MikroTik RouterOS

Online Training Class – Chapter 6

Burmese Version

Phyo Phyo Hein
B. C. Tech (hons)
MTCNA, MTCRE, MTCWE, MTCTCE, MTCUME, MTCINE
CCNA R&S, CCNP R&S, CCIP, JNCIA-Junos, JNCDA
October 26, 2016

Wireless Bridging

Introduction to Wireless

Bridge Domain

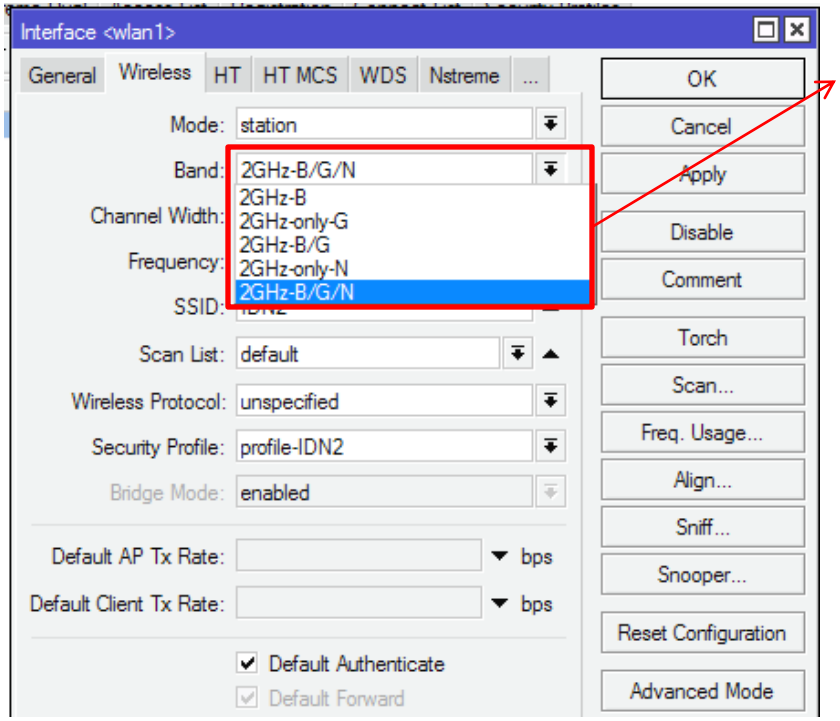
Wireless Bridging

Wireless on RouterOS

- Wireless on RouterOS typically means Wi-Fi.
- Wi-Fi is an open standard IEEE 802.11, it uses frequency 2.4GHz and 5GHz.
- RouterOS supports IEEE 802.11a/b/g/n standards:
  - 802.11a – frequency 5GHz, 54Mbps.
  - 802.11b – frequency 2.4GHz, 11Mbps.
  - 802.11g – frequency 2.4GHz, 54Mbps.
  - 802.11n (License Level 4 up) – frequency 2.4GHz or 5GHz, 300Mbps

Wireless Band

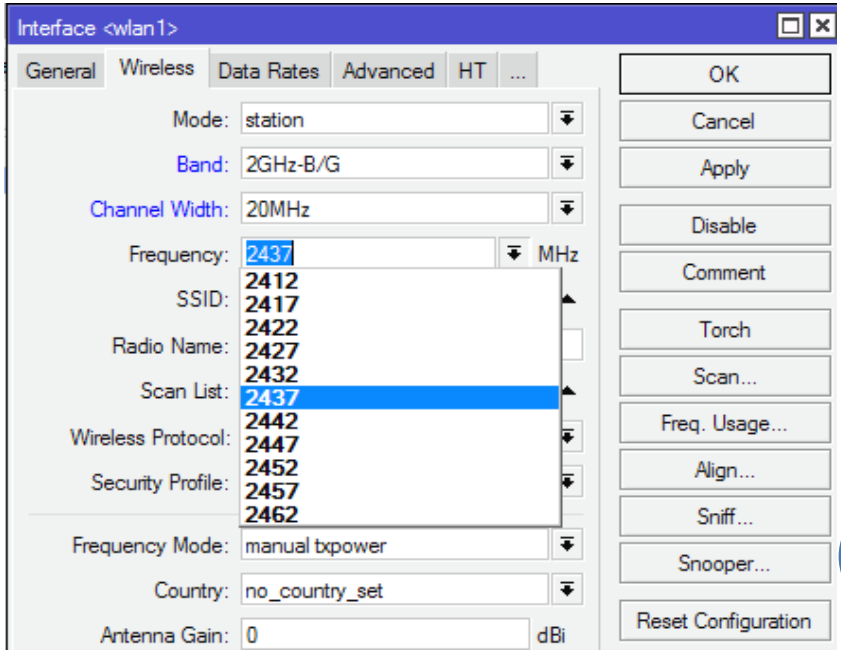
- Band is a working frequency of a wireless device.
- To connect two devices, both of them have to work on the same frequency band.



Band on the list depends on wireless card installed.

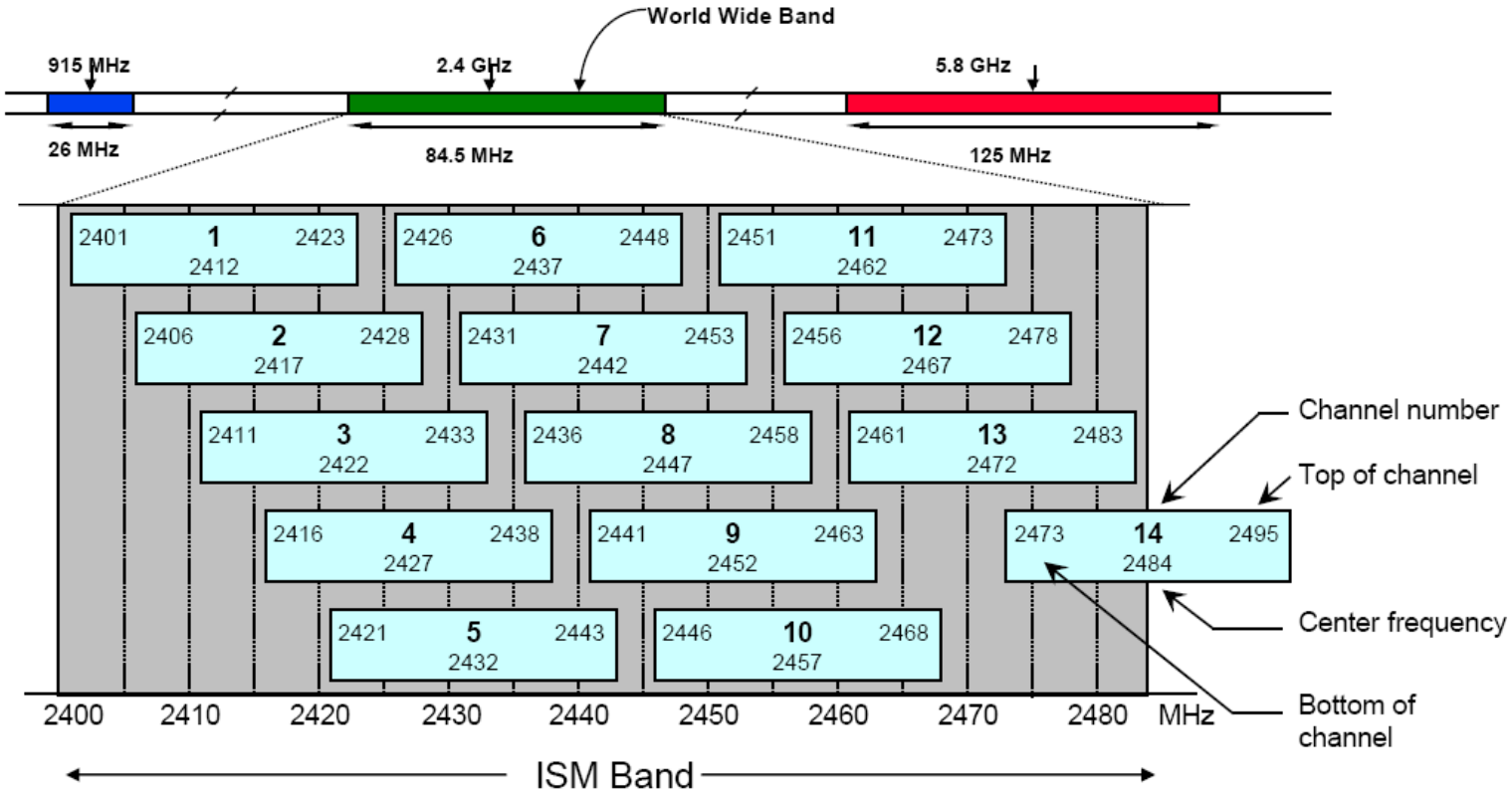
Frequency Channels

- Band frequency divided into Frequency channels.
- Access Point (AP) will operate at the frequency we chose.
- Channel values depend on the selected band, the ability of wireless card, and rules/regulations frequency of a country.
- Ranges of frequency channel for each band are as below:
  - 2.4GHz = 2192 to 2734MHz
  - 5GHz = 4920 to 6100MHz



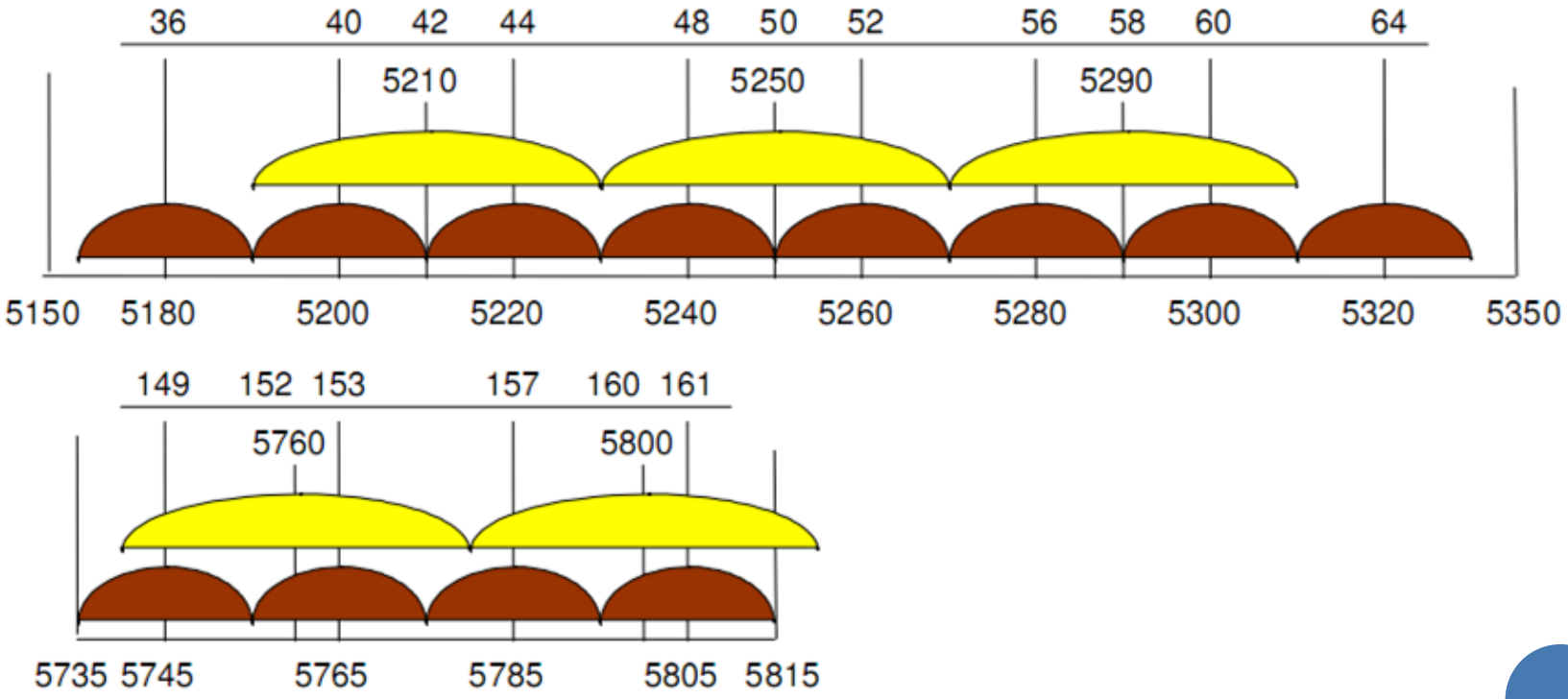
IEEE 802.11B/G CHANNELS

- IEEE 802.11b/g use ISM (Industrial, Scientific and Medical) band, which is typically free in many countries.



IEEE 802.11a Channels

- IEEE 802.11a uses 5GHz, which might requires approval from the government authority.



Frequency Regulation

- Each state has certain regulations in terms of frequency for wireless internet carrier.
- 2.4GHz frequency is usually free in many countries.
- Frequency regulation in RouterOS defined in the Wireless “country-regulation”.
- However, if it is desirable to open up all the frequencies that can be used by the wireless card, we can use the option “superchannel”.

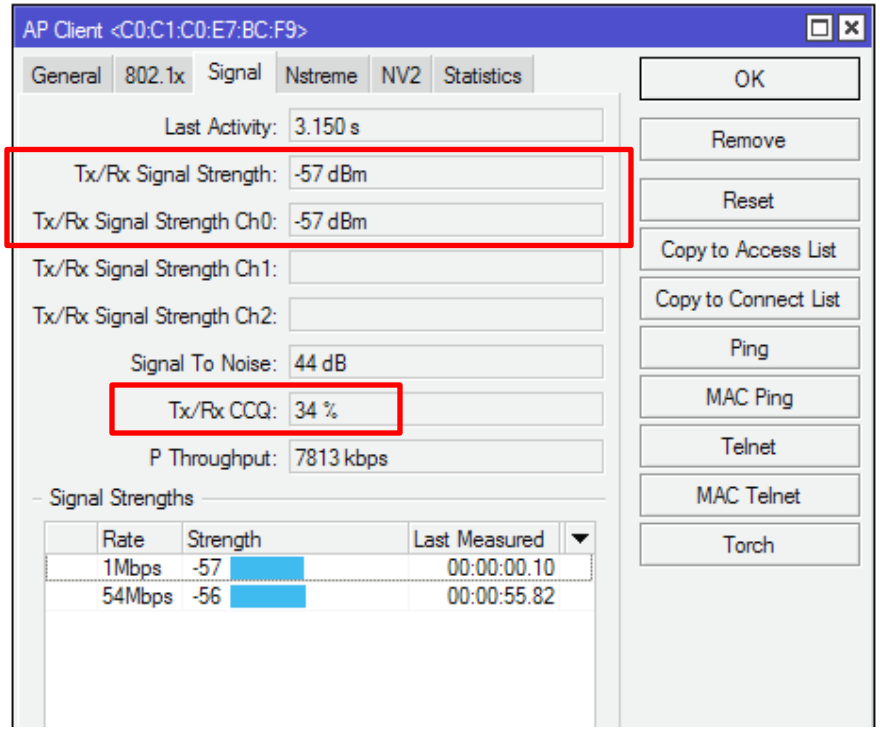
Basic Concept of Wireless Connection

i-BEAM steering ahead

- Suitability Modes:
  - AP with Station
  - AP with Repeater
  - Repeater with Repeater
- Same BAND.
- Same SSID.
- Same encryption and authentication.
- Not necessarily the same frequency of channel, station will automatically follow the frequency channel of AP.

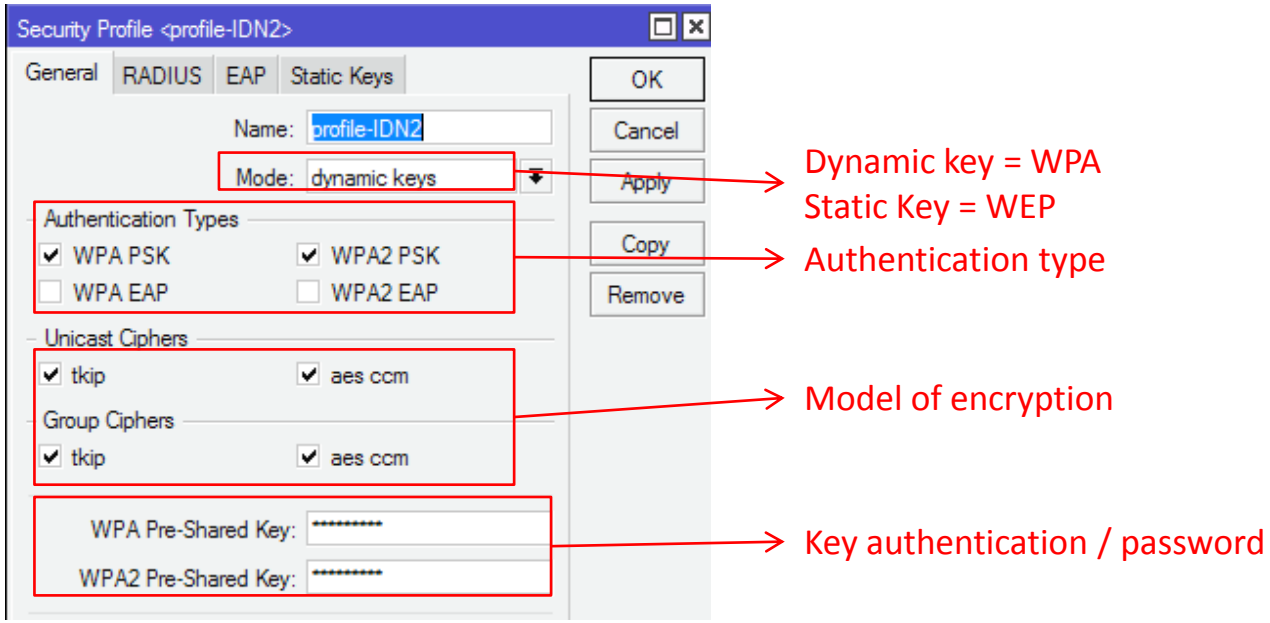
Wireless Registration

- To view connected wireless devices, go to menu **Wireless → Registration**.
  - For AP, it will show concurrent clients or repeaters.
  - For station or repeater, it will show current connected AP.
- Click on each item, go to tab **Signal** for checking current connection quality.



WIRELESS SECURITY

- There are some other security methods that can prevent the data to be retrieved and analyzed by unauthorized person:
  - Authentication (WPA-PSK, WPA-EAP)
  - Encryption (AES, TKIP, WEP)
  - Configured security profile in **Wireless → Security Profiles** and apply in **Wireless** tab of wireless interface configuration.



Bridge

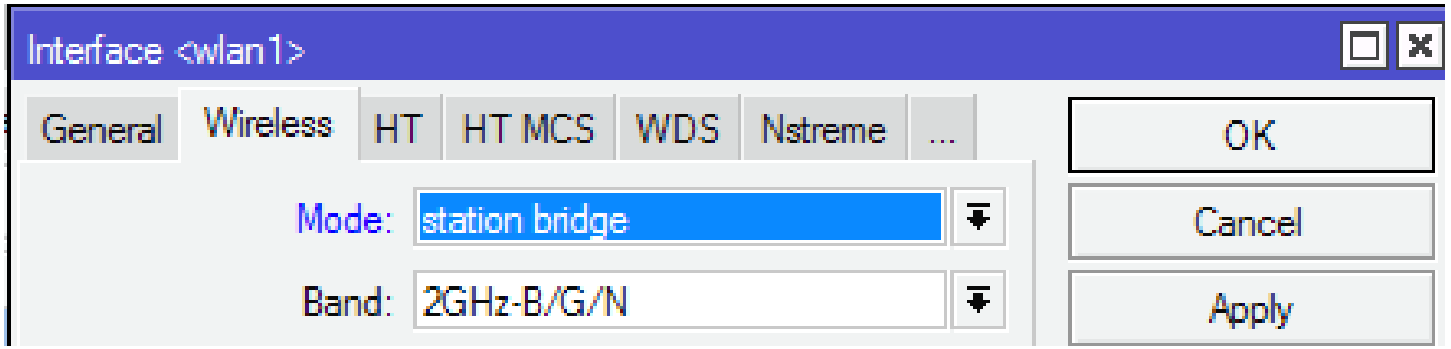
- Combine two or more interfaces to be in a single broadcast domain, called bridge domain.
- Bridge can also be used on a wireless network.
- Bridge is software-switched, while master and slave ports are hardware-switched.
- Bridge is a virtual interface, which we can create as much as we want.
- Bridges have the same weaknesses as switches:
  - Layer 2 loop due to unknown unicast flooding
  - Increased broadcast traffic

Bridge (Cont.)

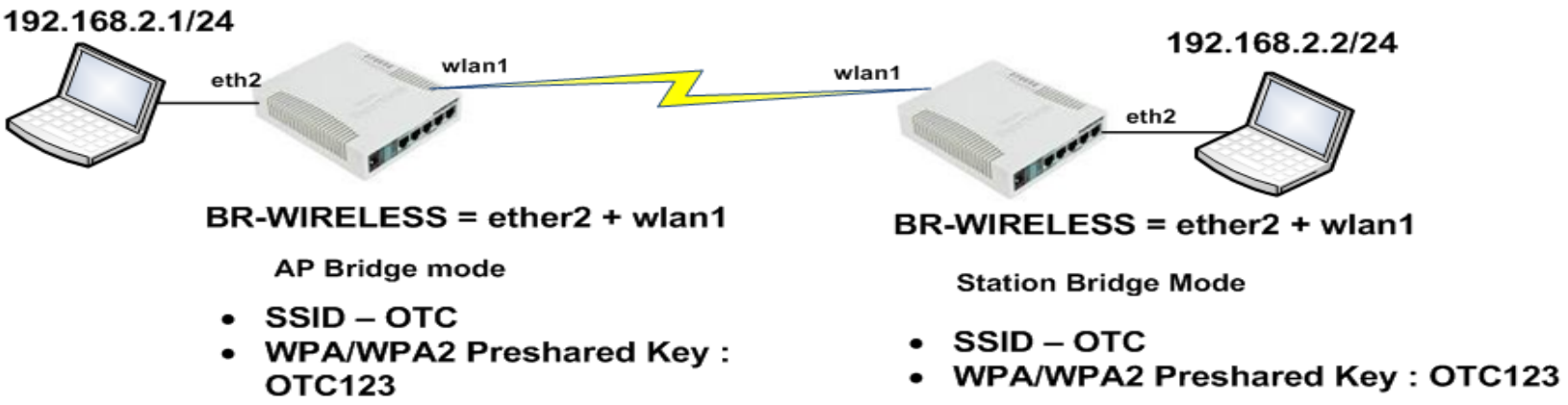
- To create bridge domain, we need to:
  - Create a bridge interface in menu **Bridge**.
  - Add physical interfaces to the bridge in menu **Bridge → Port**.
- If we created a bridge without adding physical interface to it, this bridge is considered as a loopback interface.

Wireless Bridging

- All wireless mode can be bridged, except “station” mode.
- “station” mode can’t be bridged, so there is another type of station that can be bridged:
  - station bridge
  - “station bridge” will work only on the connection between RouterOS devices (required RouterOSv5 and above).



LAB: WIRELESS BRIDGE



- Connect wireless link between routers using "ap bridge" and "station bridge" mode
- Create bridge domain by bridging following interfaces:
  - wlan1
  - ether2 (Interface that connect to your laptop)
- Configure IP addresses on laptops to a single subnet.
- Ping between laptops.

Ask Questions?

- Comment on this training video
- YouTube Channel: **Information Beam**
  - Subscribe our channel to get the latest update!
- Post in social networks
  - Information Beam Facebook Group: https://www.facebook.com/groups/1481854632142914/
- Send me an email directly
  - phyo@informationbeam.net

To Be Continued…

Thanks for your attention!

Contact Me

phyo@informationbeam.net

Skype: pphein82