Network Neutrality: Why We Should Care

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Two Different Questions

Netheads: How do we change network service provisioning so the Internet survives?

Telcos and Cablecos: How do we change the Internet so we survive?

Common Problem: How to build and operate a sustainable Internet.
The Internet is Better

Internet > application-specific networks!

- application discovery
- market discovery
- edge locus of control
The Internet brought us . . .

- email,
- the Web,
- e-commerce,
- audio-on-demand,
- video-on-demand,
- blogging, podcasting, vlogging,
- Internet telephony,
- massively multiplayer online games,
- et cetera, et cetera, et cetera

? (more in the future)

Telcos didn't create these -- we did

Because the Internet is a Neutral Ne
and let's not forget . . .

- freedom of speech,
- freedom of the press,
- group-forming (freedom of association),
- routes around censorship (to a first approx)
- other freedoms . . .

"There's divinity in it"

Professor Charles Nesson
Berkman Center for Internet & Society
Internet Improvement ~= Moore's Law

Packet Loss Seen from ESnet

http://www.slac.stanford.edu/xorg/icfa/icfa-net-paper-jan05
Internet Improvement ~= Moore's Law,

TCP throughput measured from N. America to World Regions

From the PingER project, Jan 2005

50% Improvement/year
factor of 10 in < 6 years

http://www.slac.stanford.edu/xorg/icfa/icfa-net-paper-jan05/
In other words . . .

The Internet is doing fine despite:

– It is growing without limit
– It is getting better as technology improves
– Nobody owns it
– Nobody plans its growth
– There's no business model, ROI, etc.
Big Accident

Telcos, cablecos, and cellcos -- the Internet access providers! -- will be hurt the most by the growth of the Internet.

"Network-resident" applications that run on special-purpose networks will be disrupted.
The Internet "Problem"

• "If AT&T knew what was good for it, it would kill the Internet." -- 1993
• "The Internet can't route money." -- 1997
• "Email is a feature that nobody pays for . . . AT&T needs 'network resident' applications." -- 2003
• "They're not going to use my pipes for free." -- 2006
Telcos in Crisis

Telephone Penetration
Households

Source: FCC December 2005 Universal Service Monitoring Report, Chart 6.1

Nov 2010
(80% intercept)
The Internet "Problem" (cont'd)

Market Cap

$B

Verizon  Google

0  20  40  60  80  100  120  140  160

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Carriers Fight Back

Supreme Court Brand X privatized cable (2005).
FCC DSL Order privatized DSL (2005).
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Network Neutrality

“. . . [Internet access] service that privileges, degrades or prioritizes any packet transmitted . . . based on its source, ownership or destination.”

AT&T Final Merger Commitments, 12/28/06

“We will not block, impair, or degrade content, applications, or services . . .”

Walter B. McCormick, Jr., President of the U.S. Telecom Association

Absence of deliberate anti-competitive discrimination.

I said that
Network Neutrality: Architectural View

The New Way

Net A

Net B

Net C

Net D

The Old Way

“Network of different networks” pushes differences (and added value) to the edge.

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A stupid network supplies simple connections but no "services." Instead, "services" are created by smart, network-enabled products designed for any networked application. Bring them home and plug them in.

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Network Neutrality: Business View

App-Specific Network

Application: Specific to Network

Network Layer: Designed for App

Physical Layer: Designed for App

Expense (Subsidized by Application)

Monthly Income

Inter-Networking

Application: Nonspecific -- Voice, Video, Maps, Games, Anything!

Network Layer: Internet Protocol

Physical Layer: Non-specific End-to-End Connectivity

Expense (Subsidized by Application)

Product & Service Income

Commons

Big Question: What’s the (Business?) (Operating?) Model
It is hard to make money on stupid connections.

When the middle of the network is empty, and bandwidth is plentiful, what do network service providers sell?

Ref: Paradox of the Best Network, Isenberg & Weinberger
http://netparadox.com
Carrier Attempts to "Fix" Biz Model

Inter-Networking Model

Application:
Nonspecific -- Voice, Video, Maps, Games, Anything!

Network Layer:
Internet Protocol

Physical Layer:
Non-specific End-to-End Connectivity

Contingent Routing
Application Awareness

Tiered Port Pricing Blocking

Discrimination

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Why telcos want to discriminate

Special-purpose networks discriminate. It is consistent with their 130 year legacy. Discrimination is "economically efficient."

Reference: Privacy, Economics, and Price Discrimination on the Internet, Andrew Odlyzko
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It Takes Smart People to Build a Sustainable Stupid Network

Kids, Don't Eat This

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