

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)

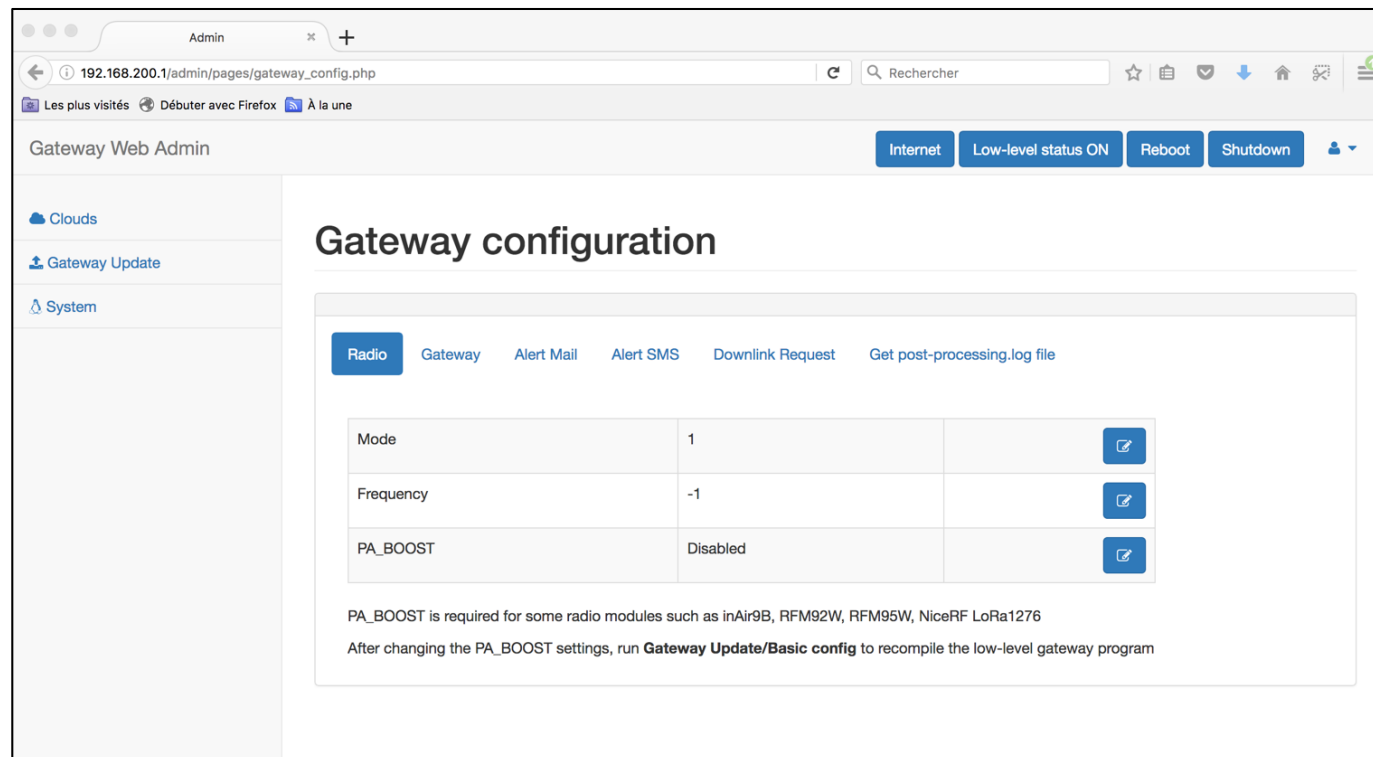
- ❑ A gateway web admin interface has been added to the latest version
- ❑ To install the web admin interface, check if you have the `gw_web_admin` folder in your `lora_gateway` folder
- ❑ If you don't, then update to the latest version
- ❑ Then, go into `gw_web_admin` and run the `install.sh` script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

GATEWAY WEB ADMIN INTERFACE (2)




□ <http://192.168.200.1/admin>

□ Login: admin

□ Password: loragateway



The screenshot shows the Gateway Web Admin interface in a web browser. The address bar displays `192.168.200.1/admin/pages/gateway_config.php`. The page title is "Gateway Web Admin". On the right, there are buttons for "Internet", "Low-level status ON", "Reboot", and "Shutdown", along with a user icon. The left sidebar contains links for "Clouds", "Gateway Update", and "System". The main content area is titled "Gateway configuration" and features a tabbed interface with "Radio" selected. The "Radio" tab shows a table with the following settings:

Mode	1	
Frequency	-1	
PA_BOOST	Disabled	

Below the table, a note states: "PA_BOOST is required for some radio modules such as inAir9B, RFM92W, RFM95W, NiceRF LoRa1276". A final instruction reads: "After changing the PA_BOOST settings, run **Gateway Update/Basic config** to recompile the low-level gateway program".

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)

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Gateway configuration

Radio Gateway Alert Mail Alert SMS Downlink Request Get processing.log file

Mode	1
Frequency	-1
PA_BOOST	Disabled

Check Internet connectivity

Display the last low-level gw status

Reboot the gateway. Need to reboot after any update

Shutdown the gateway

MAIN GATEWAY CONFIGURATION (1)

□ Gateway radio configuration section

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Clouds
Gateway Update
System

Gateway configuration

Radio Gateway Alert Mail Alert SMS Downlink Request

Mode	1	
Frequency	-1	
PA_BOOST	Disabled	

PA_BOOST is required for some radio modules such as inAir9B, RFM92W, RFM95W, NiceRF LoRa1276
After changing the PA_BOOST settings, run **Gateway Update/Basic config** to recompile the low-level gateway program

Edit PA_BOOST setting. You must use **Gateway update/Basic config** to recompile

Change LoRa mode and set to a customized frequency, e.g. 433.3MHz

MAIN GATEWAY CONFIGURATION (2)

□ Gateway configuration section

Gateway Web Admin

Clouds
Gateway Update
System

Gateway configuration

Radio Gateway Alert Mail Alert SMS Downlink Request Get

Gateway ID	0000027EB5A71F7	
Gateway ID MD5 hashed	3304d293a4f5524e3d058929cf6583fb	not editable
AES	true	
downlink	60	
IP address	10.0.13.96	not editable
Mac addresss	b8:27:eb:5a:71:f7	not editable
GPS coordinates	Latitude : 41.31423 Longitude : -0.36384	
raw format	false	
wappkey	false	

Set gateway ID (should normally be pre-configured)

Default id is 000000XXXXXXXXXX with the last 5 bytes of the gateway network interface (e.g. 27EB5A71F7)

Set the AES encryption option and the downlink feature

The MD5 hash of the gateway's ID

MAIN GATEWAY CONFIGURATION (3)

Gateway email alerting section

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

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

Callouts explain the fields:

- Enter your mail address for sending emails**: Points to the 'Mail Account' field.
- Your email account password**: Points to the 'Mail Password' field.
- The SMTP mail server to send emails**: Points to the 'Mail Server' field.
- A list of email recipient addresses to receive alert notifications**: Points to the 'Contacts' field.

MAIN GATEWAY CONFIGURATION (4)

□ Gateway SMS alerting section

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Clouds Gateway Update System

Gateway configuration

Radio Gateway Alert Mail Alert SMS Down

Enabled	false	
Pin code	0	
Contacts	+33XXXXXXXXX, +33XXXXXXXXX	

The SIM card pin code

A list of mobile phone numbers to receive alert notifications

MAIN GATEWAY CONFIGURATION (5)

□ Gateway generating downlink messages

Destination node, between 2 and 255

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

Submit will generate in the downlink folder a `downlink-post.txt` file with the following entry:

```
{"status":"send_request","dst":2,"data":"hello from gateway"}
```

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

MAIN GATEWAY CONFIGURATION (6)

□ Gateway log files section

The screenshot shows the 'Gateway Web Admin' interface. The left sidebar contains 'Clouds', 'Gateway Update', and 'System'. The main content area is titled 'Gateway configuration' and includes tabs for 'Radio', 'Gateway', 'Alert Mail', 'Alert SMS', 'Downlink Request', and a 'Get post-processing.log file' button. Below these tabs, a text box explains the download process: 'Copy the current post-processing.log file, extract last 500 lines in a separate file and make links below available (right click to download)'. A table provides two download options: '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. Three yellow callout boxes provide instructions: 'To start the generation of a copy of the log files' points to the 'Get post-processing.log file' button; 'Then, link to the entire post-processing.log file' points to the first table row; and 'Then, link to an extract containing the last 500 lines of post-processing.log file' points to the second table row.

Admin 192.168.200.1/admin/pages/gateway_config.php

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Clouds Gateway Update System

Gateway configuration

Radio Gateway Alert Mail Alert SMS Downlink Request **Get post-processing.log file**

Copy the current post-processing.log file, extract last 500 lines in a separate file and make links below available (right click to download).

The entire content of post-processing.log	click here
Last 500 lines of post-processing.log	click here

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

- ❑ The gateway must be updated to the latest version.
- ❑ Internet access for the gateway is necessary
- ❑ The update procedure can easily be done with the web admin interface, connect to the gateway WiFi first
- ❑ The update steps are
 - 1 Full Update
 - 2 Basic Config
 - 3 Update Web Interface

GATEWAY UPDATE PAGE

Gateway update section



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

If you install a new gateway with our SD card image, you can use this option.

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

Update the web admin interface 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** or **New installation**. Then reload the page.

Compile and configure the gateway (to set the gateway id & the WiFi access point SSID). 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** or **New installation**.

SOFTWARE VERSION NUMBER

Gateway Update

[New installation](#) [Full update](#) [Basic config](#) [Download and install a file](#) [Update web admin interface](#)

 Install latest version of gateway, **erasing** all existing configuration file.
Custom SSID will be preserved. May take minutes, wait for finish notification.

Git version: 313. Installed version: 313. Date of current distribution is 2018-06-21 16:28:07.326390425 +0200

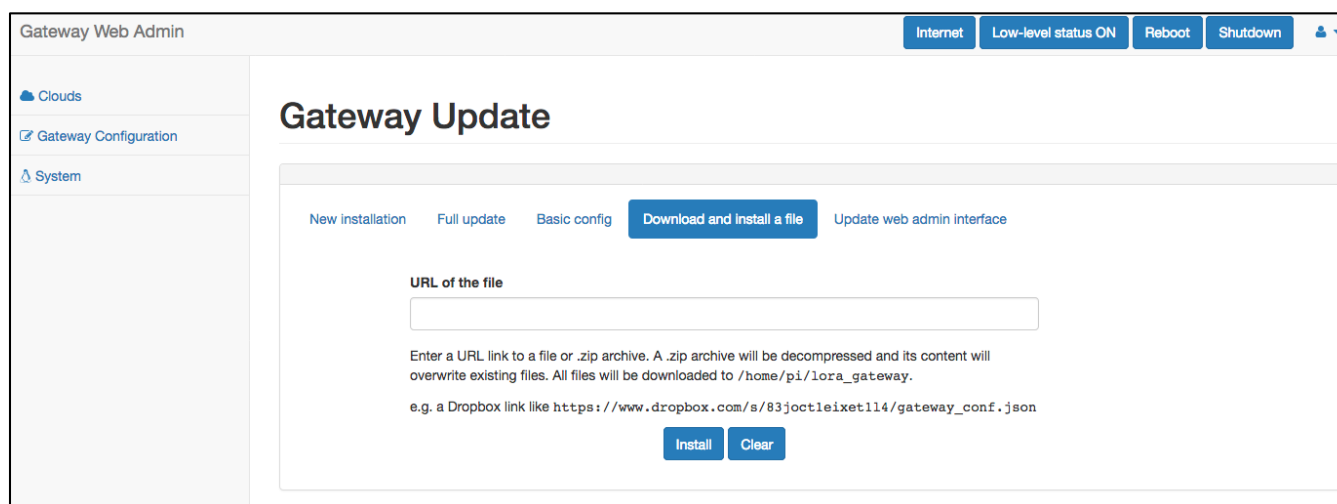
- ☐ The software version number on github and the installed version number are displayed
- ☐ Click on [Internet](#) to obtain the latest software version number on github

Internet connection successful. github version number has been obtained.

[Internet](#)[Low-level status ON](#)[Reboot](#)[Shutdown](#)

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

Enter a URL link to a file or .zip archive. A .zip archive will be decompressed and its content will overwrite existing files. All files will be downloaded to /home/pi/lor_gateway.
e.g. a Dropbox link like https://www.dropbox.com/s/83joc1eixet114/gateway_conf.json

Install Clear

GATEWAY CLOUD PAGES

□ Gateway cloud configuration section

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Gateway Configuration Gateway Update System

Cloud

The cloud configuration page is very basic. It is expected that if you want to have more advanced cloud management, you have to use `ssh` to connect to the gateway and configure it by editing the `clouds.json` file.

Cloud WAZIUP ThingSpeak Cloud No Internet Cloud Gps File Cloud MQTT Cloud Node-RED

Enabled	false	
project name	waziup	
organization name	ORG	
service tree		
auth token	this_is_my_authorization_token	
source list	Empty	

Provides a quick and easy way to configure selected clouds.

□ Configuring WAZIUP cloud

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

Gateway Configuration Gateway Update

Cloud

The WAZIUP cloud tab is only available when key_WAZIUP.py is found

Cloud WAZIUP ThingSpeak Cloud No Internet Cloud Gps File Cloud MQTT Cloud Node-RED

Enabled	false	
project name	waziup	
organization name	ORG	
service tree		
auth token	this_is_my_authorization_token	
source list	Empty	

The WAZIUP cloud uses FIWARE platform and adopts a domain approach: the domain will be defined as project_name+'-'+organization_name+service_tree, e.g. waziup-UPPA-OFFICE1-TESTS if:

- project_name is waziup,
 - organization_name is UPPA,
 - service_tree is -OFFICE1-TESTS
- service_tree can be empty otherwise it must begin with a '-'.

The device id will be organization_name+"Sensor"+device_addr. For instance, for sensor 2 hosted by UPPA: UPPA_Sensor2.

GATEWAY SYSTEM CONFIGURATION (1)

□ Gateway WiFi access point

The screenshot shows the 'Gateway Web Admin' interface in a browser. The address bar shows '192.168.200.1/admin/pages/system.php'. The left sidebar has links for 'Clouds', 'Gateway Configuration', and 'Gateway Update'. The main content area is titled 'System' and has three tabs: 'GW Access Point' (selected), 'Configure as WiFi client', and 'Switch back to AP mode'. Below the tabs, it says 'Gateway configuration file is for WiFi client mode'. There are two main sections: 'SSID' and 'WPA Passphrase'. The 'SSID' section shows 'current SSID is WAZIUP_PI_GW_27EB84C456' and 'default SSID would be WAZIUP_PI_GW_27EB84C456'. The 'WPA Passphrase' section has a text input field labeled 'wpa_passphrase'. At the bottom are 'Submit' and 'Clear' buttons.

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

If you indicate a customized SSID, it will be preserved when the gateway is updated.

Default SSID is WAZIUP_PI_GW_XXXXXXXXXX with the last 5 bytes of the gateway network interface (e.g. 27EB84C456)

If you want to get back to the default SSID, just copy/paste from here

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' (selected), 'Switch back to AP mode', 'RaspAP webgui', and 'Web admin login settings'. Below the tabs, it says 'Gateway configuration file is for WiFi client mode'. There are two input fields: 'SSID' with the value 'your_wifi_network' and 'WPA Passphrase' with the value 'your_wifi_network_password'. Below these fields are 'Submit' and 'Clear' buttons. A red warning message is displayed: '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

Gateway Web Admin

Internet Low-level status ON Reboot Shutdown

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 connection with the gateway

GATEWAY SYSTEM CONFIGURATION (4)

Run the RaspAP module

The screenshot shows the RaspAP web interface in a browser. The address bar shows `192.168.200.1/admin/pages/system.php`. The interface has a sidebar with navigation links: Dashboard, Configure WiFi Client, Configure Hotspot, Configure Networking, Configure DHCP Server, Configure Auth, Change Theme, and System. The main content area displays the RaspAP logo and a 'Dashboard' section. A green status bar at the top of the dashboard says 'Interface is up'. Below this, there are two columns of information:

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

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%

At the bottom of the dashboard, there are buttons for 'Stop wlan0' and 'Refresh'. A footer note says 'Information provided by ifconfig and iwconfig'.

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

Default login is `admin` and default password is `secret`

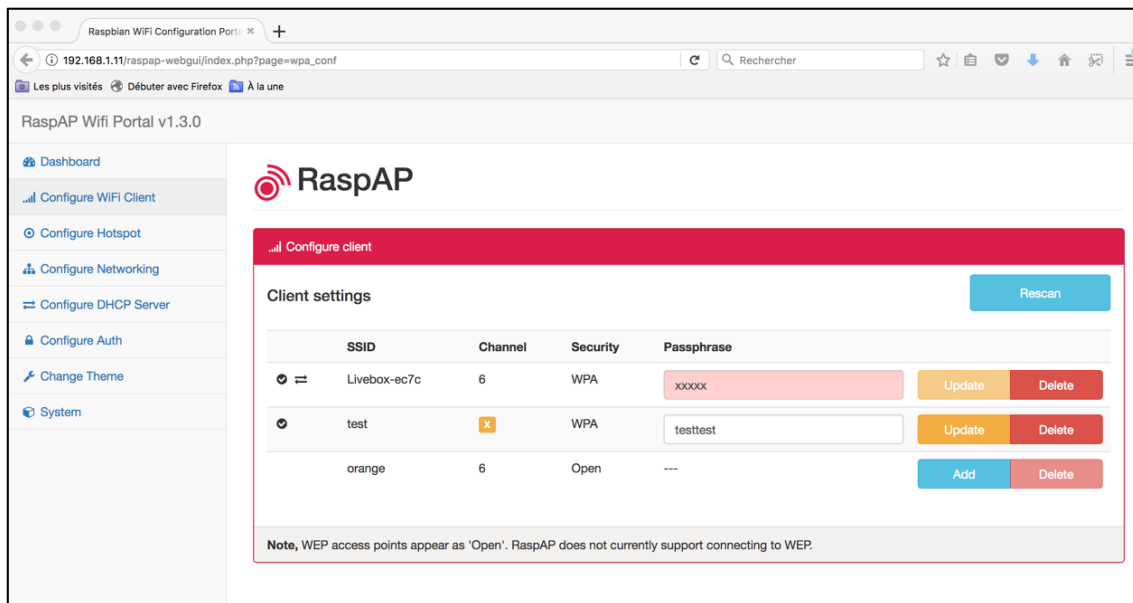
RaspAP webgui Web admin login settings

ed by wired Ethernet or 2G/3G
on. Connect to gateway's access point WiFi.

h to AP mode - now

GATEWAY SYSTEM CONFIGURATION (5)

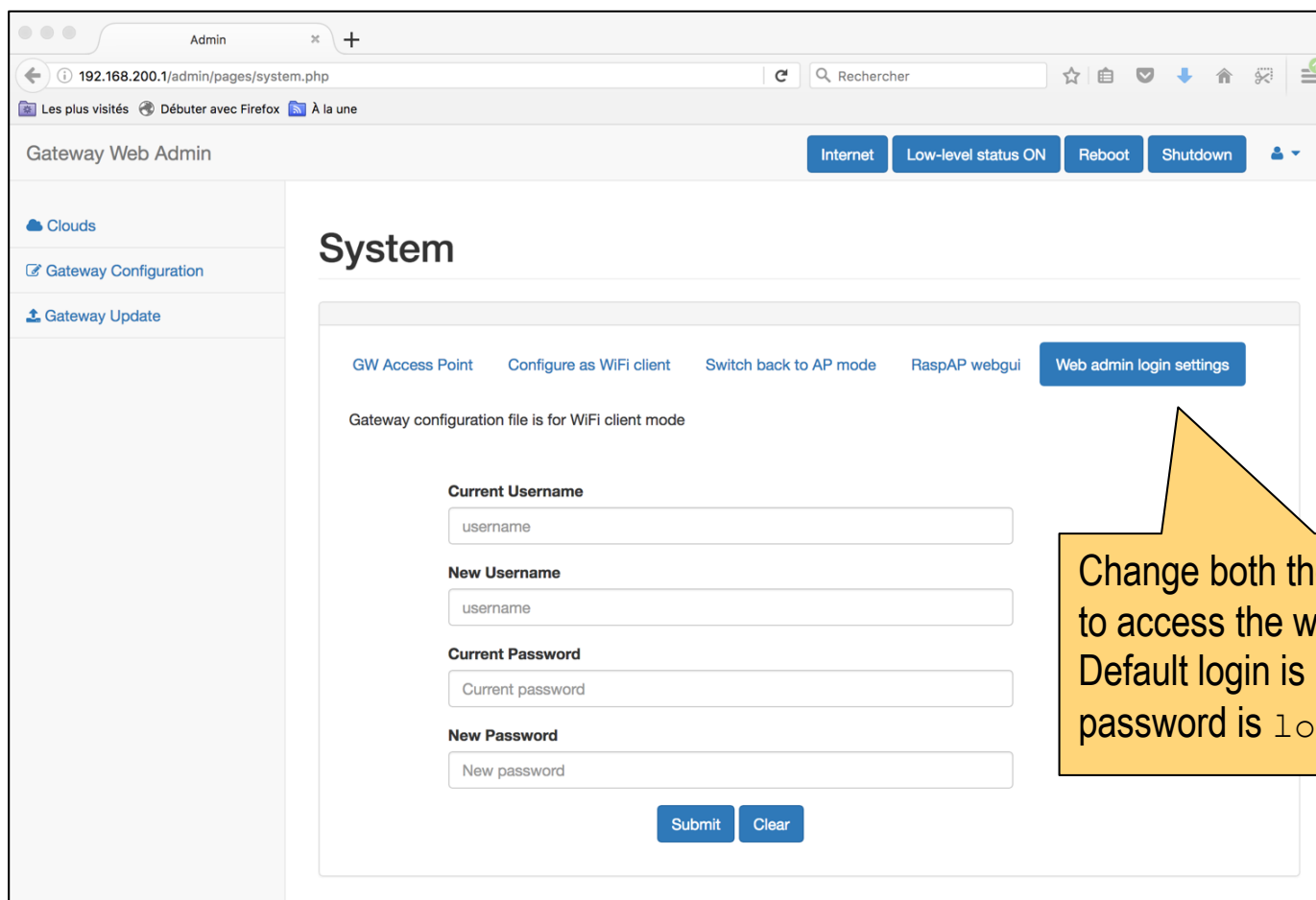
- ❑ RaspAP can configure some networking functions. It can be useful for dynamically select WiFi networks



- ❑ 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`