The 6 GHz Band in the U.S.

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Note: The views expressed in this presentation are those of the author and may not necessarily represent the views of the Federal Communications Commission

Spectrum in the United States

High-band:	24 GHz band (24.25-24.45 GHz; 25.25-25.75 GHz) 28 GHz band (27.5-28.35 GHz) Upper 37 GHz (37.6-38.6 GHz), 39 GHz (38.6-40 GHz), and 47 GHz (47.2-48.2 GHz) bands Exploring the 26 GHz (25.25-27.5 GHz), 42 GHz (42-42.5 GHz), and 50 GHz (50.4-52.6 GHz) bands
Mid-band:	2.5 GHz band (auction planning in progress) 3.45-3.55 GHz band 3.5 GHz band 3.7-3.98 GHz band
Low-band:	600 MHz band 800 MHz band 900 MHz band
Unlicensed:	Creating opportunities for **Wi-Fi in the 6 GHz**, 61-71 GHz and above 95 GHz bands

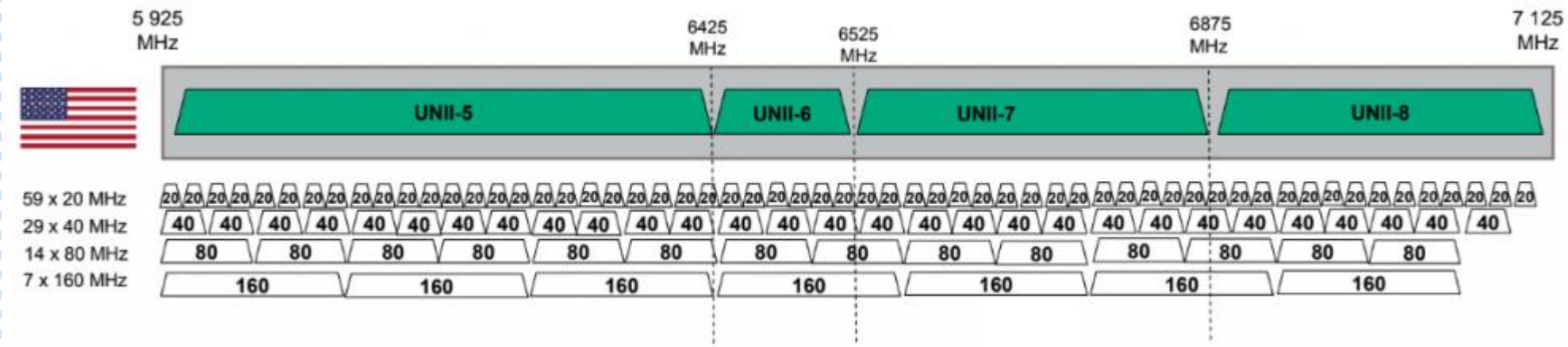
6 GHz Band

- Every day, Americans depend on wireless broadband connections to the Internet in their work, school, and personal lives.
  - The demand for wireless broadband has exploded in the past few years, most recently amidst the COVID-19 pandemic, in which classes, work meetings, doctors' appointments, religious services, and more have been conducted remotely.

- In 2020, the FCC made 1,200 megahertz (MHz) of spectrum in the 6 GHz band available for unlicensed use by wireless devices.
  - The FCC concluded that its action would ease
  - congestion, usher in a new generation of faster, better-performing devices,
  - and advance the agency's goal of making broadband connectivity available to
  - all Americans, especially those in rural and underserved areas.

6 GHz Band

- Report & Order adopted April 2020
- 1200 megahertz made available for unlicensed access in the 5.925 – 7.125 GHz (6 GHz) band



Source: Aruba Networks Presentation slide from CWNP WiFi Trek 2018

Significance: 6 GHz is close to existing 5 GHz unlicensed bands – expected that equipment can be retuned to provide access in an accelerated timeframe.

- Approximately 55 devices certified

Up to seven 160-megahertz wide channels available for unlicensed use

Technical & Operational Rules

Device Class	Operating Bands	Maximum EIRP	Maximum EIRP Power Spectral Density
Standard-Power Access Point (AFC Controlled)	U-NII-5 (5.925-6.425 GHz) U-NII-7 (6.525-6.875 GHz)	36 dBm	23 dBm/MHz
Client Connected to Standard-Power Access Point		30 dBm	17 dBm/MHz
Low-Power Access Point (indoor only)	U-NII-5 (5.925-6.425 GHz) U-NII-6 (6.425-6.525 GHz) U-NII-7 (6.525-6.875 GHz) U-NII-8 (6.875-7.125 GHz)	30 dBm	5 dBm/MHz
Client Connected to Low-Power Access Point		24 dBm	-1 dBm/MHz

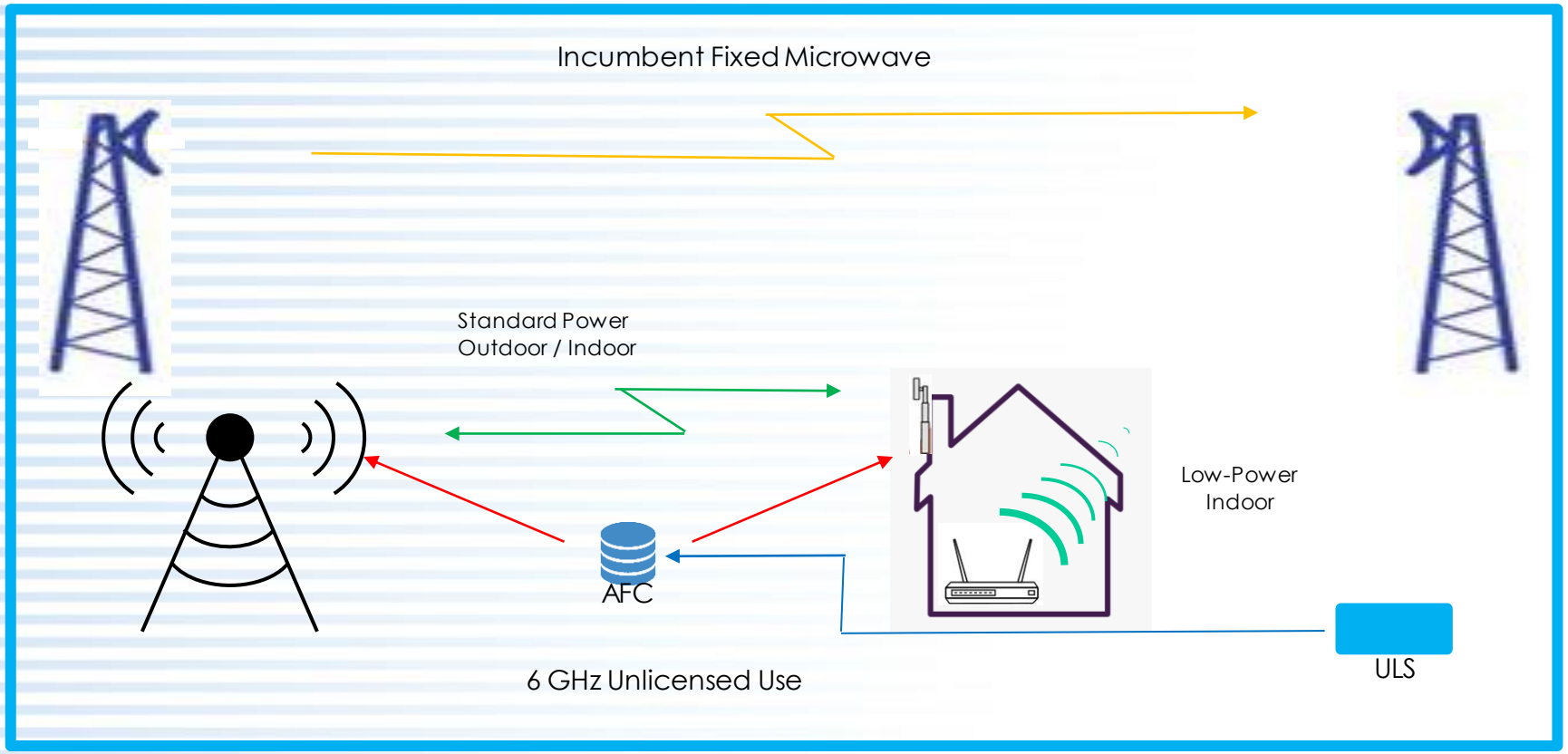
Maximum EIRP is based on a 320-megahertz wide channel; power density limits EIRP for other channel bandwidths

Standard-Power Access Point is limited to U-NII-5 & 7 (avoids operation in bands with mobile services), can operate outdoors and must be under the control of an Automated Frequency Coordination system (i.e., database)

Low-Power Indoor Access Point can operate throughout entire 1200 megahertz, but is limited to indoor usage (takes advantage of building attenuation to enable co-existence)

Rules permit additional devices to enable mesh networking

Unlicensed Devices in the 6 GHz Band



Technical & Operational Rules (cont'd)

- Standard-Power Access Points
  - Must limit power to 21 dBm above 30-degree antenna elevation angle
  - Operation is prohibited on oil platforms, cars, trains, boats, and aircraft
- Low-Power Indoor Access Points
  - Operation permitted on large aircraft flying above 10,000 feet
  - Must implement a contention-based protocol
- All Access Points
  - Prohibited to communicate with unmanned aerial systems

Commission requested that industry stakeholders create multi-stakeholder group to address issues of common interest:

- AFC standards, testing, development
- Process for interference detection and mitigation

Multi-Stakeholder Group

- Commission directed industry to form multi-stakeholder group
- Group formed – three workstreams
  - Harmful interference, detection, reporting, and resolution
  - Updating incumbent information
  - AFC development and coordination
- Several filings have been submitted to the FCC on various topics

Further Notice

- Proposes very low power operation across all 1200 megahertz, outdoors and indoors, without using an AFC
  - Expected use cases include virtual reality / augmented reality applications (e.g., smart glasses)
- Seeks comment on additional power for low-power indoor access points
- Seeks comment on permitting mobile standard-power access points
- Seeks comment on permitting higher power limits with antenna directivity requirements for standard-power access points

Public Notices

- Client-to-Client – Jan. 11, 2021
  - Sought information on whether the Commission should permit direct client-to-client communications

- AFC System proposals – Sep. 28, 2021
  - New docket – ET 21-352
  - Received filings from 14 entities expressing interest in administering an AFC
  - Proposals describe how the prospective AFC system operator will comply with AFC requirements and core functions
  - We are currently evaluating those proposals
  - Next steps would be to issue conditional approvals and then once AFCs are ready to evaluate them – private and public testing

Thank You