



Introduction

Wi-Fi 101, Part 1

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Hamina Wireless

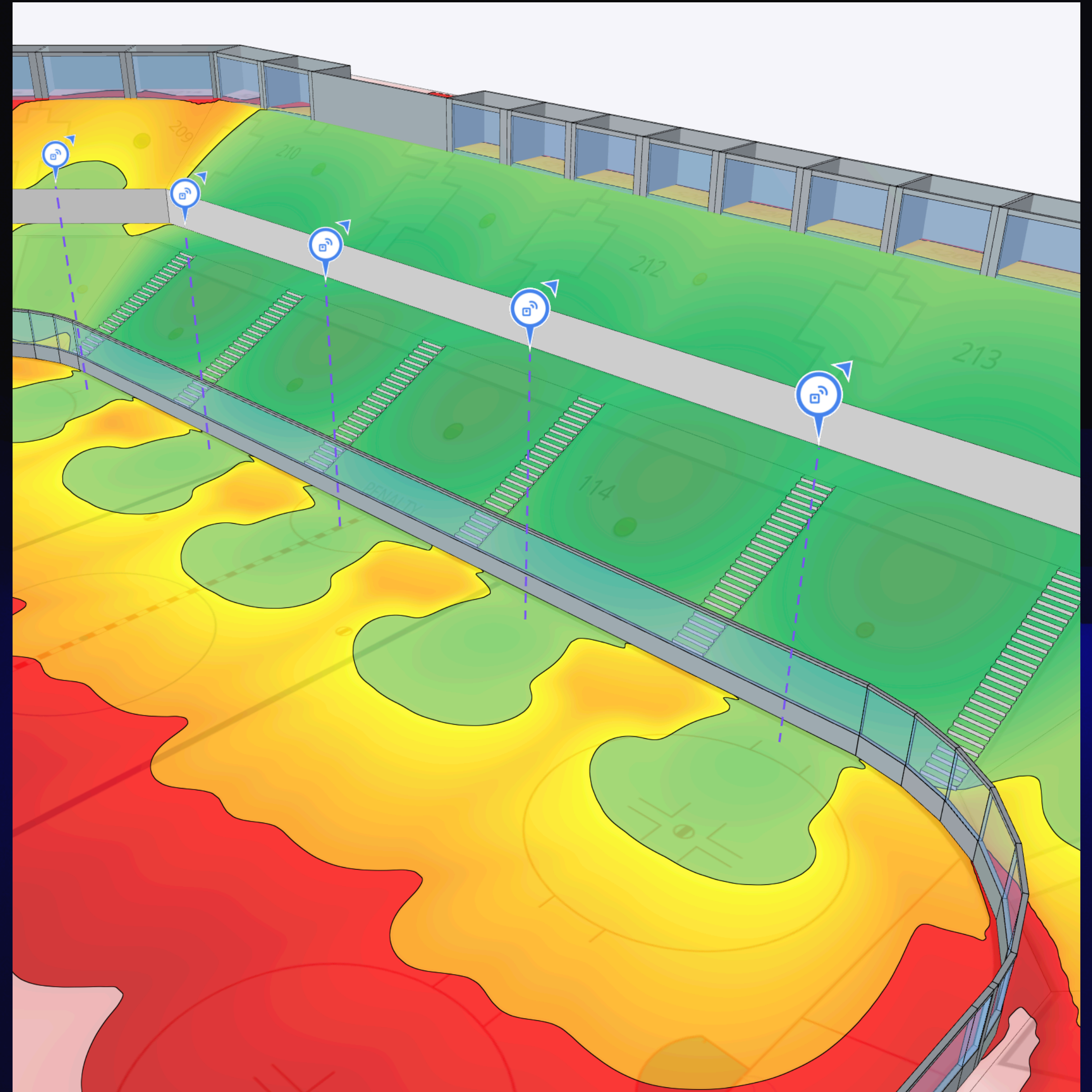
CWNP Program

- CWNP - Certified Wireless Network Professional
 - CWNA - Administrator
 - CWAP - Analysis
 - CWDP - Design
 - CWSP - Security
 - Write 3 papers
 - Attach 3+ blogs or presentations
- CWNE - Certified Wireless Network Expert
 - Joel #233, Jerry #237, Andrew #417

Agenda

Wi-Fi 101, Part 1

- IEEE and Wi-Fi Alliance
- 2.4, 5, and 6 GHz
- Major 802.11 Amendments
- 2.4 GHz Channels
- Types of Interference



IEEE

Institute of Electrical and Electronics Engineers

- Creates standards
 - 802.15.1
 - 802.15.4
 - IEEE 1394
 - 802.13
 - 802.11

Wi-Fi Alliance

A group of major players in wireless

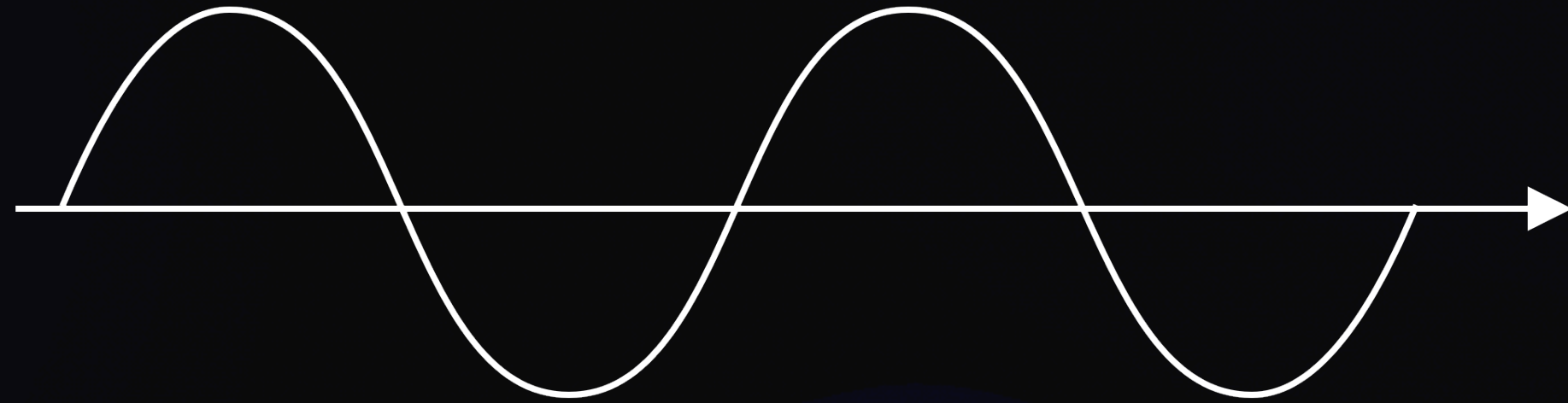
- Apple
- Cisco
- Nokia
- Ruckus
- Microsoft

Provides branding for Wi-Fi

- “Wi-Fi”
- WPA/WPA2/WPA3
- WMM

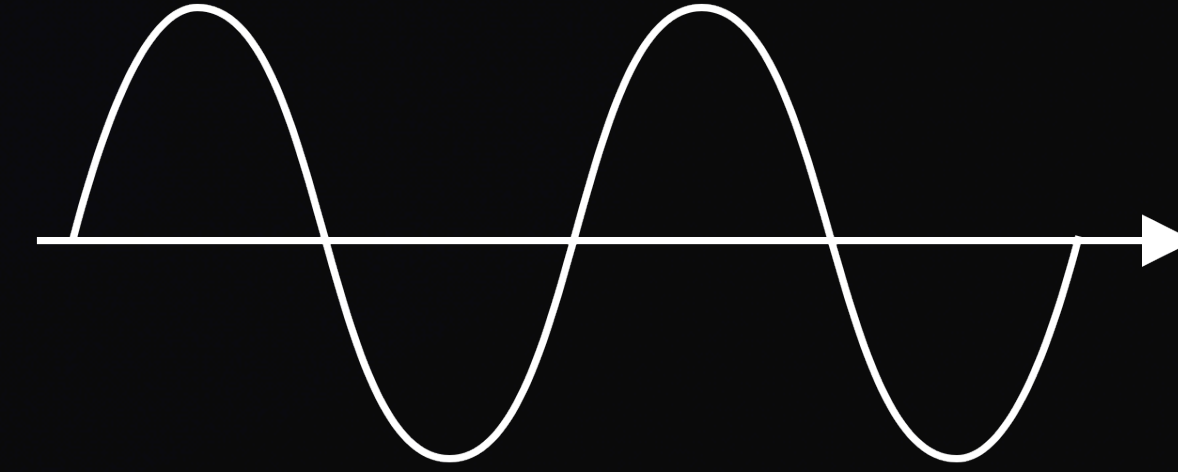
Ensures interoperability between vendors

2.4 GHz Band



- Lower frequency
- Longer wavelength
- Typically has more range
- Typically more crowded
- More non-Wi-Fi interference
- 802.11b/g/n/ax

5 GHz Band

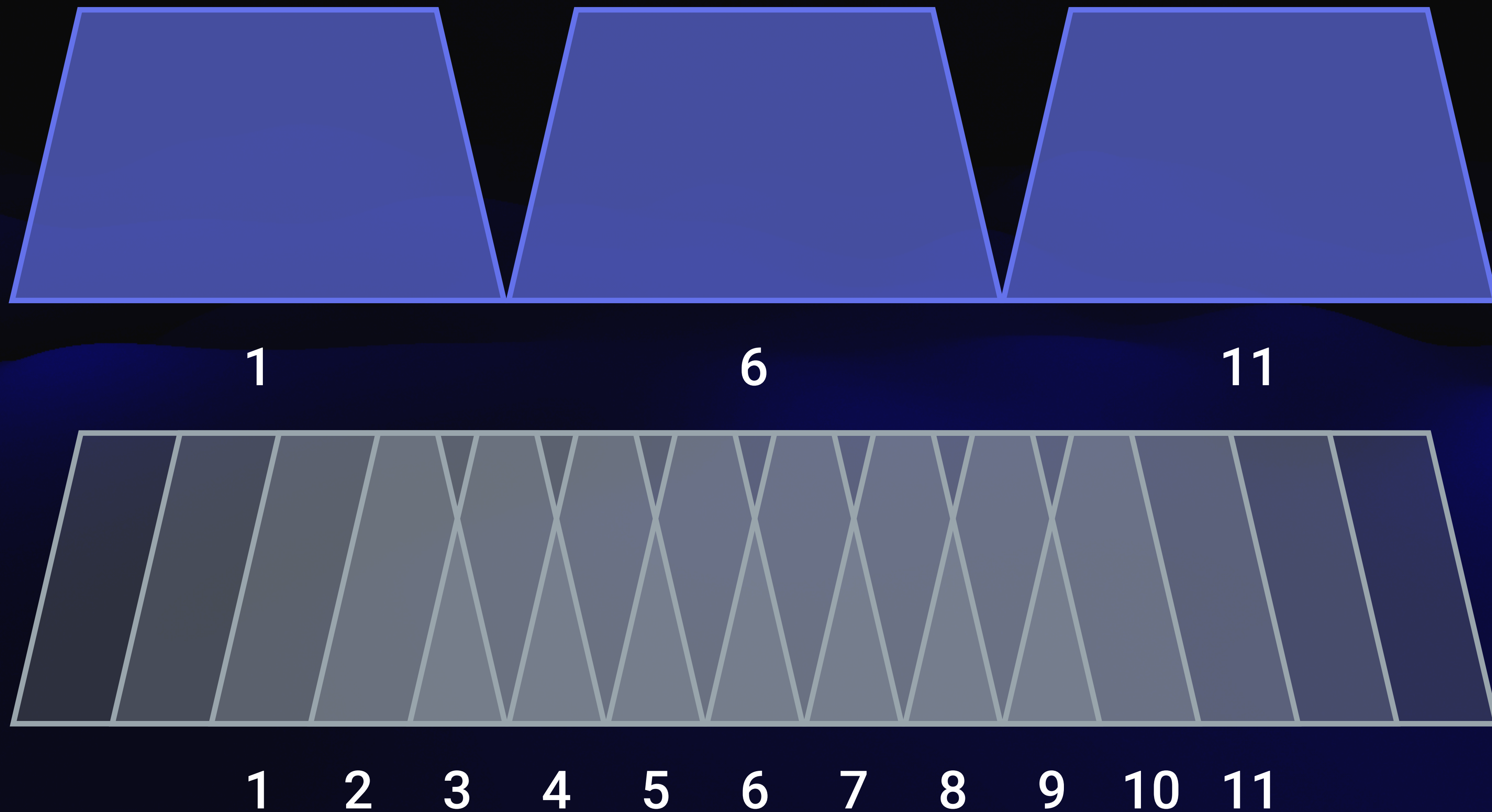


- Higher frequency
- Shorter wavelength
- Typically has less range
- Less crowded
- Less non-Wi-Fi interference
- 802.11a/n/ac/ax

Major 802.11 Amendments

Amendment	Year	Frequency Bands	Maximum Signaling Rate	Modulation Scheme	Supported Channel Widths
802.11 Prime	1997	2.4 GHz	2 Mbps	DSSS	22 MHz
802.11b	1999	2.4 GHz	11 Mbps	HR-DSSS	22 MHz
802.11a	1999	5 GHz	54 Mbps	OFDM	20 MHz
802.11g	2003	2.4 GHz	54 Mbps	ERP-OFDM	20 MHz
802.11n Wi-Fi 4	2009	2.4 and 5 GHz	600 Mbps*	HT (High Throughput)	20, 40 MHz
802.11ac Wi-Fi 5	2013	5 GHz	6933 Mbps*	VHT (Very High Throughput)	20, 40, 80, 160 MHz
802.11ax Wi-Fi 6	2021	2.4 and 5 GHz	9600 Mbps*	HE (High Efficiency)	20, 40, 80, 160 MHz
802.11ax Wi-Fi 6E	2021	6 GHz	🙋	HE	20, 40, 80, 160, 320 MHz

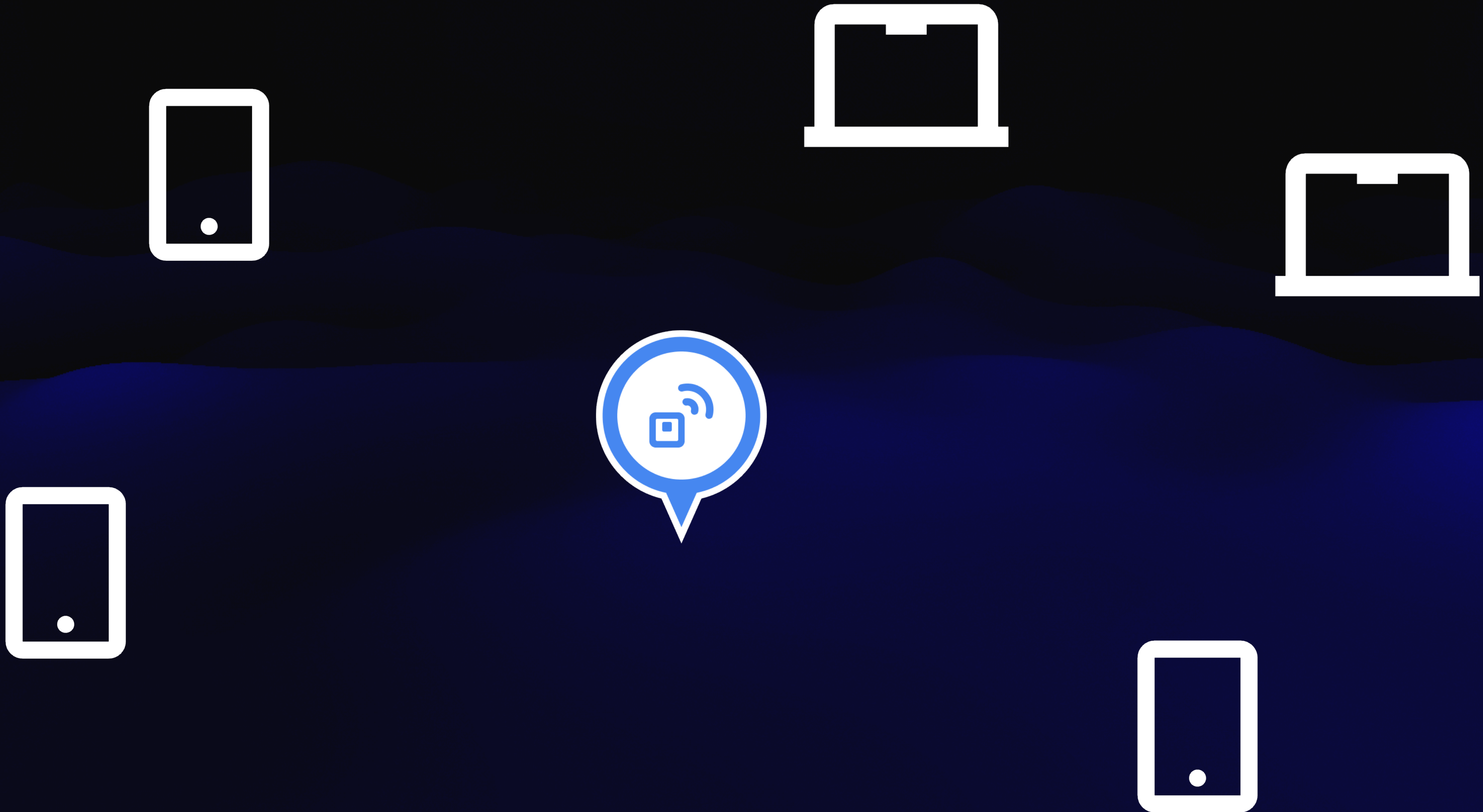
2.4 GHz Channels



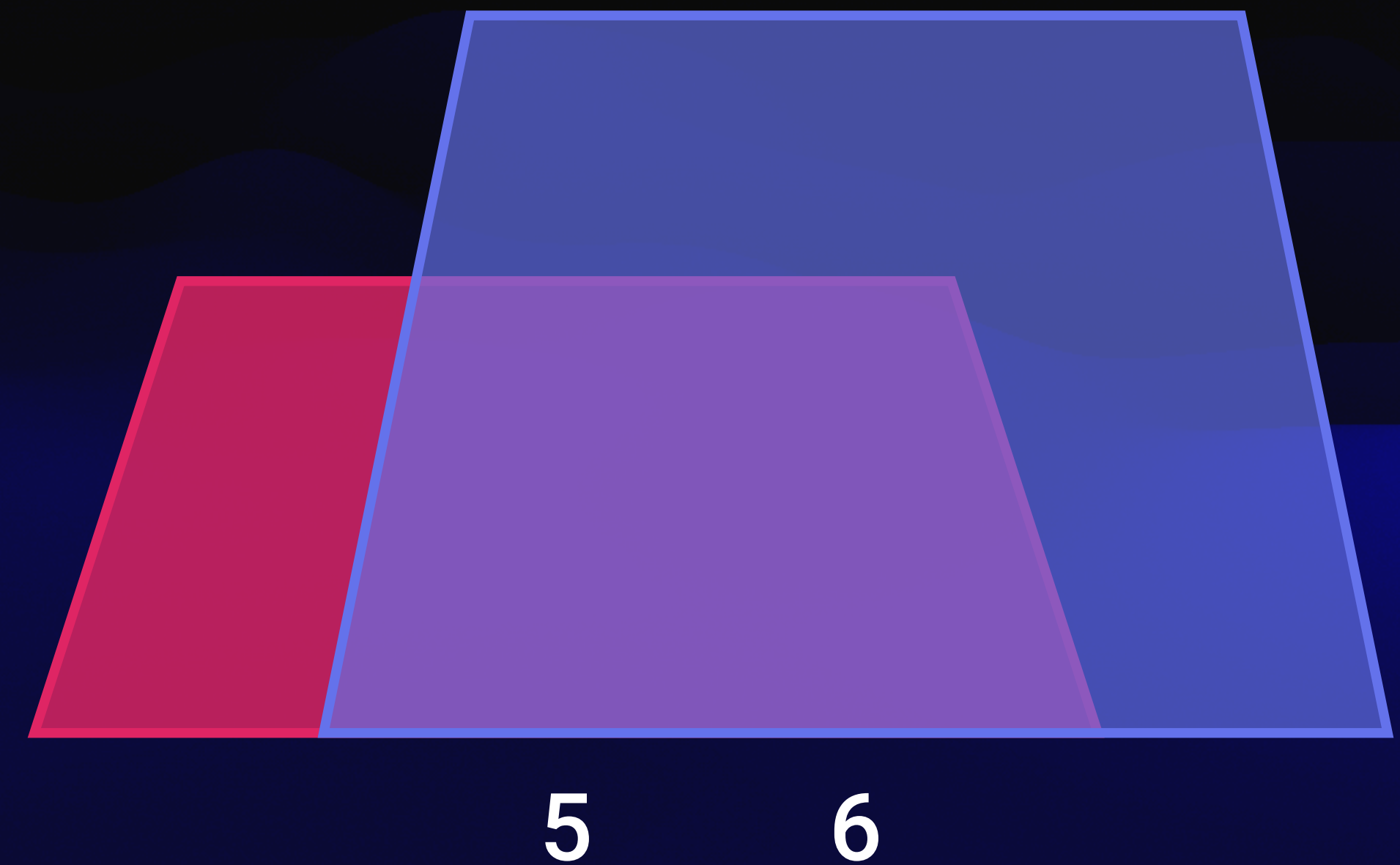
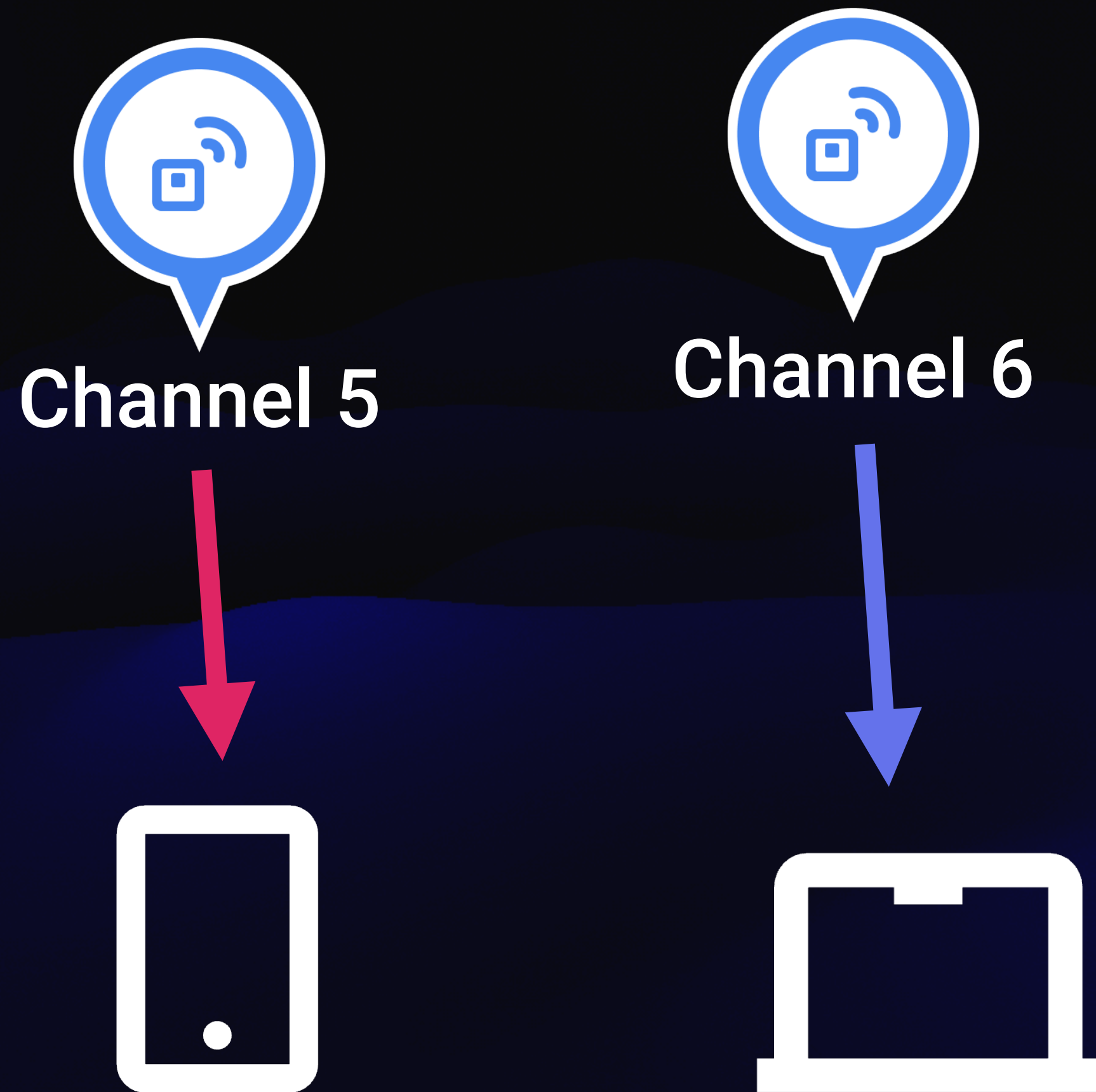
Half-Duplex Wi-Fi



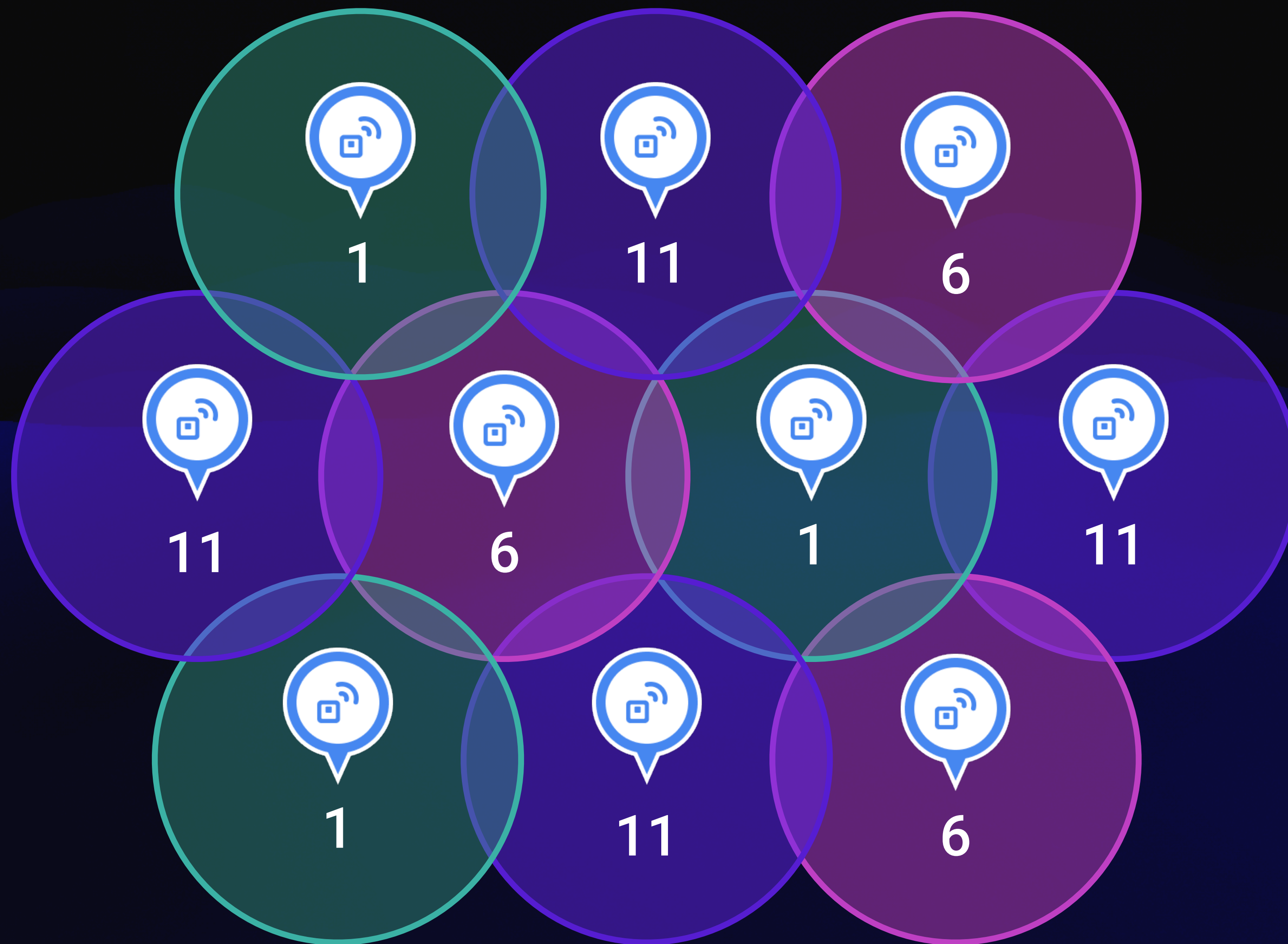
Co-Channel Interference



Adjacent-Channel Interference



2.4 GHz Channel Reuse



5 GHz Channel Reuse



What next?

- Watch for Wi-Fi 101, Part 2
- Check Hamina's training options:
 - Hamina Certified Network Architect
 - Hamina Planning Specialist
 - Hamina Survey Specialist
 - hamina.com/training
- CWNP Program:
 - cwnp.com





Thank you!

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