

**Telecommunications Services,
Information Services
The (De)Regulators' Dilemma**

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Disclaimer

The opinions expressed in this talk are those of the speaker and do not represent official FCC policy or the views of the Commissioners.



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Riddle for the Audience

Suppose the Internet existed and the telephone didn't.

Now suppose A. G. Bell, IV, invented the telephone.

Would voice be an information service?



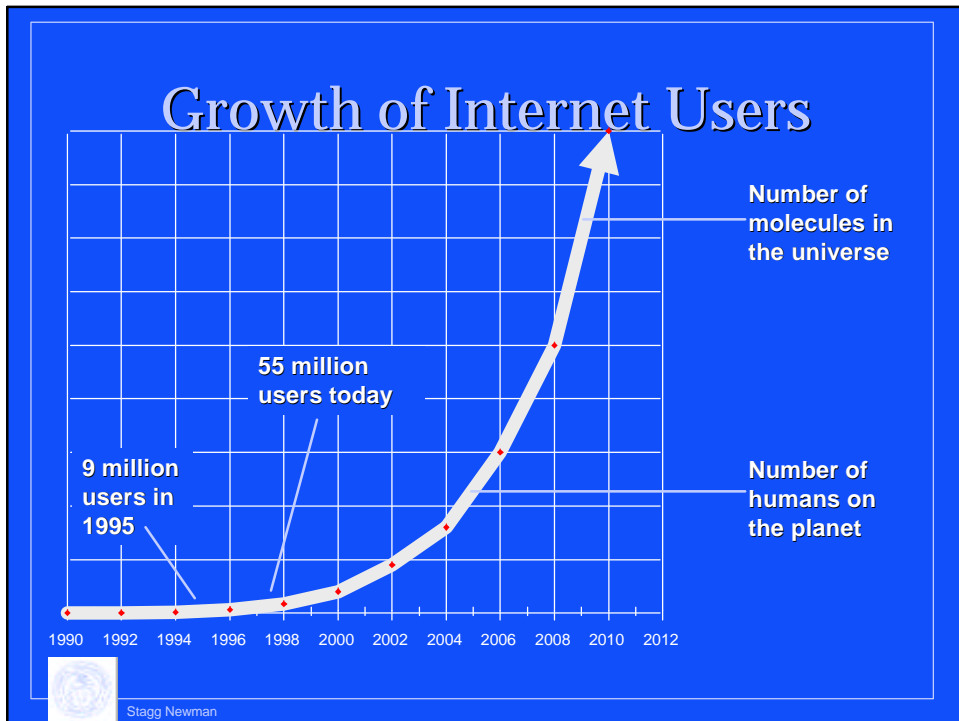
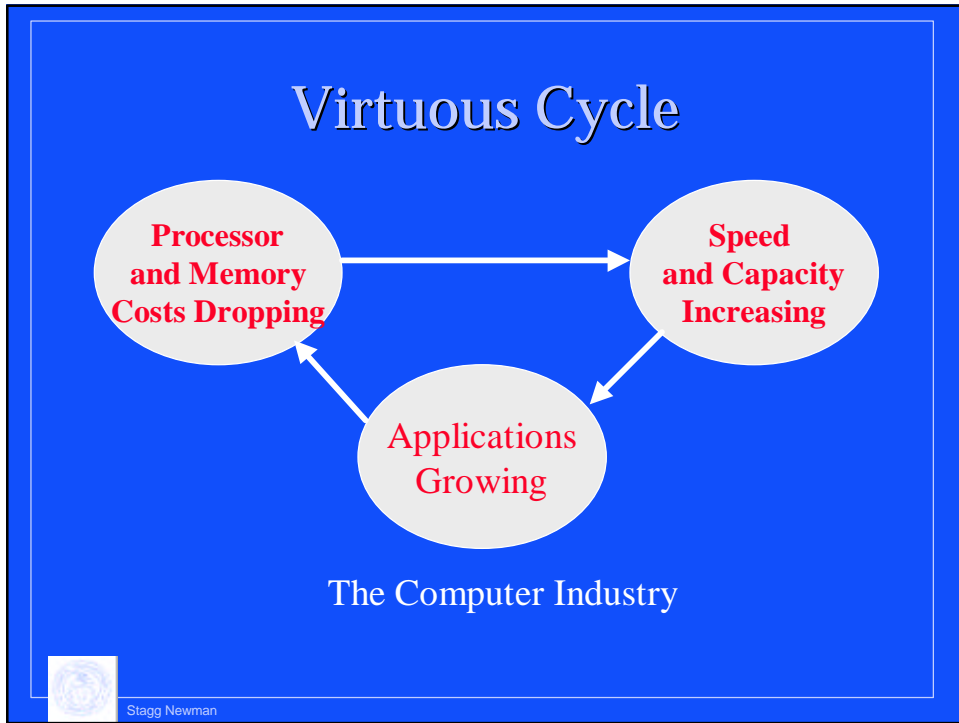
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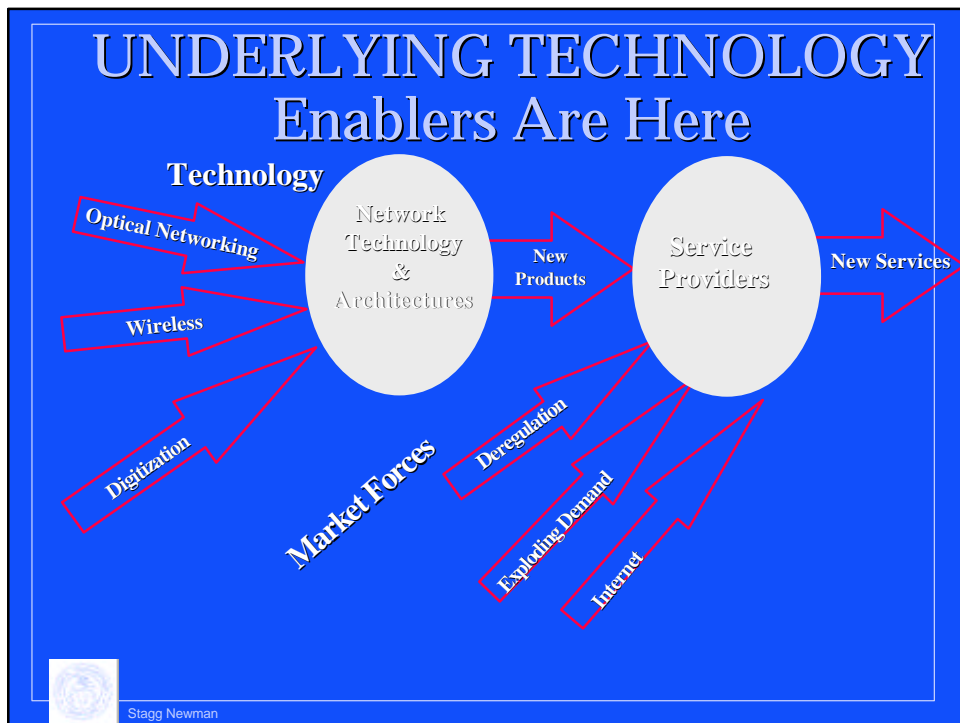
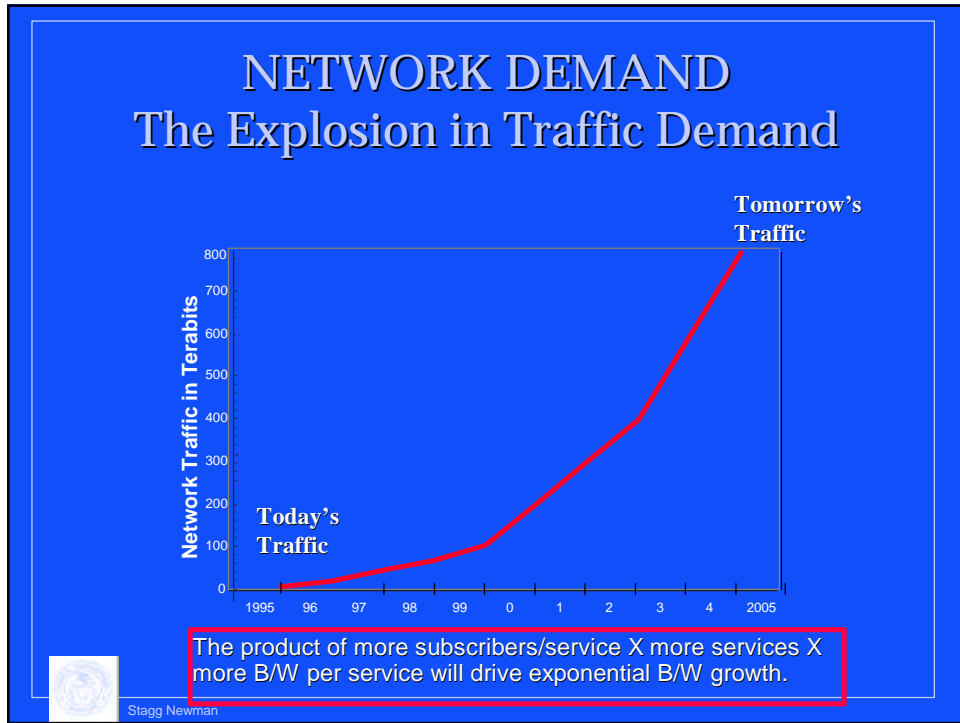
Outline

1. **Technology and Markets Obsolete Regulations**
2. Overview of Regulatory Issues & the FCC
3. Telephony Contrasted with the Internet
4. A Hypothetical New Model



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END-TO-END NETWORKING Customer Care The Achilles' Heel?

What is the Right Business Model?

US Exchange Carriers charge about \$5.00 per year to maintain telephony inside wiring and spend <\$200 per year per customer on operations, administration, and maintenance

The average business desktop costs several \$1000s/year to maintain

Multi-Tier media mass market networks have aspects of each.

Where in between these extremes is the truth?



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NETWORK DEMAND Parallels with the Computer Industry

“Free” MIPS is to the Computer Industry

as

“Free” B/W will be to the Communications Industry

The desperate search for bandwidth is generating billions of investment in the latest technology that will destabilize the industry.



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Convergence???? Digital Destabilization - Yes!!!

Technology Outpacing Regulation is not new,
but

- The pace of change is accelerating
- All boundaries are being destroyed
- Competition is accelerating
- Intelligent Networks and Smart boxes allows exploitation of regulation



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Digitization Hypotheses

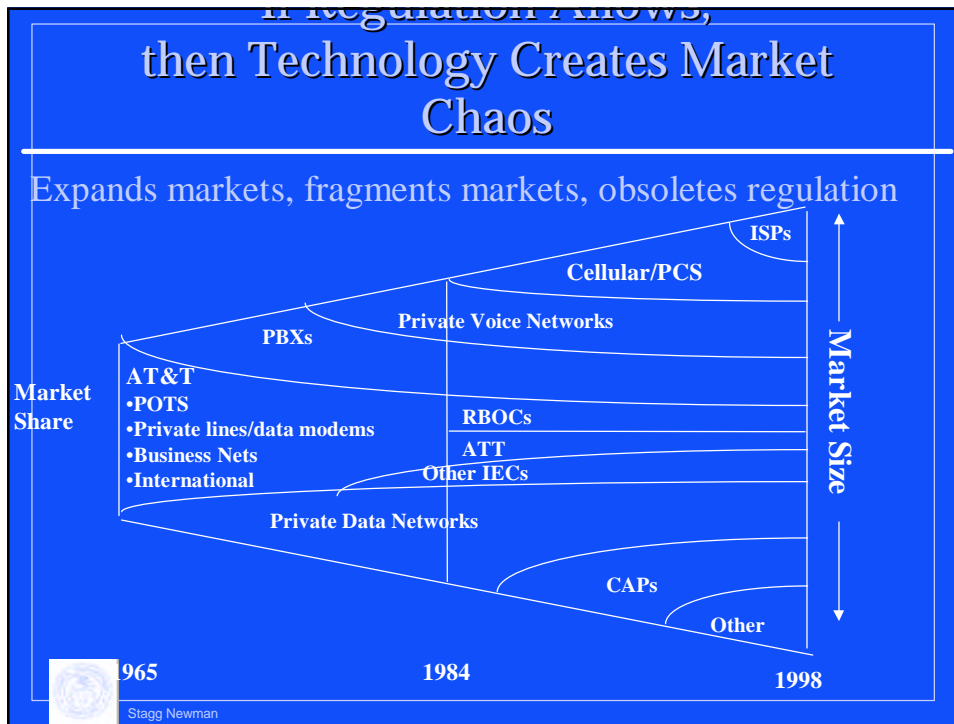
The introduction of digital technology into
a market creates competition and
obsoletes regulation because of:

- » Exponential destabilization of Price/performance
- » Reduced costs of entry
- » Enhanced feature differentiation
- » Power of microelectronics, S/W, radio, and photonics come together

*Regulated Communications Regimes Are
All Going Digital*



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~~Digitization Destroys~~
Compartmentalization
A bit does not know how its regulated.

- A Bit does not know if its Broadcast, Cable, Telephony, Computer Networking, or Electronic Print
- Bits can be transmitted over cable, satellite, terrestrial radio, power line carrier, copper or fiber
- Bits can be readily stored
- Bits can be processed anywhere
- Smart boxes and smart people can readily manipulate bits to: exploit regulation, arbitrage tariffs, and circumvent geography.

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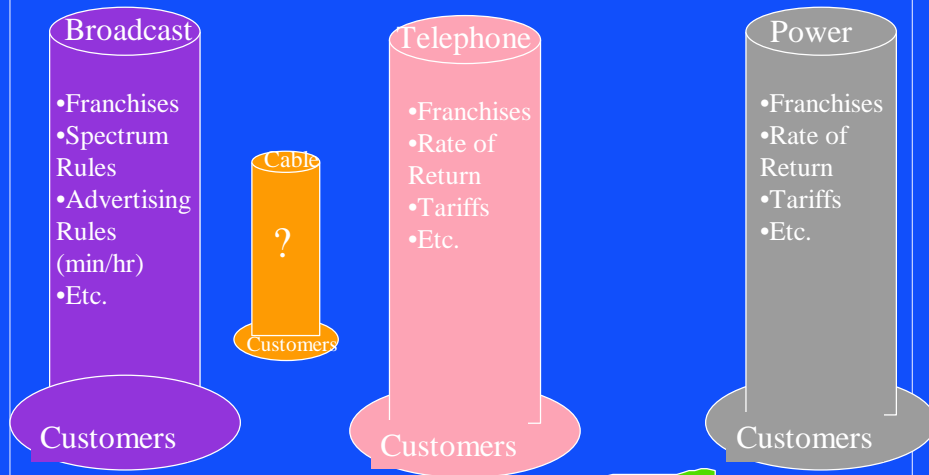
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Regulation of Standalone Industries (Silos) *The regulatory regimes in countries circa 1995.*



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Computers - The World of Bits - No regulations

Old Rules and New Realities

- Old Rules based upon industry and regulatory silos
- Old Rules based upon non-competitive model
 - » Assumed natural monopolies or regulated oligopolies
 - » Protecting incumbents
 - » Barriers to entry
- Defined industry and service boundaries
- Consumer protection through rate regulation
- Government decides winners and losers



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Regulatory Treatment of the Internet Worldwide

Increasingly Controversial

- In most countries Internet access treated as an "info service"
- But what about IP Telephony
 - » **Incumbent telcos:** "IP telephony is functional equivalent of traditional telecom. Providers of IP telephony should be subject to telecom regulation"
 - » **Internet community:** "Do not impose archaic regulatory framework on emerging technology."
- More questions w/ Fax, streaming audio/video,

.....



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The Report to Congress on Universal Service *The Internet Sections (a struggle with convergence)*

- **No Intent to Regulate the Internet**
- **Telecom Services & Info Services**
 - » Mutually Exclusive
 - » Enhanced Services = Info Services
 - » (Not in report - ATM tariffed as telecom svc)
- **Internet Access Providers are ESPs**
- **Provision of Transmission for Internet**
 - » Underlying transmission is Telecommunications
 - » Purchase of Telecom Svcs by ISP contributes to US Fund
 - » Contribution by Self Providing ISPs not *currently* required



Status of IP Telephony

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Difficult Questions

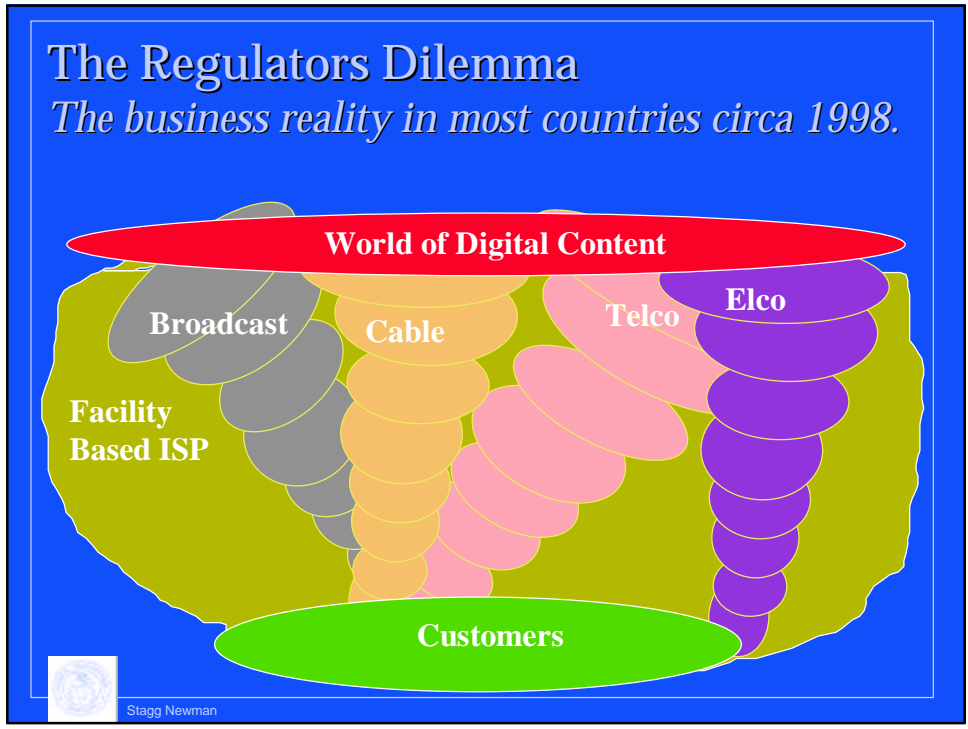
Regulators Worldwide Struggle for Answers

- **What is a telecom service, what's not?**
 - » If point-to-point data transmission is a telecom service,
 - » then is a wavelength in a DWDM system a telecom service;
 - » but then is ATM transport a Telecom service;
 - » but then is transport of IP packets a Telecom service;
 - » but what if the ISP caches, multicasts,
- **What if different industries offer the same service?**
 - » ISP access using IP directly on top of DWDM on fiber as a **CLEC**
 - » ISP access using ATM on top of ADSL as an **ILEC**
 - » ISP access using ATM with cable modem as a **Cable Operator**
 - » ISP access using modified ATM via **Satellite Operator**
 - » ISP access using private lines as a **Private Operator**



How do universal service and competition coexist?


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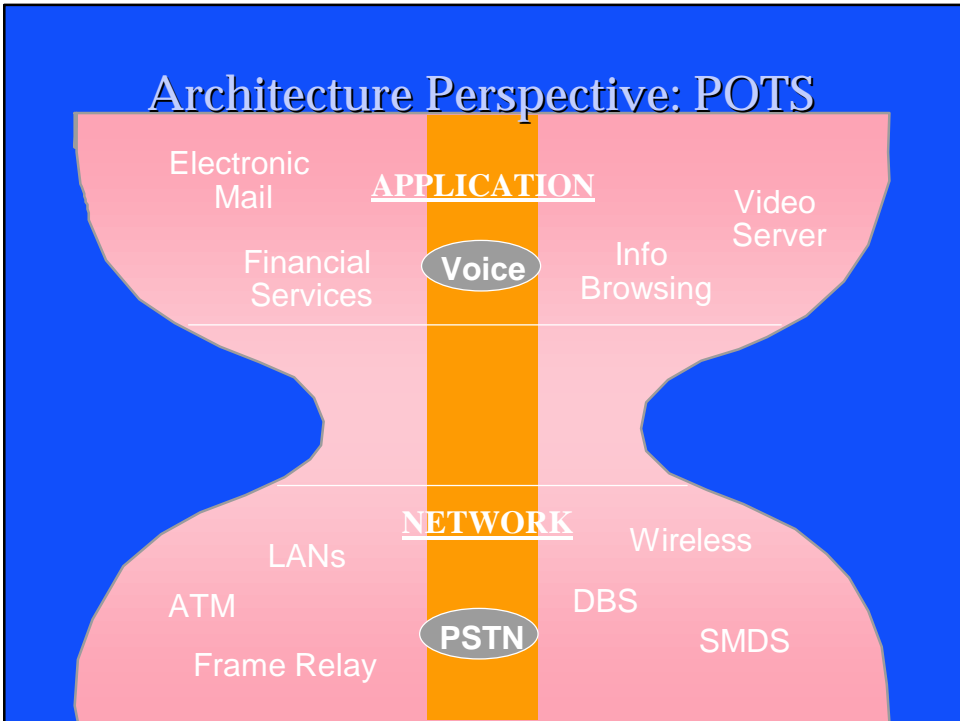
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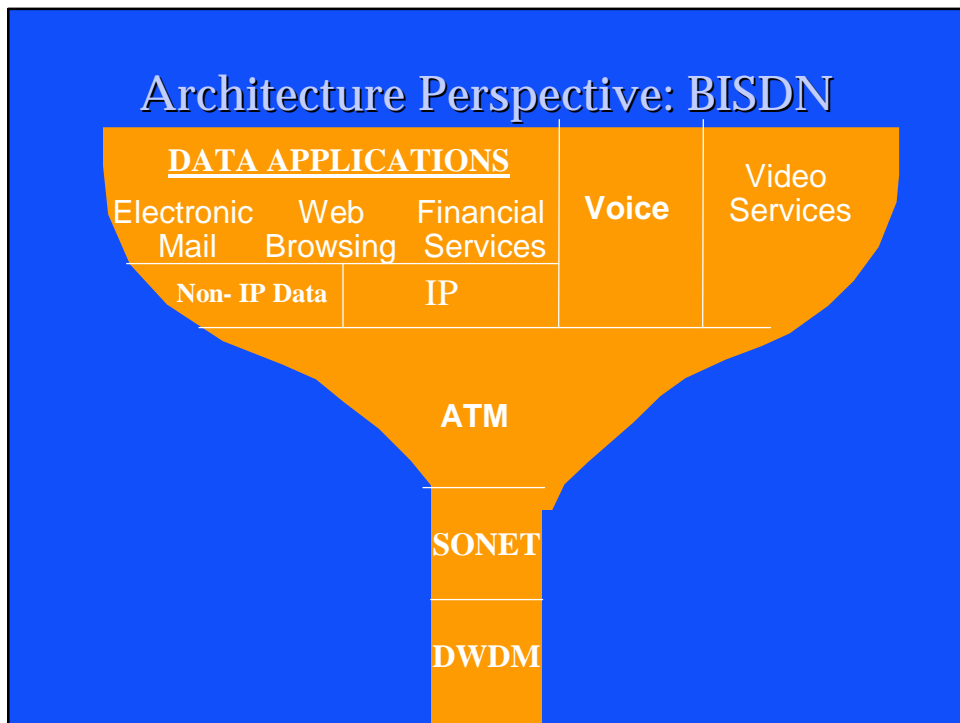
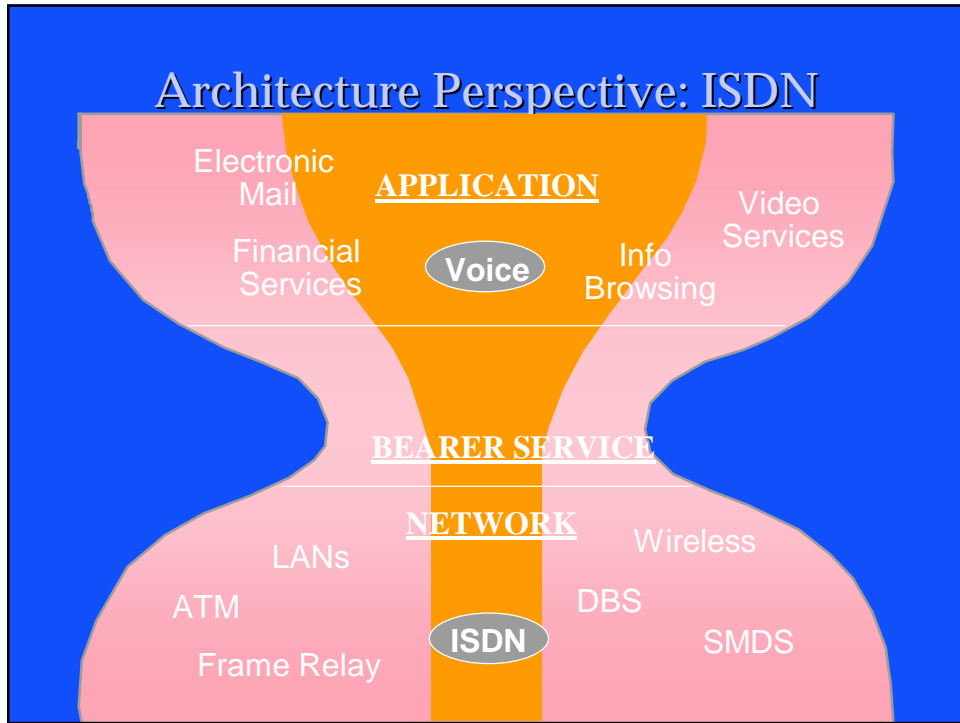
Today's Common Carrier Regulations

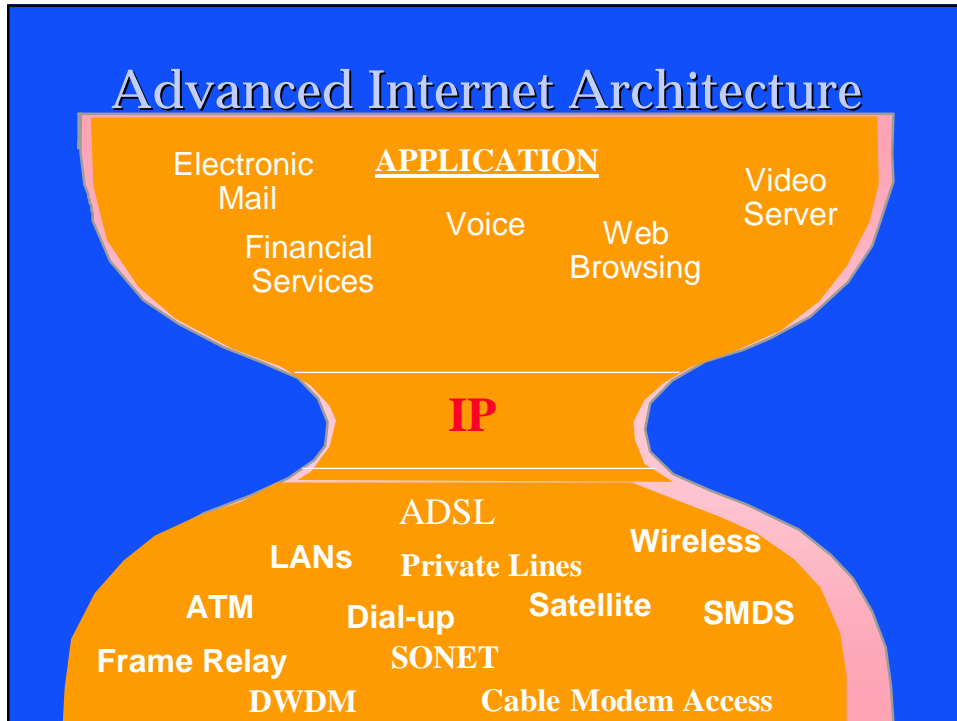
- What about interconnection?
- What about access?



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The Paradigm Shift

- Moving from circuit-switched voice to transport independent open networks (e.g TINA-C Model)
- Decoupling network transport from services
 - » Users benefit immediately from rapid innovation in software, rather than waiting for extensive switch upgrades
 - » Ability to take advantage of scale economies at the edge of the network
- Voice as one form of data, rather than data struggling through a voice
- Traditional regulatory, policy, and business models no longer work



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Convergence and Divergence

Technology will enable

(convergence)

- Many different services (under different regulatory regimes) offered by one provider
- The same service offered by many different providers (under different regulatory regimes)

(divergence)

- Many different architectures with many possible different contentious points of interconnection and access



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Chaos Isn't All That Bad

- Chaos theory: Complex systems can self-organize
- Benefits of decentralization
 - » great flexibility
 - » allows dynamic growth and evolution
 - » reduced need for (potentially cumbersome) central control
- **Difficult or impossible for one firm to dominate**
 - » new, unexpected competitive alternatives
- With proper incentives, solutions will emerge to meet demand
- Chaos leads to opportunity for the nimble



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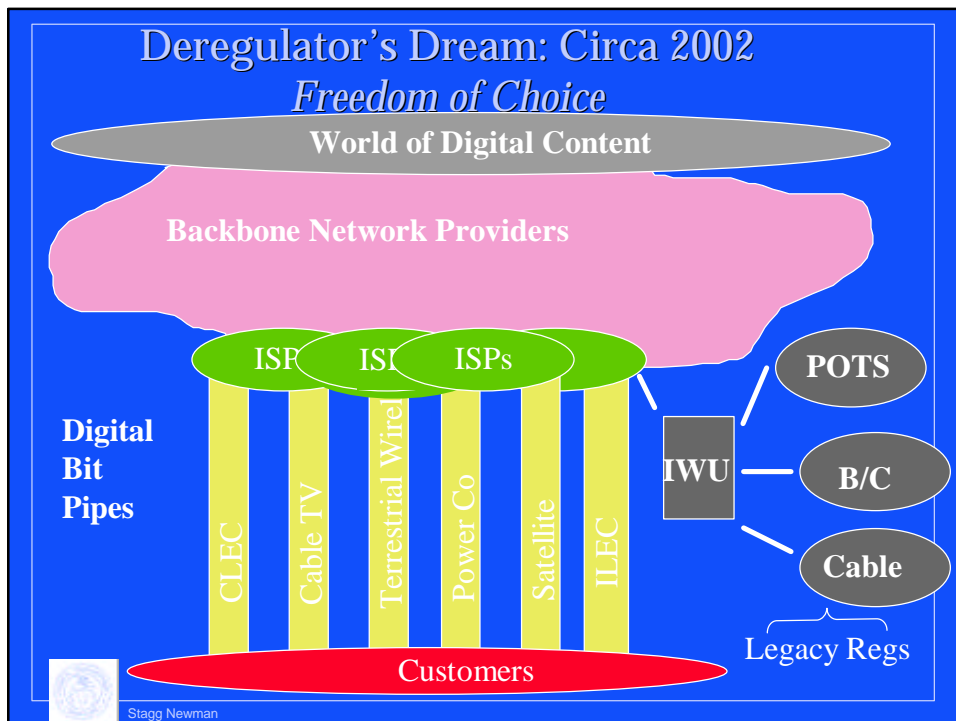
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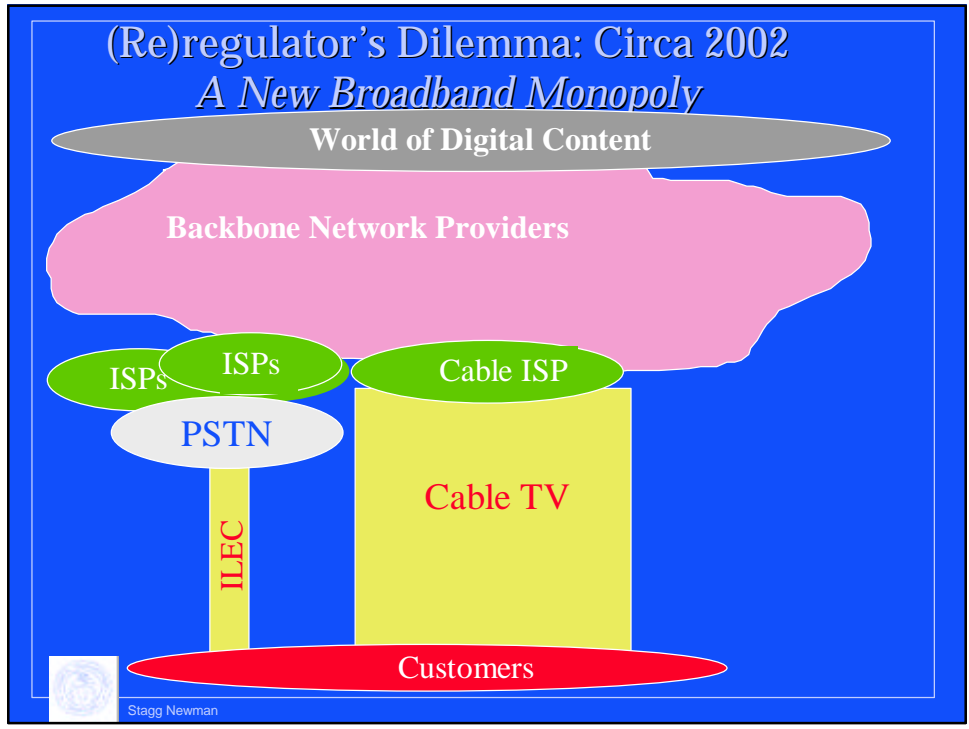
(De) Regulator's Dream

- IP separates Services Layer from Digital Access
- Services Layer is fully competitive
- Customers have many choices of ISP
- Customers have many choices of Digital Access



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The \$64 Billion Question

- What can regulators and policy makers do to encourage the the Deregulator's Dream so that they are not faced with the need for reregulation in the future?

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Possible Actions My thoughts

- Eliminate regulatory uncertainty
 - » clarify telco services, info services distinction
 - » not regulate self provided or privately procured transport facility based ISPs
 - » create roadmap for forbearance
- Continue to open traditional markets
- Continue to eliminate hidden cross subsidies
- Optimize spectrum policy for wireless internet access
- Eliminate barriers to new infrastructure and develop w/ state/local gov. best practices
- Champion open interfaces defined by industry groups (e.g. TINA-C) instead of government regulators



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Conclusion

- Bandwidth is the fuel for the coming explosive growth of the Information Society.
- The chaos of the free market is the best way to meet the thirst for bandwidth.

**The challenge: Finding the best way
to DEREGULATE**



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For More Information

FCC Web Site
<http://www.fcc.gov>



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