USER FREEDOM TO ATTACH DEVICES

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goal: “Internet of Things”

- user ability to connect devices
- interconnection + interoperability
- shared control between ISPs and users

telecom law

telecom economics

networking technology
current status: wired telephone networks

- **legal right** of users to attach non-harmful devices (Part 68 regulations)
- competitive market for devices
  - phones
  - answering machines
  - modems
current status: cable & satellite

- cable set-top boxes
  - legal right of users to attach non-harmful devices (CableCARD)
  - but hasn’t kept up with technology

- satellite set-top boxes
  - no such legal right

- competitive market for devices?

- user ability to run apps?
  - fights over control of “desktop”, search, ...
current status: wired broadband Internet

▪ Open Internet Order
▪ includes “any device” rule
  ▫ legal, non-harmful devices (but doesn’t define “harm”)
  ▫ unless “required for network management” (but doesn’t delineate what is required)
▪ includes “any app” rule
  ▫ unless “required for network management” (but doesn’t delineate what is required)
▪ DSL & cable modems
  ▫ competitive market
current status: cellular

- devices:
  - no legal right of users to attach non-harmful devices
    - users obtain almost all devices from service provider
    - locking
  - competitive market for devices?
    - device subsidies

- apps:
  - Open Internet Order only prohibits blocking competing voice & video apps
  - providers often cripple device functionality
convergence

Telephone network

Cell phone networks

Cable tv networks

Internet

Everything-Over-IP
current status: converged networks

- residential gateways
  - Verizon FIOS offers gateway, but user can substitute with own
  - AT&T U-Verse requires use of their gateway, includes mandatory use of firewall, DHCP, NAT for residential network

- set-top boxes
  - confusion at FCC ...

- smartphones
  - confusion at FCC ...
proposal: user rights

1. connect any legal non-harmful device
2. run apps of their choice
3. choose a communications provider in a competitive marketplace
proposal: provider rights

1. charge for communication services
2. use reasonable network management
3. forbearance when regulation is not necessary to ensure user rights
proposal: demarcation point

- where do the provider and user networks interconnect?
- proposal: require a standardized interface
  - examples: RJ11 jack, coax cable junction, RJ45 Ethernet jack, GSM, CDMA, LTE, Wi-Fi
proposal: demarcation point
proposal: any device

- what devices should the user be able to put on their side of the demarcation point?
- proposal: any legal non-harmful device
- two options:
  - non-harm verified by independent body
  - connect through protective circuitry
- implications:
  - user would be able to choose residential gateway
  - user would be able to choose satellite set-top box
  - user would be able to choose smartphone
current status: device management

- which functions on which devices should the service provider be able to control?
- cable & DSL modems: provider controls layers 1-3 plus selected layer 4-7 functions of provider interface
- set-top boxes: provider controls layers 1-3 of provider interface, plus menus & navigation
- smartphones: provider controls layers 1-3 of air interface, plus may cripple apps
Proposal: Gateway

- Which functions on which devices should the service provider be able to control?
- Proposal: Define “gateway” as first layer 3 device into user’s network
- Proposal: Service provider may only control
  - Layers 1-3
  - + Layer 4-7 functions required for network management
  - Of devices in between demarcation point and provider’s interface of gateway
  - Unless user gives consent
proposal: gateway
proposal: reasonable network management

- proposal: a network management practice in a user’s network is reasonable iff:
  - the user has control over the use of the practice, or
  - practice controls QoS on the basis of reasonable payment
  - (see other papers on traffic management practices used in ISP’s network)
tech + policy

parting advice:
- don’t just consider technology
- consider law
- and economic motivation