FCC Technological Advisory Council

Overview / Update

Dennis Roberson
23 July 2018

Agenda

- Overview
- Focus
- Status
- Successes

Overview

- Mission: Deliver Technology focused assessments in line with Work Group Charters from FCC Chairman's Office
- Federal Advisory Committee Act Organization
- Originally chartered - Dec 1998 (20th Anniversary year) - first meeting - April 1999
- Currently ~45 Members (more than 100 SMEs)!
- NTIA Liaison! / FCC Liaisons ~12
- Quarterly TAC Meetings / Weekly Working Group (even subgroup) Meetings

Overview (continued)

- Win/Win - industry gets a chance to inform FCC on technology related actions it should it should be aware of and consider action on.
- FCC informs industry on how it works.
- FCC allocates resources based on guidance.
- Relationship both informs and builds trust.
- Deliverables are Actionable Recommendations supplemented by White Papers as well as OJT for FCC Liaisons.

TAC Work Groups for 2016

- Mobile Device Theft Prevention*
- 5G and IoT
- Communications Strategies for UAS
- Antenna Technology
- Computational Power and Stress on Networks

* Continuing from 2017

Mobile Device Theft Prevention:

This work has been instrumental in combatting mobile device theft in the US with uniform antitheft feature guidelines for mobile devices implementation in combination with a new industry supported mobile device information portal.

1) Focus is on **supporting FCC efforts to work with foreign regulatory agencies to combat the theft/use of illegal mobile devices.**

2) The work group should **reassess the effectiveness of the information portal / make recommendations, for its future improvement**.

3) In addition, the work group will **study whether mobile device theft has declined in the US since these efforts have been implemented**.

5G and IoT:

The purpose of this working group is to study/report on the state of development of 5G IoT applications. Dimensions include:

1) Current activity in energy, health care, transportation, etc.?
2) Are opportunities, barriers/solutions being developed?
3) Are service providers and equipment developers engaged in market sectors dialogs in the U.S., and if so, how?
4) Deployment expectation for network infrastructure that can support apps?
5) International vs. U.S. progress?
6) IoT devices relying on unlicensed vs. licensed spectrum?
8) Apps and High-bandwidth IoT devices that create significantly more traffic on networks (both wireless and wireline)?
9) How might the FCC or the others encourage development of apps that are mindful of efficient use of spectrum resources ?
10) What should the FCC or others do relative to 5G and IoT to facilitate such developments?

Communication Strategies for UAS (Drones):

Presidential Memorandum – 25 Oct 25 2017, "it shall be the policy of US to support the safe operation of unmanned aircraft systems and enable the development of UAS technologies for use in agriculture, commerce, emergency management, human transportation, and other sectors". Many of these devices operate using unlicensed spectrum, should licensed spectrum be created for commercial mobile radio drone services? This work group is tasked to study the spectrum issues for UAS:

1) What frequency bands are available today? Are they sufficient? What are the trade-offs for the various alternatives?

2) What needs to be studied/done to meet the various spectrum needs for drones (command/control, payload, ID, collision avoidance), considering the need to: a) make efficient spectrum use and b) avoid causing harmful interference to ground systems?

3) Availability of test facilities to evaluate and prove concepts?

.

Antenna Technology:

Antenna technology has evolved from the time when simple omnidirectional antennas were common, to sectorized antennas on cell towers, to multiple antennas within a device that are not visible to the user. Adaptive phased array antennas have the ability to dynamically steer signals in particular directions which create new ways to think about interference avoidance and appropriate technical standards for devices. Metamaterials offer another option to produce steerable antenna arrays at low cost. New technologies such as massive MIMO and MultiUser-MIMO promise increased spectrum efficiency. This work group is **tasked to report on the state of development of antenna technologies and their implications for FCC policies, technical standards, regulatory and technical issues.** The tasking is intended to cover as broad a scope of radio services as feasible as well as fixed and mobile applications.

Computational Power and Stress on the Networks:

Big data analytics has emerged as a critical tool in many fields. This can involve the exchange of massive amounts of data across networks, often in real time. The task of this work group is to study how big data analytics, block chain, bitcoin mining, gaming, etc. may be affecting network performance. Some estimate data traffic will increase 100s of percent over the next few years. What strategies are operators (wireline/wireless) employing to monitor this growth? How are the networks planning to accommodate this growth? How are operators meeting the needs of big data - available bandwidth, latency, reliability, security, resiliency, etc.? To what extent are big data analytics and distributed computational resources able to improve the network performance? The working group is encouraged to explore these and other technical matters that may be relevant to informing the FCC about the impact of big data on IT and communications network infrastructure.

.

2017 Actionable Recommendations

Mobile Device Theft Prevention (MDTP) WG

FCC should define a national objective for MDTP:

1. Partner with industry to become more knowledge-able on security issues (ATIS, CTIA, GSMA support);
2. International outreach to increase global participation in MDTP initiatives, leveraging relationships with regulators in other countries
   - Identify if/what law enforcement relationships may assist in establishing international outreach
   - Regulators in Latin America and the Caribbean may be used to set proof point that MDTP initiatives, including the global IMEI database, are effective

2017 Recommendations (cont.)

Remove Obsolete/Unnecessary Technical Rules

1. FCC should use consensus-based standards as an alternative or an augmentation to traditional regulation
2. The FCC should change some certification processes and industry engagement models: streamlining, harmonization and create a self-certification / trusted vendor program

2017 Recommendations (cont.)

Implications of Next Generation TV Broadcasting Technology

1. FCC should closely monitor the ATSC 3.0 rollout during the transition period (and after). Important aspects of system implementation necessary to realize various ATSC 3.0 services to the public remain undefined but will likely be developed and agreed by industry participants in the marketplace. Market dynamics will determine the technical and other issues that may arise from the intersection of ATSC 3.0 with other communications facilities.
2. Examine whether Commission action is required for issues that arise.
   - Any FCC actions on these issues should be reviewed periodically and revisited as the market develops.

2017 Recommendations (cont.)

Broadband Deployment Technology Challenges

1. FCC to continue to encourage BB providers to use long term technologies. Short term technologies may exhaust USF Support over long-term.
2. FCC to develop an Economic Advisory Council to assist the Chief Economist in understanding the micro economic operation and capital costs, and risk for Broadband facilities in Rural Areas.
3. FCC to coordinate government entities to develop a standardized GIS model and accessible data base for:
   - Distribution pole line/pole loading calculation for BB design
   - Land use
   - Surface geological land soil surveys
   - Availability by Address: GIS address for location FTTH design
   - Make Government LiDAR HWY survey data available

2017 Recommendations (cont.)

Satellite Communications Plan

1. Consider using, and encouraging the use of Risk Informed Interference Analysis (among other methods) in the analysis of NGSO-NGSO coexistence
2. Improved Broadband Deployment Data
   - The FCC should revisit how to obtain the most accurate broadband data while balancing the administrative burdens and need for confidentiality imposed on network operators and service providers.
   - In its annual Section 706 NOI, the FCC should continue to seek comment on ways to improve data capture relative to actual proportions of households that actually have access to service without unduly burdening network operators and service providers.

Successes

- Spectrum Frontiers – mmWave opportunity
- Citizens Broadband Radio Service in 3.5 GHz
  - Small Cell Spectrum Sharing
  - Multi-Stakeholder Group (WinnForum)
- Progress in Mobile Device Theft Prevention
- Generally, most TAC recommendations are now being implemented, though the more complex recommendations can take several years to gain traction.

Questions?

"Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Networking and Information Technology Research and Development Program."

The Networking and Information Technology Research and Development (NITRD) Program

Mailing Address: NCO/NITRD, 2415 Eisenhower Avenue, Alexandria, VA 22314

Physical Address: 490 L'Enfant Plaza SW, Suite 8001, Washington, DC 20024, USA Tel: 202-459-9674, Fax: 202-459-9673, Email: nco@nitrd.gov, Website: https://www.nitrd.gov