Charter

• In the Open Internet R&O (and in the NPRM that proceeded it), the FCC introduced the concept of “specialized services”. We are asked to:
  – Clarify and agree on the meaning of this term.
  – Review and advise on the criteria that define it.
  – Offer advice on the issues that might be of concern to the FCC as IP-based specialized services become more common.
Why are specialized services of interest?

• Broadband providers could label a service as a "specialized service" to evade the OI rules.
  – To consider this issue, we must clarify the distinction.

• Broadband providers may constrict or fail to continue expanding network capacity allocated to broadband Internet access service to provide more capacity for specialized services. (p. 61)
Defining specialized services

• Specialized services: services offered by broadband providers that share capacity with broadband Internet access service over providers’ last-mile facilities

• Examples: facilities-based VoIP, IP video (p. 61), e-reading services, heart rate monitoring, energy sensing (p. 33)
Clarifying the definition

• (We detected considerable confusion in this context.)

• It is our understanding that:
  – Specialized services is a term that is meaningful only within the context of the OI R&O.
  – It is a way to talk about “anything else” that is IP-based over a physical access path.
  – It is NOT a new category of service for which a class of regulation is applicable.

• This is our working definition.
Implications

• Within the category of specialized services, there may be services that are subject to specific regulation under some other law or order.
  – VoIP, Video, etc.

• The OI R&O does not change any of that.

• This definition is relevant with respect to answering only one question:
  – When does a service cease to be a specialized service and fall under the requirements of the OI R&O?
Defining the boundary of the OI order

• The OI R&O can be read to suggest two criteria. They suggest a service is NOT a specialized service, and therefore is subject to the OI R&O if:
  – The service is a general service—e.g. a service like IP on which higher-level services can run, and
    • As opposed to a specific “user-level” service like telephony or home security, which is presumably a specialized service.
  – It reaches most or almost all of the end-points of the Internet.
    • E.g.—one cannot evade the R&O by offering an Internet-like service that cannot reach a small country somewhere.
Our task (1)

• The two criteria on the previous slide were derived from a reading of the R&O.

• Our task should be to decide if these are good criteria.

• Our proposed approach is to use case studies.
  – Abstract argument may not be effective.
  – Specific cases may be better suited to test the criteria.
Example case studies

• IPTV Settop boxes
• Home Security monitoring, sensor net, IOT
• Home medical monitoring
• Access for management of critical infrastructure
• MetroE/Managed VPN services to the home (company pays)
• 3rd party purchasing of services for their customers (e.g. games—see Eve Online discussion later)
The capacity issue

• A high-level goal (as articulated by the FCC).
  – Providers of higher-level services should be able to innovate without concerns about a gate-keeper.

• One goal of the OI R&O is to protect this free innovation in the context of the public Internet.

• Question: does the fact of specialized services (running on IP but NOT the public Internet) raise concerns with respect to this goal?
The concern

• Specialized services, sharing the underlying access capacity, could compete with the Internet for capacity to the point that material classes of Internet applications are not viable.
  – Also called the “dirt road” future for the Information highway.

• This issue does not relate to any specific specialized service, but the overall character of the innovative space.
  – Are there competitive concerns that arise from the way the underlying capacity is managed?

• Must monitor and measure that providers manage capacity and service levels provided to the consumer.
  – Current efforts include Measure Broadband America and Form 477.
How to think about this?

• One approach: define how much Internet is “enough”.
  – A very difficult problem, made more difficult by the change in the definition over time.

• Another approach: compare what can be done using a specialized service vs. the public Internet.
  – Does not imply the two must be equivalent.
  – Potentially makes the discussion more complex, since a specialized service may have enhanced QoS, not just raw capacity.
A capacity conundrum

• In the next decade, much of “TV” will migrate to IP.
  – Cable technology shift from QAM to DOCSIS.
  – Much of Telco TV is currently on IPTV today
  – Based on our current definition, IPTV is a specialized service
• “Traditional TV” consumes a large majority of the overall capacity of a provider’s access system.
  – No way that today’s access systems could allocate equivalent capacity to Internet access for the use of OTT providers.
• “Traditional TV” is getting lots of competition from OTT video providers, but with different capacity allocations.
  – So looking at relative capacity of the allocation to specialized services and the public Internet does not seem helpful.
  – No obvious bright line here...
Another conundrum

• Imagine a cable system today that does not choose to offer Internet.
  – Might seem like poor business sense, but lots of small franchises do this today.
  – Similar issue could apply to DSL and satellite.

• If they decided to offer a “poor” Internet service, would we view this as:
  – Better than nothing.
  – Unacceptably slow.
    • Perhaps they can call it Internet but not broadband?
A QoS example

- VoIP vs. VoInternet.
  - Facilities-based providers of modern telephony today use packet-based VoIP, not circuit switched legacy.
    - Cable over DOCSIS, telephone providers over FIOS or Uverse.
    - This is a specialized service, over IP but not over the public Internet.
  - In contrast, VoInternet.
    - Vonage offers Voice over the public Internet.
    - Skype offers a (closed) voice/video product over the public Internet.
  - Should the FCC be concerned that these OTT providers do not have access to the QoS of the VoIP offerings?
Another QoS example

• One of the creators of the online game Eve said that he would be willing to pay ISPs to give his game an assured QoS.
  – Both the provider (EVE) and the consumer might like this outcome.

• Today, we view the lack of QoS on the Internet as a leveling of the playing field.
  – Is this a good idea or a barrier to innovation.

• If EVE came to major ISPs and arranged that EVE be delivered to consumers over a specialized service, would this change our thinking?
Our task (2)

- Advise the FCC as to when the overall offering of specialized services and public Internet raises competitive concerns.
Points of agreement

• Regulation should not create a perverse incentive for operators to move away from a converged IP infrastructure. Using IP should not imply a regulatory burden related to any regulation of the Internet.

• A service should not be able to escape regulatory burden, or acquire a burden, by moving to IP.

• Proposals for regulation should be tested by applying them to the range of technologies now being used for broadband. To the extent possible, regulation should be technology-neutral. (There are painful edge-conditions to this principle.)