

Cassia Gateway Installation Guide

Release date: July 16, 2024

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1. Version Notice

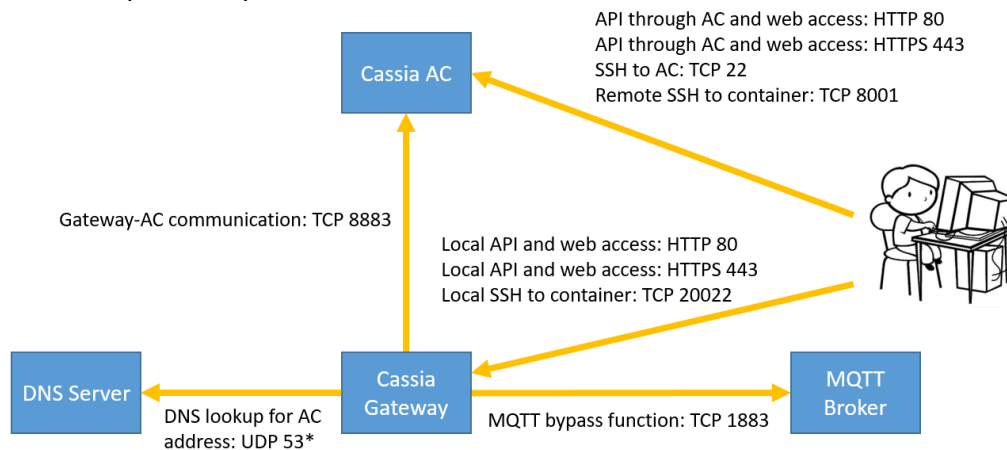
This document describes the steps of installing a Cassia gateway with firmware v1.3 or above. If the user is using firmware 1.2, please follow

https://www.cassianetworks.com/download/docs/Cassia_Quick_Start_Guide-v1.2.pdf

In this guideline, the Cassia gateway is running in AC Managed mode. If the gateway is running in standalone mode (no AC), please skip chapters 6/9/11.

2. Network Requirement

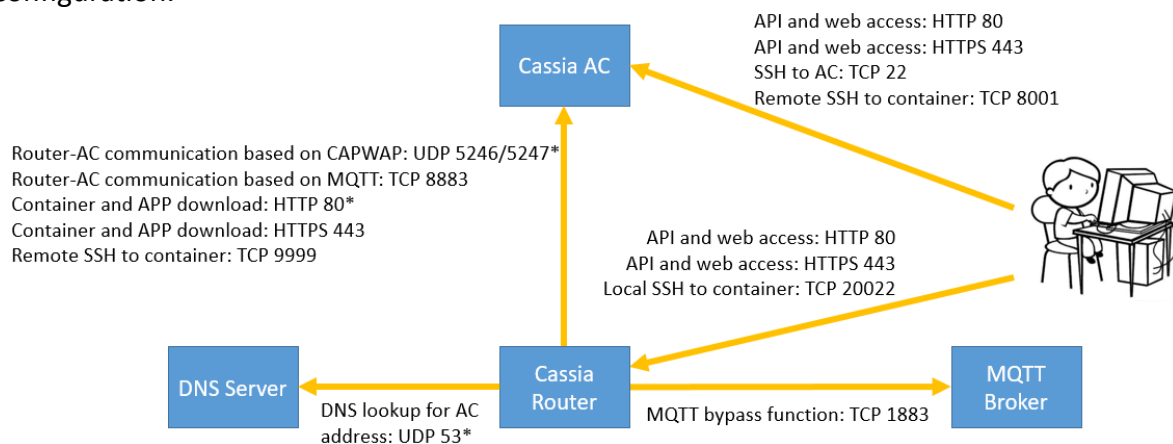
From v2.1.1, for the gateways that uses MQTT to communicate with AC (default setting), the following ports are used and required for firewall configuration. TCP ports 80, 443 and 9999 are not required anymore.



Please make sure the following ports are opened outbound on the gateway side firewall.

| Type | Port | M/O | Description |
|------|------|------------|----------------------------------------------------------------------------------------------------|
| TCP | 8883 | Mandatory | Gateway-AC communication |
| UDP | 53 | Mandatory* | DNS lookup for AC address. *Optional if internal DNS is specified in gateway network configuration |
| TCP | 1883 | Optional | For MQTT bypass function only |

For the gateways that use CAPWAP to communicate with AC or the gateways using firmware below v2.1.1, the following ports may be used and required for firewall configuration.



Please make sure the following ports are opened outbound on the gateway side firewall. The user can check if a TCP port is opened by using Netcat in gateway's local console.

| Type | Port | M/O | Description |
|-------|-------------|------------|--------------------------------------------------------------------------------------------------------------------------------|
| UDP | 5246, 5247* | Mandatory | Gateway-AC communication based on CAPWAP. *Port 5246 and 5246 can be disabled after migrating gateway-AC communication to MQTT |
| TCP | 8883 | | Gateway-AC communication based on MQTT (recommended from firmware v2.0.2) |
| HTTP | 80* | Mandatory | Container and APP download from AC based on HTTP. *HTTP port 80 can be disabled if HTTPS is enabled |
| HTTPS | 443 | | Container and APP download from AC based on HTTPS |
| UDP | 53 | Mandatory* | DNS lookup for AC address. *Optional if internal DNS is specified in gateway network configuration |
| TCP | 9999 | Mandatory | Remote SSH to container (laptop->8001->AC<-9999<-container) |
| TCP | 1883 | Optional | For MQTT bypass function only |

3. Find Gateway's MAC Address

Please find Cassia gateway's MAC address on the bottom of the gateway.



Cassia gateway's MAC address

NOTE: If you are filtering MAC addresses in your security policy, please make sure to input the active MAC addresses. For example, if you are using WIFI for uplink connection, the active MAC will be label MAC + 1. Please see the below table for the details.

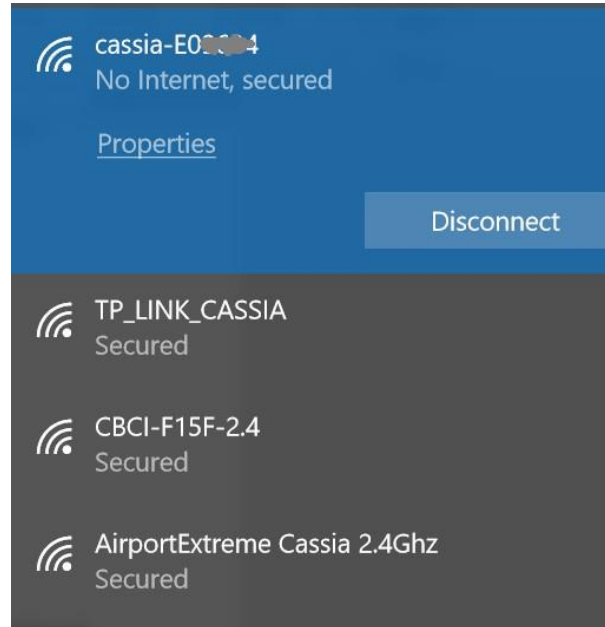
| Model | Label MAC | Ethernet MAC | WIFI MAC |
|-------------------------|-----------|--------------|----------|
| X2000/X1000/E1000/S2000 | MAC | MAC | MAC+1 |
| S1000/S1100 | MAC | MAC | MAC-1 |

4. Setup using WiFi Hotspot

From firmware 1.2, the Cassia Bluetooth gateway provides a WIFI hotspot (2.4GHz only) for initial setup. Its SSID is cassia-xxxxxxx (the xxxxxx corresponds to the last 6 digits of the

gateway's MAC address). The default password of the WIFI hotspot is the same as the SSID.

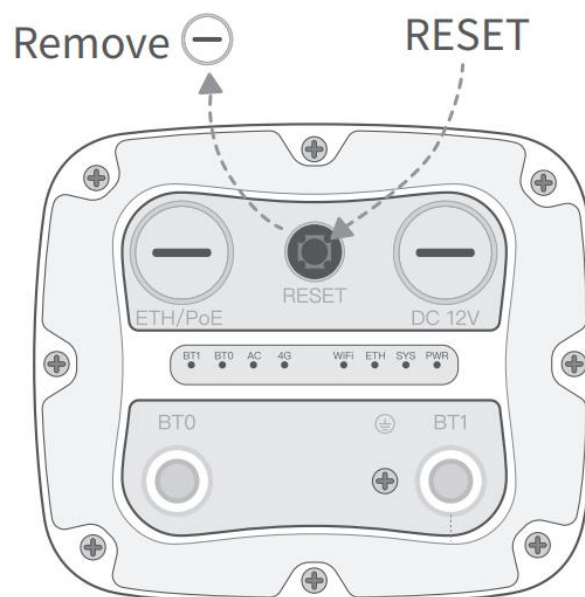
For example, if the gateway's MAC address is "CC:1B:E0:E0:96:DC", the WIFI hotspot SSID and its default password will be "cassia-E096DC".



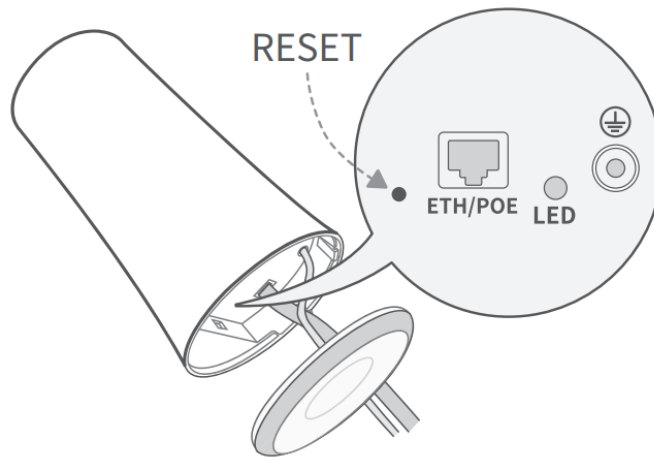
Gateway's WIFI hotspot (2.4GHz only)

Then, power up your Cassia gateway, search its WIFI hotspot from your laptop, and connect your laptop to the WIFI hotspot.

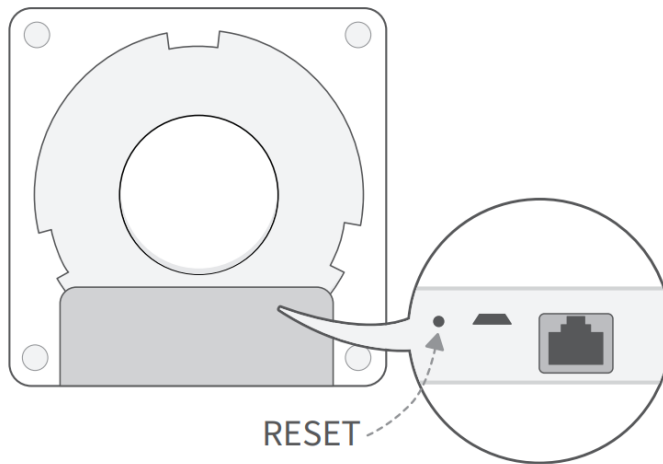
If you can't find the WIFI hotspot, and you are sure that your firmware is 1.2 or above, please press and hold the reset button at the bottom of Cassia gateway for 10 to 15 seconds while the gateway is powered on.



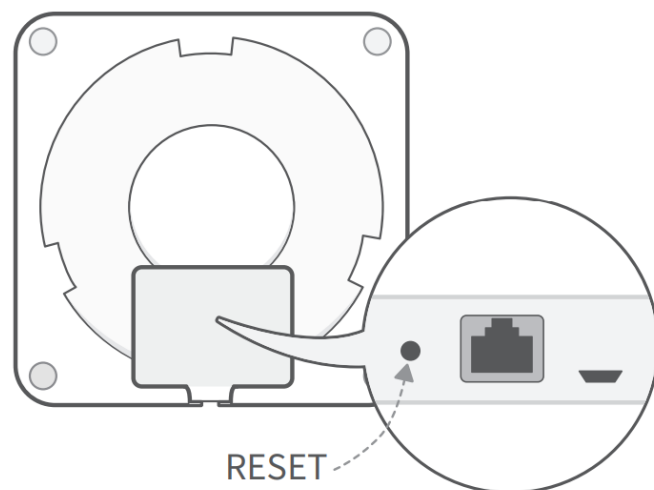
X2000 Reset Button



X1000 Reset Button



E1000 Reset Button



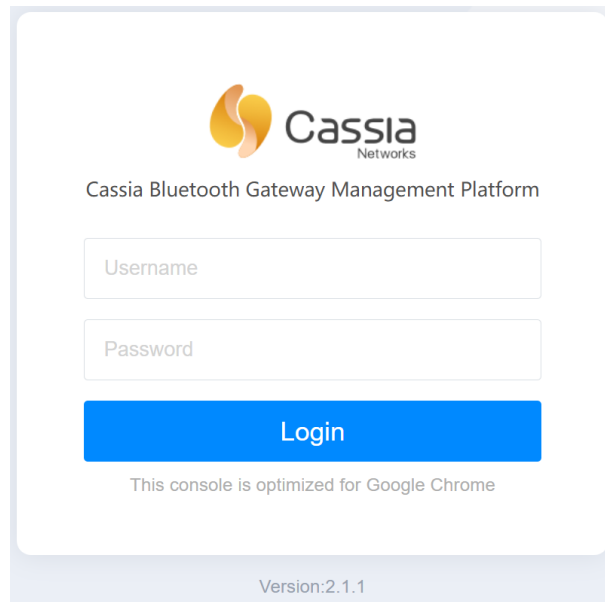
S2000 Reset Button

Please open Google Chrome on your laptop and enter the gateway's default IP address 192.168.40.1.

The first time you log in, you need to set the gateway's login password. The password

should include numbers, letters, and special characters. The password length should be between 8-20. Please note down your password for future use.

Now, please log in to the gateway's web page.

The image shows the login page of the Cassia Bluetooth Gateway Management Platform. At the top is the Cassia Networks logo. Below it, the text "Cassia Bluetooth Gateway Management Platform" is displayed. There are two input fields: "Username" and "Password". Below these fields is a blue "Login" button. Under the button, a note states "This console is optimized for Google Chrome". At the bottom of the page, the version "Version:2.1.1" is indicated.

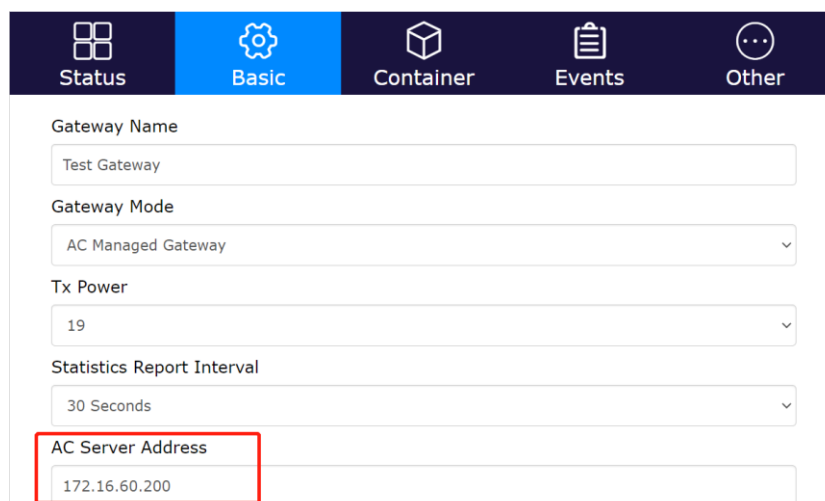
Cassia gateway's web login page

5. Setup using Ethernet Connection

If you don't have a laptop that supports WiFi, please connect the Cassia Bluetooth gateway to a managed Ethernet switch and access the DHCP table or scan using a port scanning tool to locate the IP address assigned to the gateway's MAC ID.

After that, please open Google Chrome on a computer that is connected to the same network and enter the IP address discovered above.

6. Configure AC Server Address

The image shows the configuration page of the Cassia gateway's web interface. The "Basic" tab is selected in the top navigation bar. The page contains several configuration fields: "Gateway Name" (Test Gateway), "Gateway Mode" (AC Managed Gateway), "Tx Power" (19), "Statistics Report Interval" (30 Seconds), and "AC Server Address" (172.16.60.200). The "AC Server Address" field is highlighted with a red rectangle.

Configure AC address in Cassia gateway's web

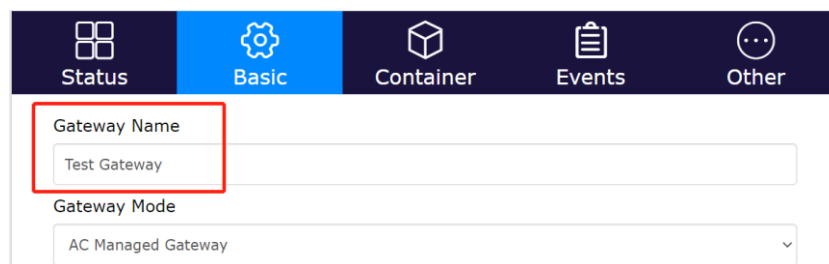
The user can skip this step in the below scenarios.

- If the gateway and the AC are in the same network and DHCP is configured in the network, AC can discover the gateways automatically.
- If the user needs to configure more Cassia gateways at the same time, it is better to use DHCP server option 43 to help the gateways to find the AC. IP gateway will serve as a DHCP relay.
- If the gateway is configured as standalone mode, there will be no AC.

7. Setup Gateway Name

From firmware v2.1.1, the user can setup gateway name from the gateway's local webpage. The user can still setup gateway's name from AC as before.

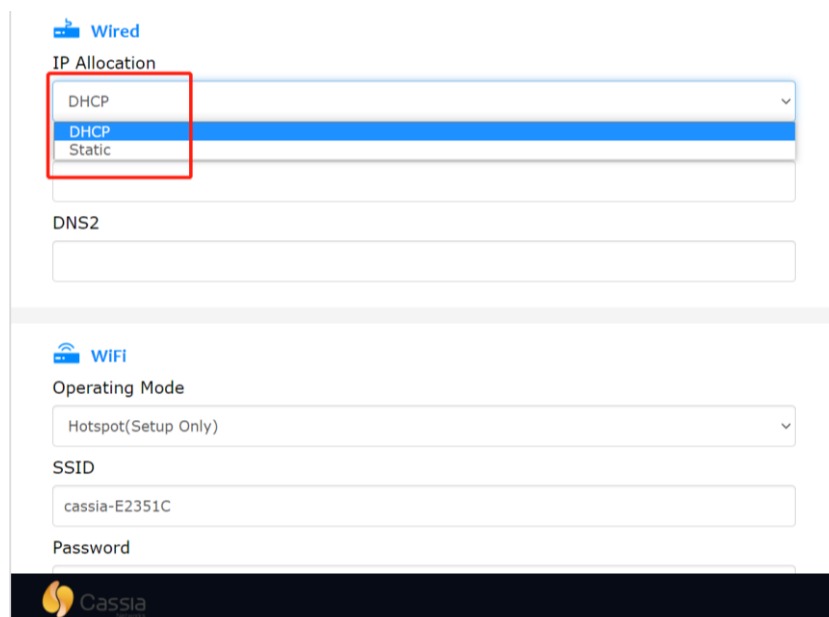
This is very useful for the user who doesn't share AC account to the engineers that install the Bluetooth gateway. When a new Bluetooth gateway is installed, the user will identify this gateway on AC by the gateway name easily, for example "Gateway 1 in factory A".



The screenshot shows the 'Basic' configuration tab for a gateway. The 'Gateway Name' field is highlighted with a red box and contains the text 'Test Gateway'. Below it, the 'Gateway Mode' dropdown menu is set to 'AC Managed Gateway'.

8. Configure Uplink Network

The Cassia Bluetooth Gateway supports Ethernet (Wired), WIFI, and USB cellular modems as networking uplinks. Please check Cassia User Manual for more information. In this guideline, we use Ethernet as an example. Below is the configuration with wired and DHCP.



The screenshot shows the network configuration page for a gateway. The 'Wired' tab is selected, and the 'IP Allocation' dropdown menu is highlighted with a red box, showing 'DHCP' selected. Below it, the 'DNS2' field is empty. The 'WIFI' tab is also visible, showing 'Operating Mode' set to 'Hotspot(Setup Only)', 'SSID' set to 'cassia-E2351C', and a 'Password' field.

Setup network configuration for your gateway

9. CAPWAP and MQTT Setting

Before firmware 2.0.2, Cassia Bluetooth gateway communicates with AC using CAPWAP protocol. CAPWAP is based on UDP port 5246 and 5247 and uses DTLS 1.2 to ensure security.

From firmware 2.0.2, the user can also select MQTT for the communication between gateways and AC. MQTT uses TCP port 8883 and TLS 1.2. MQTT improves the robustness of gateway and AC communication.

The user can set the preferred gateway-AC protocol by setting parameter “AC-Gateway Protocol Priority” on gateway’s console. First, the gateway will use the preferred protocol to connect AC. If it failed, for example port is blocked by the firewall, the gateway will try the other protocol automatically.

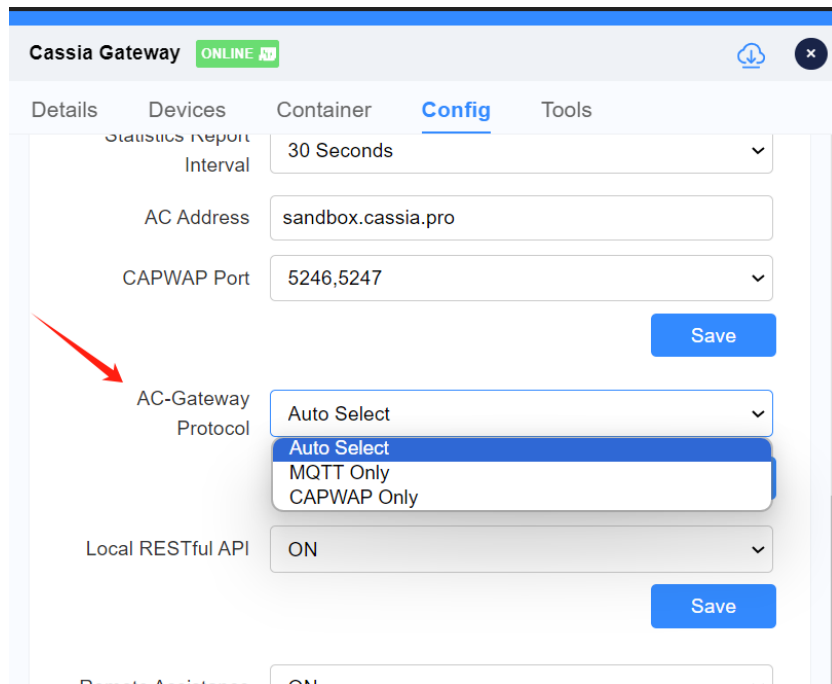
From firmware 2.0.3, the default “AC-Gateway Protocol Priority” on the gateway is MQTT. If the gateway was upgraded from lower versions, the default value will be CAPWAP.

The screenshot displays the 'Basic' configuration page of the Cassia gateway console. The page includes a navigation bar with icons for Status, Basic (selected), Container, Events, and Other. The configuration fields are as follows:

- Gateway Name: [Empty text field]
- Gateway Mode: [AC Managed Gateway (dropdown)]
- Tx Power: [19 (dropdown)]
- Statistics Report Interval: [30 Seconds (dropdown)]
- AC Server Address: [172.16.60.200 (text field)]
- AC-Gateway Protocol Priority: [MQTT (dropdown, highlighted with a red box)]
- Wired: [Wired (dropdown)]

The 'AC-Gateway Protocol Priority' dropdown menu is expanded, showing three options: MQTT, CAPWAP, and MQTT. The second MQTT option is highlighted in blue, indicating it is the selected value.

From 2.2, the customer can set “AC-Gateway Protocol” on AC for each gateway to MQTT Only, CAPWAP Only, or Auto Select. It is not necessary to set “AC-Gateway Protocol Priority” on gateway anymore.



After the gateway is online, the user can find the actually used protocol by checking “AC-Gateway Protocol” on AC or gateway’s console.

| Status | Basic | Container | Events | Other |
|---------------------|-------------------|-----------|--------|-------|
| Model | E1000 | | | |
| MAC | CC:1B:E0:E0:DE:AC | | | |
| Working Mode | AC Managed | | | |
| AC-Gateway Protocol | MQTT | | | |
| Uplink | Wired | | | |
| ETH IP | 172.16.60.115 | | | |
| WLAN IP | | | | |
| Cellular IP | | | | |
| Country/Region | Germany | | | |
| Firmware Version | 2.1.1.2106240330 | | | |
| Up Time | 6hrs 6min 21sec | | | |
| AC Online Time | 6hrs 5min 37sec | | | |

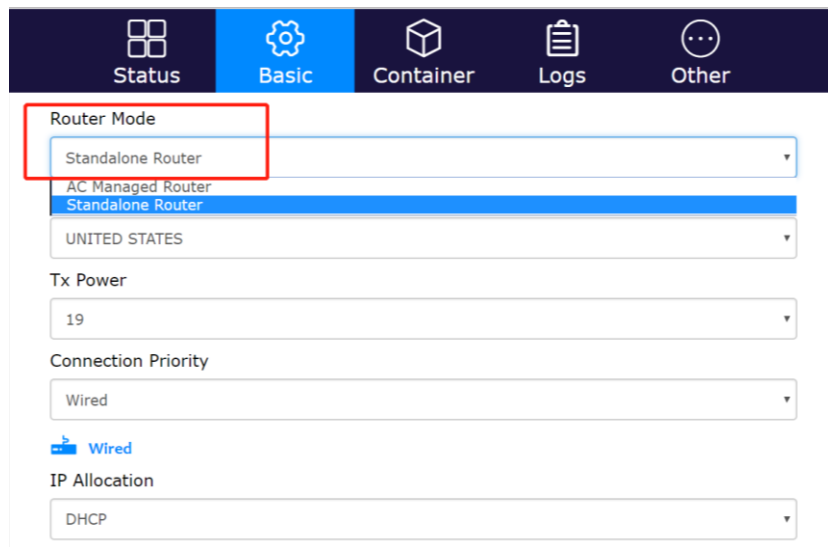
For more information about MQTT and CAPWAP, please check Cassia User Manual.

10.Enable Local RESTful API

This step is only valid for the users who want to use RESTful APIs on the local gateways (not through AC or in a container).

From firmware 1.3, if the gateway is configured as standalone mode, local RESTful API will

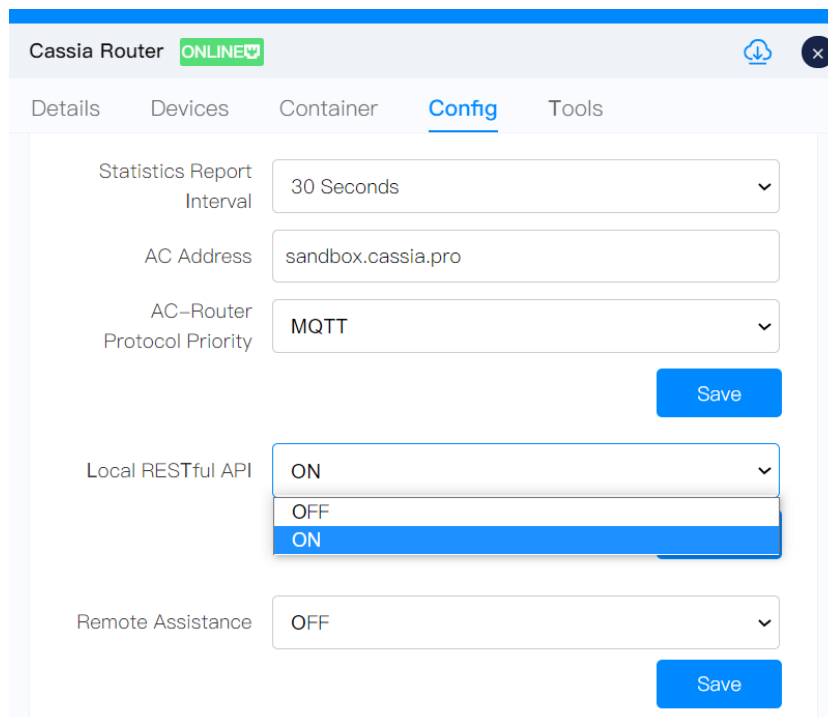
be automatically turned on. If the gateway is configured as AC managed mode, the local RESTful API will be automatically turned off.



The screenshot shows the 'Basic' configuration tab in the Gateway Console. The 'Router Mode' dropdown menu is open, with 'Standalone Router' selected and highlighted in blue. Other options visible are 'AC Managed Router' and 'UNITED STATES'. Below this, the 'Tx Power' is set to 19, 'Connection Priority' is set to Wired, and 'IP Allocation' is set to DHCP.

(v1.3) Configuration of Gateway Mode on Gateway Console

From firmware 1.3, the user can still enable the local RESTful API from the AC console like below, even if the gateway is configured as AC managed mode.



The screenshot shows the 'Config' tab in the AC Console. The 'Local RESTful API' dropdown menu is open, with 'ON' selected and highlighted in blue. Other options visible are 'OFF' and 'ON'. The 'Statistics Report Interval' is set to 30 Seconds, 'AC Address' is sandbox.cassia.pro, 'AC-Router Protocol Priority' is MQTT, and 'Remote Assistance' is OFF. There are 'Save' buttons for both the 'Local RESTful API' and 'Remote Assistance' sections.

(v1.3) Turn on Local RESTful API in AC Console

Before firmware 1.3, the user needs to turn on Local RESTful API in the AC console or gateway console manually. By default, it is OFF. Please see the below figures.

Old Bootloader

ONLINE

Details

Devices

Config

General

Name

Old Bootloader

Group

SJCLab X

SJCLab

beijing

+ Add

AC Address

test.cassia.pro

AC-AP Comm.Ports

5246,5247

Local RESTful API

ON

Remote Assistance

ON

Save

Save

Save

Save

(v1.2) Turn on Local RESTful API in AC Console

Overview

Common

Networks

Bypass

Portal Password

Old Password

New Password

Confirm Password

Save

AC Address

5246,5247

AC-AP Comm. Ports

5246,5247

Local RESTful API

OFF

Save

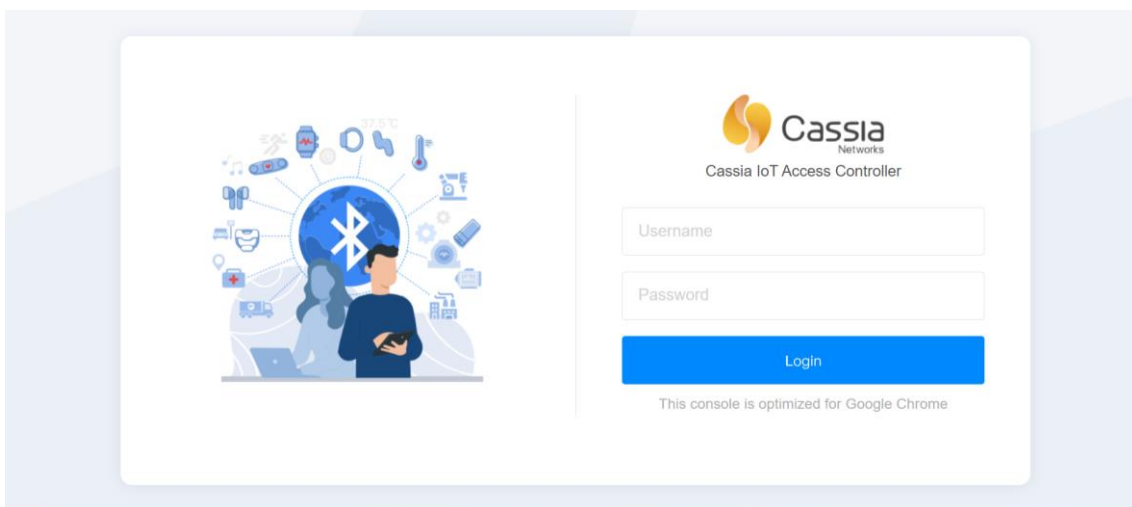
(v1.2) Turn on Local RESTful API in Gateway Console

11.Add Gateway to AC

NOTE: Please always use AC version equal or newer than gateway versions, otherwise you may see strange behaviors. For example, the gateway with 2.1.1 firmware can only connect with 2.1.0 AC with CAPWAP protocol, due to single port feature introduced in 2.1.1. So the 2.1.1 gateway which uses MQTT protocol needs 15 minutes to switch to CAPWAP and connect to 2.1.0 AC.

11.1. Login AC

Please switch your laptop to the WIFI SSID which will provide you with Internet access. Please open Google Chrome and enter the IP address or domain name of the AC, and log in.



Cassia AC login page

11.2. Discover the Gateway

Navigate to the Gateways page.



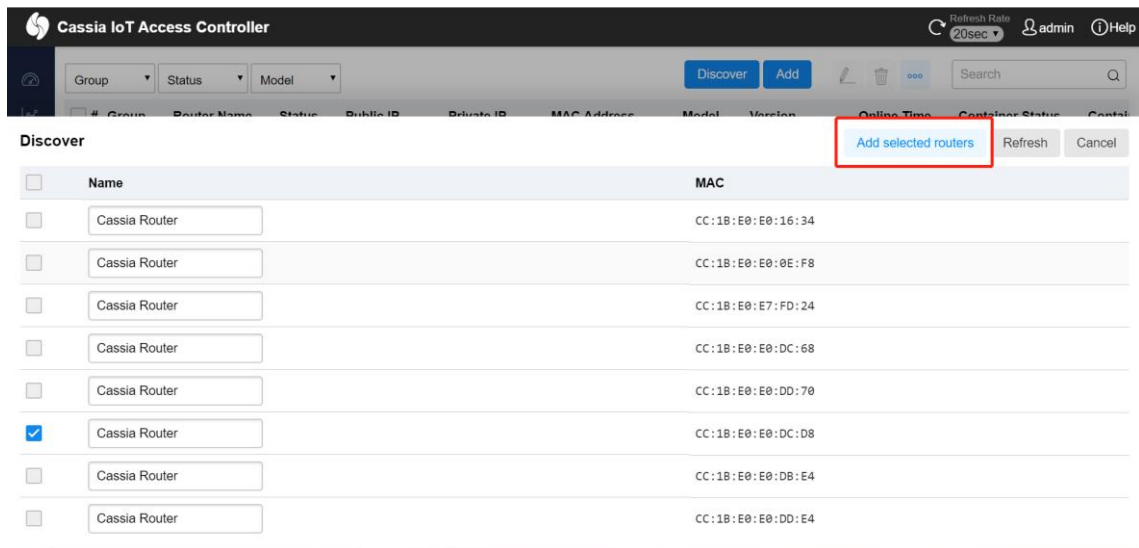
Discover Bluetooth gateways

After clicking the Discover button, Cassia AC will identify the gateways that are either in the same local network as the AC or have been configured to talk to this AC (set AC Server Address) but haven't been added to the AC yet.

11.3. Add the Gateway

Please find the gateways you want to add, then click the “Add selected gateways” button.

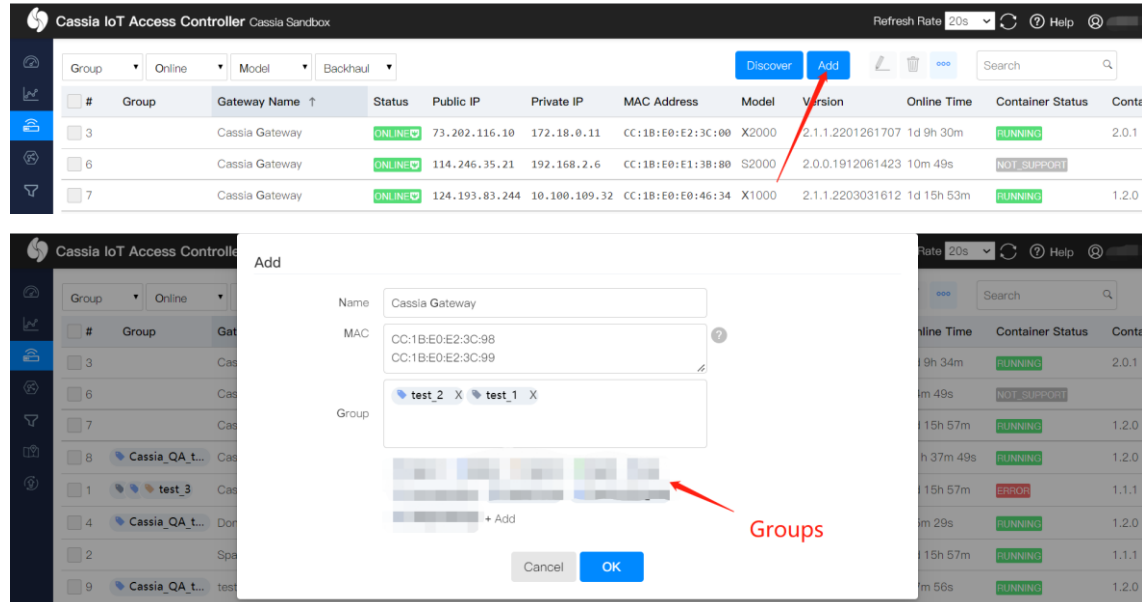
You can select multiple gateways and add all of them in one batch.



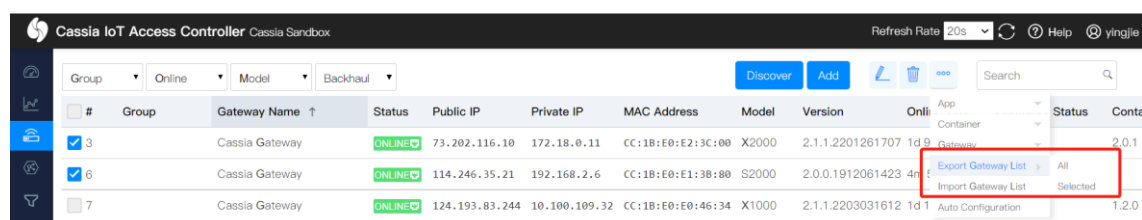
Add the gateways into the AC

11.4. Add a List of Gateways

Before sending the gateways to customers, please add the gateways in AC following below steps. You can also set name and group for the gateways. After that, when the gateways are powered up and correctly configured, they will connect to the AC automatically.



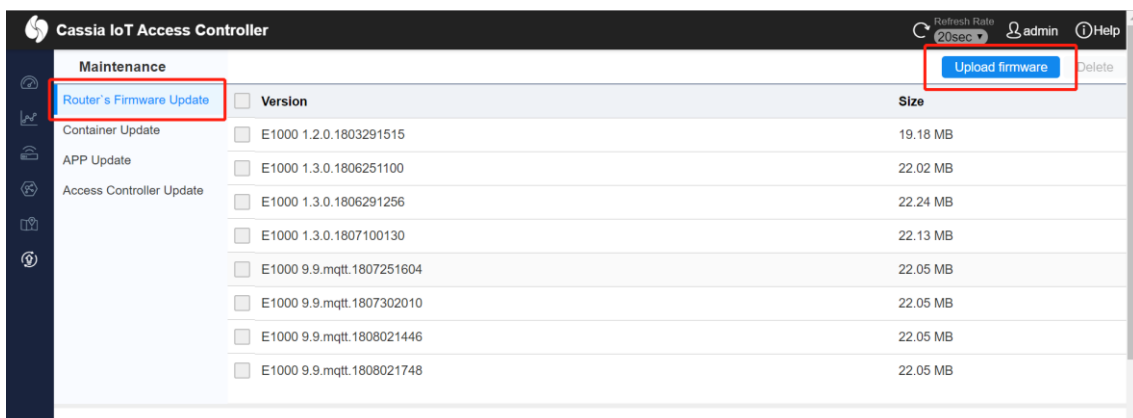
You can also export the selected gateways or all the gateways to a file and import it to another AC later.



12. Upgrade the Gateway

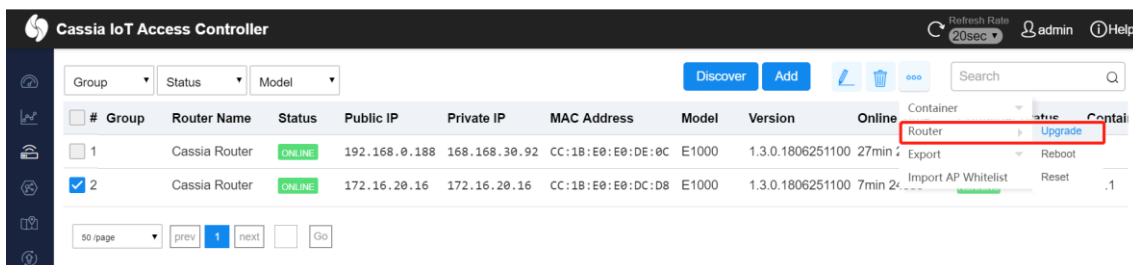
If your gateway is not running the latest firmware, you can upgrade the firmware.

If you don't have the latest firmware on the AC yet, please get it from Cassia, and then upload it to the AC maintenance page. The latest firmware download is available here: <https://www.cassianetworks.com/knowledge-base/router-gateway-firmware/>. This page is password protected. Please get in touch with your Cassia sales representative for assistance.



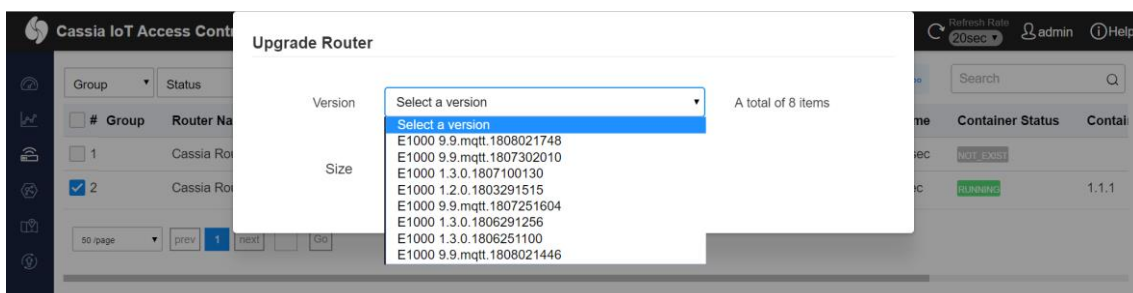
Upload firmware to the AC

Please navigate to the Gateways page, select the gateway(s) that you want to upgrade, and click the Upgrade button.



Upgrade a gateway

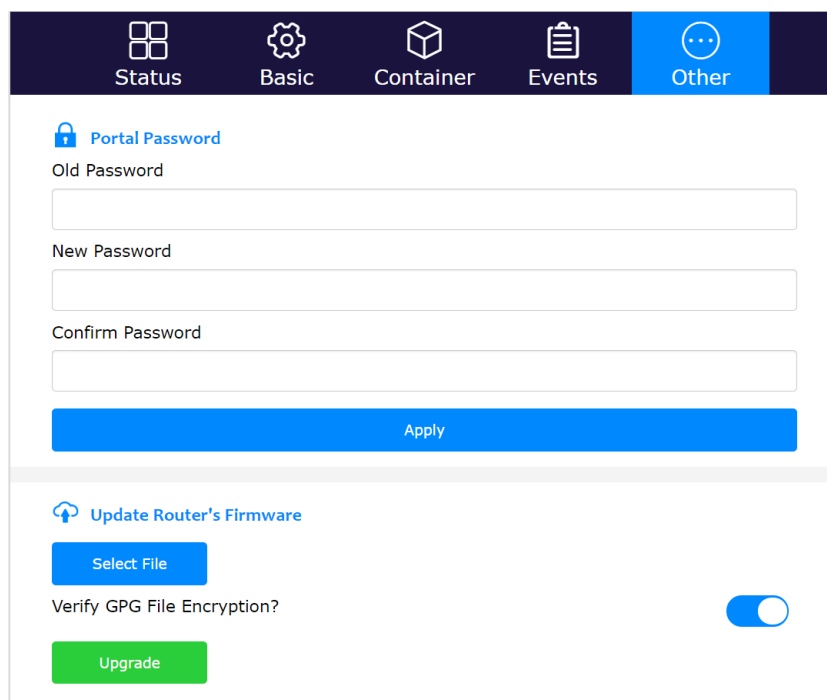
Please choose a firmware you want to upgrade to, and then click OK. If the E1000, X1000, and X2000 firmware upgrade fails during firmware download, it will resume from the last broken download.



Select firmware and upgrade the gateway

From firmware 1.3, the user can update the gateway's firmware locally from the gateway console by clicking the "Select File and Upgrade" button. If the firmware image is encrypted with *.gpg, please switch on "Verify GPG File Encryption?". Please turn it off, if the firmware image is *.gz file format. From 2022 May 1st, Cassia will only deliver gpg format firmware for all Cassia Bluetooth gateway types, except for S2000.

From firmware 1.4.2, the user can update the gateway's firmware from an Android smartphone locally. Please download the gateway firmware onto your smartphone in advance and log into the gateway's local console from WiFi hotspot (2.4GHz only) or the gateway's private IP.

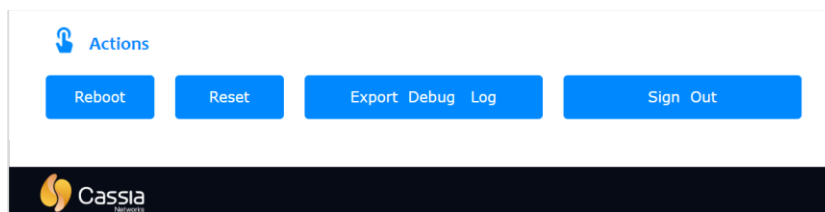


The screenshot displays the 'Other' tab in the Cassia gateway web interface. The top navigation bar includes 'Status', 'Basic', 'Container', 'Events', and 'Other'. The 'Portal Password' section contains three input fields for 'Old Password', 'New Password', and 'Confirm Password', followed by an 'Apply' button. The 'Update Router's Firmware' section features a 'Select File' button, a 'Verify GPG File Encryption?' toggle switch (currently turned on), and an 'Upgrade' button.

Update gateway's firmware locally from gateway web

13. Finish Gateway Configurations and Sign out

Please follow Cassia User Manual to finish other gateway configurations, if necessary. After the configuration, please click the Sign Out button on the Other page to sign out.



The screenshot shows the 'Actions' section of the Cassia gateway web interface. It contains four buttons: 'Reboot', 'Reset', 'Export Debug Log', and 'Sign Out'. The 'Sign Out' button is highlighted in blue. The Cassia logo is visible in the bottom left corner.

Cassia gateway configuration page – other continued

To simplify and speed up the gateway deployment and the pre-configuration before shipping gateways to the end users, you can also try "Gateways Auto Configuration" and "Gateway Batch Configuration" features on AC. Please check Cassia user manual for the detailed guideline.

14. Trouble Shooting Tips

14.1. Gateway does not generate a WIFI hotspot

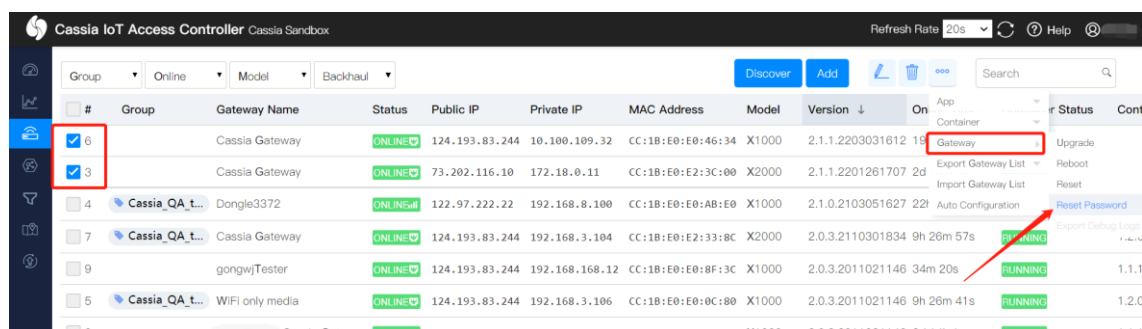
- Cassia gateway's WiFi hotspot is 2.4GHz only
- If the gateway is configured to use a WIFI network for uplink, the gateway will not generate a WIFI hotspot.
- Check the power supply and make sure the power and Wi-Fi LED are ON.
- Try to reset the Cassia Bluetooth gateway.

NOTE: once reset, all gateway configurations in the below table will be reset to the default profile settings, except for country code, container, and customer APP. You need to configure the Cassia gateway again. What is more, the gateway debugs log and route event log will be cleaned. If you would like Cassia to troubleshooting this issue, please don't reset the gateway!

| Parameter | Manufacturing Default Value |
|------------------------------|------------------------------------------------------------|
| Gateway Console Username | admin |
| Gateway Console Password | Need to set new password |
| AC Server Address | Empty |
| Local RESTful API | OFF |
| Remote Assistance | OFF |
| Connection Priority | Wired |
| WIFI / Operating Mode | Hotspot |
| WIFI / SSID | cassia-xxxxxx |
| WIFI / Password | cassia-xxxxxx |
| Local Time Zone | UTC +08:00 |
| Local Time | 1970-01-02, 00:00:00 |
| Enable Local SSH Login | OFF |
| AC-Gateway Protocol Priority | MQTT (this configuration is available from firmware 2.0.2) |

14.2. Forget gateway login password

If you forget the gateway login password, you can reset it through the AC. The read only AC account doesn't have the permission to reset the gateway login password.




You can also reset the gateway, but once reset, all the gateway configurations will be set to the default profile settings. You need to configure the Cassia gateway again. The country code, container, and customer APP will not be impacted.

14.3. Make a mistake while configuring the WIFI

- From firmware 2.0.3, the user can enable “Verify before saving” before switching to Client mode. If the gateway can’t connect to Wi-Fi AP within 30 seconds, it will switch back to Hotspot mode automatically. This function will avoid an un-necessary gateway reset if the user sets the wrong Wi-Fi configuration. If the Wi-Fi client is set to static IP, after the gateway fail to connect to Wi-Fi AP and fall back to Wi-Fi hotspot mode, the hotspot IP address will be changed from 192.168.40.1 to the new static IP.
- If you didn’t enable “Verify before saving”, you have to reset the Cassia Bluetooth gateway. Once reset, all gateway configurations will be reset to the default profile settings, except for country code, container, and customer APP.

14.4. Wi-Fi or USB cellular uplink is not stable

- If you are using gateway firmware v2.0 or higher versions, please check the Wi-Fi and cellular network signal strength on AC->Gateway->Details->Uplink or gateway console Status tab. If the signal strength is POOR, please try other WiFi SSID, try 5G WiFi (only supported by E1000 and X2000), try SIM card from other cellular operators, or try other uplink solutions. Only some cellular modems support signal strength measurement. Please check the Cassia user manual for the list.
- If you are using gateway firmware lower than v2.0, please check the Wi-Fi and cellular signal strength on your mobile phone.
- The country code should be set correctly when using 5G Wi-Fi. Otherwise, 5G Wi-Fi may not work correctly.
- Cassia gateway supports USB cellular modem auto recovery function. After setting “Recover Action” to ON, Cassia gateway will power reset the USB cellular modem (X2000) or reset the USB interface (other gateways) if it can’t reconnect to the cellular network in 10 minutes. For an AC managed gateway, if the cellular connection can’t be recovered in one hour, the gateway will soft reboot automatically. All cellular modems connected by USB port are able to support this function.


Cellular Modem


USB Modem Type

HUAWEI E3372s-153/E8372h-153, Novatel USB730L

Recovery Action

OFF

Apply


Cassia
Networks

Cassia IoT Access Controller Cassia Sandbox
Refresh Rate 20s
? Help @ yingjie

| # | Group | Router Name | Status | Public IP | Private IP | MA |
|---|-------|---------------|---------|---------------|-----------------|-----|
| 1 | | Cassia Router | ONLINE | 136.24.229.34 | 192.168.1.119 | CC: |
| 2 | | Cassia Router | ONLINE | 96.64.240.30 | 10.1.10.237 | CC: |
| 3 | | Cassia Router | OFFLINE | 50.35.185.130 | 192.168.254.178 | CC: |

50 /page
prev 1 next
Go

Cassia Router ONLINE
Details Devices Container **Config** Tools

Password: *****
IP: 192.168.40.1
Netmask: 255.255.255.0
Save

Cellular Modem
USB Modem Type: HUAWEI E3372s-153/E8372h-153, Novatel USE
Cellular modem auto power reset: ON
Save

Bypass

14.5. Gateway can't connect to AC

- Double-check the Bluetooth gateway configuration and Internet connection.
- Check Ethernet and Wi-Fi LED on Cassia Bluetooth gateway. Check the LED on the USB cellular modem. Check the 4G LED on X2000.
- In case a USB cellular modem is used, check the model is supported (check Cassia User Manual) and that the modem has established a connection to a mobile network.
- Check that the network does not use VPN.
- Check the network firewall settings.
- Check the connection to AC with Debug Tools in the Other tab. Please check Cassia User Manual for more information.

- Check CAPWAP and MQTT configuration. Please check Cassia User Manual for more information.
- Reboot the Bluetooth gateway (power off/on)

14.6. Check if a Bluetooth device can be scan or connect

- Check the Bluetooth device is power on and working well.
- Check the Bluetooth Low Energy LED is ON.
- Check Bluetooth Low Energy chip status on gateway webpage -> status tab or AC webpage -> gateway detail tab
- The gateway location or orientation needs to be changed if the Bluetooth devices are not reachable or if the RSSI is lower than -70, e.g. -80. If you are using AC software v1.4 or higher versions, you can try to scan and connect the Bluetooth device with Bluetooth Debug Tool in AC (read only user doesn't have the permission). Please use "Cassia Bluetooth Debugger 2" on <http://www.bluetooth.tech>, if you are using lower AC versions or you are a read only user.
 - RSSI value between 0 and -70 is OK
 - RSSI value between -70 and -80 is weak. The Bluetooth device might be scan and connect from time to time
 - RSSI value -80 or less is poor. Most probably the Bluetooth device cannot be reached.

NOTE: From firmware v2.0.3, CORS is disabled by default on AC and Router due to security reasons. Client-side scripts (e.g. JavaScript) are prevented from accessing the AC webpage and gateway local webpage, unless "Access Control Allow Origin" in AC settings and "Allow Origin" in gateway webpage is set.

For example, when using the Bluetooth debug tool, please set "Access Control Allow Origin" and "Allow Origin" to * or the URL of the requesting page <http://www.bluetooth.tech/>. Please refer to <http://www.bluetooth.tech/debugger2/dist/Debugger2-Troubleshooting.pdf> for detailed instruction.

X2000 LED (Green)

| LED | Function | Status | Description |
|-----|---------------|----------|----------------------------------------------------|
| PWR | Power status | Off | Power off |
| | | Solid on | Power on |
| SYS | System status | Off | The system didn't start or cannot operate normally |

| | | | |
|-------|-----------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Solid on | The system is starting, going to reset, or cannot operate normally |
| | | Slow blinking | The system is operating normally |
| ETH | Ethernet status | Off | No Ethernet link |
| | | On | Ethernet link present |
| | | Blinking | Sending or receiving data |
| WIFI | Wi-Fi status | Off | Wi-Fi didn't start or is in disable mode |
| | | On | Wi-Fi is operating normally in hotspot or client mode |
| | | Blinking | Sending or receiving data |
| BT0/1 | Bluetooth status | Off | Bluetooth chip didn't start |
| | | Solid on | Bluetooth chip is operating normally |
| | | Fast blinking | Bluetooth connection has been setup |
| | | Slow blinking | Bluetooth scan has been enabled |
| 4G | Cellular modem status | Off | USB cellular modem is not connected to X2000 or cellular modem works abnormally |
| | | Solid on | 1: PPPoE cellular modem*: X2000 has connected to the cellular network 2: DHCP cellular modem*: X2000 has connected to the cellular modem. NOTE: Does not guarantee cellular network connectivity |
| | | Blinking | 1: PPPoE cellular modem*: X2000 is sending or receiving data to the cellular network 2: DHCP cellular modem*: X2000 is sending or receiving data to the cellular modem. NOTE: Does not guarantee cellular network connectivity |
| AC | AC online status | Off | X2000 is offline on AC |
| | | Solid on | X2000 is online on AC |

* Huawei models E3372s-153 and E8372h-153 are DHCP cellular modems. MultiTech models MTCM-LNA3-B03 and MTCM2-L4G1 are PPPoE cellular modems. If you want to know the type of other USB cellular modems, please contact your Cassia sales/support contact

E1000/S2000 LED (Green)

| LED | Function | Status | Description |
|-------|------------------|---------------|-------------------------------------------------------|
| PWR | Power status | Off | Power off |
| | | Solid on | Power on |
| SYS | System status | Off | The system didn't start or cannot operate normally |
| | | Solid on | The system cannot operate normally |
| | | Fast blinking | The system is starting or going to reset |
| | | Slow blinking | The system is operating normally |
| ETH | Ethernet status | Off | No Ethernet link |
| | | On | Ethernet link present |
| | | Blinking | Sending or receiving data |
| WIFI | Wi-Fi status | Off | Wi-Fi didn't start or is in disable mode |
| | | On | Wi-Fi is operating normally in hotspot or client mode |
| | | Blinking | Sending or receiving data |
| BT1/2 | Bluetooth status | Off | Bluetooth chip didn't start |
| | | Solid on | Bluetooth chip is operating normally |

| | | |
|--|---------------|-------------------------------------|
| | Fast blinking | Bluetooth connection has been setup |
| | Slow blinking | Bluetooth scan has been enabled |

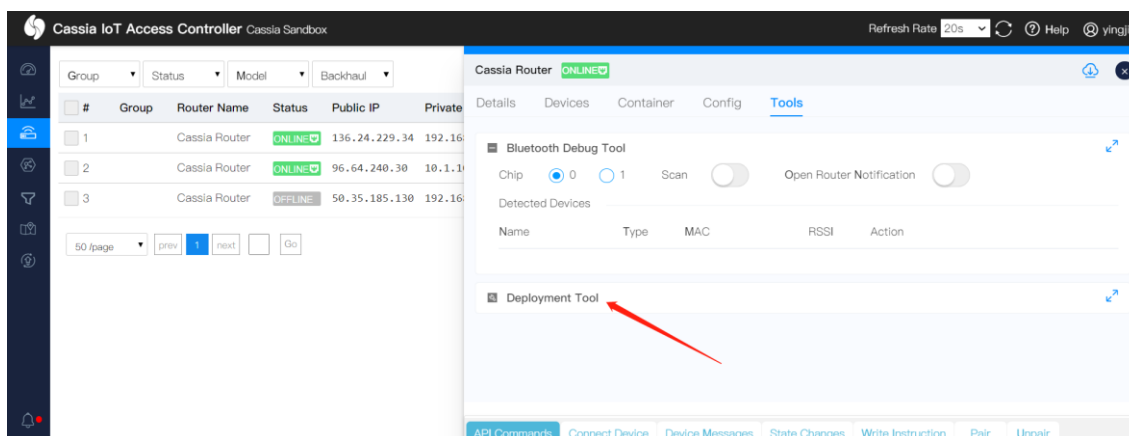
X1000 LED (Blue)

| LED | Function | Status | Description |
|-----|--------------|----------|-------------|
| PWR | Power status | Off | Power off |
| | | Solid on | Power on |

X1000 LED may keep on blinking if the PoE power supply is not stable. Please try to replace the PoE injector.

14.7. Check Bluetooth scan and connect performance in planning and deploy phase

From firmware 2.1.0, the user can run the deployment tool by selecting “Deployment” in the gateway’s local console, or run it from the AC console tools tab. Deployment tool can help the customer to assess the gateway and device’s Bluetooth performance during the planning and deploying phase.



The customer can check the scan and connect performance in real-time, including RSSI, the number of scanned packets, scan and connect duration, connection success and failure rate, etc. Device name filter and MAC filter with wildcard are supported. To get the correct display format, please use this tool on the computer only.

Cassia Deployment Tool

Configure

Gateway MAC

CC:1B:E0:E2:3B:C4

Devices MAC

Please use a separate line for each MAC address, support *, e.g. CC:1B:E0*

Devices Name

Please use a separate line for each device name, support *, e.g. NAME*

Scan Duration

60

s

Connection Timeout

10

s

Connection Attempts

1

times

Scan Testing

Connection Testing

Scan Statistics

| # | Scan Duration | Devices MAC | Devices Name | RSSI | | | Packet Number | Details |
|---|---------------|-------------|--------------|------|-----|-----|---------------|---------|
| | | | | Min | Max | Avg | | |

Connection Statistics

| # | Attempts | Devices MAC | Time (Seconds) | | | Success | Fail | Success Rate | Details |
|---|----------|-------------|----------------|-----|-----|---------|------|--------------|---------|
| | | | Min | Max | Avg | | | | |

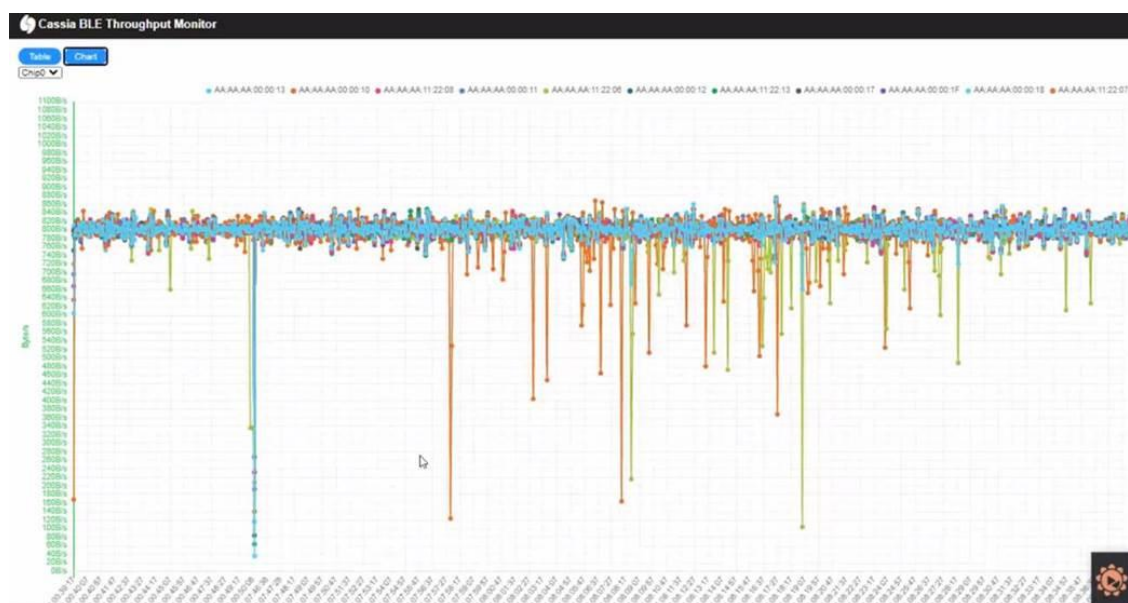
Clear

Export

14.8. Check the multiple connection performance and the throughput

From firmware 2.1.0, the user can run the Bluetooth Low Energy throughput monitor tool by selecting “Throughput” in the gateway’s local console. This tool can show how many Bluetooth Low Energy connections on each chip and show the Bluetooth Low Energy throughput of all the connections or part of them. The user can check the result in chart format (not supported by S2000) or table format.

This tool is not available on the AC console because the traffic amount is huge. To get the correct display format, please use this tool on the computer only.



Starting from firmware 2.2, the user can also view the RSSI and Packet Loss Rate of each BLE connection on the AC's Devices -> History page. Please note, the BLE connection needs to be maintained for at least about 10 seconds to show the Packet Loss Rate.

| Cassia IoT Access Controller | | | | | | | |
|----------------------------------------|---------------------|-------------------|-------------------|--------------|-----------------|------|------------|
| Refresh Rate 20s | | | | | | | |
| Connected Detected Locationing History | | | | | | | |
| Export Connect History Search | | | | | | | |
| # | Time | Device | Gateway | Event | Reason | RSSI | LossRate ↓ |
| 28 | 2024-06-21 20:08:31 | AA:AA:AA:00:02:04 | CC:1B:E0:E3:F8:70 | disconnected | connect timeout | -66 | 42% |
| 26 | 2024-06-21 20:08:31 | AA:AA:AA:00:02:06 | CC:1B:E0:E3:F8:70 | disconnected | connect timeout | -58 | 33% |
| 27 | 2024-06-21 20:08:31 | AA:AA:AA:11:22:09 | CC:1B:E0:E3:F8:70 | disconnected | connect timeout | -65 | 27% |
| 50 | 2024-06-21 19:46:06 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | connected | | | |
| 49 | 2024-06-21 19:46:07 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | disconnected | host disconnect | | |
| 48 | 2024-06-21 19:46:09 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | connected | | | |
| 47 | 2024-06-21 19:46:10 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | disconnected | host disconnect | | |
| 46 | 2024-06-21 19:46:12 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | connected | | | |
| 45 | 2024-06-21 19:46:18 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | disconnected | host disconnect | | |
| 44 | 2024-06-21 19:46:19 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | connected | | | |
| 43 | 2024-06-21 19:46:20 | 2C:A0:42:A5:61:1D | CC:1B:E0:E1:92:B8 | disconnected | host disconnect | | |

14.9. Gateway on-line and off-line

From firmware 2.1.1, the user can check the gateway's offline reason in AC event log. When the gateway is on-line again, AC will generate a new event log in AC Events page. It will show the reason of the previous offline and will show the uplink technology used by this gateway, for example Ethernet, Wi-Fi or 4G. Below are several examples.

Type

Level

Search

#

Time

Type

Level

Description

| | | | | |
|----|-------------------------------|------------------|---------|-----------------------------------------------------------------------------------------------------|
| 1 | 2023-03-09T13:27:10.810+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to online through mqtt! |
| 2 | 2023-03-09T13:26:45.055+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to offline through mqtt! |
| 3 | 2023-03-09T13:25:10.069+08:00 | Network Event | INFO | Gateway(MAC:CC:1B:E0:E0:96:54) current uplink: wired, last offline reason: power, |
| 4 | 2023-03-09T13:25:09.617+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to online through mqtt! |
| 5 | 2023-03-09T13:25:05.846+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to offline through capwap! |
| 6 | 2023-03-09T13:22:44.285+08:00 | Network Event | INFO | Gateway(MAC:CC:1B:E0:E0:96:54) current uplink: wired, last offline reason: Echo timeout |
| 7 | 2023-03-09T13:22:43.924+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to online through capwap! |
| 8 | 2023-03-09T13:20:59.846+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to offline through capwap! |
| 9 | 2023-03-09T13:18:54.024+08:00 | System Operation | INFO | Gongwj login succeed |
| 10 | 2023-03-09T12:48:27.293+08:00 | Network Event | INFO | Gateway(MAC:CC:1B:E0:E0:96:54) current uplink: wired, last offline reason: The connection was lost. |
| 11 | 2023-03-09T12:48:26.931+08:00 | Network Event | WARNING | Gateway(MAC:CC:1B:E0:E0:96:54) change to online through capwap! |
| 12 | 2023-03-09T11:25:52.802+08:00 | System Operation | INFO | dapeng log out |

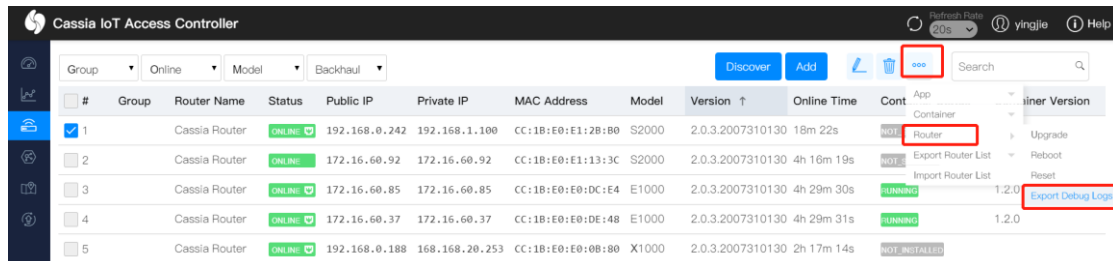
From AC 2.2, the user can find the time when the gateway was offline from the AC. This feature will help the trouble shooting of network issues.

15. Contact Cassia Support

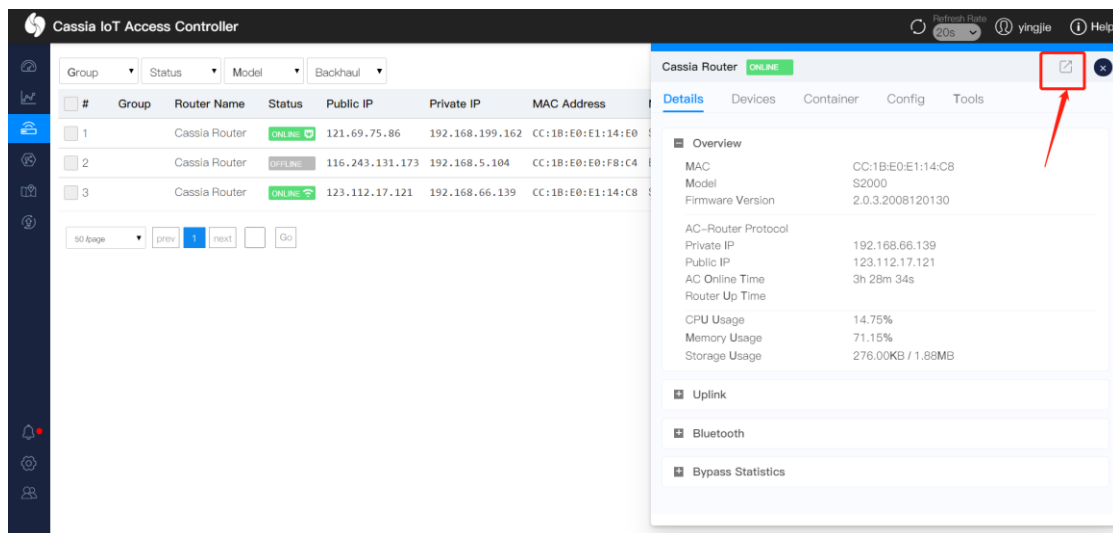
If you can't fix the issue following the above tips, please contact Cassia support support@cassianetworks.com. Please export the gateway debug log and gateway event log, and email them to us for further analysis.

NOTE: the gateway debug log and route event log will be cleaned after the gateway reset. If you would like Cassia to troubleshooting, please don't reset the gateway!

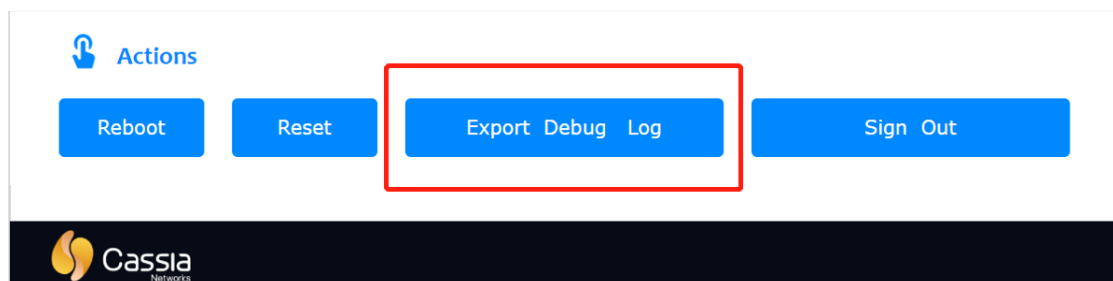
From firmware 2.0.3, the user can download the gateway debug log from AC too (see below screenshot). Only one gateway's debug log can be downloaded from AC at the same time. It may take 2-5 minutes (time out in 10 min) to download one gateway debug log. Please don't touch the AC console and wait until the download is finished, otherwise, the download may be interrupted. This log is not readable to end-users.




On the AC console, the user can export the gateway event log by clicking the below button.





On the gateway console, the user can export the gateway debug log by clicking the Export Debug Log button on the Other tab. This log is not readable to end-users.





On the gateway console, the user can export the gateway event log by clicking the Export button on the Events tab.

Status

Basic

Container

Events

Other

Level ▾

Module ▾

Export

| ID ▴ ▾ | Time | Date | Level | Module | Description... |
|--------|----------|------------|-------|-----------|----------------|
| 1 | 16:14:23 | 2020-01-20 | ERROR | bluetooth | bluethooth... |
| 2 | 16:13:41 | 2020-01-20 | ERROR | bluetooth | bluethooth... |