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IMPACT OF COMMUNICATIONS LAW AND ECONOMICS UPON NETWORK ARCHITECTURE

Economics? Why me?

- When network researchers don't think about how Economics affects deployment ...
 - We create protocols that ignore the **motivations of the players** that **might** deploy them
 - "QoS is dead"
 - Not!
 - Why did it take so long?
 - Comcast used DPI to **terminate** selected file-sharing connections.
 - What should they have done?
 - Why didn't we help them?

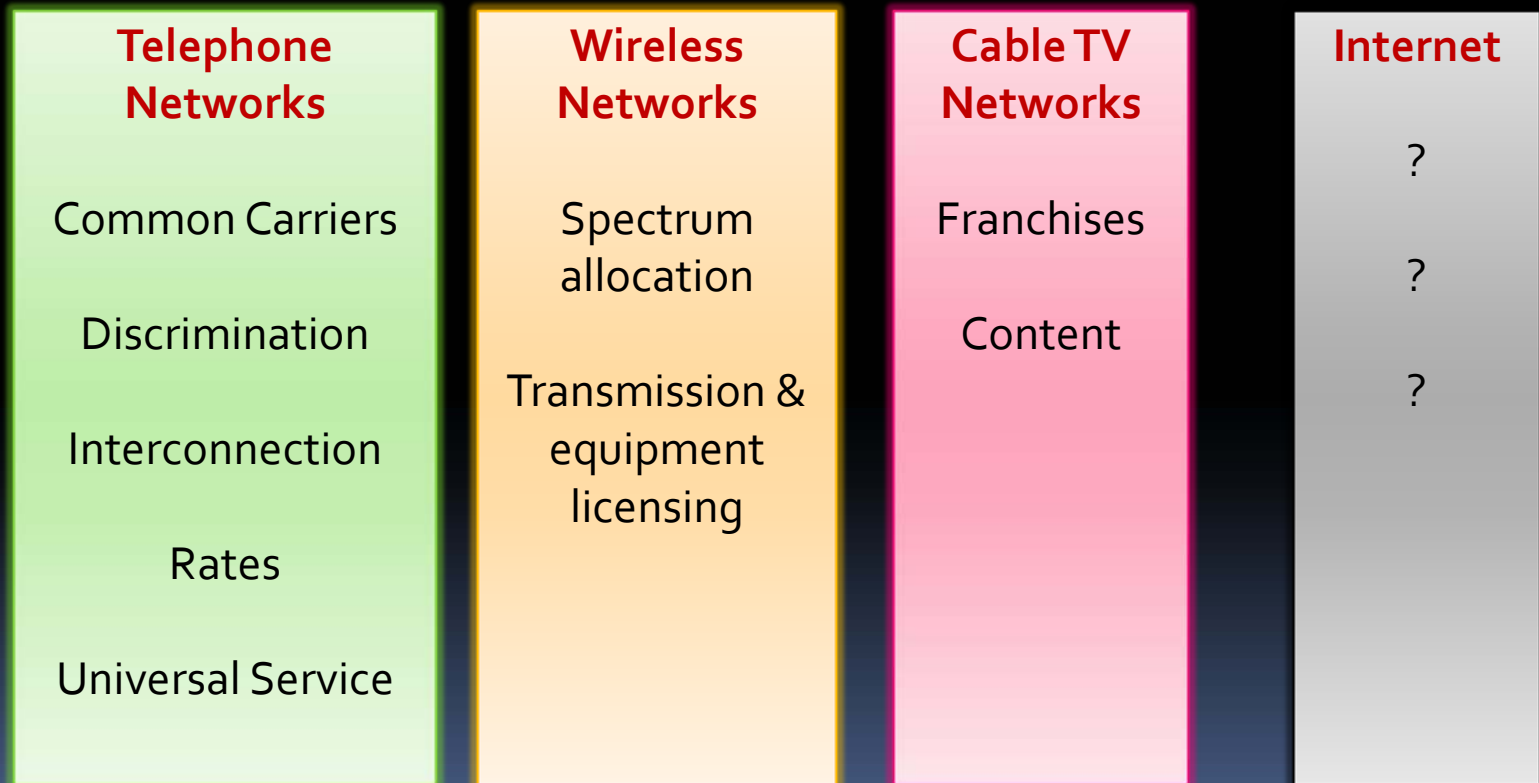
Law? Why does this matter?

- When Internet public policymakers & regulators don't understand how the Internet works ...
 - Senate Commerce net neutrality markup
 - Congress could **outlaw** QoS
 - Or they could allow ISPs to **withhold QoS** from their competitors
 - Or ... ??

Law? Why me?

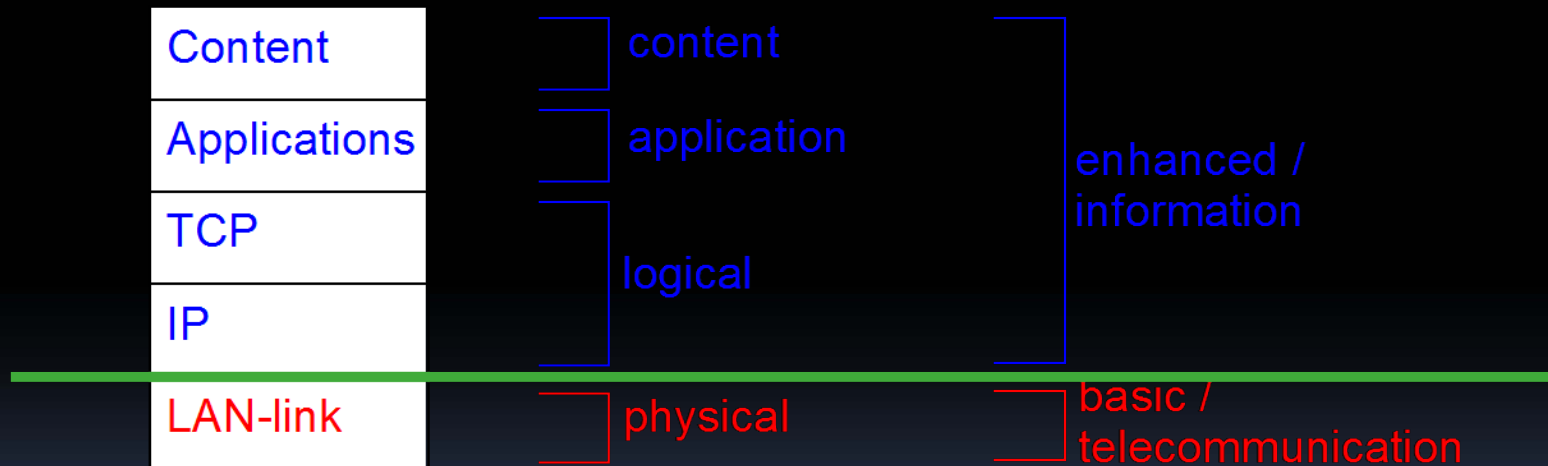
- When network researchers don't understand how Internet policy & regulations are made ...
 - We create protocols that ignore how Congress/FCC/Courts will **regulate** the networks & services
 - ISPs are using QoS to give priority to their own VoIP traffic, and **not to competitors**.
 - Is this what we intended?

A Regulator's View



Layers?

- A regulator's view of layers



Layers?

- A economist's view of layers



The diagram illustrates a two-layer network architecture. It features two horizontal bars representing layers, supported by vertical pillars. The top layer is labeled 'Applications (voice, video, email, web, ...)' and is associated with a blue bracket and text indicating 'Many providers due to low barrier-to-entry'. The bottom layer is labeled 'Physical Infrastructure (lines, equipment)' and is associated with a red bracket and text indicating 'Few providers due to high barrier-to-entry'. A horizontal dashed green line separates the two layers. The pillars are represented by textured rectangular blocks.

Applications (voice, video, email, web, ...)

Many providers due to **low** barrier-to-entry

Physical Infrastructure (lines, equipment)

Few providers due to **high** barrier-to-entry

Tenets for FIND researchers

#1

Pay more attention to the
motivations of Autonomous Systems

Tenets for FIND researchers

#2

Pay more attention to the **motivations** of
ISPs

vs. application providers

vs. users

e.g. the **interface** between network & transport
layers

and the **interface** between the application
provider and the user

Tenets for FIND researchers

#3

Don't presume you know what the user wants

Tenets for FIND researchers

#4

Empower users to make their own choices

Examples

- Traffic management:
 - Use DPI to terminate “low priority” sessions?
 - Use DPI to delay or smooth “low priority” sessions?
 - Let the user decide what is low priority and how to treat it!
- Net neutrality:
 - QoS within walled gardens only?
 - QoS at exorbitant prices?
 - QoS decided by ISP?
 - QoS decided by application provider?
 - QoS decided by user!