Choosing Hardware for MeshCore vs Meshtastic

MeshCore and Meshtastic are both LoRa mesh networking platforms. They run on largely the same hardware, but differ in firmware features and which boards are best suited to each role. This guide helps you decide which firmware to run based on the hardware you already own, or which hardware to buy if you are starting fresh.

The Fundamental Hardware Difference

The biggest practical difference is not the radio chipset — both platforms support the common LoRa radios. The real constraint is the MCU and its flash/RAM size, which determines which firmware roles a board can run:

- **Meshtastic** supports the SX1276, SX1278, SX1262, and SX1268, plus the SX1280 and LR111x families. Its hardware support surface is broad. The vast majority of currently manufactured Meshtastic hardware uses SX126x chips, which the project recommends; SX1276/SX1278 are the older generation (see the Meshtastic devices page).
- **MeshCore** supports both SX126x (SX1262/SX1268) and SX127x (SX1276/SX1278) radios. SX126x is preferred for new boards, but SX1276 boards such as the Heltec LoRa32 V2 and LilyGo T-Beam SX1276 are officially supported via dedicated firmware variants (which build with `RADIO_CLASS=CustomSX1276`). See the MeshCore variants list.

This means the decision tree starts at the MCU and how much flash/RAM it has — not the radio chipset. On older ESP32 boards the limiting factor is the ESP32's flash size and RAM, not the radio.

MCU Considerations

Both platforms run on ESP32 and nRF52840 MCUs, but with different trade-offs:

MCU	MeshCore Support	Meshtastic Support	Key Advantage

nRF52840	Runs all MeshCore firmware roles (Companion, Repeater, Room Server, Sensor)	Fully supported	Hardware AES (128-bit), Bluetooth 5 (BLE 5.0), very low sleep current (~1–3 µA System ON idle; ~1.5 µA per the Nordic nRF52840 datasheet), UF2 flashing.
ESP32 (original)	Supported (companion/repeater/room server; sensor builds are limited on memory-constrained 4 MB boards)	Fully supported	WiFi support (Meshtastic uses WiFi for MQTT bridging). Higher power draw than nRF52840.
ESP32-S3	Supported (e.g. Xiao S3 WIO variant)	Supported	Faster CPU, native USB. Generally higher power than nRF52840.
ESP32-classic + SX1276 (e.g. Heltec V1/V2, T-Beam SX1276)	Supported (SX1276 boards run MeshCore via dedicated variants)	Supported	SX1276 is supported on both platforms; on these older boards the constraint is the ESP32's flash/RAM, not the radio. SX1276 wakes the MCU on DIO0 rather than DIO1.

If You Already Own Hardware

Use this decision guide based on what you currently have:

T-Beam v0.7 / v1.0 / v1.1 (SX1276)

You can run either. These boards use the SX1276 radio, which is supported by both platforms. They work well with Meshtastic, and they also run MeshCore via the `lilygo_tbeam_SX1276` firmware build — no board replacement is needed.

T-Beam v1.2 or later (SX1262)

You can run either. Both platforms support this hardware. Choose MeshCore if you want path-based routing and lower channel utilization at scale (this benefit applies to stable, repeated unicast traffic, not to group/broadcast or high-churn networks). Choose Meshtastic if you need WiFi/MQTT bridging, the Meshtastic app ecosystem, or channel encryption compatibility with an existing Meshtastic network.

T-Beam Supreme (ESP32-S3 + SX1262)

You can run either. Same guidance as T-Beam v1.2+. The Supreme is a newer, more capable board and works well with both. On MeshCore it runs the Companion, Repeater, and Room Server firmware variants.

Heltec WiFi LoRa 32 V1 or V2 (SX1276)

You can run either. The Heltec WiFi LoRa 32 V2 runs MeshCore via the `heltec_v2` build (SX1276 is supported, with a DIO0-wake hot-fix). Both V1 and V2 are also supported by Meshtastic, though Meshtastic's V1 support is increasingly constrained by the board's limited flash size.

Heltec WiFi LoRa 32 V3 (ESP32-S3 + SX1262)

You can run either. The V3 is a small, capable board. Because of the ESP32's limited flash/RAM, hosting a Room Server on this board is not recommended; choose an nRF52840 board (such as the RAK4631) for a room server.

RAK4631 / RAK WisBlock with SX1262

You can run either. Many users consider the RAK4631 (nRF52840 + SX1262) a flagship MeshCore board: it runs the full set of firmware roles, including Sensor, with low power draw and UF2 flashing. It is also a fully supported Meshtastic target if needed.

Heltec HT-n62

MeshCore supported (Companion and Repeater firmware). This matches the Supported Hardware for MeshCore page. Check Meshtastic's hardware compatibility list for current support status on this board.

If You Are Buying New Hardware

If you are purchasing hardware specifically to run MeshCore, the recommendation is:

1. **RAK4631 on a RAK19007 base board** - best flexibility, runs all firmware roles, lowest power, UF2 flashing. Recommended for repeaters, room servers, and sensor nodes.

2. **T-Beam Supreme** - good choice if you want onboard GPS and a slightly more integrated form factor. Runs the Companion, Repeater, and Room Server firmware variants.
3. **Heltec WiFi LoRa 32 V3** - smallest and cheapest option for companion/client or repeater nodes. Hosting a room server on it is not recommended.

Feature Comparison: MeshCore vs Meshtastic

Feature	MeshCore	Meshtastic
Routing model	Flood-first, then learned direct path	Flood-based (rebroadcast to all)
Channel utilization at scale	Lower for stable repeated unicast (targeted forwarding)	Higher (all nodes rebroadcast)
SX1276 support	Yes (e.g. Heltec V2, T-Beam SX1276)	Yes
SX1262 support	Yes	Yes
WiFi / MQTT bridging	WiFi client supported; MQTT bridging via community gateways (not a built-in core feature)	Yes (core feature)
Room server (group chat infrastructure)	Yes (dedicated firmware)	N/A (different model)
Sensor node firmware	Yes (Simple Sensor example; typically nRF52840 boards)	Yes (broader support)
Mobile app	MeshCore app (Android/iOS)	Meshtastic app (Android/iOS)
BLE configuration	Yes	Yes
Community size	Smaller, growing	Larger, mature

Summary: Key Decision Rule

> **Both MeshCore and Meshtastic run on SX1276 and SX1262 boards.** The radio chipset is rarely the deciding factor — the real constraint on older ESP32 boards is the MCU's flash/RAM size, which limits which firmware roles (especially Room Server and Sensor) a board can run. Choose MeshCore for better scaling with flood-first/direct-path routing on stable networks, or Meshtastic for its broader app and ecosystem maturity. For room servers and sensor nodes, an nRF52840 board such as the RAK4631 is the most capable choice.

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