BLE Session JSON Export Manual

This document explains the structure and purpose of the JSON file exported by the BLE Scanner system. It details every section, field, and their intended use so that other users or developers can easily understand and analyze the data collected by the ESP32 BLE scanning platform.

1■■ File Overview

The JSON file consists of four main parts: **meta** – metadata about the session and scanning parameters **counts** – overall statistics **devices_seen** – summary of unique detected devices **events** – full log of all BLE advertisement packets

2■■ meta — Session Metadata

Describes the session environment, including creation time, serial settings, and scanning parameters. Each field provides context for interpreting the data.

Field	Type	Example	Description
created_at_local	string	2025-10-08T14:49:33	Time when the JSON was created.
session_started_at_local	string	2025-10-08T14:47:57	Time scanning started.
serial.port	string	COM9	ESP32 serial port used.
serial.baud	number	115200	UART baud rate.
params.presence_window_s	number	5.0	Presence window in seconds.
params.min_rssi	number/null	null	Minimum RSSI filter for GUI.
csv_stream_log	string	ble_log.csv	Simultaneous CSV log file.

3■■ counts — Quick Statistics

Field	Type	Example	Description
total_events	number	4321	Number of BLE packets received.
unique_devices	number	25	Number of unique devices detected.

4■■ devices_seen — Device Summary

Lists all unique BLE MAC addresses detected during the scan. Each entry records when the device was first and last seen during the session.

Field	Type	Example	Description
mac	string	5C:C1:D7:DE:8E:AD	BLE MAC address of the device.
first_seen_local	string	2025-10-08T14:47:58.142	Time of first advertisement.
last_seen_local	string	2025-10-08T14:49:32.928	Time of last advertisement.

5■■ events — Full Advertisement Log

The 'events' list contains every individual BLE advertisement packet received during the session. Each event includes detailed metrics such as RSSI, manufacturer ID, timestamps, and scanner ID.

Field	Type	Example	Description
mac	string	18:56:D9:5D:38:9E	Device MAC address.
rssi	number	-90	Signal strength (dBm).
txpwr	number	0	Advertised transmit power.
mfg.raw_hex	string	0x0006	Raw manufacturer ID.
mfg.resolved	string	Microsoft	Manufacturer name.
adv_len	number	31	Payload length in bytes.
scanner	string	ESP32-S3-01	Identifier of scanning device.
timestamp_local	string	2025-10-08T14:47:57.982	Local timestamp of reception.
timestamp_esp_us	number	7962801	ESP32 microsecond timestamp.
adv_int_ms	number/null	108.1	Advertising interval estimate.

6■■ Summary

meta: Provides context about the scanning session.
counts: Shows the number of devices and packets logged.
devices_seen: Summarizes each unique device (first/last seen).
events: Contains all raw BLE advertisement packets.
This structured format supports both quick analysis and in-depth research, ensuring data reproducibility and compatibility with Python, MATLAB, or other analytics tools.