

# LoRa Gateway configuration

## Overview

This document describes how to take an off-the-shelf gateway device and set it up to provide LoRaWAN network coverage to nearby sensor devices. The device used in this example is a [Mikrotik wAP LR9 kit](#) which operates in the 902-928 MHz frequency range

The instructions would also apply to the wAP LR8 kit (863-870 MHz) and other Mikrotik IoT gateway devices.

The LR9 is weatherproof and can be purchased from many NZ suppliers such as [PB Tech](#), [Go Wireless](#), [Ascent](#), etc. We recommend attaching an external antenna (such as the MikroTik LoRa Antenna kit) for better coverage and range.

As with most Mikrotik products it allows for flexible configurations - it includes a 2.4Ghz Wifi radio and can operate as either an access point, or a client to connect to a nearby WiFi access points wirelessly. In this example the device is set up as an access point (i.e. a hotspot) connected to the internet via ethernet (e.g. a residential installation with a lan cable connected to a router).

This setup uses the gateway's built in web interface. Power users will want to use Mikrotik's free [Winbox](#) configuration tool - an [example config](#) file is provided.

## Gateway setup

1. Connect the gateway device via ethernet to your network and power it up. You will be able to connect to it wirelessly - it will have a hotspot name such as Mikrotik-E6B3F9
2. Open your browser and connect to the address <http://192.168.88.1/> and close the initial welcome screen
3. Change the Quick Set drop down to PTP Bridge AP default configuration as follows:

RouterOS v6.49.7 (stable)

Quick Set WebFig Terminal

WISP AP

active

Wireless

Wireless Protocol ☒ 802.11 ☐ nstreme ☐ nv2

Network Name

Frequency  MHz

Band

Channel Width

Country

MAC Address 48:8F:5A:E6:B3:7F

Use Access List (ACL) ☐

Security ☐ WPA ☒ WPA2

Encryption ☒ aes ccm ☐ tkip

WiFi Password  ☒ Hide

Configure

Mode ☒ Router ☐ Bridge

Address Acquisition ☐ Static ☒ Automatic ☐ PPPoE

IP Address  Renew Rel

Netmask 255.255.255.0 (/24)

Gateway 192.168.7.1

MAC Address

Firewall Router ☐

Local Net

IP Address

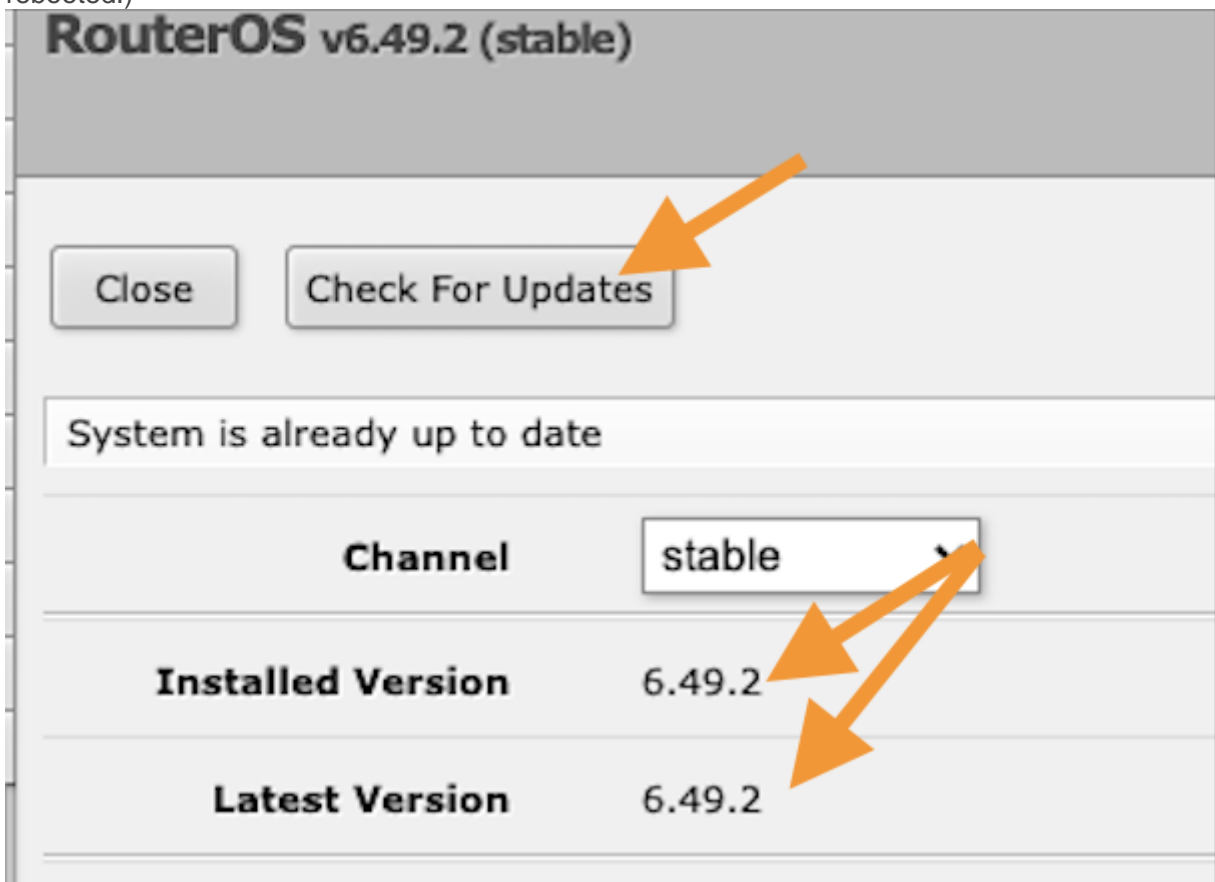
Netmask 255.255.255.0 (/24)

Note this address

- The **Network Name** will become the visible hotspot name
- Set the **Country** to New Zealand
- Set **Security** to WPA2
- Set a good **Wifi Password**
- Make sure **Address Acquisition** is set to Automatic and take a note of the **IP Address** provided
- Turn **Firewall Router** *off* (unchecked). This will allow you to connect to the gateway over the LAN as well as via WiFi.
- Set an admin password (at the bottom of the screen) and apply the configuration.

The gateway will reboot. You will be able to connect to it wirelessly as before (with the new hotspot name), or you can connect to it over the LAN using the IP Address listed.

4. On the Quick Set page, use 'Check for updates' to install the latest firmware (reconnect after it has rebooted.)



5. Click the WebFig tab to open the LoRa > Servers tab. If it is not already listed, add the following:

RouterOS v6.49.7 (stable)

Devices Channels Traffic Servers

Add New

8 items

Name	Address	Up port	Down port
TTN V3 (au1)	au1.cloud.thethings.network	1700	1700
TTN V3 (eu1)	eu1.cloud.thethings.network	1700	1700
TTN V3 (nam1)	nam1.cloud.thethings.network	1700	1700
TTN-EU	eu.mikrotik.thethings.industries	1700	1700
TTN-US	us.mikrotik.thethings.industries	1700	1700
TTS Cloud (au1)	au1.cloud.thethings.industries	1700	1700
TTS Cloud (eu1)	eu1.cloud.thethings.industries	1700	1700
TTS Cloud (nam1)	nam1.cloud.thethings.industries	1700	1700

Add entry using these values

(you can delete the other entries)

6. Under the Devices tab, configure the LoRa router:

The screenshot shows the RouterOS v6.49.7 (stable) configuration interface for the LoRa service. The left sidebar contains a menu with options: CAPsMAN, Wireless, Interfaces, PPP, Bridge, Switch, Mesh, IP, MPLS, Routing, System, Queues, Dot1X, Files, Log, RADIUS, Tools, LoRa, MetaROUTER, Partition, Make SupoutLrif, Undo, Redo, Hide Passwords, Safe Mode, Design Skin, WinBox, Graphs, and End-User License. The main configuration area for the LoRa service is displayed, with the following settings and annotations:

- Enabled:** ☒ (Annotated with "Enable" and a red arrow pointing to the checkbox.)
- Status:** Disabled
- Name:** gateway-0 (Annotated with "Leave as default" and a red arrow pointing to the text field.)
- Hardware ID:** [Redacted]
- Gateway ID:** [Redacted]
- Firmware ID:** 63705e9
- Network Servers:** TTN V3 (au1) (Annotated with "As defined in network tab" and a red arrow pointing to the dropdown menu.)
- Channel plan:** AU 915 Sub 2 (Annotated with "AU 915 Sub 2" and a red arrow pointing to the dropdown menu.)
- Antenna Gain:** 6 dBi (Annotated with "As per your antenna spec" and a red arrow pointing to the text field.)
- Forward:** ☒ Valid, ☒ Error, ☐ Disabled
- Network:** ☒ Public, ☐ Private
- LBT:** ☐
- Src. Address:** [Redacted]
- Band:** 902-928
- Locks:** [Redacted]
- Spoof GPS:** [Redacted]

## Network service setup

The gateway can now be added to the Things Network. [Create an account](#) on the website first and then **Register a gateway**.

## Register gateway

Register your gateway to enable data traffic between nearby end devices and the network.

Learn more in our guide on [Adding Gateways](#).

Gateway EUI [?](#)

Reset

← Cut and paste your gateway ID

Gateway ID [?](#) \*

← This field will be auto-populated

Gateway name [?](#)

← Choose a name to identify your gateway

Frequency plan [?](#) \*

← Select this plan

☐ **Require authenticated connection** [?](#)

Choose this option eg. if your gateway is powered by [LoRa Basic Station](#)

### Share gateway information

Select which information can be seen by other network participants, including [Packet Broker](#)

☒ **Share status within network** [?](#)

☒ **Share location within network** [?](#)

Register gateway

After a few minutes you should see the gateway connected. Set the location settings so that the gateway will be visible to other users.

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