

Cassia AC and Bluetooth Gateways 2.1.1 GA

Release Notes

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Release Notes

A. About this Release

This is the 2.1.1 GA release that applies to the Cassia IoT Access Controller (AC) and Cassia Bluetooth gateways. This document provides detailed information on the following: upgrade instructions, notes, fixed bugs, and known issues.

Below is the list of firmware and software versions for this release:

- AC Server software: Cassia-AC-2.1.1.2312121711.zip.gpg
- X2000 firmware: X2000_2.1.1.2312122315.gz.gpg
- X1000 firmware: XC1000_2.1.1.2312122315.gz.gpg
- E1000 firmware: E1000_2.1.1.2312122315.gz.gpg

B. Upgrade Notice (Please read this section carefully before upgrading your AC server &

gateway firmware)

- In order to upgrade the Cassia Bluetooth gateway to 2.1.1 firmware, the user must use a 2.1.1 version of the AC software. **2.1.1 AC and gateways will use the “unique port” feature, therefore, make sure the TCP port 8883 is opened on the firewall for both the AC and gateway side before upgrade.**
- The 2.1.1 version of the AC server software is backward compatible with previous gateway firmware versions 2.1.0, 2.0.3, 2.0.2, and 1.4.3. **The old AC version will not work properly with the latest 2.1.1 gateway.**
- When upgrading the gateway firmware in the gateway’s local console, please use the local install file *.gz and turn off the “Verify File Encryption” option.
- When upgrading AC software, please ensure the host server has **a minimum of 2GB of free storage available.**
- From version 2.0.3, a newly installed AC image will support MQTT only. CAPWAP will be disabled by default. If you need to connect a v1.4.x gateway, which only supports CAPWAP as an AC-gateway protocol with a v2.0.3 AC instance, please enable the CAPWAP protocol in the AC settings.
- For AC software upgrades from a previous release, both CAPWAP and MQTT will be enabled by default. Since the TCP-based MQTT protocol is more reliable on the internet than the UDP-based CAPWAP protocol, **it is highly recommended to disable CAPWAP in the AC settings if using the Cassia RESTful API to collect device data from the AC.**
- From v2.0.3, CORS is disabled by default. Client-side scripts (e.g., JavaScript) are prevented from accessing the AC or gateway webpages due to security reasons, unless ‘Access Control Allow Origin’ in the AC settings or gateway configuration tab is set. For example, if using the Bluetooth debugger in <http://www.bluetooth.tech/debugger/>, please set ‘Access Control Allow Origin’ in the AC settings and gateway configuration to (* or the exact URL of the requesting page <http://www.bluetooth.tech>).
- From v2.1.0, in the return message of scan API through AC, the parameter name (“event type”) has been changed from ‘evt_type’ to ‘evtType’. This is to keep it consistent with the local API in which ‘evtType’ is used. For example,

```
{"bdaddrs":[{"bdaddr":"E1:D2:F8:F9:82:E0","bdaddrType":"random"}],"adData":"0201000000000000000000000000","name":"(unknown)","rssi":-29,"evtType":0}
```
- Container 2.0.1 can only be installed on the gateway with firmware version 2.1.1. Previous container versions (1.1.1, 1.2.0) are also compatible.
- Web login password in gateway local console is encrypted from firmware version issued after May 1st 2022. Login API (http://{gateway_ip}/cassia/login) should use the new encrypted password to get the cookie. There is no impact on the API through AC as well as calling API from the container. Please contact Cassia Networks technical support for details.
- The firmware version with gz format will not be delivered from 2022 May 1st, for all gateway types except for S2000. Only gpg format will be available. For MultiTech and Soracom modems, it is recommended to disable the LTE Low-Frequency Band in the cellular profile settings to have a more stable cellular

connection to the internet.

C. New Features and Enhancements

Description	Affected Software
Consolidated the AC Management port – only TCP port 8883 is needed for v2.1.1 gateways, CAPWAP continues to be supported	AC/All Gateways
AC event log - add a username for each operation	AC
AC statistics - 5-minute sampling granularity for the last 24 hours, and one-hour granularity for the last 3 months	AC
AC device history - extend historical device connection logs up to 7 days	AC
Multiple-AC-server viewer	AC
Auto Configuration – The gateway can be automatically configured during the initial setup process when connected to the AC for the very first time.	AC
Allows user to configure gateway name in the local console	AC/All Gateways
AC UI – allows the gateway to be assigned up to 3 groups	AC
BLE Debug Tool upgraded to v2	AC
Container – sudo upgrade to version 1.9.5p2-1	X2000/X1000/E1000
Container – supports user-defined delete_app.sh script	X2000/X1000/E1000
Scan filter – option to add a timestamp in the scan result	AC/All Gateways
Scan filter – display connectable devices only	AC/All Gateways
Scan filter – Value Filter without offset	AC/All Gateways
Support Huawei modem 8372h-320/820 (EU)	All Gateways
JQuery upgraded from version 1.2.0 to 3.5.1	All Gateways
Dropbear upgraded from version 2016.74 to 2017.75	All Gateways
Suspends console login after 5 failed attempts, auto release after 15 minutes	AC/All Gateways
Supports local gateway console login password expiration every 180 days after “Change Password Every 180 days” is turned on.	AC/All Gateways
BLE – supports data length extension (DLE)	E1000/S2000
Cellular enhancement – When the auto-recovery option is ON and the gateway is in AC-managed mode, the gateway will be rebooted if the cellular connection cannot be recovered in 1 hour.	All Gateways
Filter enhancement – AC Combined SSE API supports scan filters (name, mac, value, and duplicate filters)	AC

Additional updates in X2000_2.1.1.2110291527.gz.gpg

BLE – supports data length extension (DLE)	X2000
Supports 4G modem Soracom Onyx Modem SC-QGLC4-C1	X2000

Additional updates in Cassia-AC-2.1.1.2201201553.zip.gpg

X2000_2.1.1.2201261707.gz.gpg S2000_2.1.1.2201281240.tar.gz.gpg

Gateway local console login password resets from AC	AC/All Gateways
Scan Filter – filters and parses for iBeacon/Eddystone	X2000

Additional updates in X2000_2.1.1.2202171745.gz.gpg

XC1000_2.1.1.2202171742.gz.gpg S2000_2.1.1.2202171742.tar.gz.gpg

Supports cellular modem AK-020 for Japan	S2000
Supports MultiTech modem MTCM-LNA3-B03 for Verizon private network	All Gateways

Additional updates in Cassia-AC-2.1.1.2204181329.zip.gpg

AC email notification supports customer-configured email server	AC
Cassia RESTful API supports switching Bluetooth antenna between external to internal	AC/X2000
Time zone setting is changed from zone-based to location (country or major city) based selection, to support daylight saving time (DST)	AC
The deployment tool supports the device name filter and MAC filter with the wildcard filter	AC

Additional updates in E1000_2.1.1.2111161336.tar.gz.gpg

Supports cellular modem Soracom Onyx Modem SC-QGLC4-C1	E1000
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Additional updates in E1000_2.1.1.2205262247.gz.gpg

X2000_2.1.1.2205171754.gz.gpg XC1000_2.1.1.2207292110.gz.gpg

Supports network diagnostic tool in debug tool of gateway local webpage	E1000/X1000/X2000
The deployment tool supports the device name filter and MAC filter with a wildcard filter.	E1000/X1000/X2000
Time zone setting is changed from zone-based to location (country or major city) based selection, to support DST	E1000/X1000/X2000
Scans API to support scan with both chips and merge result by "chip=all"	E1000/X1000/X2000
Scan Filter – filters and parses for iBeacon/Eddystone	E1000/X1000/X2000
Scan Filter – supports multiple value and name filters	E1000/X1000/X2000

Additional updates in S2000_2.1.1.2208121710.tar.gz.gpg

Upgrades BusyBox to 1.34.1	S2000
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Additional updates in Cassia-AC-2.1.1.2301131733.zip.gpg

X2000_2.1.1.2301201336.gz.gpg XC1000_2.1.1.2301201330.gz.gpg

E1000_2.1.1.2301201332.gz.gpg S2000_2.1.1.2301201611.tar.gz.gpg

Modem enhancement – add an option of “disable LTE low-frequency band” to increase stability for MultiTech and Soracom modems.	All gateways
Security enhancement – limits gateway’s Wi-Fi hotspot connection number to 1	All gateways
Security enhancement – integrates AppArmor and Seccomp to protect container	E1000/X1000/X2000
Security enhancement – adds additional DDOS protection	E1000/X1000/X2000
Adds gateway previous offline reason in AC event log	AC and all gateways

Additional updates in X2000_2.1.1.2303090947.gz.gpg

XC1000_2.1.1.2303082218.gz.gpg E1000_2.1.1.2303082218.gz.gpg

Modem enhancement – allows an option to ‘disable LTE low-frequency band’ on MultiTech and Soracom modems for a more stable connection.	E1000/X1000/X2000
Modem enhancement – supports ZTE MF79U, Qualtech EG25G, Qualtech EC20.	E1000/X1000/X2000
Modem optimization – reduces cellular traffic amount	E1000/X1000/X2000

Additional updates in Cassia-AC-2.1.1.2304121107.zip.gpg

Security enhancements for a developer key, Read-Only User permission, and the RESTful API through AC.	AC
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Additional updates in Cassia-AC-2.1.1.2307111740.zip.gpg

Security enhancements for OpenSSL, Read Only User, API through AC, etc.	AC
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Additional updates in Cassia-AC-2.1.1.2308101422.zip.gpg

X2000_2.1.1.2309061648.gz.gpg XC1000_2.1.1.2309061648.gz.gpg

E1000_2.1.1.2309061647.gz.gpg

Container enhancement – increases container memory limitation from 128MB to 144MB.	X1000
Scan Filter enhancement – adds report_interval to report advertising packet in a fixed interval.	E1000/X1000/X2000
The modem recovery option is set to ON as the default value	E1000/X1000/X2000
Adds modem support for MultiTech MTCM2_L1G2D_B03/FS040U	E1000/X1000/X2000
Security enhancement – upgrades 3 rd party software and	AC / All gateways

libraries.	
ATX2000 Support 1) Displaying mode name on the web displayed as "iWAPXN3-ATX2000" 2) Setting external antenna to "Both" by default. 3) Triggering ATX2000 Reset by 3 continuous power cycle reboots within a 90-second to 180-second window.	ATX2000

Additional updates in Cassia-AC-2.1.1.2312121711.zip.gpg

X2000_2.1.1.2312122315.gz.gpg XC1000_2.1.1.2312122315.gz.gpg

E1000_2.1.1.2312122315.gz.gpg

WiFi enhancement - adds an option to hide Wi-Fi hotspot SSID	E1000/X1000/X2000
Modem enhancement - displays ICCID for a SIM card	E1000/X1000/X2000
Security enhancement – upgrades 3 rd party softwares and libraries.	AC / All gateways
ATX2000 improvement - triggers ATX2000 reset by 3 continuous power cycle reboots within 2-3 mins, 2-3 min and 3-4 mins windows.	ATX2000

D. Fixed Bugs since the last Release

- Fixed gateway group name, allowed for the underscore character to be used. Optimized the MQTT connection and the API request optimization to reduce frequent gateway online/offline events in the AC console.
- Optimized the Wi-Fi connectivity to improve the Wi-Fi connection stability.
- Improved the accuracy of the AC server's CPU load calculation.
- Fixed the issue of the S2000 web session expiring immediately after the login.
- Fixed the issue of the Wi-Fi LED not turning off after disabling Wi-Fi.
- Fixed the issue of losing email notifications for gateway online status change.
- Fixed the issue of supporting the BLE tool Bluepy in the X2000 container.
- Fixed the issue of losing the BLE connection sporadically in v2.1.0 X2000.
- Fixed the issue of log size control related to the cellular 'auto recovery' function.
- Removed the /nohup.out log out of container applications.
- Fixed the sporadic issue of the X1000 firmware upgrade failure.

Additional updates in Cassia-AC-2.1.1.211105170, X2000_2.1.1.2111091130, E1000_2.1.1.2111161336:

- Fixed the issue of the email address not allowing '-' in the AC.
- Fixed the issue of the email notifications for the online/offline groups in instances of the AC notification being OFF.

- Fixed the issue of the AC gateway page showing '{Template Error}' after upgrading to 2.1.1
- Fixed the issue of the AC CPU load increasing due to the handling of more than 50K connection history records, and changed the size limitation of the connection history to either seven days or 100K records.
- Fixed the incomplete BLE 5 extended advertise packet scan output in the X2000.
- Fixed the CORS setting failure with * and character / on the local console page.
- Fixed the scan stop issue due to the BLE chip being stuck in the reboot loop in E1000.

Additional updates in Cassia-AC-2.1.1.2201201553.zip.gpg

X2000_2.1.1.2201261707.gz.gpg S2000_2.1.1.2201281240.tar.gz.gpg

- Fixed the issue of the AC system notification email not being sent due to the email server configuration changes.
- Fixed the issue of X2000 not getting a scan response from any device after the BLE connection exists on the chip.
- Fixed the issue of losing the DNS server configuration in the container.
- Fixed the issue of the Wi-Fi interface going down sporadically.
- Fixed the AC gateway connection issue due to a special MTU size in the Verizon private network.
- Fixed the issue of the gateway cellular backhaul switching the AC gateway communication protocol from MQTT to CAPWAP.

Additional updates in Cassia-AC-2.1.1.2202171356.zip.gpg

X2000_2.1.1.2202171745.gz.gpg XC1000_2.1.1.2202171742.gz.gpg

S2000_2.1.1.2202171742.tar.gz.gpg

- Fixed the AC UI issue of the 'Export gateway debug log' not working properly.
- Fixed the issues of the gateway cellular connection happening due to the special MTU size in the default setting.

Additional updates in Cassia-AC-2.1.1.2204181329.zip.gpg

- Fixed the timestamp issue in the AC device page connection history.

Additional updates in E1000_2.1.1.2205262247.gz.gpg

X2000_2.1.1.2205171754.gz.gpg XC1000_2.1.1.2207292110.gz.gpg

- Fixed the issue of failing to look up the DNS server in the container.
- Fixed the issue of failing to set peer DNS in modem configuration.
- Fixed the issue of container 2.0.1 full storage due to the excessive system journal and Ubuntu logs.
- Fixed the issue of the Wi-Fi hotspot disappearing sporadically.
- Fixed the issue of the Wi-Fi interface going down sporadically in E1000.
- Fixed the issue of the event log tooltip of the local gateway page not closing when changing tabs.
- Fixed the issue of the Bluetooth connect device error when using a resolvable

address.

- Fixed the issue of the Bluetooth chip cycling reboot and scan function stopping sporadically.

Additional updates in Cassia-AC-2.1.1.2207292123.zip.gpg

X2000_2.1.1.2207292108.gz.gpg XC1000_2.1.1.2207292110.gz.gpg

E1000_2.1.1.2207292112.gz.gpg

- Fixed the issue of the connection API returning to an incorrect mode.
- Fixed the issue of the gateway not being able to connect to 5Ghz Wi-Fi AP w/ DFS channels in Japan.
- Fixed the issue of using duplicate scanners returning errors for the AC combined SSE API.

Additional updates in Cassia-AC-2.1.1.2301131733.zip.gpg

X2000_2.1.1.2301201336.gz.gpg XC1000_2.1.1.2301201330.gz.gpg

E1000_2.1.1.2301201332.gz.gpg S2000_2.1.1.2301201611.tar.gz.gpg

- Fixed the 5Ghz Wi-Fi connection issue by changing the Japan country code to J3.
- Fixed the issue of the container status being stuck on "installing".
- Fixed the issue of the gateway not connecting to AC sporadically with a Wi-Fi connection.
- Fixed the issue of the AC server going down due to email notification being "ON" and the email address being empty.

Additional updates in X2000_2.1.1.2303090947.GHz.gpg

XC1000_2.1.1.2303082218.gz.gpg E1000_2.1.1.2303082218.GHz.gpg

- Fixed the issue of the X1000 Bluetooth not being able to be recovered after hanging up.
- Fixed the Wi-Fi configuration change failure from the local console after the gateway reset.
- Reduced 20MB cellular modem traffic per month by reducing heartbeat (ping) interval.
- Gateway would not send CAPWAP discovery requests and data channel probes if it is already online with MQTT.
- Changed the AC gateway connection hello expiration from 3*10s to 5*10s to avoid frequent offline/online.

Additional updates in X2000_2.1.1.2307041834.gz.gpg

XC1000_2.1.1.2307041923.gz.gpg E1000_2.1.1.2307041834.gz.gpg

- Fixed the issue of batch connection API failure on X2000.
- Automatically start Bluetooth in the container when closing Cassia Bluetooth Stack.
- Remove options --syslog-only and --systemd-activation for dbus when closing Cassia Bluetooth Stack.

- Gateways do not perform CAPWAP self-discovery when the AC address is not empty.

Additional updates in Cassia-AC-2.1.1.2308101422.zip.gpg

X2000_2.1.1.2309061648.gz.gpg XC1000_2.1.1.2309061648.gz.gpg

E1000_2.1.1.2309061647.gz.gpg

- Fixed the issue of cellular modem RSSI/IMSI/IMEI not being displayed on a webpage.
- Fixed the issue of sudo failure in container 1.2.0 in 2.1.1 July 2023 version (2.1.1.2307041834).
- Fixed the issue of the gateway type being sporadically updated to C1000.
- Fixed the issue of the sporadic X1000 chip reset failure when scan API is called frequently.
- Turned on an additional debug log for PPP when the cellular modem connection failed.
- Improved firmware upgrade failure error message.
- Allowed gateway to switch from HTTP to HTTPS and uploaded certificate through API from the container.
- Allowed the highspeed multiple connection mode to use the BLE parameter from the gateway, and supervision timeout to be set to ≥ 5 seconds.
- Disabled coredump file for AC server.
- Fixed the issue of slower gateway firmware upgrade from hotspot.
- Reduced gateway timestamp gap during offline by updating timestamp before re booting.
- Fixed the issue of the E1000 chip resetting when the DLE and pair requests are handled concurrently.

Additional updates in Cassia-AC-2.1.1.2312121711.zip.gpg

X2000_2.1.1.2312122315.gz.gpg XC1000_2.1.1.2312122315.gz.gpg

E1000_2.1.1.2312122315.gz.gpg

- Fixed the issue with X2000 and ATX2000 external antenna setting when Cassia Bluetooth stack is disabled.
- Fixed the issue of not being able to select multiple ATX2000 in AC for operations.
- Fixed the issue of X2000 BLE chip sporadically failing to start.
- Fixed the issue of E1000 chip sporadic reset due to chip is not ready.
- Removed E1000 option --syslog-only and --systemd-activation for dbus when closing Cassia Bluetooth stack and fixed the kernel panic issue.

E. Known Issues and Restrictions

- If the AC and gateways are connected through the internet, and the Cassia RESTful API through the AC is called to collect device data, please **disable UDP-based CAPWAP protocol in the AC settings (set CAPWAP port to**

Disable), which will enable all gateways to communicate with the AC through TCP based MQTT only. Otherwise, there might be a packet loss or an incorrect message sequence for device data with a CAPWAP configuration. Oftentimes, the API calls might return HTTP 502 or 504 errors, depending on the connection quality of the internet.

- The maximum number of SSE connections for one gateway is 32. Cassia's local RESTful API will return '502 Bad Gateway' when this limit is exceeded. Currently, there are 4 types of SSE connections: `"/gap/nodes?event=1"`, `"/gatt/nodes?event=1"`, `"/management/nodes/connection-state"`, and `"/gap/rssi"`. It is recommended to maintain only one stable SSE connection for each type and to close unused SSE connections by closing the HTTP connection. It is not recommended to frequently open and close combined SSE connections.
- Container status on the AC gateway list webpage is updated in each 'Statistics Report Interval'. When the interval is set longer than 30 seconds, e.g., 5 minutes, the container status on the AC gateway list will not be updated on a timely basis.
- For the S2000 gateway, in situations where the number of received advertising packets is greater than 200 per second, it is recommended to use a "scan filter" or "pure scan filter" to reduce the CPU load.
- In order to get a prompt response for the GATT discovery API, the gateway, by default, will use the cached GATT database which was discovered during the previous connection. Connection API parameter `discovergatt=0` needs to be specified when the user needs the gateway to read real-time GATT service and characteristics from the BLE device.
- In the AC settings, enabling 'Room-Based BT Positioning' or 'Gateway Auto-Selection' will consume additional CPU resources. It is recommended to enable these features only when needed.
- LED enhancement – 2 additional BT LED status indicators for scanning and connecting have been added in support of Cassia's Bluetooth stack. If using BlueZ, BT LED will not display new status behavior.
- When enabling the Wi-Fi 'verify and save' function during provisioning the Wi-Fi client is set to static IP, and if the gateway does not connect to the Wi-Fi AP with the current settings, it will fall back to Wi-Fi hotspot mode. In this case, the hotspot IP address will have already been changed from the default IP (192.168.40.1) to the new static IP address.
- In Wi-Fi hotspot mode, the 'verify and save' button disappears after switching tabs. The button will appear again after refreshing the webpage.