

Characteristics of Wireless Networks

Change is Constant...multiple generations, revisions of a generation, & upgrades in a revision
→ Impractical to track network management mechanisms in a timely fashion for regulatory needs

Network Characteristics & Policy Implications

Dynamic Radio Channel, Ever-Changing Networks, Variety of Apps, & Shared Radio Resources → Impractical to quantify any truly verifiable performance guarantees

Inherent Differences between Wireline and Wireless Networks

Characteristic	Wireline	Wireless
Communications Channel	Relatively clean with signal regeneration	Impaired with noise, interference, multipath, and blockage
Bandwidth	No spectrum limitations	Severe Spectrum limitations
Mobility	None	Constant, complex, often unpredictable, and often consuming extensive resources
Security	A lesser concern due to the physical path between the provider and the user (buried or on aerial infrastructure).	A greater challenge due to the possibility of tracking a user and variety of interfaces
Response to Capacity Demand	Capacity increases may be feasible, although soaring demand and increasing congestion issues may call for additional pricing, bandwidth limitations, and prioritization mechanisms.	Primarily managed dynamically through prioritization, scheduling, and power allocation.
Network Complexity	Relatively simple	Extremely complex
Network Stability, Deployment, and Maintenance	Comparative stable platform and systems, although high growth in demand and new applications are issues	Extremely dynamic platforms and systems. Deployment and maintenance require constantly dealing with real estate acquisition and zoning issues; Planning and maintenance are more difficult, and continuous maintenance and frequent resetting of network parameters required; Infrastructure changes to address localized capacity issues have ripple effects through adjacent cells.
Quality of Service	Easier to implement due to availability of higher capacity and predictability of resource requirements	Quite difficult to implement due to variable capacity, unpredictability of resource requirements, and existence of proprietary mechanisms; Industry moving towards IMS and PCC.

Differentiation: A MUST for the Wireless Network

User Differentiation: Channel Conditions

- Good channel: higher data speeds
- Poor channel: lower data speeds
- Network management needs to differentiate among users experiencing different channel conditions to increase aggregate speeds for ALL users

User Differentiation: Resource Consumption

- From excellent to poor channel conditions, resource consumption can increase by a factor of 36 for a user, starving other users
- Network management needs to differentiate among users to satisfy needs of all users

Differentiation

Cost of “No Differentiation”

More blocked calls and reduced data speeds

Service Differentiation: Quality of Service

- Different services such as web browsing and voice calls need different Quality of Service
- Network management needs to differentiate among user services to optimize overall user experience of these services

Transparency

- **The Transparency Rule**

- The FCC should retain, but not expand, the existing transparency rule.
- The proposed expanded transparency requirement of network performance including throughput, congestion and peak load management would be meaningless and potentially confusing to a subscriber as these metrics are monitored and changed on a millisecond by millisecond basis.

Transparency Rule & Wireless Networks

Network Management

Proprietary product differentiators; Disclosure would reduce innovations and degrade user experience

Additional Disclosures

Proprietary product differentiators; Disclosure would reduce innovations and degrade user experience

Challenges of Additional Disclosures

Expanded Regulation Would Harm Consumers

- An expanded No Blocking Rule would inhibit wireless providers from managing their networks. Determining a “Minimum Level of Service” for the variety of communications and circumstances within the wireless network is infeasible.
- An Anti-Discrimination/Commercial Reasonableness Rule would inhibit mobile providers from differentiating network traffic and introducing differentiated offerings in the marketplace.
- Applying a one-size-fits-all regime would reduce consumer options.

**A Reasonable Network
Management Exception Cannot**

Competition Delivers for Wireless Consumers

“The American consumer has been the beneficiary: new pricing and new services that have been spurred by competition.”

-- Prepared Remarks of FCC Chairman Tom Wheeler, 2014 CTIA Show, Las Vegas, NV (Sept. 9, 2014)

- Mobile Broadband Speeds: Increased 8 times over since 2010
- Mobile Broadband Prices: Dropped 93% between 2008 and 2012
- Consumer Choice: 92% of Americans are served by 3 or more mobile broadband providers (as compared to 15% for wired providers)

“Competition today is driving enormous benefits in the direction of the American Consumer.”

-- Remarks of Bill Baer, Assistant Attorney General, Antitrust Division, U.S. Department of Justice (Jan. 30, 2014)

Title II Would Jeopardize the Mobile Marketplace's Dynamism, Deter Investment and Innovation, and Harm Consumers

- Section 332 bars the FCC from reclassifying mobile broadband into a common carrier service.
- A Title II regime would subject mobile broadband to a host of inappropriate regulations, eviscerating the ability to innovate and suppressing investment.
- Forbearance associated with a “third way” approach would itself be extremely risky.
- No matter how the Commission effectuated reclassification, it would be subject to years of litigation, extending uncertainty and harming consumers.

**Mobile Broadband Is A Single
Integrated Information Service**