

DATA SHEET

Cassia IoT Access Controller

Cassia IoT Access Controller (AC) is a powerful IoT network management solution. With the Cassia AC, businesses will now have unprecedented access, control and security over their IoT environments. The Cassia AC solution enables seamless deployment and management of hundreds of Bluetooth routers, and monitoring of thousands of connected devices in an enterprise environment from one centralized interface.

OVERVIEW

Until now, lack of standardization and interoperability across protocols has been a major impediment to IoT market growth. By improving the functionality of Bluetooth so that it can work across greater distances and a wide variety of products, Cassia Network is backing Bluetooth as the ubiquitous wireless technology. In doing so, the company is solving two of the most fundamental barriers to IoT market entry – the cost and difficulty of deploying large-scale IoT environments that work.

With the Cassia IoT Access Controller (AC), businesses will now have unprecedented access, control and security over their IoT environments. The Cassia AC solution enables seamless deployment and management of hundreds of Bluetooth routers, and monitoring of thousands of connected devices in an enterprise environment from one centralized interface.

From office to the factory floor, from sports arenas to hospitals, IoT is on the cusp of radically changing how many industries operate. Together, Cassia's groundbreaking AC and Bluetooth routers will open the door for enterprise IoT applications and environments that have not been realized before.

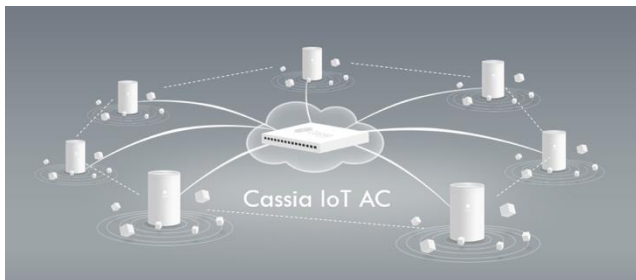


Figure 1 – Cassia IoT Access Controller

UNIQUE BENEFITS

Seamless Bluetooth Coverage

The Cassia AC and Bluetooth routers together provide seamless Bluetooth coverage for data collection and location tracking both indoor and outdoor, without requiring any changes to the Bluetooth end devices.

Centralized Management and Control

The Cassia AC solution enables easy deployment and management of hundreds of Bluetooth routers connected with thousands of devices in an enterprise environment from one centralized interface. Real-time router and device monitoring, automatic router discovery, one-click firmware upgrade, device locationing and security policies are all seamlessly integrated.

End-to-End Security

The communication from the client devices, to the Cassia Bluetooth Router, the Cassia AC and the application server can all be encrypted, providing end-to-end security.

Location Tracking

The Cassia AC, together with multiple Cassia Bluetooth routers, can track and report location of the Bluetooth LE devices within its coverage, providing location tracking of people and assets in real time.

Flexible Deployment and Easy Access

The Cassia AC can be deployed on an on-premise server; in a private cloud; or in Cassia's public cloud. Administrators can access the Cassia AC from a web-browser, through a PC or a tablet, without any special training.

Expandable Scalability

Build Bluetooth wireless networks as big or small as needed. Flexibility to pay as you grow: The Cassia AC offers software license flexibility to add additional access points as business requirements change.

FEATURES

Dashboard and statistics

The dashboard displays real-time data in the current state, including Throughput, System, Routers connected, Clients connected and Top 10 Used Routers. See Figure 2 for a screen shot.

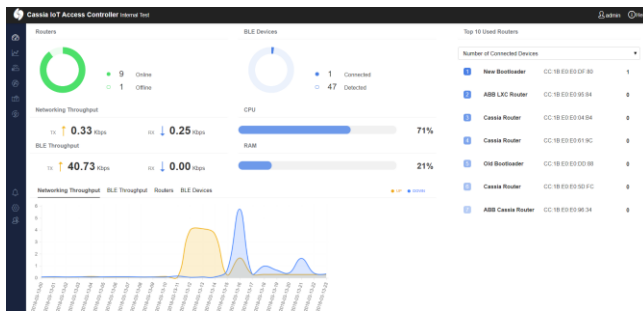


Figure 2 – Cassia IoT AC Dashboard

Router and Device Management

- **Router auto discovery:** The Cassia AC can auto-detect Bluetooth routers that are in the same local network or have been configured to talk to this AC. Administrator can add the routers into the AC router list without manually entering their MAC addresses.
- **Fast configuration:** Cassia AC can configure Bluetooth routers individually or in batch. The parameters include group, network settings, AC Domain/IP address, etc.
- **One-click firmware upgrade:** Administrator can upload multiple firmware images to the Cassia AC and select a version to perform an upgrade for one or multiple Bluetooth routers in the network.

- **Router and Device Listing:** Display the status of all Bluetooth routers and clients in its network in real-time.

#	Group	Router Name	Status	Public IP	Private IP	MAC	Model	Version	Online time
1	Cassia Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.100	CC-18-E0-E0-0F-80	C1000	1.2.0.1802081043	4hrs 45min 50sec
2	# SCSLAB	Old Broadcaster	Online	94.44.246.10	192.168.1.100	CC-18-E0-E0-0F-80	E1000	1.2.0.1802130030	20hrs 25sec
3	# SCSLAB	New Broadcaster	Online	94.44.246.10	192.168.1.101	CC-18-E0-E0-0F-80	E1000	1.2.1.1802124027	20hrs 45min 31sec
4	Cassia Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.100	CC-18-E0-E0-0F-80	C1000	1.2.2.1801101046	-
5	# SCSLAB	Cassia Router	Online	118.144.246.201	172.16.1.100	CC-18-E0-E0-0F-80	C1000	1.2.1.1802124028	8hrs 57min 28sec
6	Cassia Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.101	CC-18-E0-E0-0F-80	C1000	1.2.2.1802081043	20hrs 57min 50sec
7	ABB LK2 Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.100	CC-18-E0-E0-0F-80	E1000	1.2.0.1802130030	4hrs 45min 50sec
8	Cassia Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.100	CC-18-E0-E0-0F-80	C1000	1.2.1.1802124028	20hrs 45min 31sec
9	Cassia Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.100	CC-18-E0-E0-0F-80	C1000	1.2.2.1802081043	20hrs 57min 50sec
10	ABB Cassia Router	CC-18-E0-E0-0F-80	Online	94.44.246.10	192.168.1.101	CC-18-E0-E0-0F-80	E1000	1.2.0.1802130030	20hrs 57min 50sec

Figure 3 – Cassia IoT AC Device Management

- **Fast relocation:** If you need retire an AC and relocate the routers that it manages, you can export the router list into a file and import it from the new AC. Thus, the relocation process is speedy.
- **Realtime logs:** The Cassia AC's events page displays multiple types of logs, including HTTP API, Network Event, System Operation. The events are categorized into three severity levels: Info, Warning and Error.

#	Time	Type	Level	Description
1	2018-03-14T18:02:26.749-07:00	System Operation	INFO	admin login success
2	2018-03-14T14:14:53.200-07:00	Network Event	WARNING	API MAC CC18E0E00F80 is online
3	2018-03-14T14:14:47.715-07:00	System Operation	INFO	admin add API CC18E0E00F80
4	2018-03-14T14:14:40.048-07:00	Network Event	INFO	Receive Discovery packet from API MAC CC18E0E00F80
5	2018-03-14T13:20:17.827-07:00	Network Event	WARNING	API MAC CC18E0E00F80 is online
6	2018-03-14T13:20:12.719-07:00	Network Event	INFO	Receive Discovery packet from API MAC CC18E0E00F80
7	2018-03-14T13:19:56.306-07:00	Network Event	WARNING	API MAC CC18E0E00F80 is online
8	2018-03-14T13:19:51.414-07:00	Network Event	INFO	Receive Discovery packet from API MAC CC18E0E00F80

Figure 4 – Cassia IoT AC Events

Advanced Security

- The communication from the client devices, to the Cassia Bluetooth Router, the Cassia AC and the application server is all encrypted.
- The Cassia Cloud APIs use OAuth (Open Authentication) for user authentication
- The Cassia AC uses Docker architecture in the Cloud. The Docker Container isolates applications from one another and the underlying infrastructure, while providing an added layer of protection for the application.

- Use router whitelist to manage the access of Routers to the AC management
- User management -- Create and manage user accounts with different levels of access control
- Support Bluetooth 4.1 Secure Simple Pairing: just works, passkey entry and OOB
- Access to the AC webpage support TLSv1.2 over HTTP.
- Communication between the AC and Cassia router is based on DTLS1.0 over UDP
- The AC and router firmware are signed by certificate to ensure authenticity

Map and Location Management

- Maps management: upload floorplans for the space being covered
- Annotate the maps for Bluetooth routers deployed
- Support APIs for a third-party inquiry
 - Query the routers around a device, or the devices around a router
 - Query the router list per device for all devices

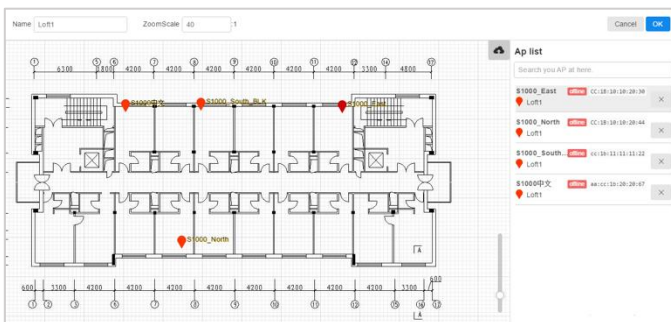


Figure 5 – Cassia IoT Access Controller Map Management

Zone-based Positioning

- The Cassia AC uses the classic RSSI (signal strength) triangulation to locate a Bluetooth device in a zone. This feature is widely used at campus and senior facilities for people and asset tracking.
- Track location in real-time, at an accuracy level of 5-10 meters.

License

- Based on subscription time (monthly or yearly)
- Based on the number of Bluetooth routers managed
- Based on modules, whether advanced modules are used (basic, advanced positioning, roaming)

Application Interface

The Cassia IoT AC provides data output APIs to Application Servers. APIs are based on HTTP/HTTPS.

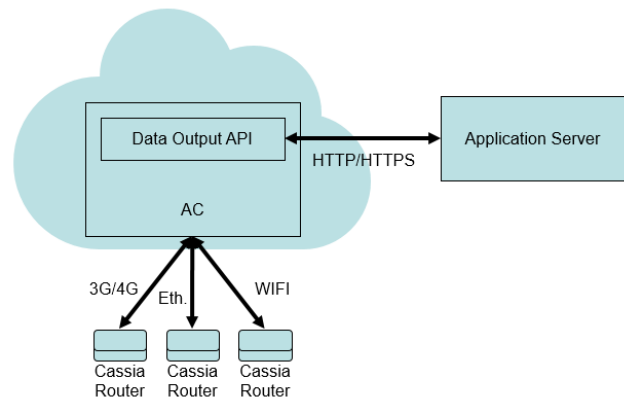


Figure 6 – Cassia IoT Access Controller flow diagram

Deployment

Cassia IoT AC can be flexibly deployed at

- On-premise hardware box
- Private cloud: customer managed private or public cloud
- Cassia public cloud