## What's New With Unlicensed **National Information Infrastructure** (U-NII) First R&O + More to Come **TCB** Workshop April 9, 2014 **Aole Wilkins**

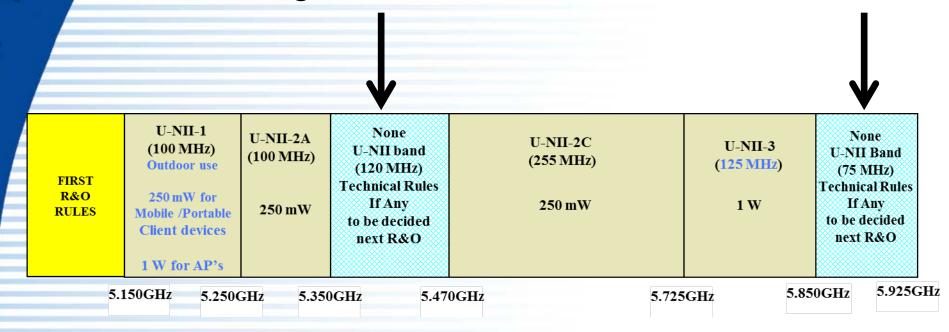
#### U-NII First R&O First Report & Order (First R&O): FCC 14-30 of March 31, 2014

http://www.fcc.gov/document/5-ghz-u-nii-ro or http://hraunfoss.fcc.gov/edocs\_public/attachmatch/FCC-14-30A1.pdf

After public comments, reply comments, and internal deliberation. The First R&O Adopts new rules to increase the Security of devices and enhances the existing spectrum. Includes a Transition Period for Manufacturers to comply with the new rules.

#### **U-NII First R&O (**¶ 9-10**) Proposed New Bands—U-NII-2B and 4** Bands

#### Deferring action on these bands



## U-NII First R&O (¶ 22-46) U-NII-1

#### Access Points

- Removes indoor restriction.
- Power: 50 mW  $\rightarrow$  1 W .

- PSD: 4 dBm/MHz  $\rightarrow$  17 dBm/MHz .

Non- Point to Point: 21 dBm EIRP above a 30 degree elevation angle.

Point to Point: 23 dBi antenna allowed before a power reduction.

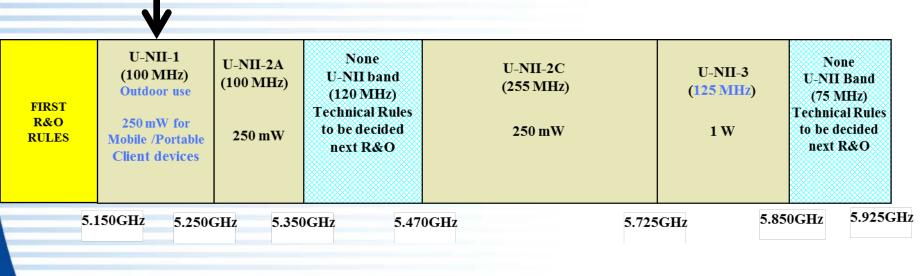
Indoor: 6 dBi antenna allowed before a power reduction.

R&O RULES	U-NII-1 (100 MHz) 1 W Outdoor use	U-NII-2A (100 MHz) 250 mW	None U-NII-2B (120 MHz) Technical Rules If Any to be decided next R&O	U-NII-2C (255 MHz) 250 mW	U-NII-3 (125 MHz) 1 W	None U-NII-4 (75 MHz) Technical Rules If Any to be decided next R&O
--------------	--	---------------------------------	---	---------------------------------	-----------------------------	---

## U-NII First R&O (¶ 22-46) U-NII-1

#### Mobile and Portable Client Devices

- Power: 50 mW  $\rightarrow$  250 mW
- PSD: 4 dBm/MHz  $\rightarrow$  11 dBm/MHz
- 6 dBi antenna allowed before a power reduction.



### **U-NII First R&O (¶ 48-67):** Interference Avoidance & Mitigation

- Requires security features to prevent reprogramming.
  - No change to U-NII by unauthorized parties ( country code, frequency range, modulation type, maximum output power).
- Explicitly requires U-NII-2 equipment to operate with the DFS on.
- Sensing requirements.
  - Changes from 80% to 100% of emissions bandwidth.

#### Interference Avoidance & Mitigation Continued

- Removes the restriction for certification in the U-NII-2C band under the interim certification procedures.
  - Manufacturers have the option of using the new rule to or the interim procedures for up to twelve months.
- 50 MHz of spectrum is available for U-NII use again.

#### **U-NII First R&O(¶ 76-86)** Dynamic Frequency Selection (DFS)

Sensing

-

- Sensing requirements
  - 100% of emissions bandwidth
  - Adjacent channel sensing NOT required
- Relaxed sensing threshold (-62 dBm)
  - Permit when EIRP < 200 mW and
  - PSD < 10 dBm/ MHz
- New Bin 1 radar waveforms.
- Eliminates uniform channel spreading requirement.
- Does not require demonstration of channel loading with MPEG test file.

#### U-NII First R&O(¶87-123) 5.8-GHz 15.247 DTS Merges Into U-NII-3

- Extend the U-NII-3 band by 25 MHz to match 15.247 band.
- 1watt limit with 6 dBi antenna and no bandwidth dependence.
- Minimum 500 kHz 6 dB bandwidth.
- Fixed point-to-point allowed without reduction to power or PSD for high gain systems.
- PSD limit = 30 dBm / 500 kHz (reference bandwidth)
- Keeps 15.407 Unwanted emissions limit(Below -17 dBm/MHz within 10 MHz of band edge, below -27 dBm/MHz beyond 10 MHz of the band edge. 15.209 general emission limits below 1 GHz.)
- Measurement bandwidth can be 300 kHz
- Removes 5.8 GHz DTS from 15.247 (Frequency hopping remains)[Effective After 12 months]

#### U-NII First R&O(87-123) 5.8-GHz 15.247 DTS Merges Into U -NII 3

#### Will simplify testing:

OLD RULES	No DFS U-NII-1 (100 MHz) 50 mW Indoor Only	DFS U-NII-2A (100 MHz) 250 mW	U-NII-2B U-NII band (120 MHz) No Technical Rules	DFS U-NII-2C (255 MHz) 250 mW	No DFS THYSE   U-NII-3 (100 MHz)   1 W Part 15.247 Rules   (105 - 4Hz) -4Hz)	U-NII-4 U-NII Band (75 MHz) No Technical Rules		
FIRST R&O RULES	U-NII-1 (100 MHz) Outdoor use 250 mW for Mobile /Portable Client devices 1 W for AP's	U-NII-2A (100 MHz) 250 mW	None U-NII band (120 MHz) Technical Rules to be decided next R&O	U-NII-2C (255 MHz) 250 mW	U-NII-3 (125 MHz) 1 W	None U-NII Band (75 MHz) Technical Rules to be decided next R&O		
5.150GHz 5.250GHz 5.350GHz 5.470GHz 5.725GHz 5.850GHz 5.925								
April 8-9, 2014 TCB Workshop						10		



#### U-NII First R&O(¶ 124-125) Rule Cleanup

- Power and PSD: average over interval of continuous transmission (not peak)
  - Maximum conducted output power
    - Removes references to "detector response times"" and "true peak"
  - "Peak power spectral density" -> "Maximum Power Spectral Density"
- Peak excursion: this requirement was removed as it was determined to be no longer necessary.
- §15.215: Emission bandwidth of U-NII devices may span across multiple U-NII sub-bands.



#### U-NII First R&O(¶ 126-134) Transition Periods

- Grandfathering- Existing devices will be grandfathered for the life of the equipment. Applies to devices which are operating in field, do not cause interference, and are not modified.
- 12 month transition applications for certification of U-NII devices must meet the new and modified rules after 12 months.
- 24 month transition the manufacture, marketing, sale and importation of non-compliant devices must cease after 2 years.
- Class II permissive change allowed for old equipment for up to 2 years under the old rules.
- Class II permissive change allowed indefinitely if such changes would result in compliance with the new or modified rules.



# Thanks!

TCB Workshop