

Network Neutrality: The US Debate

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Who controls the Internet?

Original Internet

Users decide

The End-to-End Arguments Broad Version

Network only general services of broad utility across applications

Network not optimized in favor of specific applications

All application-specific functionality at end hosts

Consequence: Network is application-blind

Network can't control

Today network can control

Is this a problem?

Questions

FRAMEWORK

A. WIRELINE NETWORKS

I. Proposed Rule

1. Does the rule ban blocking?
2. Does the rule also ban discrimination?
3. If yes, how is discrimination defined?
4. Does the rule allow access charges?

II. Proposed Exceptions

1. Security
2. Congestion Management

B. WIRELESS NETWORKS

Question 1

Blocking

Do network providers have an incentive to block?

- Not always ...

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- ... but more often than you would expect:
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 - to manage bandwidth on their networks

If there is an incentive, should regulators care?

Network neutrality opponents:

- There usually is no incentive to block ...
- ... and existing incentives are generally not a problem:
 - to increase their profits
 - to exclude unwanted content
 - to manage bandwidth on their networks

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 - to manage bandwidth on their networks (o.k.)

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 - to manage bandwidth on their networks (o.k.)

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Network neutrality opponents:

- There usually is no incentive to block ...
- ... and existing incentives are generally not a problem:
 - to increase their profits (mostly o.k., rest covered by antitrust)
 - to exclude unwanted content (o.k.)
 - to manage bandwidth on their networks (o.k.)

Question 2

Only blocking

vs.

Blocking and discrimination

Question 3

How to define discrimination

OPTIONS

All or nothing

- Allow all discrimination (aka no non-discrimination rule)
- Ban all discrimination (aka treat every packet the same)

Application-blindness

- Ban discrimination based on applications
- Ban discrimination based on applications or classes of applications

Other criteria

- Ban discrimination that is anticompetitive or harms consumers
- Ban discrimination that is not disclosed

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ban application-specific discrimination
(based on application or class of application)
allow application-agnostic discrimination

Constraints on Network Evolution: Allows Quality of Service

- 1) Different classes of service offered on a non-discriminatory basis
- 2) Users able to choose whether and when to use which class of service
- 3) Network provider only allowed to charge its own Internet service customers for use of different classes of service*

Question 4

Access charges or
Whom are network providers allowed to charge?

OPTIONS

nobody

only their own access customers

access customers and application/content developers
(but needs to be non-discriminatory)

access customers and application/content developers
(without restrictions)

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Users choose
vs.
Network providers choose

OPTIONS

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only their own access customers

access customers and application/content developers
(but needs to be non-discriminatory)

access customers and application/content developers
(without restrictions)





Question 5

Exeptions

Security

Reasonable Network Management

The Comcast logo is centered on a dark gray background. It features a red, thick, curved line that forms a partial circle around the first 'c' of the word 'comcast'. The word 'comcast' is written in a white, lowercase, sans-serif font. The red curve starts at the top left, goes around the 'c', and ends at the bottom left.

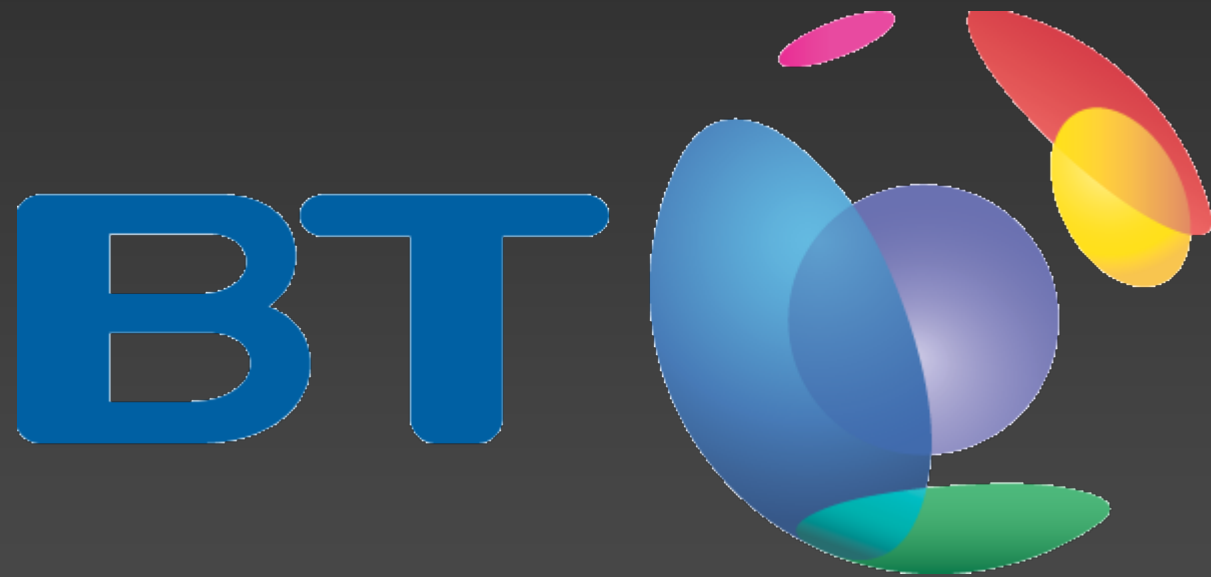
comcast



up to 5 megabytes/sec

p2p: 30 kilobytes/sec

4:30 pm until 2 am



up to 8 megabytes/sec

streaming video: 986 kilobytes/sec

5 pm until midnight

OPTIONS

any congestion management is fine

any congestion management is fine, as long as it is disclosed

congestion management needs to be as application-agnostic as possible

Question 6

Wireless networks

FCC Internet Policy Statement, 2005

- "... consumers are entitled to access the lawful Internet content of their choice."
- "... consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement."
- "... consumers are entitled to connect their choice of legal devices that do not harm the network."
- "... consumers are entitled to competition among network providers, application and service providers, and content providers. "

October 2009

„Preserving the Open Internet“

Nondiscrimination

Transparency

For more ...

Barbara van Schewick. *Internet Architecture and Innovation*.
MIT Press 2010. <http://netarchitecture.org>

Barbara van Schewick. *Writing and Testimony on Network
Neutrality*. <http://netarchitecture.org/content/writing/>