Recent Spectrum Developments 2014

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May 13, 2014

Overview

- The New FCC
- Repurposing Spectrum through Auctions
- New Sharing Paradigms
- Hot Topics – More Efficient Use of Spectrum

The New FCC





- Chairman
  - Tom Wheeler (D) (June 2018)
- Commissioners
  - Mignon Clyburn (D) (June 2017)
  - Jessica Rosenworcel (D) (June 2015)
  - Ajit Pai (R) (June 2016)
  - Michael O'Rielly (R) (June 2014)

What's Driving the Focus on Spectrum?

- Demand continues to sky-rocket
  - 64% of US mobile subscribers own smartphones
  - Smartphone traffic will increase 10x from 2013 to 2019
  - 34% of American adults own a tablet
  - Tablets generate 2.6x as much traffic as smartphones
  - 45% of global mobile traffic offloaded by WiFi, femtocells
- Wireless industry valued at $195 billion
  - Larger than air transport, auto manufacturing, and agriculture
- Two primary goals:
  - Enable broadband, promote spectrum efficiency

Incentive Auction

- May 15 Open Meeting: FCC to Adopt Order
  - Proceeding initiated Dec. 2012
  - Over 1,400 filings in the docket
- First 2-sided spectrum auction ever
- Wheeler:
  - "Incentive auctions could revolutionize spectrum policy by applying market forces to the allocation of spectrum and not simply the assignment of individual licenses."
- Order will set framework; other proceedings to follow
- Auction expected mid-2015

Incentive Auction—The Basics

- A voluntary market-based mechanism to clear incumbent spectrum licensees and assign new licenses
- Three elements:
  - Reverse Auction ("supply side") – willing incumbents (broadcasters) sell
  - Forward Auction ("demand side") – wireless bidders buy
  - Repacking the Band – relocating remaining broadcasters
- Options for broadcasters that choose to participate:
  - Exit
  - Channel Sharing
  - Move from UHF to VHF

Incentive Auction – Band Plan

- Challenges:
  - Amount of spectrum recovered will be unknown until the auction
  - FCC seeks near-nationwide band plan, with some variability among markets
- FCC Staff proposal on "down from 51" from NPRM:
  -

  - License paired spectrum
  - Auction 5x5 MHz licenses; can be aggregated
  - Use new, Partial Economic Area (PEA) license sizes; can be aggregated
  - Require interoperability across 600 MHz Band

Incentive Auction – Unlicensed

- Spectrum Act:
  - Permits unlicensed use in guard bands, which "shall be no larger than is technically reasonable to prevent harmful interference"
- Low-band unlicensed opportunities following the Incentive Auction:
  - Guard Bands
  - Duplex gap
  - Channel 37
  - Continued use of remaining TV White Spaces
- Guard bands and duplex gap – what size?

Incentive Auction – Major Issues

- Wireless Provider Concerns
  - Spectrum Aggregation Limits: Mobile Spectrum Holdings proceeding
    - Also on agenda for FCC May 15 meeting
    - Attention to spectrum below 1 GHz – "low band" spectrum
  - Draft Spectrum Reserve (Set-Aside), perhaps most controversial issue:
    - Open eligibility to start the Forward Auction
    - Once a threshold (pricing) is met, FCC will bar large "low-band" spectrum holders from bidding on certain licenses that will be "reserved" for other bidders

Incentive Auction – Major Issues

- Broadcaster Concerns
  - Those staying in broadcasting:
    - Repacking methodology
    - Reimbursement
  - Those participating in the auction:
    - Initial prices for clearing stations
    - Scoring stations differently
- Wireless Microphone Concerns – loss of reserved channels?
- Wireless Medical Telemetry Concerns – unlicensed in channel 37?
- Complexity

Advanced Wireless Service (AWS)-3

- FCC Report & Order (March 2014)
- Repurposes 65 MHz
  - 1755-1780/2155-2180 MHz paired
    - Adjacent to AWS-1 (1710-1755/2110-2155 MHz)
  - 1695-1710 MHz unpaired, uplink
- Auction will include six licenses in each market, ranging from 5 MHz unpaired to 10x10 MHz paired
- Auction in the Fall 2014

AWS-3: Sharing with Gov't Users

- Since 2010, significant government-industry focus
  - CSMAC process
  - DoD: compress above 1780 MHz; move to 2025-2110 MHz
- 1755-1780 MHz
  - Transitional sharing prior to federal relocation
  - Permanent sharing with some federal systems that remain
  - Size / nature of the protection zone
- 1695-1710 MHz
  - 27 protection zones, coordination with federal incumbents

H Block: DISH is the Winner

- 10 MHz, paired: 1915-1920/1995-2000 MHz
- DISH won all 176 licenses , auction completed February 2014
  - Upper block (1995-2000 MHz) is adjacent to DISH's nationwide AWS-4 spectrum (2000-2020/2180-2200 MHz)
- AWS-4 Order (2013):
  - DISH holds AWS-4 nationwide spectrum, 2000-2020/2180-2200 MHz
  - FCC allowed DISH to convert 2000-2020 MHz to downlink spectrum, all 40 MHz of AWS-4 would be downlink
  - Must decide by June 2016
  - Fate of 5 MHz block, 2020-2025 MHz, depends on DISH decision

New Sharing Paradigms –
President's Council of Advisors on Science and Technology

- 2012 PCAST Report
  - Clearing / reallocation of Federal spectrum is not sustainable
  - The norm for spectrum use should be sharing, not exclusivity
- Recommendations:
  - Immediately identify 1,000 MHz for sharing (2.7-3.7 GHz)
  - Develop a new Federal spectrum architecture:
    - Wide spectrum bands
    - No service-specific Federal allocations
    - Dynamic, real-time sharing while ensuring that primary Federal users are protected
  - Consider receiver performance
  - Create incentives for Federal users to use spectrum more efficiently

PCAST's Three-Tiered Spectrum Access Regime

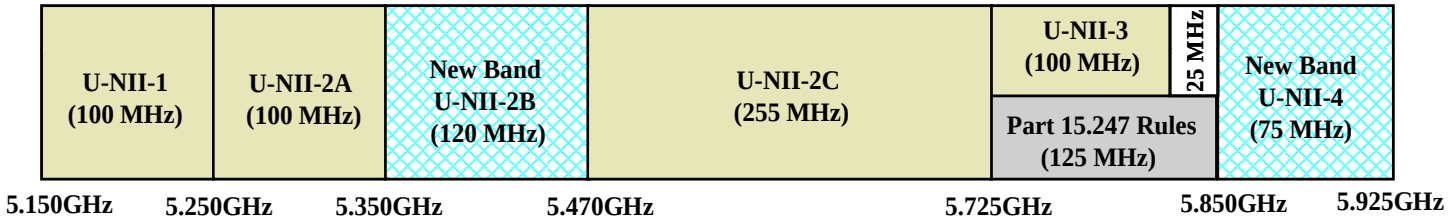
- Federal Primary Access
  - users register in a database and have protection when operating
  - no right to preclude non-interfering use by others
- Secondary Access
  - users have short-term operating rights with interference protection from opportunistic users
  - users vacate when a Federal Primary Access user seeks to operate
- General Authorized Access
  - users have opportunistic access to unoccupied spectrum
  - must have the ability to operate on multiple bands to avoid being obsolete if any one band becomes unavailable

3.5 GHz

- FCC Further NPRM on 3550-3650/3700 MHz (April 2013)
- Envisions small cells, backhaul
- "Citizens Band Broadband Service," modeled after PCAST
  - Incumbent Access: federal and grandfathered Fixed Satellite users
  - Priority Access: 10 MHz licenses, census tract basis, one year term that can be aggregated up to 5 years
  - General Authorized Access: 50% of band, plus opportunistic use of other
- Exclusion Zones to protect Incumbent Access
  - FNPRM tees up 2010 NTIA Fast Track exclusion zones but hints more work
  - NTIA based on high-powered operations, not small cells
  - Current exclusion zones would limit Priority Access and GAA operations along both coasts and the Gulf, prohibiting access to 60% U.S. PoPs

5 GHz Unlicensed

- FCC First Report & Order (2014)
- Substantially modifies rules governing unlicensed use of the U-NII-1 band.



- Allows outdoor use of 5150-5250 MHz (U-NII-1 band) at higher power
- Extends the upper edge of the U-NII-3 band by 25 MHz, to 5725-5850 MHz
- Requires all U-NII devices to have software that prevents modification, reducing potential for harmful interference
- Provides enhanced protection for Terminal Doppler Weather Radar
- Order did not address proposed new bands (U-NII-2B or U-NII-4). Proceeding continues for an additional 195 MHz

Progeny and Unlicensed

- 902-928 MHz
  - Progeny is M-LMS licensee; band also used for Part 15 unlicensed
- In June 2013, FCC allowed Progeny to establish a new location service, finding that its field test showed the new service does not cause "unacceptable levels of interference" to unlicensed
- FCC rules for this band sought co-existence among services, even though Part 15 devices are not entitled to protection.
- Record pit Progeny's 911 location service against unlicensed advocates including Google, WISPs, EZ-Pass, and utilities that rely on Part 15 devices for communications
- 2013 Order found that most unlicensed devices will continue to work as intended, and there was not an unacceptable level of interference.

Globalstar Rulemaking

- NPRM on Globalstar proposal for 2473-2495 MHz (Nov. 2013)
- Seeks comment on a low power terrestrial mobile broadband service that would operate across a 22 MHz wide band:
  - Globalstar's licensed MSS spectrum at 2483.5-2495 MHz, and
  - Unlicensed spectrum immediately adjacent at 2473-2483.5 MHz
- Comments filed May 5, including:
  - Evaluate risk that the new service could disrupt existing unlicensed 2.4 GHz operations
  - Reject proposal because it will cause congestion in 2.4 GHz band, forcing bluetooth etc. down into the WiFi portion of the band
  - Relax unlicensed OOBE at the upper 2.4 GHz band edge that currently bars WiFi use of 802.11 Channels 12 and 13 in the US

Airborne Wireless Services

- In-Flight Mobile Wireless Services NPRM (Dec. 2013)
  - Proposes to bring competition to onboard WiFi services via third-party access to CMRS spectrum above 10,000 feet
  - Interference Protection: in US CMRS bands, European mobile bands?
  - Authorization Model: Part 87 Airline? Unlicensed / licensed-by-rule? Market?
- 14.0-14-5 GHz Backhaul for Airborne Wireless Services
  - Earth Stations Aboard Aircraft (ESAA) Order
  - Air-Ground NPRM

LightSquared

- Access to spectrum in the 1525-1559 MHz/1626.5-1660.5 MHz band
- FCC has proposed to suspend LightSquared authority for terrestrial service due to GPS community interference concerns in 1525-1559 MHz band
- LightSquared is pursuing a new approach – 20 MHz L-Band uplink and 1670-1680 MHz for downlink
  - Proposes swap of terrestrial downlink rights in spectrum closest to GPS (1545-1555 MHz) in exchange for terrestrial downlink rights at 1670-1680 MHz
    - Needs access to 1675-1680 MHz, to be shared with Federal users; currently holds rights to 1670-1675 MHz
    - Claims testing demonstrates terrestrial operations are compatible with incumbent meteorological uses at 1675-1680 MHz, assuming weather balloons are relocated
  - Proposes to forego use of 1526-1536 MHz as part of swap above, pending a rulemaking to create new rules for terrestrial downlink operations in 1526-1536 MHz
- LightSquared's efforts are complicated by its ongoing bankruptcy proceedings

FirstNet

- Spectrum Act authorized creation of FirstNet to construct, operate, and manage a nationwide public safety wireless broadband network
  - Directs use of private sector for building, operating the network
  - Designates up to $7 billion of auction revenues for network buildout
- Issued RFIs to gain further knowledge prior to RFP stage
- Engaged in significant outreach with state/local/Tribal partners
- FirstNet Program Roadmap calls for a competitive process for network proposals and proposals for leasing agreements for excess network capacity
- Expected to release draft RFPs for network and equipment proposals in Spring 2015

Administration – Efficient Federal Use

- Office of Science & Technology Policy RFI on incentives for federal agencies to increase spectrum efficiency through relocation, improved technologies, sharing (Jan. 2014)
- Topics included
  - Spectrum user fees (payable by agencies)
  - A spectrum fund (to cover agency costs of planning/executing sharing and relocation strategies)
  - Spectrum property rights (allowing agencies to assign/share spectrum rights for compensation)
  - Command-and-control (central authority would have control over sharing/relocation)

Capitol Hill – #CommActUpdate

- House Energy & Commerce Committee inquiry in advance of updating the Communications Act
- Issued Spectrum White Paper, sought comment (April 2014)
- Multiple perspectives on key issues
  - Mobile Wireless Competition: spectrum limits
  - Commercial Spectrum: licensed / unlicensed split
  - Government Spectrum: more efficient use, sharing, clearing
  - FCC/NTIA/single agency?

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