Technical Advisory Council

Federal Communications Commission

Summary of Meeting

November 4th, 2010

The Technical Advisory Council for the FCC was convened for its first meeting at 1:00 P.M. on November 4th, 2010 in the Commission Meeting Room at the FCC headquarters building in Washington, DC. A full video transcript of the meeting is available at the FCC website at <http://www.fcc.gov/encyclopedia/technology-advisory-council> together with a copy of all materials presented at this meeting. A copy of attendees is included as Attachment A.

In accordance with Public Law 92-463, the entire meeting was open to the public.

Major points made during the meeting include:

* IPv6 transition cited as major risk to US technology leadership and current incentives for transition are lacking
* FCC policy should focus on accelerating transition to future systems
* Global competition should be included as factor in policy development
* Major communication dependent infrastructure programs such as Smart Grid are perceived as having little effective coordination among agencies. FCC is technology leader and should be driving effort to ensure that solutions meet 21st century needs.
* Privacy and security identified as key concerns and it was suggested that the FCC should include this as a certification process
* Spectrum efficiency cited as issue and the FCC should redefine goals/requirements to address efficiency in broad sense. It was noted that efficiency standards can depend upon the technology/application
* Technology naturally follows Moore’s Law; but little work done on installation and operating costs of technology
* Easements and ROW cited as friction in deployment of infrastructure and it was noted that inter-agency cooperation may identify program synergies
* Silos cannot be supported in 21st century. Focus on infrastructure sharing among sectors/applications, spectrum sharing among technologies
* Some members suggested creation of a Techcore similar to Americore focused on technology initiatives
* FCC should sponsor technology competitions much as organizations such as NASA do
* Research: FCC should establish national testbeds and work with those agencies with resources to fund research to establish objectives aligned with communication evolution goals
* Policies should be developed to accelerate retirement of legacy systems
* FCC should assume CTO role among agencies on communications technology

At the conclusion of the meeting, it was noted that a blog is being set up for ongoing discussion purposes and it was requested that participants use this to identify “friction points” for investment in technology and infrastructure. The TAC Chairman also indicated that based upon this day’s interactions, a number of working committees would be established to better define objectives and goals. It was noted by FCC Chairman Genachowski that recommendations of the TAC must be actionable within the next two years and that the focus needs to be on the creation of jobs and maintaining US competiveness.

Points made by each participant are summarized below:

* Tom wheeler
  + Noted that email concerning TAC can be sent to: [tac@fcc.gov](mailto:tac@fcc.gov) and that Chris Lewis will be running a blog
  + Emphasized that the TAC has a broader role than a “spectrum task force”
  + Most of net employment gains (census bureau) from 1987 to 2005 came from companies less than 5 years old
  + What innovations are down road that the FCC needs to think about, be aware of and anticipate?
  + IP world is moving faster than previous experiences, we need to ask questions regarding how the FCC can use this speed to foster development and create jobs
  + How do we lead in this with measurable investment and job creation?
    - Assure FCC is leading economic growth
    - FCC is leading technology agency
  + What is the role of a network-rooted agency in a world of IP that drives applications to the edge?
  + Tom noted that there will be working groups developed out of this process to develop ideas and that collaborative technology will be used to support this effort while full meetings will be held at the FCC.
  + We need to stimulate economic growth in areas relevant to authority of the Commission
  + A Techcore similar to Americore
  + Goal of group is to recommend actions and guide Commission
  + Tom introduced the Matrix as a discussion mechanism explaining that the x dimension emphasized agency actions: bully pulpit, policies to spur investment and policies that diminish investment.
  + Noted that NTT says conversion to IPv6 will drive 10M jobs and asked what can Commission do?
  + Noted the amount of time that had been spend discussing IPv6
  + Y axis of matrix should be less focused on applications and more on enabling routes that get us there
  + Tom summarized suggested Y axis topics made by others
    - Leveraging of other agencies to coordinate on overlapping policy issues such as IPv6 transition
    - Information and entertainment delivery
    - Security and privacy
    - An Awards program similar to NASA technology competition contests
    - Easements and Right of Way improvements
    - Infrastructure sharing
    - Spectrum sharing
    - Spectrum efficiency
    - National Testbeds; integration testing and environment
    - Accelerating replacement of infrastructure and legacy systems
    - Research leadership role
  + Spectrum needs to be up as a priority
  + CTO role for FCC
    - * Coordinating privacy and security stuff so we don’t get specialized networks
      * Coordination of physical infrastructure
  + Members were encourage to blog on frictions that exist that inhibit investment
* Mike Pellon
  + Need to leverage ability to marshal ideas across multiple agencies of government
  + Noted that NIST is expert agency on privacy and security
  + Noted that companies asking for separate spectrum since common infrastructure not reliable
    - Should we improve core rather than build special networks?
* Julie Knapp
  + FCC engaged on many of these issues. We need to communicate better on things we are doing
* Dennis Roberson
  + Focus on the research dimension; building on the front end of process
  + FCC can drive research agenda in other organizations
  + Establish national test beds that are well structured where researchers can go
  + Test beds can be blessed by FCC with specific criteria
  + Spectrum is natural resource
  + FCC could put criteria in place where radio systems meet figure of merit; output, receiver specs, efficiency, etc.
* Adam Drobot
  + Research impacts nation in long run; need to provide access to real data; real operating problems
  + Telecom electronics on exponential curve but installation and operating costs not being researched
  + White House agency NITRD (National Coordinating Office (NCO) for Network and Information Technology Research and Development) coordinates research programs across agencies
  + He noted that while others have pointed out that there is no business demand for IPv6, but 5 of elements on y axis require IPv6
  + This body should look at what is the future and what should be reformulated in this regulatory space to support expected future evolution
* Tom Evslin
  + Believes smart grid will focus on small things but not big things and has concerns regarding this
  + Believes making (order of magnitude) more spectrum available most important things Commission can do
  + Smart grid will drive demand for IPv6 due to M2M needs
  + Government needs to move to its owns operations on IPv6
  + FCC should push for Exec Branch support for a leadership role in security and privacy
  + Obstacle to small business is regulation
  + FCC should not pick winners with any funding mechanisms
  + Suggested experimental regulation-lite
    - Small company could easily get experiment license
  + FCC should assume leadership role in smart grid pushing security and privacy
  + Give private sector rational group of standards for efforts such as smart grid
* Kevin Kahn
  + Questioned to what extent to include international overtones in discussion
  + Lots of things happening globally on Internet; US has traditionally led
  + Not bringing outside issues in discussion may blindside us
  + China has made Internet of things a national agenda
  + China was poor in IPv4, so China is pushing an IPv6 agenda
    - Danger in IPv4 is that we sustain inertia, with drive in IPV6 market being lower
    - This will have a large impact on Internet Governance; if we are not in the leadership on key roles,
  + Worries that edicts to buy equipment not enough
  + Spectrum, Security/Privacy are fundamental assets that should come off the y axis
* Jesse Russell
  + Public private partnership needed to drive jobs
    - Small companies don’t have resources to drive employment
    - Don’t have lobbyists to drive investment and employment
    - Small business in past depended on VC arm
    - No government assets to fund first level of development
  + Wants government funding sources for small high tech companies
  + Exponential growth from wired to wireless
  + Security and privacy needs to be ensured
  + FCC role is to define how wireless devices to be secured and devices protected
  + FCC certification of devices should include privacy and security
  + Security platform must exist at service layer
  + We need to secure the individual not the device so the network can certify the person and not the device
  + Support of platforms supporting multiple sectors/applications
  + FCC should have small technology mentor program
  + Small companies of today large companies of tomorrow
* Greg Lapin
  + FCC doesn’t have much money as other organizations
  + FCC should partner with other agencies in terms of their cash programs
  + FCC has regulated only transmitters
  + NTIA approves systems
  + Should the FCC regulate systems and not devices
* Daniel Reed
  + Current PCAST reviewing NITRD and now is perfect time to review overall process
  + Security required building a chain of trust across all applications
  + If we don’t drive in key areas, we will lose leadership
  + Will require multiagency coordination, it’s about finding common ground
  + FDA/FCC coordination on medical devices is one good example
* Jack Waters
  + Difference between compliance recommendations and true adoption
  + IPNG decision was 15 years ago and still not at IPv6
  + Education should be in docket; lots of innovation comes thru this
* Charlotte Field
  + All set-top boxes will have internet address
  + Big issue on managing operations and getting it right or we will have problems for all
  + This is an activity that should be pushed and multithreaded
  + IPv6 not that far away
* Marvin Sirbhu
  + Is FCC website reachable via IPv6?
* Randy Nicklas
  + Most equipment bought today is IPv6 capable
  + Where is the principle work remaining?
  + Do we think that there will be balkanization of Internet; depends upon patterns of communications?
* Dick Lynch
  + We have implemented IPv6, waiting for everybody to come
  + Sales teams don’t see demand for IPv6
  + People don’t need to know they need to demand IPv6
  + Is security at device level or network level?
* Mark Bayliss
  + Comcast is a good example for IPv6 but we can’t fall behind the rest of the world
  + Great Britain produced cars but failed to change to other side of road, their auto industry failed as a result
  + US is central peering point in world an advantage we need to maintain but cost of transport beyond peering points higher than rest of world
  + FCC can address cost of transfer to end locations
  + Cost for bandwidth provisioning high
  + Currently in VA with with tobacco funds we built out Internet infrastructure
    - Microsoft doing huge IT center build as result
    - IT centers drive peering advantages
  + We need low cost transport
  + Easements and row issues kill projects;
  + FCC should address this or cost of transport
  + Raised issue on peering leadership
    - Easement issue on lowering infrastructure costs
    - What concrete steps to help those in rolling out infrastructure
    - Synergy with sewers and fiber placement?
* Dave Tennenhouse
  + Accelerate Legacy Telecom Structure replacement
  + Use blog to get idea of where investment frictions exist
  + We can coalesce and prioritize suggestions from blog
* Andy Setos
  + All use of spectrum should be gauged to efficiency
  + Used smart grid as example where security is required
  + We need to be clear on where to focus and understand what the downstream effect is
* Robert Zitter
  + We are required to provide television with analog to legacy sets
  + Made point that some regulation inhibits evolution
* Nomi Bergman
  + Would love to go all digital but not always consumer friendly
  + Areas of television and video production missing from y axis
* Geoffrey Mendenhall
  + Add information an entertainment delivery to fixed and mobile devices
  + Wired infrastructure can be expanded indefinitely
  + Suggested hybrid applications where distribution is determined by need such as one to many; or many to many
  + How to determine best method for last mile and last 500 feet
  + Commission can provide guidance thru policy
  + Hybrid systems
    - Pushing data out thru efficient structure
* John Chapin
  + Companies regulated by FCC have moved from hardware to software
  + History is where new spectrum band opens up, that is where innovation and jobs occur
  + We need to stay ahead of rest of world either thru efficiency standards, received standards, etc.
  + FCC Contest for Spectrum Sharing
  + FDIR? is an outreach to small companies and the FCC should link to this effort
* Brian Daly
  + Cellular industry have been forced to evolve on spectrum efficiency
* Dale Hatfield
  + More efficiency in wireless has resulted from fixed infrastructure providing smaller cell sites
  + Radar is big user of spectrum and we need to think what efficiency means for this
* Richard Currier
  + Migrating mobile communications to other networks (e.g. wifi) releases spectrum for true mobile applications
* Lynn Claudy
  + FCC started out regulating broadcasters
  + Not a spectrum problem, a system problem
  + DTV Transition required FCC incenting actors to move
* Brian Markwalter
  + FCC allowed low barrier to entry and allowed innovation
  + Worries about building large system requirements blocking market entry
  + CEA, NIST is doing privacy and security
* Bud Tribble
  + Bully pulpit is fine but caution this doesn’t turn into incentives driving specific technology
  + There are things we haven’t invented yet that we don’t want to preclude
* Peter Bloom
  + FCC should sponsor research awards or contest
  + NASA space glove contest
  + Need to maintain focus on jobs
  + Disappointed not more discussion and keep jobs as goal
  + Suggested Tech-core for jobs allowing tech students for rural communities allowing tech based communities
* Ari Juels
  + Security privacy should be part of certification
  + Should regulators regulate just carriers or end points
  + Focus on IPv6 as template for work; use this as drill down model to define how other issues should be approched
* Hilton Nicholson
  + How to create job growth
  + It is a multiagency problem
  + We need a CTO to bring agencies together; a multiagency problem
  + Focus on these multiagency issues and what kind of employment we can generate by upgrading infrastructure
  + Push to address nearer term infrastructure
  + Synergies that can be created between agencies
* Harold Teets
  + Companies need ubiquitous access to Ethernet networks
  + Need it to be more intelligent to allow reasonable management of applications
  + Need ability to drive more fiber/network in place
  + Shovels in ground that require Right of Way, need to facilitate building infastructure
  + Fundamental need for Ethernet capability
  + How do we as a group encourage this
  + IPv6 will be bigger problem than we think
* FCC Chairman Genachowski
  + Economy needs help
  + We need ability to compete globally
  + NSF Gathering Storm report
    - Looked at US against 40 countries and ranked on basis of small number of metrics
    - US ranked 6th out of 40
  + Report looked at rate of change of metrics
    - US ranked 40th out of 40
  + Pointed at Applied Materials
    - CTO and technology operations moved to Beijing
  + We need a process for identification of ideas that by happy coincidence we are always working on and proposed improvement on these ideas
  + Also generate new ideas
  + Problem of legacy infrastructure and how to think about infrastructure of future
  + Couple of areas where 20th century success poses future challenge 21st century
    - Example:
      * Spectrum: Broadcast spectrum an incredible success
      * Voice over copper a success story
      * Whether and how we tackle them will determine future success
      * Challenge: consider that as a country we have some innovator’s dilemmas; how do we tackle them
      * FDA example: discussed where we are working with them
  + Maintain near term focus on job creation
  + Series of good ideas for near term action

Walter Johnston, Chief/ECD

FCC

**11-4-10 Attendees**

| **Name** | **Title** | **Company** | **Representing** |
| --- | --- | --- | --- |
| Bayliss, Mark | President | Visual Link Internet, Lc | Virginia ISP Association and the West Virginia Broadband CO-OP |
| Bergman, Nomi | President | Bright House Networks | Bright House Networks |
| Bloom, Peter | Advisory Director | General Atlantic | General Atlantic |
| Pellon, Mike | Vice President, Regulatory Compliance and Standards | Motorola | Motorola |
| Chapin, John | Visiting Scientist Communication & Network Group Research Laboratory of Electronics | Massachusetts Institute of Technology | SDR Forum |
| Claudy, Lynn | Senior Vice President of Science and Technology | National Association of Broadcasters | National Association of Broadcasters |
| Currier, Richard | Vice President and Chief Technical Officer | Loral Space and Communications | Loral Space and Communications |
| Daly, Brian | Director AT&T Core & Government/Regulatory Standards CTO - Strategic Standards | AT&T | AT&T |
| Doug Sicker | Chief Technologist | FCC | FCC |
| Drobot, Adam | President Advanced Technology Solutions and CTO | Telcordia Technologies Inc. | Telcordia Technologies Inc. |
| Evslin, Tom | Chief Technology Officer State of Vermont | State of Vermont | State of Vermont |
| Field, Charlotte | Senior Vice President – Infrastructure and Operations, National Engineering and Technical Operations | Comcast Corporation | Comcast Corporation |
| Genachowski, Julius | Chairman | FCC | FCC |
| Gorenberg, Mark | Managing Director | Hummer Winblad Venture Partners | Hummer Winblad Venture Partners |
| Green, Dick | Board Member | Liberty Global, Inc | Liberty Global, Inc |
| Hatfield, Dale | Executive Director | Silicon Flatirons Center for Law, Technology, and Entrepreneurship University of Colorado at Boulder | Silicon Flatirons Center for Law, Technology, and Entrepreneurship University of Colorado at Boulder |
| Hudson, Erwin | Executive Vice President & Chief Technology Officer | WildBlue Communications, Inc. | WildBlue Communications, Inc. |
| Juels, Ari | Chief Scientist | RSA Laboratories / EMC | RSA Laboratories / EMC |
| claffy, kc | Adjunct Professor in the Computer Science and Engineering Department | UC at San Diego | Caida |
| Kahn, Kevin | Intel Senior Fellow, Director Communications Technology Intel Labs | Intel Corporation | Intel Corporation |
| Knapp, Julie | Chief/OET | FCC | FCC |
| Lapin, Gregory | Consultant | Independent Consultant | American Radio Relay League |
| Lewis, Chris | Acting Deputy Director, Office of Legislative Affairs | FCC | FCC |
| Leibovitz, John | Deputy Bureau Chief, WTB | FCC | FCC |
| Lynch, Richard | Executive Vice President & Chief Technology Officer | Verzon | Verizon |
| Markwalter, Brian | Vice President, Technology & Standards | Consumer Electronics Association | Consumer Electronics Association |
| McHugh, John | Technical Director | OPASTCO | OPASTCO |
| Mendenhall, Geoffrey | Vice President - Transmission Research & Technology | Harris Corporation | Harris Corporation |
| Nicholson, Hilton | CEO | Sixnet | Sixnet |
| Nicklas, Randy | Chief Technology Officer | XO Communications | XO Communications |
| Reed, Daniel | Corporate Vice President  Technology Strategy and Policy and eXtreme Computing Group | Microsoft | Microsoft |
| Roberson, Dennis | Vice Provost and Research Professor, Illinois Institute of Technology | Wireless Network and Communications Research Center | Wireless Network and Communications Research Center |
| Russel, Jesse | CEO | incNetworks | incNetworks |
| Setos, Andy | President, Engineering | Fox Group | FOX Group |
| Sirbu, Marvin | Professor of Engineering and Public Policy, Industrial Administration and Electrical and Computer Engineering | Carnegie Mellon University | SGE |
| Teets, Harold | Senior Vice President, Information and Network Technologies | Time Warner Telecom, Inc. | Time Warner Telecom, Inc. |
| Tennenhouse, David | Partner | New Venture Partners | New Venture Partners |
| Tribble, Bud | VP Software Technology | Apple, Inc. | Apple, Inc. |
| Walter Johnston | Chief/ECC | FCC | FCC |
| Waters, Jack | Chief Technology Officer | Level 3 Communications LLC | Level 3 Communications LLC |
| Wheeler, Tom | Managing Director | Core Capital Partners, LLC | Core Capital Partners, LLC |
| Zitter, Robert | Chief Technology Officer | Home Box Office | Home Box Office |