PSTN Transition Focus Group: Report

Tom Payne
Director of Technology Programs

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Strategic Approach

INDUSTRY CONCERN

As networks migrate from PSTN to all IP-based networks, regulations must evolve to address a changing environment.

PSTN TRANSITION FOCUS GROUP

Use case approach to address key technical and regulatory issues in order to lay the ground work for the new network environment.

Sub-Teams

Given the multi-dimensional aspects of this topic, overall lead and sub-teams were formed. Co-led by AT&T (Brian Daly) and Verizon (Mike Nawrocki), with four sub-teams:

Application Services: Carroll Gray-Preston, GENBAND

- Address protocol issues when services are migrated (e.g., Voice, Voice Mail, Conferencing, Call Routing, ACD, Call Features (Block, Forward)).

Transport: Richard Ejzak & Kevin Sparks, Alcatel Lucent

- Focus on end-to-end communications and interconnection in a packet based network, including interconnect models.

Access Network: Stephen Hayes, Ericsson

- Address any end-user access issues related to the migration (e.g., Alternative accesses, User expectations, Stranded CPE).

Policy: Tom McGarry, Neustar

- Collaborate with Access, Transport, and Application Services sub-teams to assess policy implications (e.g., FCC TAC, Critical Legacy Transition Working Group).

Outline of Focus Group Report

- Executive Summary of Overall Assessment & Major Findings
- Introduction covering Landscape Team Conclusions
- Focus Group Assessments
  - Policy
  - Access
  - Application Services
  - Transport
- Current State of the PSTN in Transition
- Summary of Standards & Regulatory Implications
- Recommendations – How To Best Manage the PSTN in Transition as an Enabler to Future National Policy Goals

Sub Team Deliverables Outlined in Supplemental Material

Timeline

4/25/2012
Focus Group Kickoff
6/21/2012
Board Meeting
6/12/2012
TOPS Council Meeting
12/4/2012
TOPS Council Meeting
10/16/2012 - 11/17/2012
Finalize Conclusions, Recommendations, and Architecture
4/25/2012 - 6/11/2012
Refine Scope
6/13/2012 - 9/18/2012
Sub-team Work
9/18/2012 - 10/16/2012
Merge Sub-team Work
5/1/2012
6/1/2012
7/1/2012
8/1/2012
9/1/2012
10/1/2012
11/1/2012
12/1/2012
4/25/2012
6/27/2012
TAC Meeting
9/10/2012
TOPS Council Meeting
9/24/2012
TAC Meeting
11/2/2012
Board Meeting
12/10/2012
12/10/2012
Final TAC Meeting

Supplemental Material

Participants

- Alcatel-Lucent
- AT&T
- Cisco
- Ericsson
- GENBAND
- Huawei
- JDSU
- Juniper
- Neustar
- Qualcomm
- Time Warner Cable
- Verizon

Sub-Team Scope's Focus

Define by:

- Network domains
- Key issue areas

Application Services Scope

- Some public policy objectives could take advantage of emerging capabilities to better meet national goals. Further analysis is appropriate for a Focus Group.
  - **Accessibility:** Analysis of future Accessibility scenarios and TRS requirements in Focus Group.
    - Potential to enhance user experience by embracing and extending existing capabilities.
    - PTSC Issue S0068: TRS in IP Networks. FG could be useful catalyst to re-energize this work.
- Many user-perceived important attributes are not explicitly mandated by FCC. In some cases, derived from obligations such as outage reporting.
  - Technology options available to enable the PSTN in Transition, though this may be more or less difficult with any given technology option.
  - Technology options and implications not well understood by everyone (including some people on the TAC).
  - Focus Group will map out PSTN Transition options, articulate dependencies, and identify “smooth transition” paths.
  - Identify strengths and weaknesses of the key options.
    - Objective is not to recommend a specific approach, but to ensure the TAC understands the characteristics of the options that are available

Application Services Scope (cont.)

- Privacy and Security of increasing importance
  - Recommend Focus Group assessment of mechanisms to support security and privacy objectives for the PSTN in transition.
  - New capabilities should also be considered to understand where they create new security and privacy risks (e.g. presence, location and mobility), and where they may offer valuable new capabilities (e.g. identity mechanisms).
  - Consider how existing and future capabilities and regulations would apply to new services, and identify potential opportunities and gaps impacting privacy and security.

Transport Scope

- Managed network interconnect models with bundled signaling and media are well specified.
- There is potential for further focus group work to address:
  - Unbundled managed network models
  - Internet interconnect models
  - Hybrid interconnect between bundled and unbundled models
- Focus Group should conduct further analysis of number translation capabilities, including infrastructure ENUM.
- Aspects of the interconnect models to be addressed include:
  - Corresponding charging and business models
  - Efficient media and signaling protocol interworking
  - QoS (only for managed network models)
  - Optimal media routing (ICE and/or OMR)
  - Secure end party identification
  - Signaling and media integrity and privacy
- Responsibility for the above work might be shared/split between the OTT-LT and the PSTN Transition FG.
- No regulatory issues yet identified, subject to further Focus Group analysis.

Access Networks Scope

- Items recommended for Further Study:
  - Network Limited to voicegrade channels [Issue #1]
    - Inventory the devices that may be stranded
    - Document techniques to continue supporting non-voice services that use the “voicegrade” channel, and where necessary investigate possible mitigation methods
      - Include support for end-to-end DTMF in the analysis
    - Identify enhanced capabilities enabled by PSTN transition
  - Carrier-provided line power for CPE connected to voice lines [Issue #2]
    - Develop a position on how to approach the issue of regulation of this aspect of the transition
  - Analog subscriber side signaling [Issue #4]
    - Address further in conjunction with issue # 1

Policy Scope

- This sub-team will serve as a coordination point for communication with the TAC.
- The following issues were identified as needing further evaluation by a Focus Group
  - Definitions of services and service providers used by regulators
  - Rate centers and LATAs
  - Numbering
  - Carrier of last resort
  - Quality of customer experience
  - The network edge, i.e., location for IP-IP interconnection btwn two service providers

Sub Team Deliverables

Deliverables	Policy	Access	Application Services	Transport
Definitions of PSTN, service categories & service provider types.	☑		✓	
List of Social Policy Goals and relationship to services and service providers (including 911, CALEA, GETS, WPS, Accessibility, USF, Reliability).	☑	✓	✓	✓
Numbering Resources – transition strategy from current NPAs/LATAs/RCs to future network; addressing & routing evolution path; portability.	☑	✓	✓	✓
Inventory of types of CPE dependent on voice grade channels that could be stranded; relative impact based on proliferation and alternatives.		☑		
Assessment of the evolution from CO line powering on CPE, customer expectations and regulations.	✓	☑		

✓ Indicates participant ☑ Indicates Primary Owner(s)

Sub Team Deliverables (cont'd)

Deliverables	Policy	Access	Application Services	Transport
Evolution path and implications covering: baseline services required to meet national policy goals, advanced communication services, and other services dependent on the PSTN.			☑	
New services, capabilities and improvements to national policy goals based on transition from PSTN to Successor networks.		✓	☑	
Inventory of current interconnection models and reference architectures and standards.				☑
Assessment of ENUM and its future role in enabling interconnection.				☑
Assessment of future interconnection models and the impact of new technical capabilities.				☑

✓ Indicates participant ☑ Indicates Primary Owner(s)

Technology Trends

- **Voice is an app**: Voice is evolving to become an application delivered over an IP access and transport infrastructure supporting many services.
  - Access and platform agnostic.
  - More service alternatives for voice and non-voice services.
- **Mobility / Nomadicity:** Regulatory model must acknowledge migration away from fixed end-user locations.
- **Presence and location** are becoming important application enablers but are creating new challenges:
  - How to discover (e.g. 911), and how to safeguard (protect privacy).
- **Service models are changing**:
  - Services provided by cloud-based platforms and delivered over an undifferentiated IP pipe; and
- **Interconnection model is changing:**
  - IP points of interconnection will be fewer (more direct), have less geographic significance, and need enhanced security

Strategic Drivers for PSTN Transition

- Customers are quickly embracing alternative communication technologies that are not part of the traditional PSTN, (e.g., 3G/4G cellular; VoIP; OTT services like Skype...) thus negating the assumption that the current PSTN is the only system supporting our social and economic needs as a nation, and changing the way networks are monetized.
- As such, the Landscape Team will evaluate traditional PSTN services in the "PSTN in Transition", and what the implications will be from both a technical and regulatory perspective. This would include:
  - Functionality: e.g., resiliency/reliability, advanced communication services, accessibility, 911, FAX, alarm systems.
  - Network interfaces and infrastructure for the PSTN in transition, e.g., NNI, services interconnection, numbering.
  - Policy, e.g., universal service, numbering, outage reporting, CALEA.
- Then, from a technology perspective, the Landscape Team will provide an industry view of what our national goals should be, ensuring alignment with the FCC.

Observations for the TAC

- PSTN Transition is an *evolutionary* process, not a network replacement event.
- "Successor networks" will consist of **multiple** interconnected networks supporting a range of IP-based services and applications.
- The impact of this evolution can be applied to two general classes of Regulatory and Policy considerations –
  1. **Basic societal needs**: A set of core regulations that must transition to successor networks.

     (Examples include 911, CALEA, outage reporting, number portability)
  2. **Regulations** developed around the underlying PSTN network model that must be further analyzed.

     (Examples include LATAs, Rate Centers, COLR)

Observations for the TAC (cont.)

- There are other regulations and obligations that will continue to be relevant, but will be altered as a result of new technologies and the marketplace (e.g., Interconnection).
- Some user perceptions and expectations that were linked to the PSTN will be impacted (e.g. CO power).
- This transition has to account for stranded CPE as the access networks transition to successor networks.
- Successor networks may also create new opportunities (e.g. to improve accessibility for persons with disabilities).
- Further analysis based on use cases and focus groups is the next logical step to assess the bounded set of key issues.