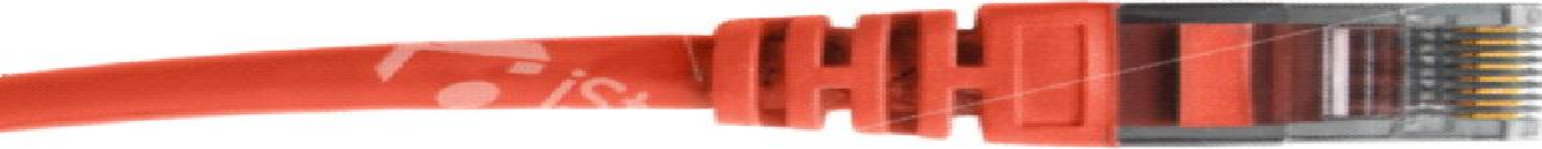


Net Neutrality and what it means for libraries

A presentation by *Alex Guindon & Danielle Dennie*

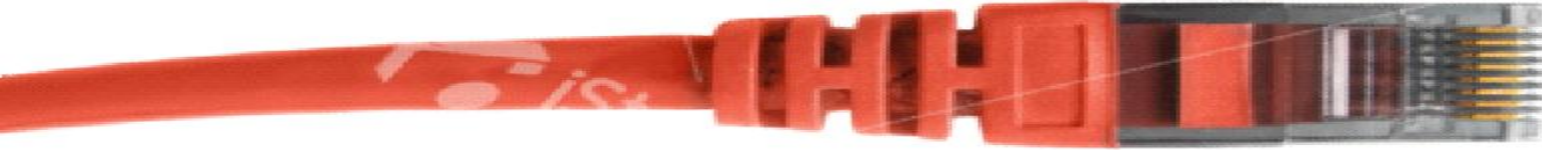
Brown bag lunch series, March 25, 2010
Concordia University Libraries

Introduction

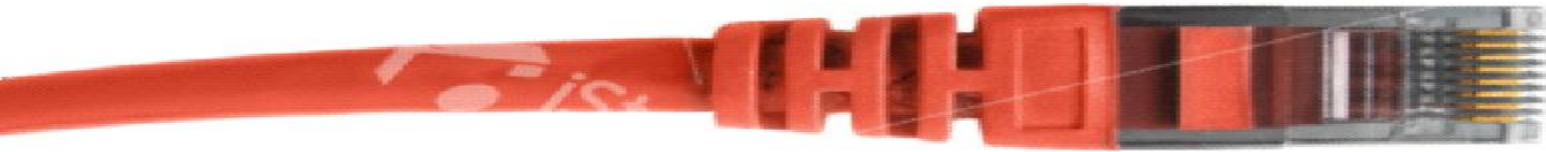


- Net Neutrality is a complex issue that has legal, technological, economic and societal ramifications
- Debate polarized between an idealized vision of a neutral Internet and an approach favouring market solutions rather than non-discrimination legislation

Definition



- “Network neutrality is best defined as a network design principle. The idea is that a maximally useful public information network aspires to treat all content, sites, and platforms equally” (Tim Wu)
- This original Internet design is blind to the **type of data**, the **type of application**, the **origin & destination** of the transmitted information



LEGAL FRAMEWORK

Legal Framework



- The conception that communication and transport networks (like phone, telegraph, airlines, buses) should be neutral is based on the idea of **common carriers**
- “A common carrier is a private party offering transport or communication services which is subject to public duties in return for legal benefits” (Sandvig 2007)
- This is a Common Law notion going back to the 19th century

Common Carriers



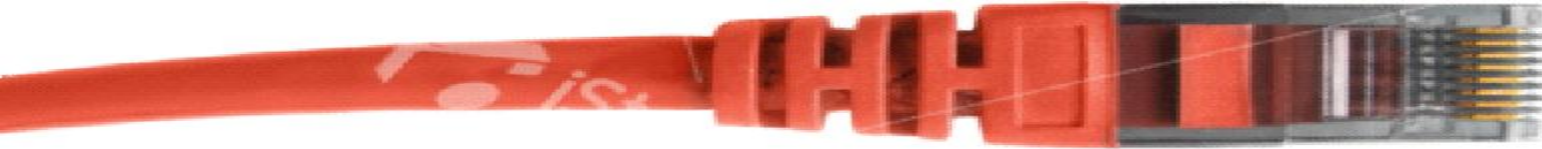
Legal benefits:

- Liability protection (not responsible for illegal content transmitted)
- “Public right of way” to provide their services

Obligations:

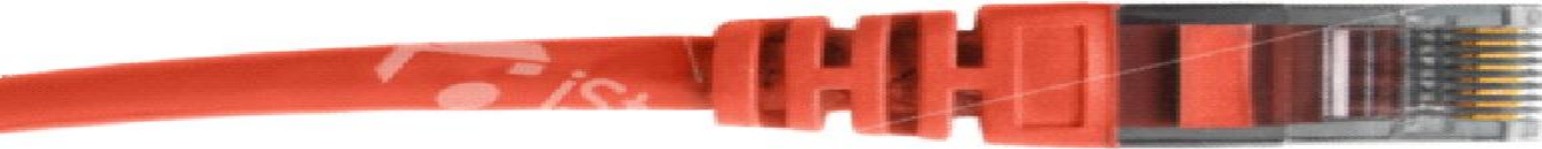
- **Non-discrimination**, i.e. must carry all people (or content) indiscriminately
- Interconnection: must ensure inter-communicability between networks.
- Reasonable price for access

Canadian legislation



- In Canada, the *Telecommunications Act* applies to Internet communication
- Article 27(2) stipulates:
“No Canadian carrier shall, in relation to the provision of a telecommunications service or the charging of a rate for it, unjustly discriminate or give an undue or unreasonable preference toward any person, including itself, or subject any person to an undue or unreasonable disadvantage.”
- The CRTC has decided to intervene as little as possible in the area of retail Internet services
- Public hearings were held in July. A new policy was issued in October.

U.S. Legislation

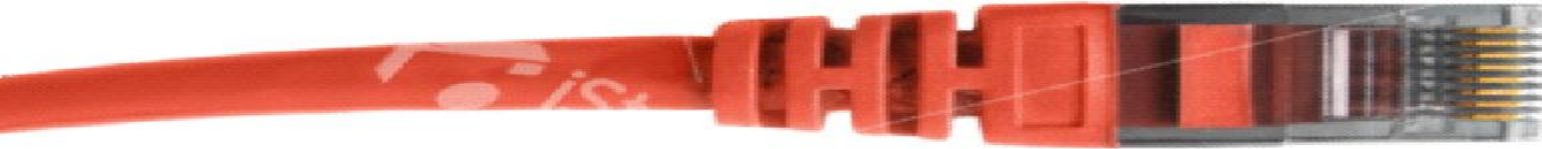


- *Brand X* decision (2005): the Supreme Court confirmed the Federal Communications Commission (FCC) decision that cable companies are information services *and not* telecommunication services
- Two months later the FCC extended that statute to DSL networks (broadband) provided by phone companies

As a result:

- Incumbents (telcos and cablecos) are not submitted to common carriage obligations
- Cable and phone companies are not obliged to share their *high-speed* network with competitors anymore

U.S. Legislation

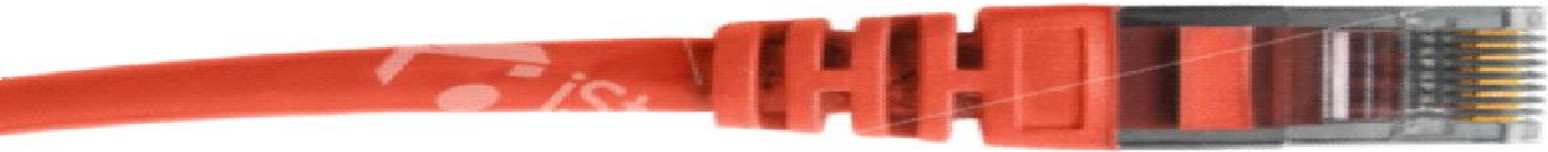


To maintain some openness the FCC proposed these 4 policy principles:

1. Consumers are entitled to access the lawful Internet content of their choice
2. Consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement
3. Consumers are entitled to connect their choice of legal devices that do not harm the network
4. Consumers are entitled to competition among network providers, application and service providers, and content providers.

But...

All of these principles are subject to *reasonable network management*.



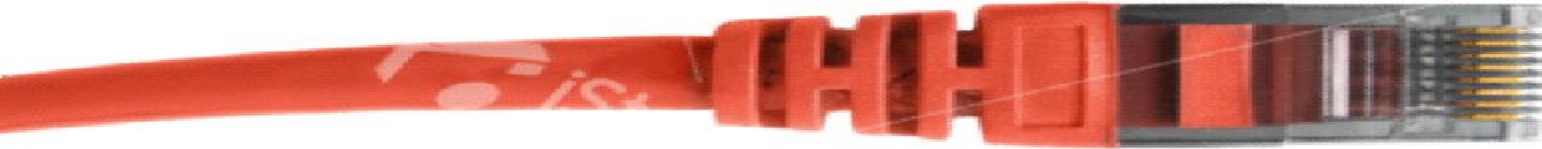
TECHNOLOGICAL ASPECTS

Technological aspects



- Information on the Net is transmitted in the form of data packets
- In original design, the Internet (hardware and protocols (TCP/IP) is a “dumb network”: its function is to pass packets of data, via “pipes”, along a chain of “nodes” until they reach their destination
- The nodes make no judgment on the data packets

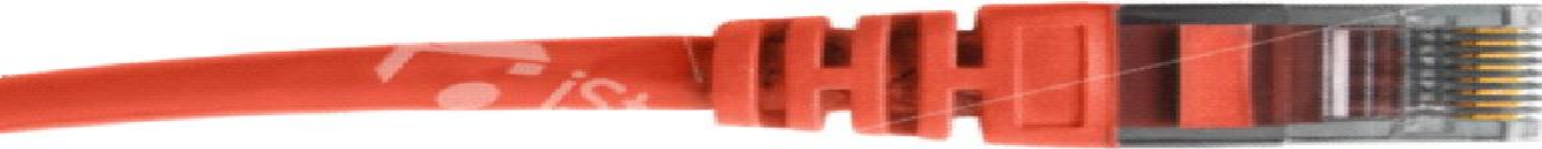
FIFO and Best Effort principles



Packets are transmitted according to two principles:

- 1. FIFO (first-in/first out):** “what comes in first is handled first, what comes in next waits until the first is finished, etc.”
- 2. Best effort:** no guarantee that data is delivered, some packets are dropped. Speed depends on network traffic

Is the Net Neutral?



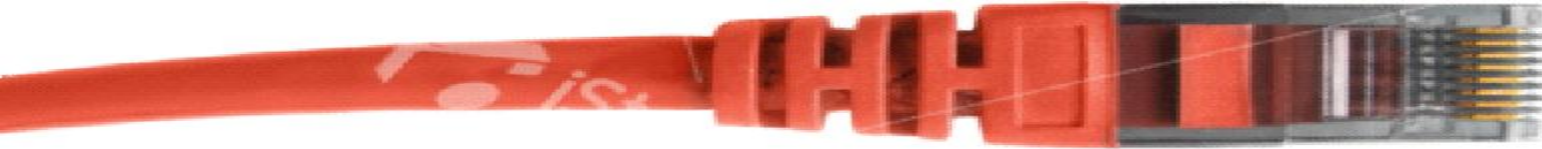
- Several authors claim (convincingly) that the Internet has not been really neutral for a long time
- Graham Longford presents 2 types of discrimination:
 1. Content discrimination
 2. Protocol and application discrimination (Network management)

Content discrimination



- 1. Preferred content arrangements**
Some content only accessible via specific ISPs
- 2. Access tiering and transmission tariffs**
ISPs want to apply additional charges to content providers and users for “faster lanes”
- 3. Content blocking or filtering (Deep Packet Inspection (DPI))**
Blocking by address (source or destination) or by looking at actual content (DPI)
- 4. Distributed Computing**
Distributed network of local servers to cache high-demand pages. Some firms (Akamai) provide that service to content providers

Protocol and application discrimination



1. Port blocking

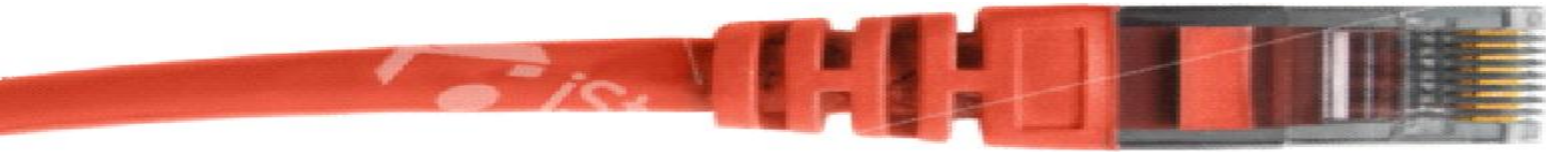
In general, specific applications (email, Web, peer-to-peer) use specific ports. Blocking those ports, blocks these applications. Used to fight viruses.

2. Traffic shaping/traffic prioritization

- Speed up latency sensitive applications (video, VoIP)
- Slow down certain applications (throttling) which are considered bandwidth-hungry (peer-to-peer)

3. Quality of service enhancements (QoS)

Additional fees for better service for specific apps (VoIP)



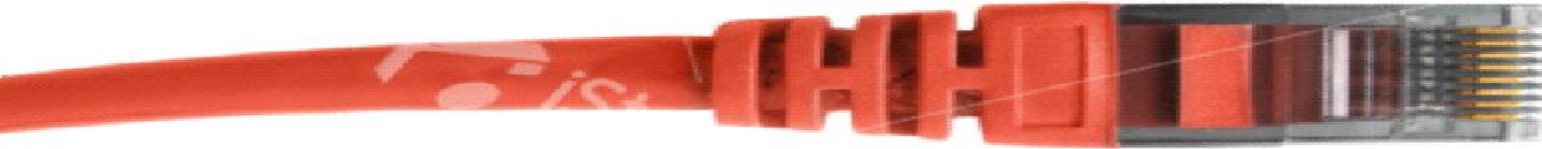
THE DEBATE

The Net Neutrality Debate



- Arguments for Net Neutrality
- Arguments against it
(or for Net Diversity)
- A third way?

Arguments for Net Neutrality



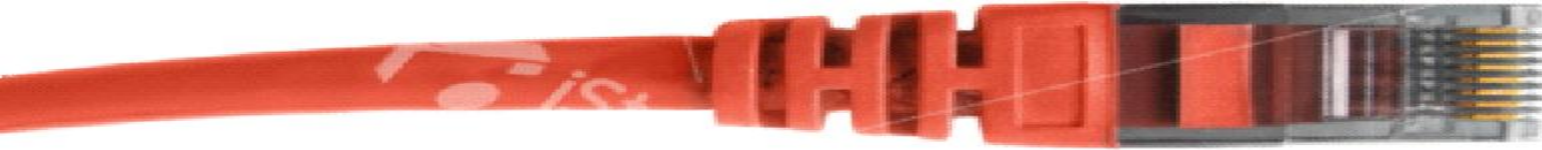
- Broadband Internet is an essential public utility. It's a major source of information, education and an important communication channel. It should be protected against all forms of discrimination and censorship
- In North America, infrastructure owners (incumbents) are in a quasi-monopoly situation
- Incumbents, by virtue of vertical integration, own contents and conduits. This leads to discrimination and is against common-carrier principles
- Incumbents do not divulge:
 - Precise information on available bandwidth
 - Information on traffic management techniques used

Arguments **for** Net Neutrality



- Innovation online is spurred by an open and neutral Net. All players (non-profits, startups, independent researchers) are on equal footing
- Innovation is more likely to come from small businesses or individuals than from large firms who can pay access to a fast lane
- Deep Packet Inspection is an infringement on the private life of citizens
- Traffic management is not efficient and ends up being more costly than investment in infrastructure
- Incumbent can artificially slow down traffic to convince consumers to pay more for Quality of Service arrangements

Arguments **against** Net Neutrality



- Content providers (like Google and other big players) have a free ride: they benefit from the existing networks without having to pay for them
- Some discrimination is good:
 - To fight virus and security threats (port blocking, DPI)
 - So that low-latency applications can function properly (traffic prioritization, QoS)
 - Gives customers more flexibility in choice of services
- The original Net architecture is dated (or even obsolete) and needs to be adapted or rebuilt

Arguments **against** Net Neutrality



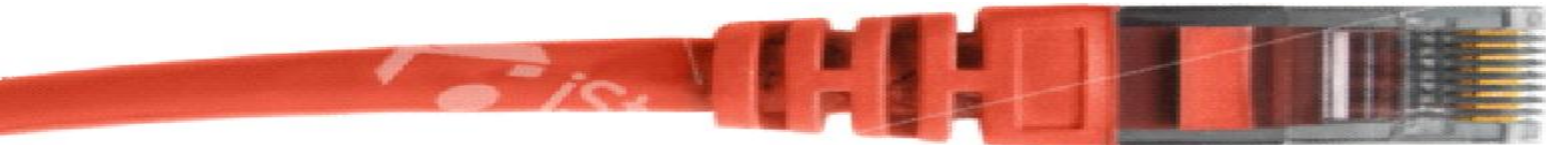
- Network innovation is best served by market solutions
- Legislation is inefficient and costly
- New income sources are needed for Network upgrade (investment in the “last-mile”)
- The end of guaranteed access to incumbent infrastructure is a strong incentive for innovation in last-mile access

A Third Way?

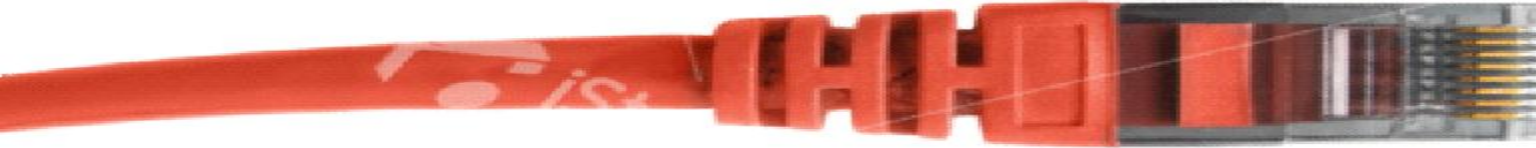


- The Internet is not neutral now and has not been for quite some time
- It would be hard to go back to a purely neutral Net
- Not all discrimination is bad
- There is a need for network management
- No discrimination about the source or destination of data
- No discrimination against competitors or in favour of incumbents own content
- Infrastructure improvement will be very costly. Who will pay the bill and how?

Net Neutrality timeline in Canada



Net Neutrality timeline in Canada



July

2005

Telus cuts subscriber access to pro-union website
“Voices for Change”

December

2005

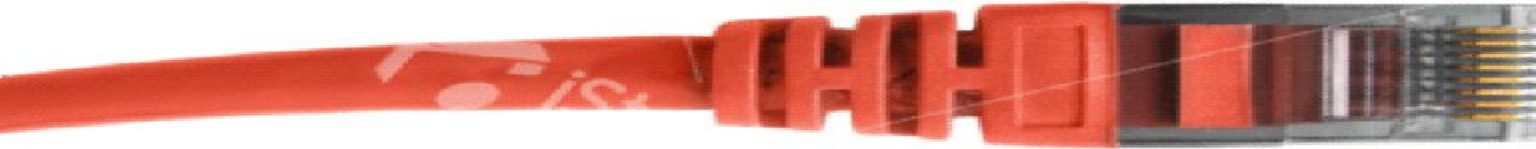
Rogers admits to traffic shaping (aka “throttling”) P2P
traffic on its network

November

2007

Bell Sympatico admits to traffic shaping (aka “throttling”) P2P
traffic on its retail network

Net Neutrality timeline in Canada



CBCnews.ca

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Bell crimps P2P file-sharing during peak hours

Last Updated: Tuesday, March 25, 2008 | 6:10 PM ET Comments 87 Recommend 350
CBC News

Bell Canada is slowing down access on its Sympatico internet servers for users who file share during prime time to prevent them from clogging the network, a spokesman said Tuesday.

Bell began the process, which it calls managing the bandwidth capacity but which is widely known as "throttling," on March 14. The company plans to have it rolled out across the Sympatico service area — Quebec and Ontario — by April 7, spokesman Jason Laszlo said.

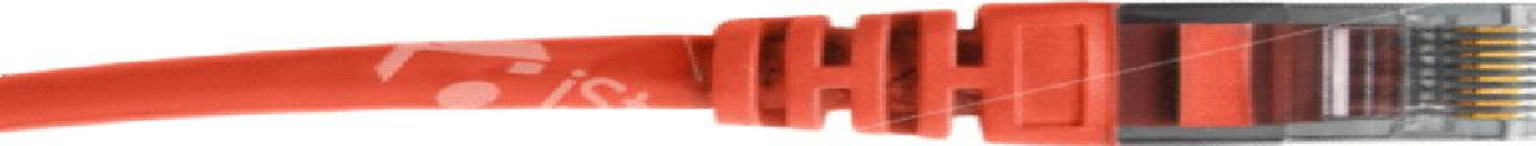
It will be in effect during the peak period for internet use in late afternoon and the evening, he said. For people sharing files, the system "will simply not work as fast." But other users will not be delayed.

Bell, like other internet service providers, says it has capacity problems caused by peer-to-peer (P2P) file-sharing systems such as BitTorrent, which can be used to download movies, music and games. "We're certainly not unique in this," Laszlo said, adding that other service providers are managing P2P downloads.

March

2008

Net Neutrality timeline in Canada



Canadian Radio-television and Telecommunications Commission / Conseil de la radiodiffusion et des télécommunications canadiennes

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Proactive Disclosure

2008-04-03 - #: 8622-C51-200805153 - Canadian Association of Internet Providers (CAIP) - Application requesting certain orders directing Bell Canada to cease and desist from throttling its wholesale ADSL Access Services

File using the [On-line Services](#)

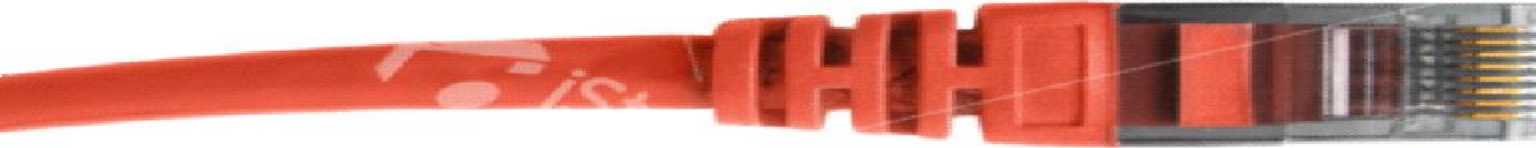
2008-12-22 - Telecom Cost Order CRTC 2008-23 Determination of costs award with respect to the participation of the Campaign for Democratic Media in the proceeding initiated by the Canadian Association of Internet Providers' Part VII application
Reference: 8622-C51-200805153 and 4754-321

2008-12-22 - Telecom Cost Order CRTC 2008-24 Determination of costs award with respect to the participation of l'Union des consommateurs in the proceeding initiated by the Canadian Association of Internet Providers' Part VII application
Reference: 8622-C51-200805153 and 4754-322

2008-12-22 - Telecom Cost Order CRTC 2008-25 Determination of costs award with respect to the participation of the Public Interest Advocacy Centre in the proceeding initiated by the Canadian Association of Internet Providers' Part VII application
Reference: 8622-C51-200805153 and 4754-323

April
2008

Net Neutrality timeline in Canada



CAIP filing pointed to the following Telecommunications Act provisions

Section 7 (i) [Privacy]: It is hereby affirmed that telecommunications performs an essential role in the maintenance of Canada's identity and sovereignty and that the Canadian telecommunications policy has as its objectives (...)
(i) to contribute to the protection of the privacy of persons

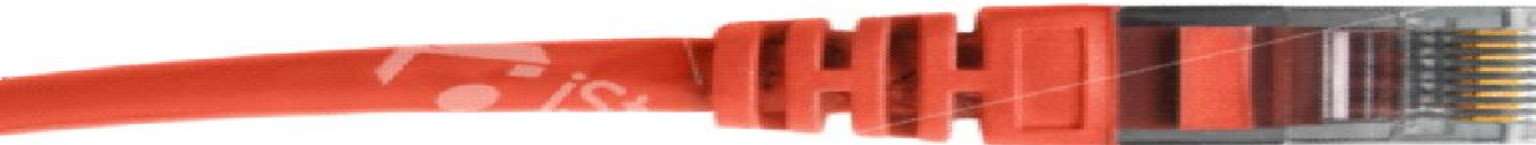
Section 27 (2) [Unjust discrimination]: No Canadian carrier shall, in relation to the provision of a telecommunications service or the charging of a rate for it, unjustly discriminate or give an undue or unreasonable preference toward any person, including itself, or subject any person to an undue or unreasonable disadvantage.

Section 36 [Controlling content]: Except where the Commission approves otherwise, a Canadian carrier shall not control the content or influence the meaning or purpose of telecommunications carried by it for the public.

April

2008

Net Neutrality timeline in Canada



Canadian Radio-television and Telecommunications Commission / Conseil de la radiodiffusion et des télécommunications canadiennes

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Privacy and Security
Proactive Disclosure

Telecom Decision CRTC 2008-108

Ottawa, 20 November 2008

The Canadian Association of Internet Providers' application regarding Bell Canada's traffic shaping of its wholesale Gateway Access Service

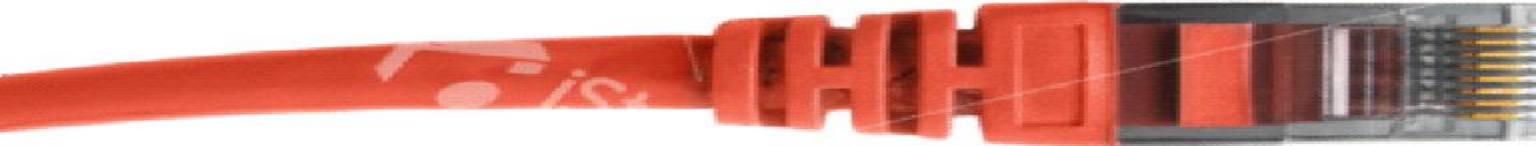
Reference: [8622-C51-200805153](#)

In this Decision, the Commission denies the Part VII application by the Canadian Association of Internet Providers requesting that the Commission order Bell Canada to cease and desist from traffic shaping of its wholesale Asymmetric Digital Subscriber Line services and, in particular, the wholesale service known as Gateway Access Service (GAS).

The Commission's determinations in this Decision relate solely to Bell Canada's traffic-shaping practices in relation to its wholesale GAS, and are based on the evidence filed in this proceeding.

November
2008

Net Neutrality timeline in Canada



Canadian Radio-television and Telecommunications Commission / Conseil de la radiodiffusion et des télécommunications canadiennes

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Proactive Disclosure

Telecom Public Notice CRTC 2008-19

Additional reference: [2008-19-1](#), [2008-19-2](#), [2008-19-3](#)

Ottawa, 20 November 2008

Notice of consultation and hearing

Review of the Internet traffic management practices of Internet service providers

Reference: [8646-C12-200815400](#)

In this Public Notice, the Commission initiates a public proceeding to consider Internet traffic management practices for both wholesale and retail Internet services. The Commission invites detailed written comments, with supporting rationale, on the issues identified below. The proceeding will include an oral public hearing, which will begin on 6 July 2009 at the Conference Centre, Phase IV, 140 Promenade du Portage, Gatineau, Quebec.

November

2008

Net Neutrality timeline in Canada



Canadian Radio-television and Telecommunications Commission / Conseil de la radiodiffusion et des télécommunications canadiennes

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Telecom Regulatory Policy CRTC 2009-657

Route reference: Telecom Public Notice [2008-19](#)

Ottawa, 21 October 2009

Review of the Internet traffic management practices of Internet service providers

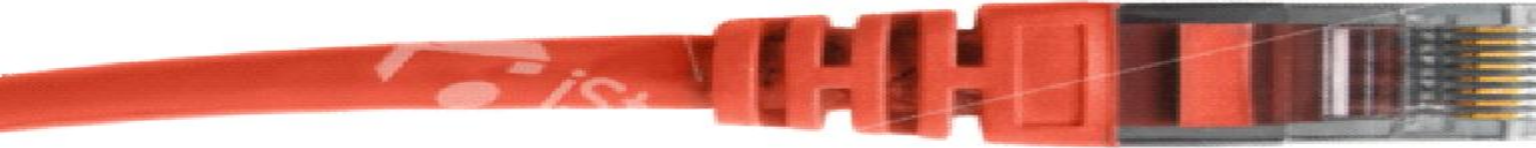
File number: [8646-C12-200815400](#)

In this decision, the Commission sets out its determinations in the proceeding initiated by Telecom Public Notice [2008-19](#) regarding the use of Internet traffic management practices (ITMPs) by Internet service providers (ISPs). The Commission establishes a principled approach that appropriately balances the freedom of Canadians to use the Internet for various purposes with the legitimate interests of ISPs to manage the traffic thus generated on their networks, consistent with legislation, including privacy legislation.

October

2009

Net Neutrality timeline in Canada



Telecom Decision CRTC 2009 - 657

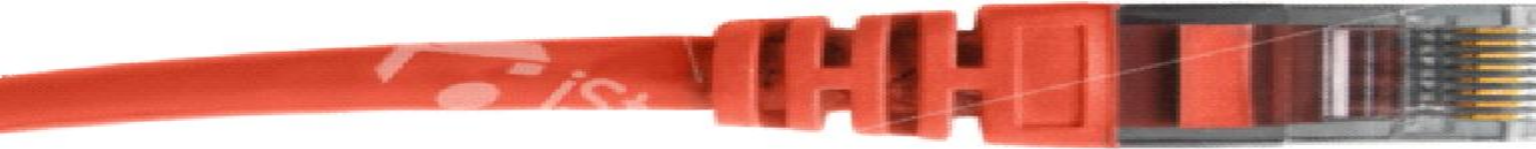
1 – Unjust discrimination

- Application-specific ITMPs degrade or prefer one application, class of application, or protocol over another and may (...) warrant investigation under subsection 27(2) of the Act.

October

2009

Net Neutrality timeline in Canada



Telecom Decision CRTC 2009 - 657

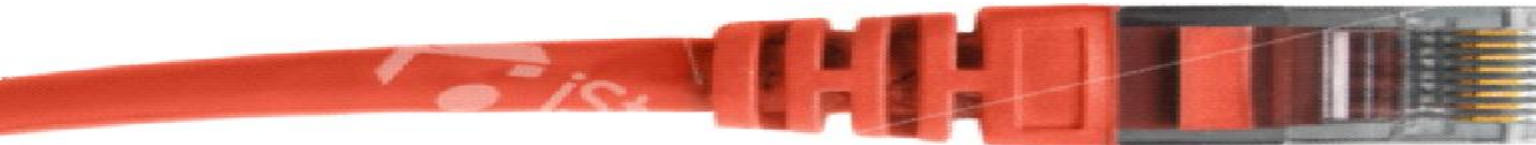
2 - Transparency

« [T]he Commission directs **all primary ISPs**, as a condition of providing retail Internet services, to **disclose** to their retail customers, clearly and prominently on their websites, **information related to their technical ITMPs**. (...) » (para 60)

October

2009

Net Neutrality timeline in Canada



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ISPs fall short on network management rules

BY MICHAEL GEIST, CITIZEN SPECIAL FEBRUARY 16, 2010

Last fall, the Canadian Radio-television and Tele-communications Commission issued its much-anticipated Internet traffic management ruling, better known as the net neutrality decision. The case attracted national interest as the CRTC established several key requirements for Canada's Internet providers.

These included new transparency obligations that forced ISPs to disclose their network management practices, such as why the practices were introduced, who will be affected, when it will occur, and how it will impact users' Internet experiences (down to the specific impact on speeds). The CRTC also opened the door to complaints about network management practices by establishing a test that any harm to users be as little as reasonably possible.

Several months later, Canada's ISPs have had ample time to comply with the new requirements, yet a review of the policies from the biggest ISPs -

STORY TOOLS

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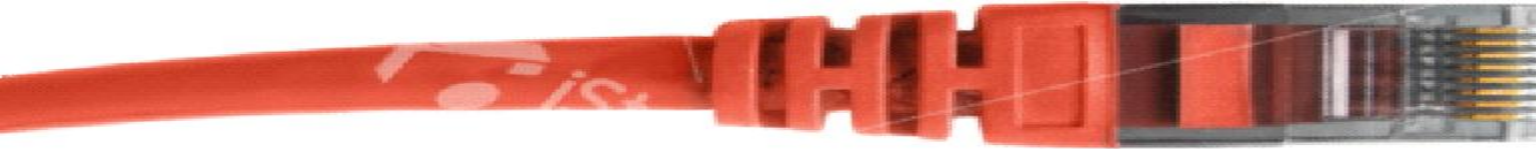
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Net Neutrality timeline in Canada



Telecom Decision CRTC 2009 - 657

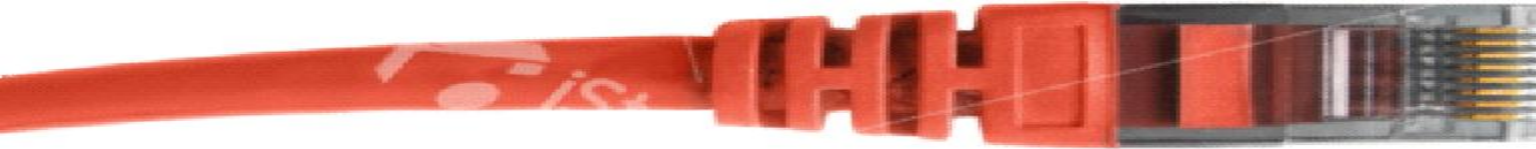
3 - Privacy

- “The Commission considers that **certain ITMPs raise privacy concerns** in regard to the collection and use of personal information.” (para. 100)
- “The Commission therefore directs all **primary ISPs**, as a condition of providing retail Internet services, **not to use for other purposes personal information collected** for the purposes of traffic management and not to disclose such information.” (para. 103)

October

2009

Net Neutrality timeline in Canada



Telecom Decision CRTC 2009 - 657

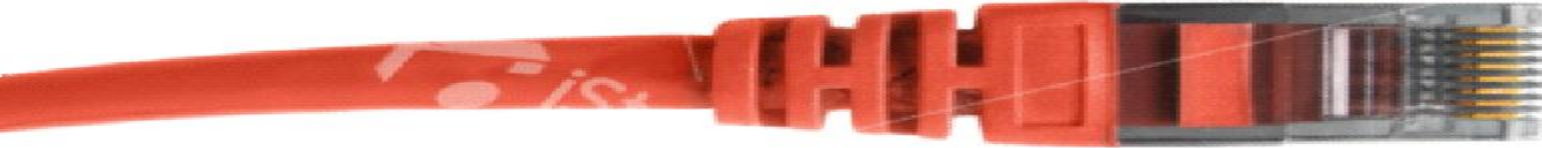
4 – Content control

- “In the case of **time-sensitive audio or video traffic** (i.e. real-time audio or video such as video conferencing and voice over Internet Protocol (VoIP) services), ITMPs that introduce delays or jitter are likely to cause degradation to the service. The Commission considers that **when noticeable degradation occurs, it amounts to controlling the content** and influencing the meaning and purpose of the telecommunications in question.” (para. 125)

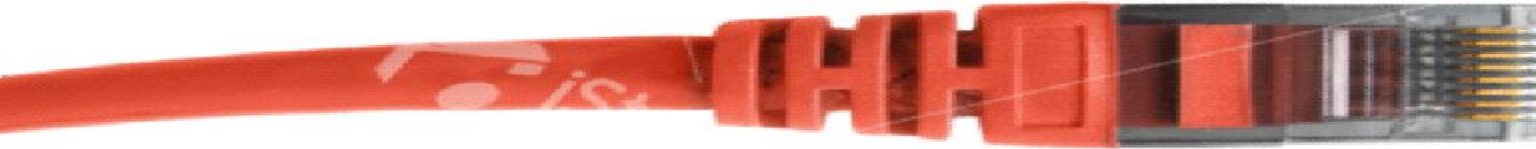
October

2009

Net Neutrality timeline in the U.S.A.



Net Neutrality timeline in the U.S.A.



March

2002

FCC issues ruling declaring that cable modem services are an “information service”

June

2005

Brand X Decision: Supreme Court upholds FCC ruling. Cable ISPs remain "information services"

August

2005

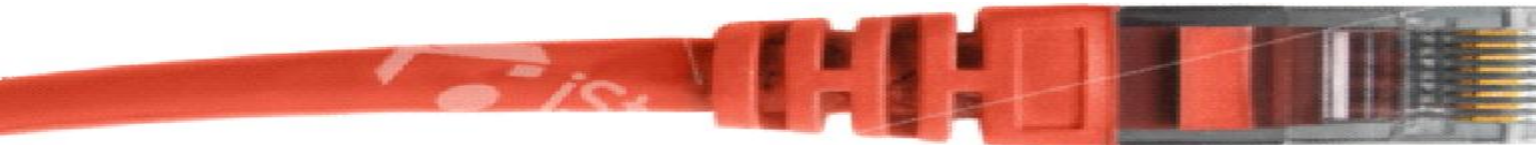
FCC classifies all wireline broadband internet access services, including DSL, as information services

August

2005

FCC releases a Policy Statement outlining the four Internet Principles

Net Neutrality timeline in the U.S.A.



NEWS

Federal Communications Commission
445 12th Street, S.W.
Washington, D. C. 20554

News Media Information 202 / 418-0500
Internet: <http://www.fcc.gov>
TTY: 1-888-835-5322

This is an unofficial announcement of Commission action. Release of the full text of a Commission order constitutes official action.
See *MCI v. FCC*, 515 F.2d 385 (D.C. Cir. 1974).

FOR IMMEDIATE RELEASE:
August 5, 2005

NEWS MEDIA CONTACT:
Mark Wigfield, 202-418-0253
Email: mark.wigfield@fcc.gov

FCC Adopts Policy Statement

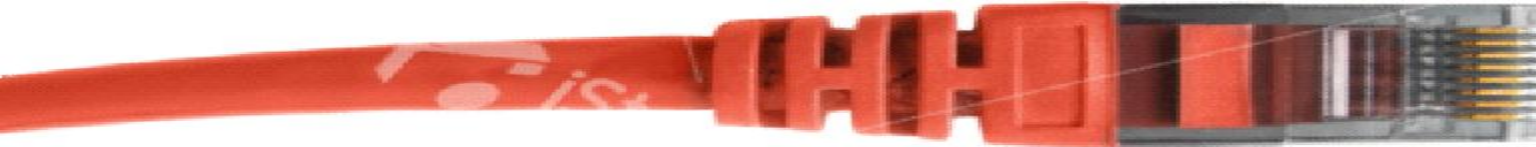
New Principles Preserve and Promote the Open and Interconnected Nature of Public Internet

Washington, D.C. – The Federal Communications Commission today adopted a policy statement that outlines four principles to encourage broadband deployment and preserve and promote the open and interconnected nature of public Internet: (1) consumers are entitled to access the lawful Internet content of their choice; (2) consumers are entitled to run applications and services of their choice, subject to the needs of law enforcement; (3) consumers are entitled to connect their choice of legal devices that do not harm the network; and (4) consumers are entitled to competition among network providers, application and service providers, and content providers. Although the Commission did not adopt rules in this regard, it will incorporate these principles into its ongoing policymaking activities. All of these principles are subject to reasonable network management.

August

2005

Net Neutrality timeline in the U.S.A.



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Comcast blocks some Internet traffic

Tests confirm data discrimination by number 2 U.S. service provider



Matthew Elvey, a Comcast subscriber in the San Francisco area who has noticed BitTorrent uploads being stifled, acknowledged that the company has the right to manage its network, but said he disapproves of its method.

Jeff Chiu / AP

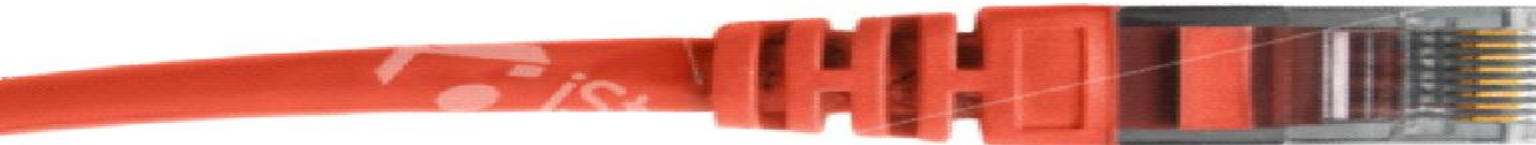
By Peter Svensson
AP Associated Press

MSN TECH AND GADGETS

October

2007

Net Neutrality timeline in the U.S.A.

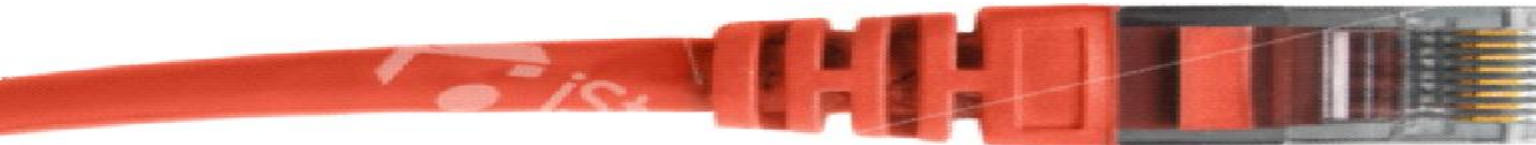


Federal Communications Commission		
Before the Federal Communications Commission Washington, D.C. 20554		
In the Matters of)	
Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications)	File No. EB-08-IH-151
Broadband Industry Practices)	WC Docket No. 07-52
Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management")	
MEMORANDUM OPINION AND ORDER		
Adopted: August 1, 2008		Released: August 20, 2008
By the Commission: Chairman Martin and Commissioners Copps and Adelstein issuing separate statements; Commissioners Tate and McDowell dissenting and issuing separate statements.		
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APPENDIX: List of Commenters		

« The record leaves no doubt that Comcast's network management practices discriminate among applications and protocols rather than treating all equally. (...) [I]n laymen's terms, Comcast opens its customers' mail because it wants to deliver mail not based on the address or type of stamp on the envelope but on the type of letter contained therein. »

August
2008

Net Neutrality timeline in the U.S.A.



Codifying the Existing Four Internet Principles:

« We (...) propose to **codify the principles as obligations of broadband Internet access service providers** (...). We believe that codifying them as obligations of particular entities, rather than just as principles, would make clear precisely who must comply and in what way. » (para. 90)

In the Matter of

Preserving the Open Internet

Broadband Industry Practices

WC Docket No. 07-52

NOTICE OF PROPOSED RULEMAKING

Adopted: October 22, 2009

Released: October 22, 2009

Comment Date: January 14, 2010

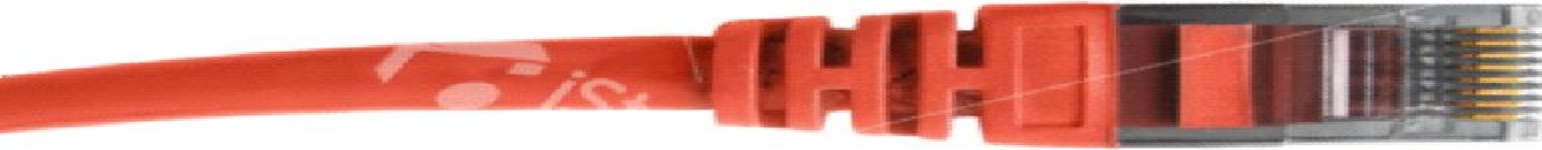
Reply Comment Date: March 5, 2010

By the Commission: Chairman Genachowski and Commissioners Copps and Clyburn issuing separate statements; Commissioners McDowell and Baker concurring in part, dissenting in part, and issuing separate statements.

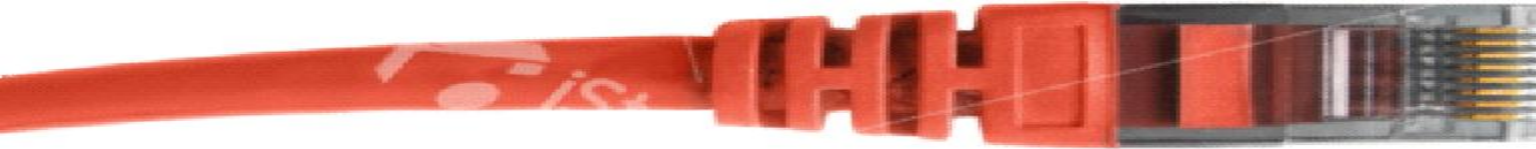
October

2009

Net Neutrality and libraries



Net Neutrality and libraries



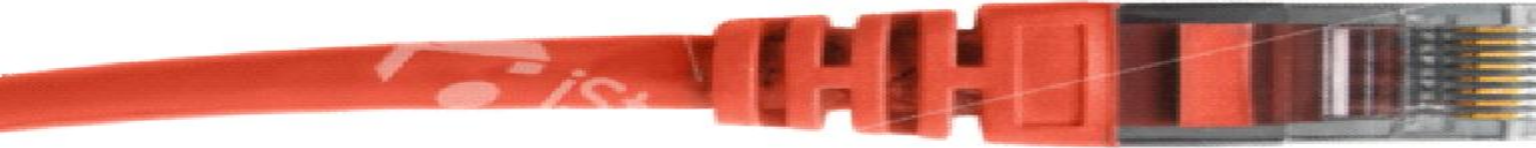
Ideals protected in a world with net neutrality:

1 – *Intellectual freedom and access to information*

“All persons in Canada have the fundamental right, as embodied in the nation’s Bill of Rights and the Canadian Charter of Rights and Freedoms, to have access to all expressions of knowledge, creativity and intellectual activity, and to express their thoughts publicly (...) *It is the responsibility of libraries to guarantee and facilitate access to all expressions of knowledge and intellectual activity*” [emphasis added]

- *CLA Statement on Intellectual Freedom*

Net Neutrality and libraries



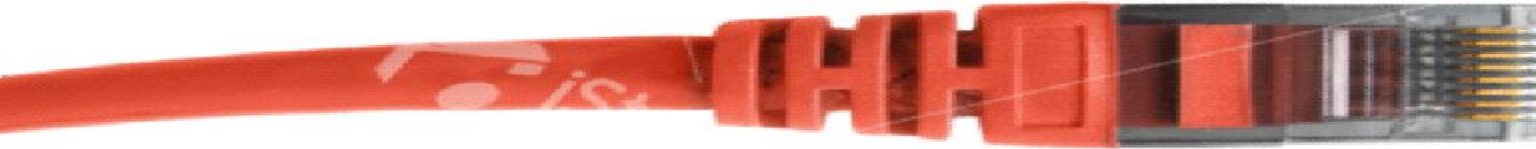
Ideals protected in a world with net neutrality:

2 – *Cultural diversity*

« Many documentary filmmakers now routinely use BitTorrent (...) as part of a multi-distribution strategy to reach as broad an audience as possible – legally, openly and purposefully. Throttling of file sharing applications slows down file transfer speeds (...) and (...) can make it virtually impossible to transfer files through such applications (...). BitTorrent makes it affordable to distribute high quality digital video and enables filmmakers, especially smaller, emerging filmmakers with constrained budgets, to contribute to that marketplace. (...) DOC believes that ISPs are in an unsuitable place to make decisions regarding Internet content. »

- Documentary Organization of Canada (DOC) written submission to the CRTC's net neutrality hearings

Net Neutrality and libraries



Ideals protected in a world with net neutrality:

3 – Privacy

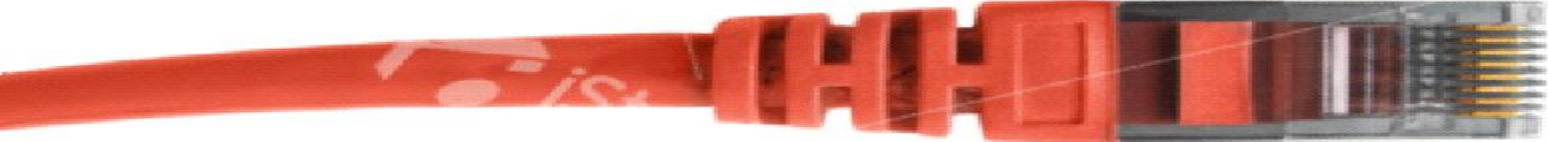
« Library users shall have the right to personal privacy and anonymity. Librarians and other library staff shall not disclose the identity of users or the materials they use to a third party. »

- IFLA's Statement on Libraries and Intellectual Freedom

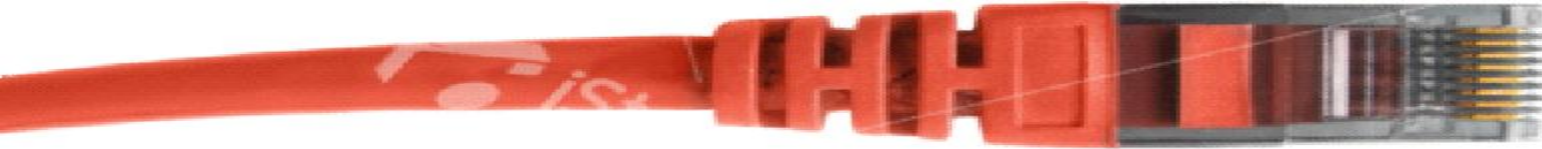
« DPI technology has the capability to look into the content of messages sent over the Internet – enabling third parties to draw inferences about users' personal lives, interests, purchasing habits and other activities. »

- Office of the Privacy Commissioner of Canada 2008

Conclusion



Conclusion



CRTC's new policy positive aspects:

- ***There is now a framework that limits discrimination***
- ***Transparency is required on the part of ISPs***
- ***Economic measures are preferred over technical traffic management***
- ***Commitment to users' privacy is reaffirmed***

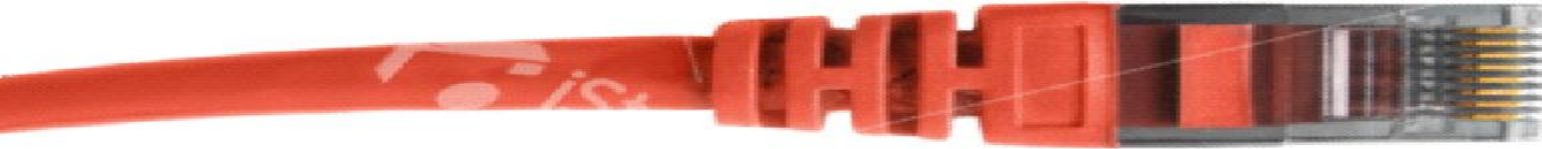
Conclusion



What is missing from the policy:

- *Acknowledgment that the Net is an essential public utility*
- *Duopoly (cablecos & telcos) situation is not addressed*
- *Burden of the proof rests on users (complaint-based system)*

Conclusion



The Need for a Broadband Strategy in Canada

- Canada is falling behind in broadband penetration and speed of access
- Investment in last-mile architecture is needed and should be facilitated by governments
- New forms of last-mile management should be explored:
 - Publicly-owned infrastructure, operated by ISPs
 - Development of next-generation wireless networks



Thank you!