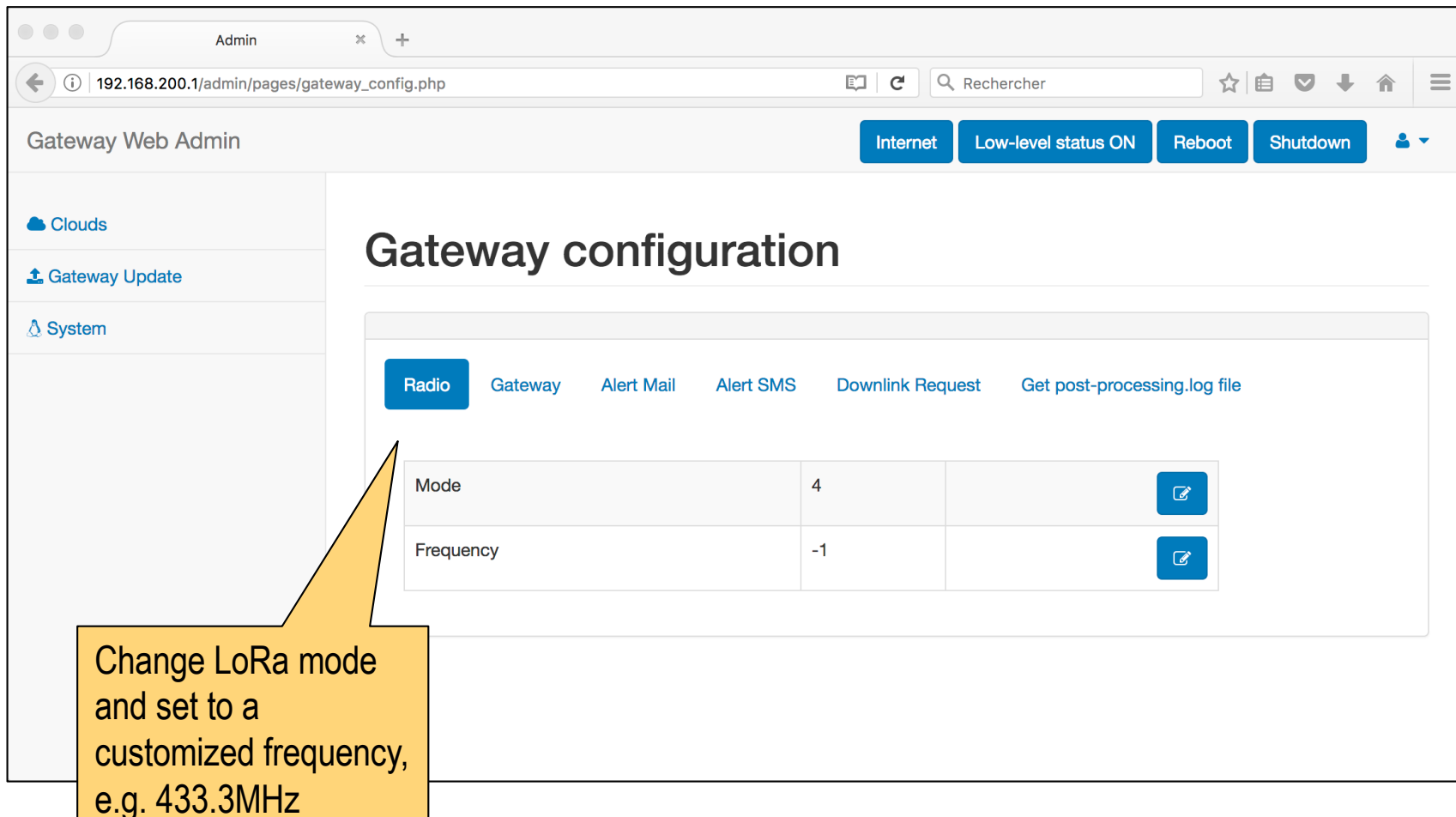


The screenshot shows the 'Gateway Web Admin' interface. The browser address bar displays '192.168.200.1/admin/pages/gateway_config.php'. The page title is 'Gateway configuration'. A sidebar on the left contains links for 'Clouds', 'Gateway Update', and 'System'. The main content area has a top navigation bar with buttons: 'Internet', 'Low-level status ON', 'Reboot', and 'Shutdown'. Below this, there are tabs for 'Radio', 'Gateway', 'Alert Mail', 'Alert SMS', 'Download request', and 'Get post-processing log file'. The 'Radio' tab is active, showing a table with columns for 'Mode' and 'Frequency'. The 'Mode' column contains the value '4'. Four yellow callout boxes with arrows point to the buttons in the top navigation bar:



- Check Internet connectivity** (points to the 'Internet' button)
- Display the last low-level gw status** (points to the 'Low-level status ON' button)
- Reboot the gateway. Need to reboot after any update** (points to the 'Reboot' button)
- Shutdown the gateway** (points to the 'Shutdown' button)

MAIN GATEWAY CONFIGURATION (1)

□ Gateway radio configuration section



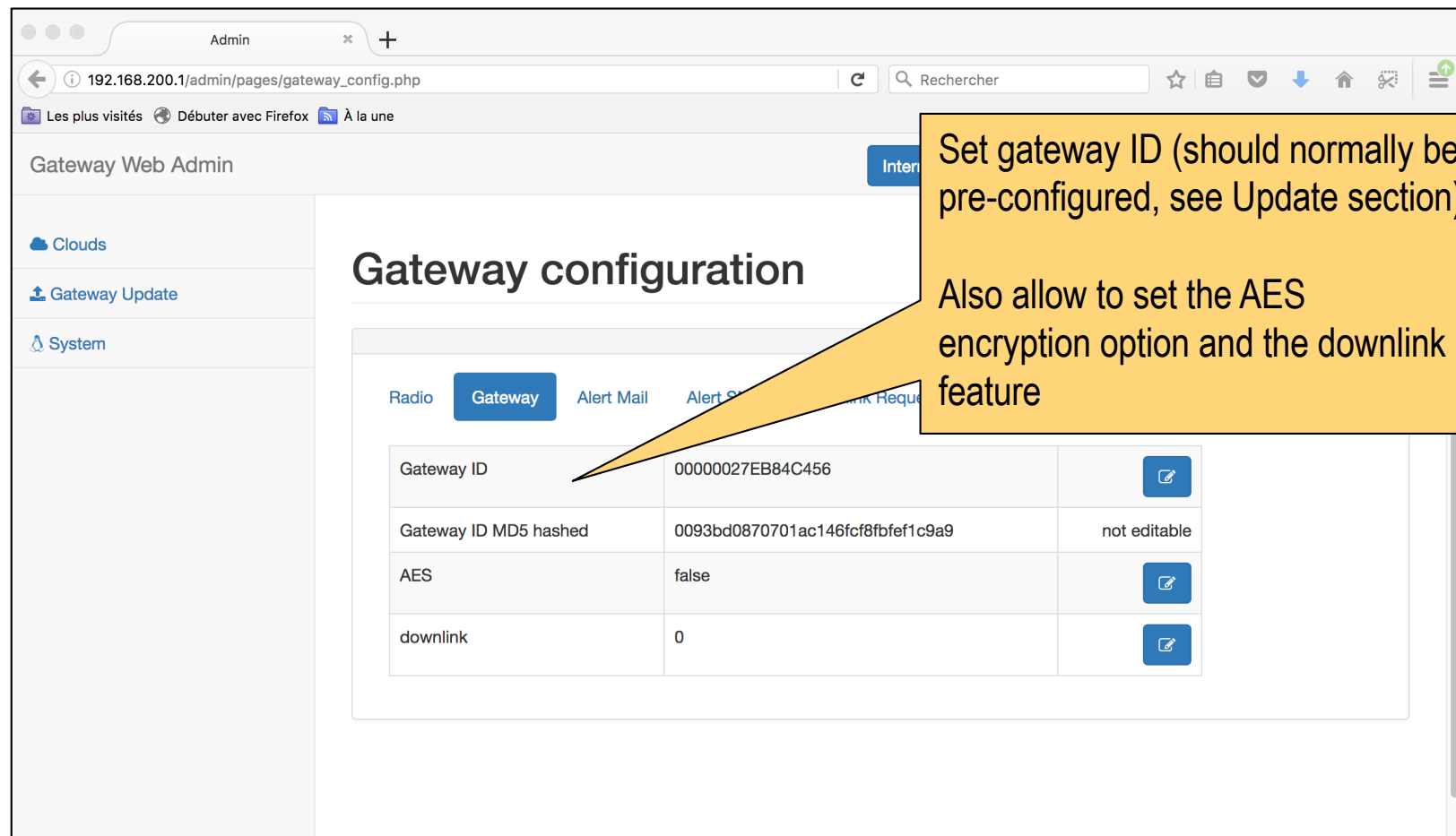
The screenshot shows the 'Gateway Web Admin' interface. The main heading is 'Gateway configuration'. Below it, there are tabs: 'Radio' (selected), 'Gateway', 'Alert Mail', 'Alert SMS', 'Downlink Request', and 'Get post-processing.log file'. The 'Radio' tab contains a table with the following data:

Mode	4	
Frequency	-1	

A yellow callout box points to the 'Radio' tab with the text: 'Change LoRa mode and set to a customized frequency, e.g. 433.3MHz'.

MAIN GATEWAY CONFIGURATION (2)

□ Gateway configuration section



The screenshot shows the 'Gateway configuration' section of the 'Gateway Web Admin' interface. The browser address bar shows '192.168.200.1/admin/pages/gateway_config.php'. The left sidebar contains links for 'Clouds', 'Gateway Update', and 'System'. The main content area has tabs for 'Radio', 'Gateway', 'Alert Mail', and 'Alert S...'. The 'Gateway' tab is active, displaying a table with configuration parameters.

Parameter	Value	Editable
Gateway ID	00000027EB84C456	Yes
Gateway ID MD5 hashed	0093bd0870701ac146fcf8fbef1c9a9	not editable
AES	false	Yes
downlink	0	Yes

Two callout boxes provide additional information:

- Set gateway ID (should normally be pre-configured, see Update section)** (points to the Gateway ID field)
- Also allow to set the AES encryption option and the downlink feature** (points to the AES and downlink fields)

MAIN GATEWAY CONFIGURATION (3)

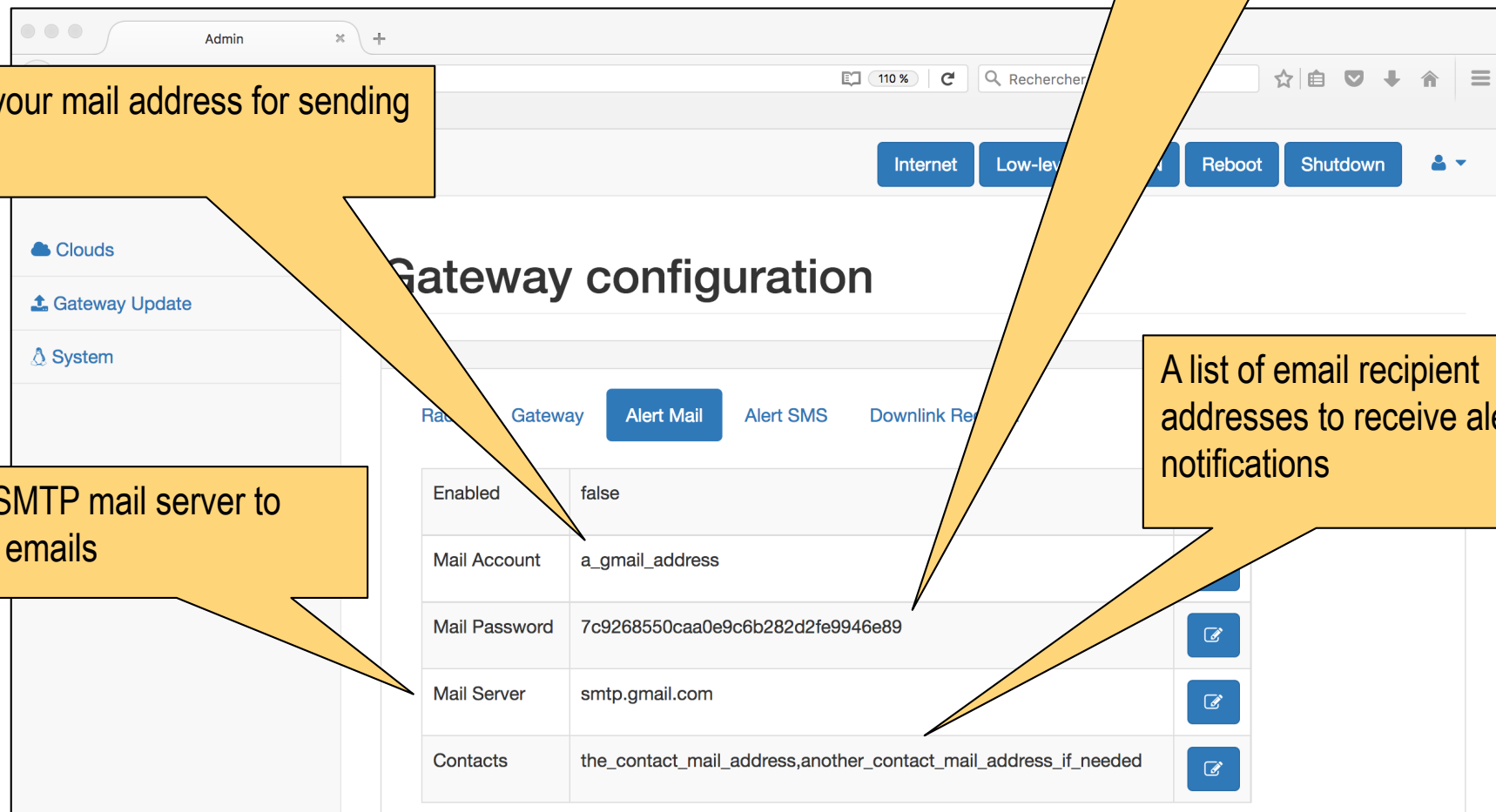
□ Gateway email alerting section

Your email account password

Enter your mail address for sending emails

The SMTP mail server to send emails

A list of email recipient addresses to receive alert notifications

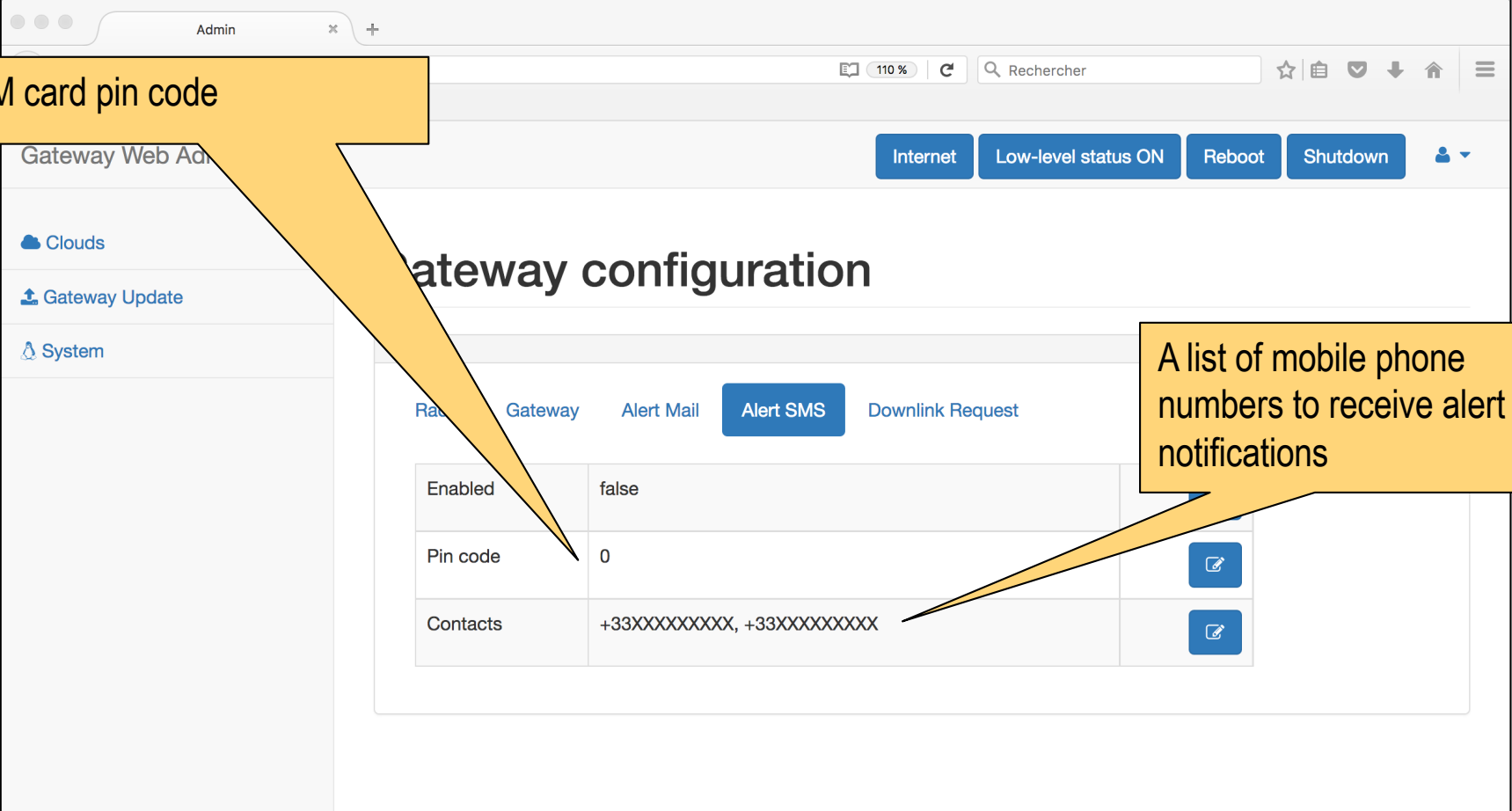


The screenshot shows the 'Gateway configuration' page with the 'Alert Mail' tab selected. The configuration table is as follows:



Field	Value
Enabled	false
Mail Account	a_gmail_address
Mail Password	7c9268550caa0e9c6b282d2fe9946e89
Mail Server	smtp.gmail.com
Contacts	the_contact_mail_address,another_contact_mail_address_if_needed

MAIN GATEWAY CONFIGURATION (4)

□ Gateway SMS alerting section



The screenshot shows a web browser window with the title 'Admin'. The main content area is titled 'Gateway configuration'. On the left, there is a sidebar with links for 'Clouds', 'Gateway Update', and 'System'. The main content area has a top navigation bar with buttons for 'Internet', 'Low-level status ON', 'Reboot', and 'Shutdown'. Below this, there is a section titled 'Gateway configuration' with a sub-section 'Alert SMS'. This section contains a table with the following data:

Parameter	Value	Action
Enabled	false	
Pin code	0	
Contacts	+33XXXXXXXXX, +33XXXXXXXXX	

Two yellow callout boxes provide additional information:

- A callout box pointing to the 'Pin code' field contains the text: 'The SIM card pin code'.
- A callout box pointing to the 'Contacts' field contains the text: 'A list of mobile phone numbers to receive alert notifications'.

MAIN GATEWAY CONFIGURATION (5)

□ Gateway generating downlink messages

Admin 192.168.200.1/admin/pages/gateway_config.php

Gateway Web Admin

Destination node, between 2 and 255

The string to send. Can be specific commands for the device if it has been programmed/configured accordingly.

Gateway configuration

Radio Gateway Art Mail Alert SMS Downlink Request

Destination 2

Message hello from gateway

Submit Clear

More info on https://github.com/CongducPham/LowCostLoRaGw/blob/master/gw_full_latest/README-downlink.md

That will generate in the downlink folder a downlink-post.txt file with the following entry:
`{"status":"send_request","dst":2,"data":"hello from gateway"}`

MAIN GATEWAY CONFIGURATION (6)

□ Gateway log files section

The screenshot shows the 'Gateway Web Admin' interface. The main heading is 'Gateway configuration'. Below it, there are tabs: 'Radio', 'Gateway', 'Alert Mail', 'Alert SMS', 'Downlink Request', and 'Get post-processing.log'. A blue button labeled 'Get post-processing.log' is visible. Below the tabs, there is a section with a download icon and text: 'Copy the current post-processing.log file, extract last 500 lines in a separate file and make links b... available (right click to download)'. Below this, there are two rows of links: 'The entire content of post-processing.log' with a 'click here' link, and 'Last 500 lines of post-processing.log' with a 'click here' link.

To start the generation of a copy of the log files

Then, link to the entire post-processing.log file

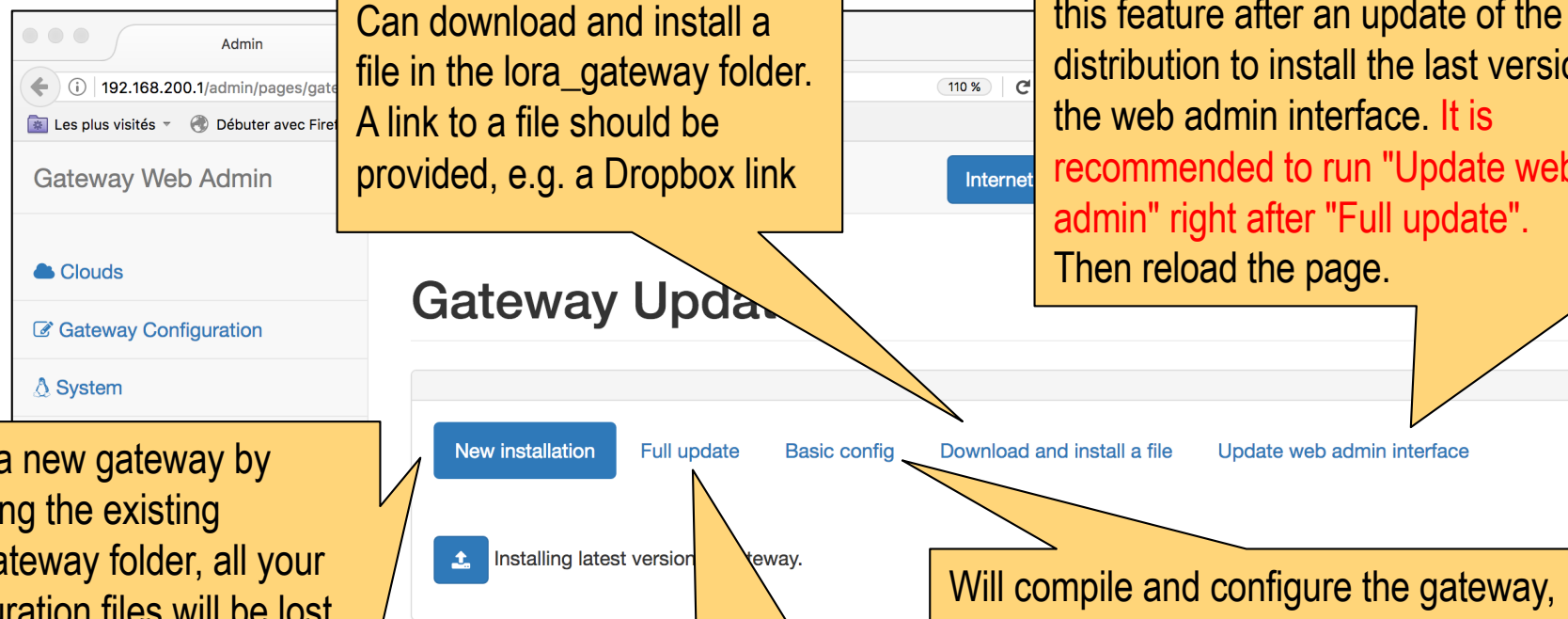
Then, link to an extract containing the last 500 lines of post-processing.log file

GET GATEWAY LOG FILES

- ☐ The "Get post-processing.log file" option is a convenient way for an end-user to obtain the log file that can be sent (mail) to an experienced user for analysis or debug purposes.
- ☐ The entire post-processing/log file can be obtained, or
- ☐ Only the last 500 lines
- ☐ The last feature can be used by an end-user to see whether data have been recently received from end-devices or not

GATEWAY UPDATE PAGE

Gateway update section



Can download and install a file in the lora_gateway folder. A link to a file should be provided, e.g. a Dropbox link

Update the web admin interface. Use this feature after an update of the distribution to install the last version of the web admin interface. **It is recommended to run "Update web admin" right after "Full update".** Then reload the page.

Install a new gateway by removing the existing lora_gateway folder, all your configuration files will be lost.

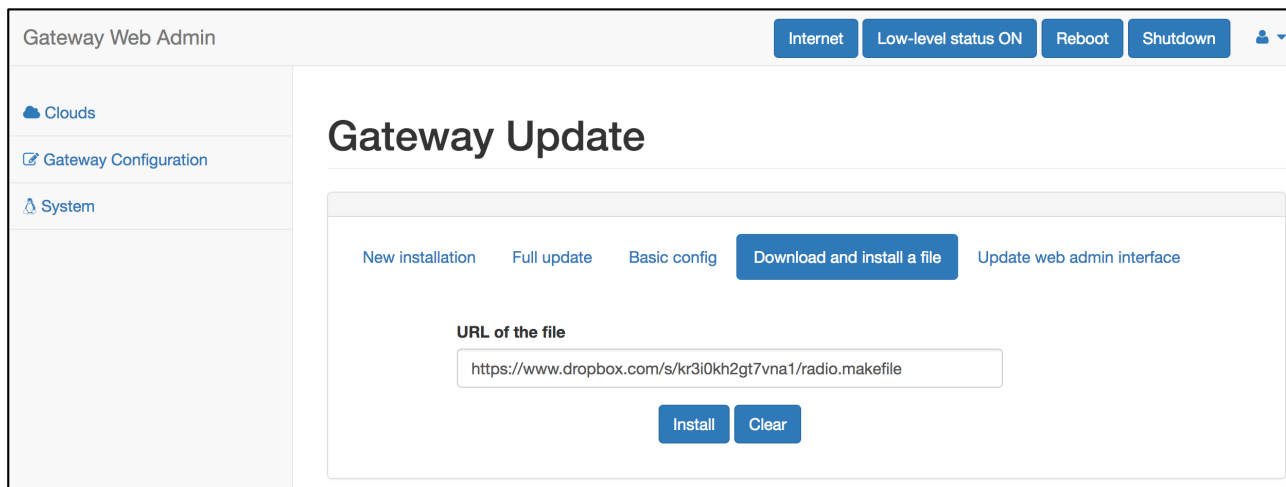
This may be needed after a major upgrade of the distribution if you start from a very old SD card image.

Update with latest version on github, all your configuration files will be kept. This is the **recommended option**.

Will compile and configure the gateway, especially for the **gateway id** & the **WiFi access point SSID** derived from the last 5 bytes of the eth MAC address. This is also required if you install a new gateway using the provided SD card image. **It is recommended to run "Basic config" right after "Full update".**

DOWNLOAD & INSTALL A FILE

- ❑ The "Download and install a file" option is a convenient way to install a configuration file
 - ❑ For instance, a customized radio.makefile file can be edited by an experienced user, then put on Dropbox and the link provided to an end-user (mail, SMS,...)
 - ❑ After installation, the end-user can use "Basic config" to recompile the gateway program and then reboot



Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Clouds Gateway Configuration System

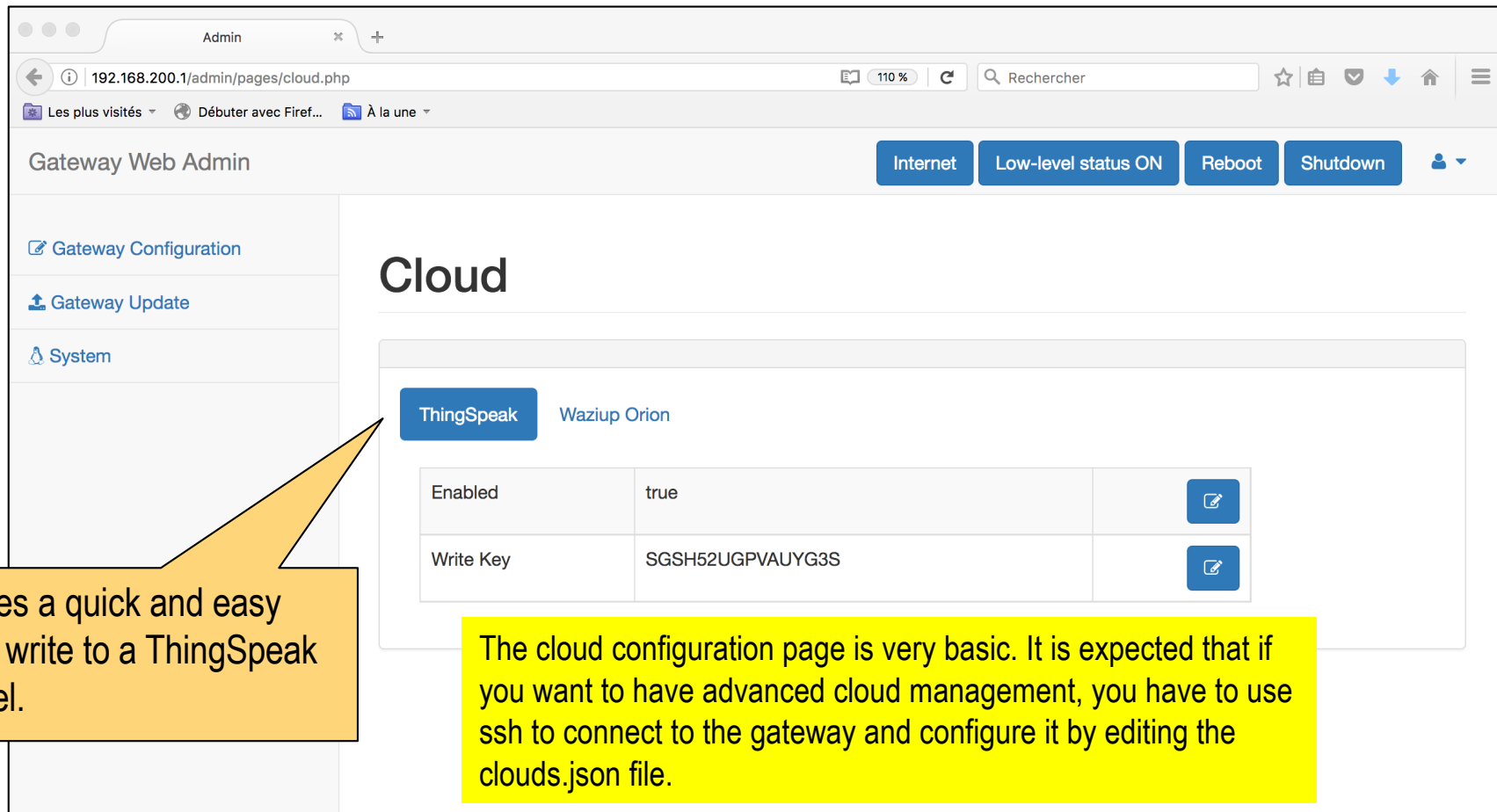
Gateway Update

New installation Full update Basic config **Download and install a file** Update web admin interface



URL of the file

Install Clear

□ Gateway cloud configuration section



The screenshot shows the 'Gateway Web Admin' interface. The left sidebar contains links for 'Gateway Configuration', 'Gateway Update', and 'System'. The main content area is titled 'Cloud' and features a 'ThingSpeak' button and a 'Waziup Orion' button. Below these, there is a table with configuration details:

Enabled	true	
Write Key	SGSH52UGPVAUYG3S	

An orange callout box points to the 'ThingSpeak' button with the text: 'Provides a quick and easy way to write to a ThingSpeak channel.'

A yellow callout box at the bottom right states: 'The cloud configuration page is very basic. It is expected that if you want to have advanced cloud management, you have to use ssh to connect to the gateway and configure it by editing the clouds.json file.'

□ Configuring WAZIUP Orion cloud

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Cloud

The WAZIUP Orion tab is only available when using the FIWARE Orion Context Broker

ThingSpeak Waziup Orion

Enabled	false
Project	waziup
Organization	UPPA
Service tree	/TESTS

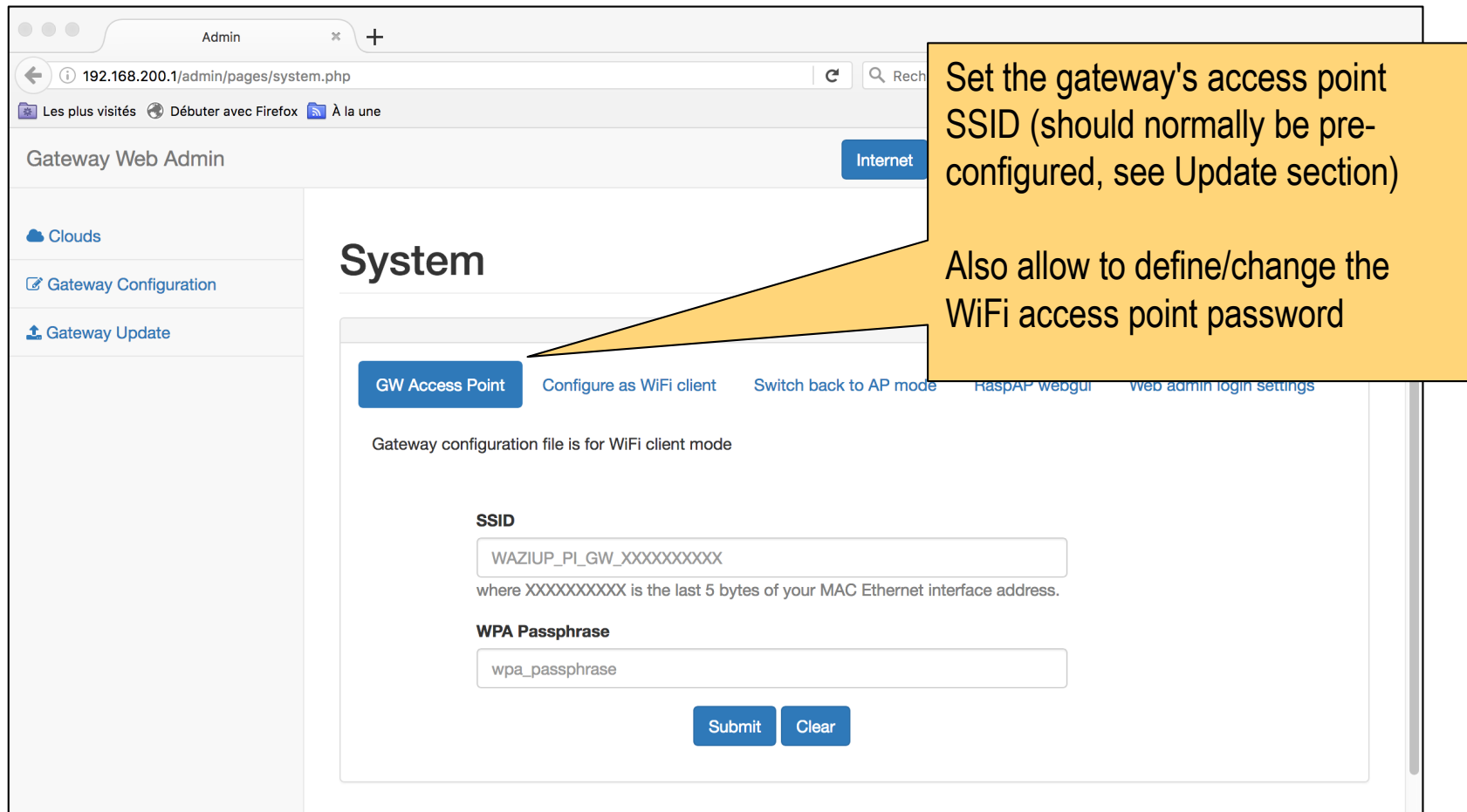
Project name will be the FIWARE Orion Service

Organization name will be used to derive the sensor name which will be for instance UPPA_Sensor2

Must begin with a '/'. The FIWARE Orion Service-path will be derived using both the Organization name and the Service tree:
 `'/' + organization_name + service_tree`, giving
 `'/' + UPPA + '/TESTS' → '/UPPA/TESTS'`

GATEWAY SYSTEM CONFIGURATION (1)

□ Gateway WiFi access point



The screenshot shows the Gateway Web Admin interface. The browser address bar displays `192.168.200.1/admin/pages/system.php`. The page title is "Gateway Web Admin". The left sidebar contains links for "Clouds", "Gateway Configuration", and "Gateway Update". The main content area is titled "System" and has a tab labeled "GW Access Point". Below the tab, it states "Gateway configuration file is for WiFi client mode". There are two input fields: "SSID" with the value "WAZIUP_PI_GW_XXXXXXXX" and "WPA Passphrase" with the value "wpa_passphrase". A note below the SSID field says "where XXXXXXXXXX is the last 5 bytes of your MAC Ethernet interface address." At the bottom are "Submit" and "Clear" buttons. A yellow callout box points to the "GW Access Point" tab with the text: "Set the gateway's access point SSID (should normally be pre-configured, see Update section)" and "Also allow to define/change the WiFi access point password".

Set the gateway's access point SSID (should normally be pre-configured, see Update section)

Also allow to define/change the WiFi access point password

GATEWAY SYSTEM CONFIGURATION (2)

□ Configure as WiFi client

The screenshot shows the 'Gateway Web Admin' interface in a web browser. The address bar shows '192.168.200.1/admin/pages/system.php'. The page title is 'System'. There are tabs for 'GW Access Point', 'Configure as WiFi client' (which is active), 'Switch back to AP mode', and 'RaspAP webgui'. Below the tabs, it says 'Gateway configuration file is for WiFi client mode'. There are two input fields: 'SSID' with the placeholder 'your_wifi_network' and 'WPA Passphrase' with the placeholder 'your_wifi_network_password'. Below these fields are 'Submit' and 'Clear' buttons. A warning message is displayed in red text: 'Warning: if a valid WiFi network is not configured you will not be able to connect through the gateway's access point anymore. If that happens, use wired Ethernet to switch back to access point mode. You MUST reboot after submitting the command.'

Configure the gateway as WiFi client to connect to an existing WiFi network. Changes will take effect after reboot.

Warning: if a valid WiFi network is not configured you will not be able to connect through the gateway's access point anymore. If that happens, use wired Ethernet to switch back to access point mode.

GATEWAY SYSTEM CONFIGURATION (3)

□ Configure as WiFi Access Point

Admin

192.168.200.1/admin/pages/system.php

Rechercher

Internet Low-level status ON Reboot Shutdown

Configure the gateway as Access Point

System

GW Access Point Configure as WiFi client Switch back to AP mode RaspAP webgui Web admin login settings

Gateway configuration file is for WiFi client mode

Warning: Internet connectivity should then be provided by wired Ethernet or 2G/3G

Warning: If using the "now" mode, you may loose current connection. Connect to gateway's access point WiFi.

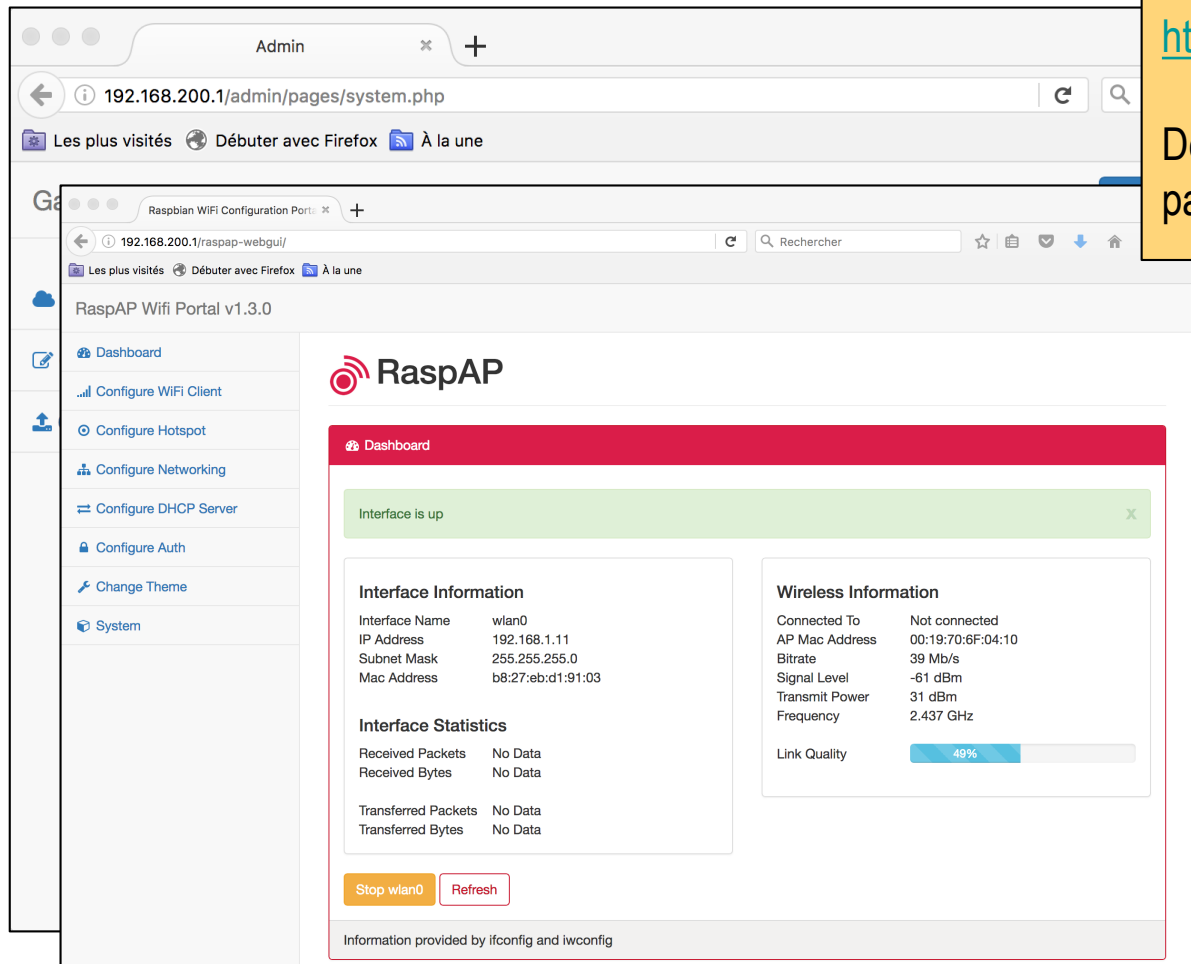
Switch to AP mode - next reboot Switch to AP mode - now

Changes will take effect after reboot

Switch to AP mode immediately, you may loose connectivity with the gateway

GATEWAY SYSTEM CONFIGURATION (4)

□ Run the RaspAP module



The screenshot shows two browser windows. The top window is the 'Admin' interface at 192.168.200.1/admin/pages/system.php. The bottom window is the 'Raspbian WiFi Configuration Portal' at 192.168.200.1/raspap-webgui/. The portal displays the 'RaspAP' dashboard with a green status bar indicating 'Interface is up'. The dashboard is divided into three sections: 'Interface Information', 'Interface Statistics', and 'Wireless Information'. The 'Interface Information' section shows details for the wlan0 interface. The 'Interface Statistics' section shows no data for received or transferred packets and bytes. The 'Wireless Information' section shows the interface is not connected to any network, with details for AP Mac Address, Bitrate, Signal Level, Transmit Power, and Frequency. A 'Link Quality' bar is shown at 49%. At the bottom of the dashboard, there are buttons for 'Stop wlan0' and 'Refresh'. A footer note states 'Information provided by ifconfig and iwconfig'.

Interface Information	
Interface Name	wlan0
IP Address	192.168.1.11
Subnet Mask	255.255.255.0
Mac Address	b8:27:eb:d1:91:03

Interface Statistics	
Received Packets	No Data
Received Bytes	No Data
Transferred Packets	No Data
Transferred Bytes	No Data

Wireless Information	
Connected To	Not connected
AP Mac Address	00:19:70:6F:04:10
Bitrate	39 Mb/s
Signal Level	-61 dBm
Transmit Power	31 dBm
Frequency	2.437 GHz
Link Quality	49%

Run the RaspAP web module from
<https://github.com/billz/raspap-webgui>

Default login is admin and default
password is secret

RaspAP webgui Web admin login settings

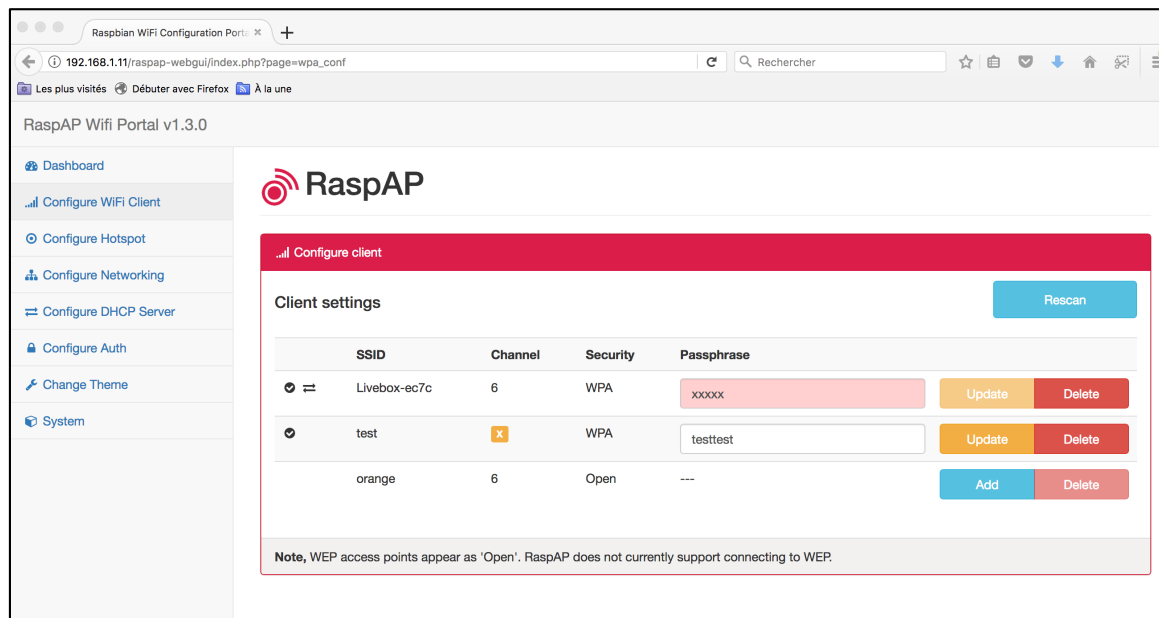
Connect by wired Ethernet or 2G/3G

Connect to gateway's access point WiFi.

Switch to AP mode - now

GATEWAY SYSTEM CONFIGURATION (5)

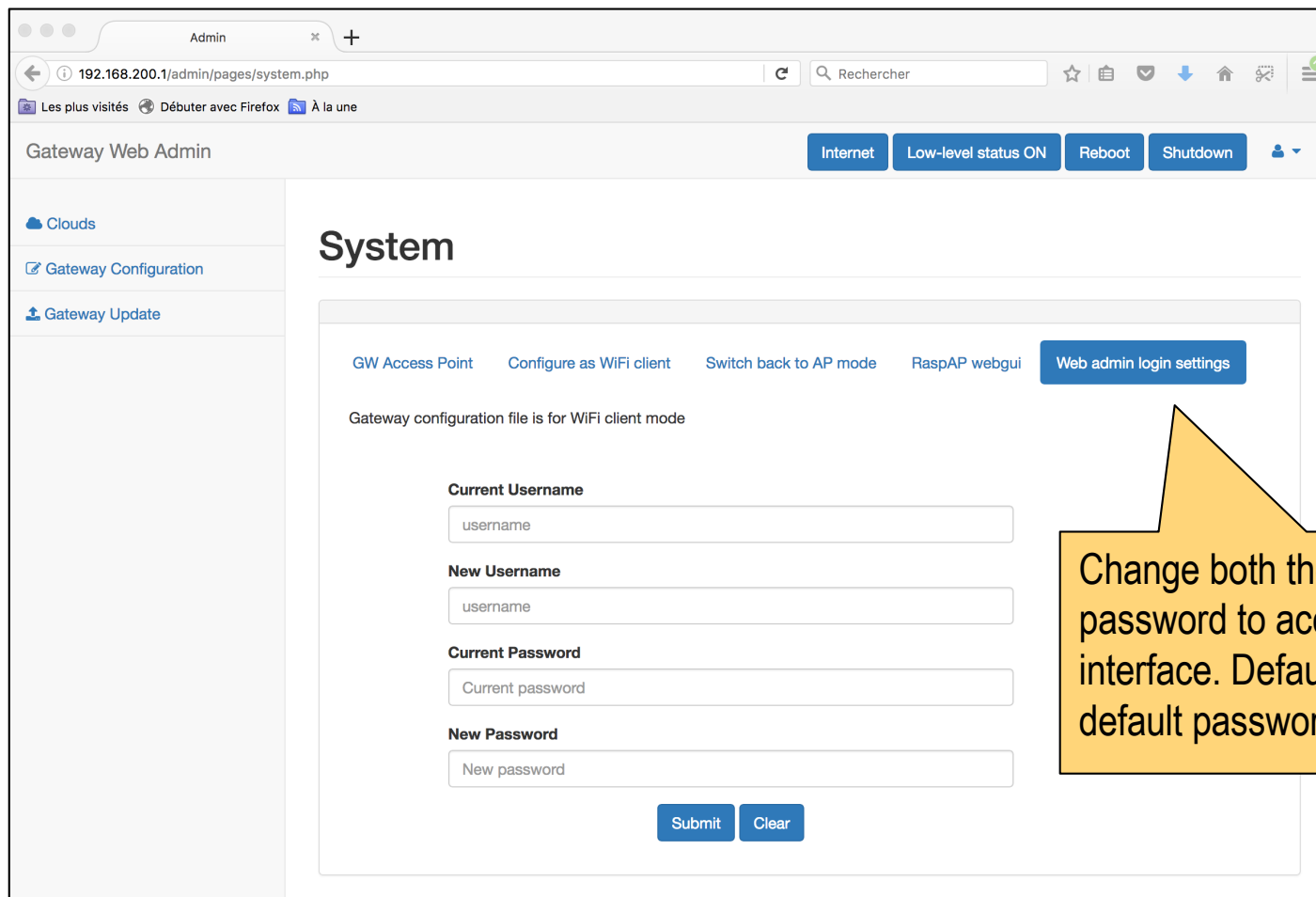
- ❑ RaspAP can configure some networking functions. It can be useful for dynamically select WiFi networks



- ❑ However, it is recommended to use our web admin interface to control WiFi client <-> Access Mode feature

GATEWAY SYSTEM CONFIGURATION (6)

□ Configure auth for web admin interface



Admin

192.168.200.1/admin/pages/system.php

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Clouds

Gateway Configuration

Gateway Update

System

GW Access Point Configure as WiFi client Switch back to AP mode RaspAP webgui Web admin login settings

Gateway configuration file is for WiFi client mode

Current Username

username

New Username

username

Current Password

Current password

New Password

New password

Submit Clear

Change both the login and password to access the web admin interface. Default login is admin and default password is loragateway