Meshtastic Node IDs, Addresses, and Naming

Understanding how Meshtastic nodes are identified helps you interpret the node list, configure direct messaging, and troubleshoot network issues.

Node ID Format

Every Meshtastic node has a 32-bit node ID derived by default from its hardware MAC address. It is not guaranteed to be globally unique. The ID is displayed in several formats:

- **Decimal:** 2882343476 (rarely used in user interfaces)
- **Hex with prefix:** !abcd1234 (most common display format; the "!" prefix denotes a node ID)
- **Short ID:** The last 4 hex digits, e.g., "1234" - used as the default short name

The node ID is normally fixed (MAC-derived) and is effectively permanent for typical users, but it is not strictly immutable: it can change on certain firmware events and can be overridden in firmware or config on some boards.

Long Name and Short Name

In addition to the hardware node ID, each node has two user-configurable names:

- **Long name** - Up to 40 bytes (about 37-39 ASCII characters; fewer if multibyte/UTF-8 or emoji are used, since those count as multiple bytes). Used in the full node list. Example: "Portland-Burnside-Bridge-Repeater" or "KG7XYZ Mobile"
- **Short name** - Up to 4 characters. Displayed on the map and in compact node list views. Example: "PDX1", "K7AB"

```
# Set long name:
meshtastic --set-owner "Your Long Name Here"


# Set short name:
```

```
meshtastic --set-owner-short "SHT1"
```

Channel Name and Hash

Meshtastic channels have both a name and a PSK (encryption key). The channel name is displayed to users; the PSK is what actually controls which nodes can communicate on the channel. Two nodes can have different channel names but the same PSK - they'll still communicate (though the name mismatch may confuse users).

The "channel hash" is a short numeric identifier derived from the channel name AND the PSK, included in packet headers to quickly identify which channel a packet belongs to without decrypting the payload. Because the channel hash and the source/destination node IDs sit in the plaintext header, a passive RF observer can tell which channel a packet belongs to and who sent and received it without the PSK - only the message content is hidden.

How Nodes Discover Each Other

Meshtastic nodes don't have a directory or registration system. Discovery happens organically:

1. Nodes periodically broadcast "NodeInfo" packets containing their node ID, name, hardware model, and (optionally) GPS position
2. Any node that receives a NodeInfo packet adds the sender to its local node database
3. NodeInfo packets propagate through the mesh via the same flooding mechanism as messages
4. Nodes that haven't been heard from in a configurable time period are marked as "stale" in the node database

This means in a well-connected mesh, a new node will typically appear in all other nodes' lists within a few minutes of powering on, even if it's multiple hops away.

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