

# PRESERVING THE ESSENTIAL INTERNET June 2006

"Network neutrality" – or, more precisely, "Internet neutrality" – is perhaps the most prominent and contentious issue in Internet and telecommunications policy today. Proponents of nondiscrimination requirements for providers of broadband networks argue that government action is necessary to preserve essential qualities of the Internet. Network providers warn that government-imposed neutrality requirements would subject the Internet to burdensome regulation and bureaucracy and would undermine the providers' ability and incentive to expand their broadband networks and service offerings.

As a preliminary matter, CDT believes the term "network neutrality" is imprecise and has come to mean different things to different stakeholders in the debate. For some, network neutrality means creating a full common carriage regime for broadband networks; for others, the focus is on interconnection. It appears that some neutrality proponents may be attempting to reach beyond Internet offerings to address the use of broadband networks in their entirety.

In CDT's view, the focus of the debate today should be squarely on preserving the openness of the *Internet* – as opposed to other, non-Internet services that also may be carried over broadband networks. We believe that companies investing in broadband networks should be free to use those networks for a wide range of non-Internet services on terms and conditions of their own choosing. For that reason, we believe that "Internet" neutrality better reflects the proper scope of the issue than does "network" neutrality. Our recommendation is to distinguish between "networks" and "the Internet" and to focus the policy debate on the latter.

Preserving the Internet as an open platform for speech and innovation, without gatekeepers or centralized control, has been a defining issue for CDT since its inception. In the mid-1990s, CDT helped to litigate and win the landmark *ACLU v. Reno* case, which found in the Internet's open, nondiscriminatory architecture a constitutionally relevant basis to give the medium the highest form of free speech protection. In 2000, CDT published "The Broadband Internet: The End of the Equal Voice?" which reviewed the risks to the Internet and urged the Internet community – including network architects, access providers, content providers, and concerned public interest organizations – to strive to maintain the medium's robust openness and unfettered freedom. More recently,

CDT has engaged in a series of consultations with stakeholders from all sides of the debate and commissioned a paper on the subject by Daniel Weitzner of MIT.

Based on these experiences and activities, CDT has concluded:

- Today's Internet is "neutral" in a number of crucial ways. These essential attributes of neutrality set the Internet apart from many other communications networks, especially cable TV networks. (See Section 1 below.)
- The neutrality of the Internet is rooted in its design and history and has been fundamental to its unique ability to foster free expression, democratic participation, economic activity and innovation. Key elements of neutrality were central to the Internet's architecture from the very beginning and to its ensuing growth and success. (See Section 2 below.)
- The future of Internet neutrality is uncertain. The neutral characteristics of the Internet did not arise through the commercial marketplace, and there is no guarantee that market forces alone will ensure their preservation. Recent statements by top corporate officials, legal and regulatory decisions freeing broadband from any nondiscrimination requirements, and fundamental differences between the markets for narrowband and broadband Internet access service together create cause for concern. (See Section 3 below.)
- Legislation is warranted. In the absence of legislated safeguards, there is a real risk that network providers will not choose to retain the core elements of Internet neutrality. This risk, and the potential consequences, are simply too great to take no action. Legislation is needed to protect the essential openness of today's Internet. (See Section 4 below.)
- Legislation should focus on "Internet neutrality" rather than "network neutrality," should be specific and targeted in its coverage and requirements, and should be crafted to avoid a bureaucratic, time-consuming or otherwise heavy-handed or over-inclusive regulatory scheme. Legislation to protect the essential characteristics of Internet service that exist now should seek to use the least intrusive means of doing so. In particular, since broadband networks often carry cable television and other non-Internet services over much of their bandwidth, legislation should focus specifically on the portion of each broadband network dedicated to the Internet and should leave the non-Internet portion alone. Issues relating more broadly to the overall network will bear monitoring for any impact on the Internet, but do not warrant legislative action now. In addition, while legislation will entail some obligations associated with common carriage, it should not impose full common carrier obligations on broadband access providers. (See Section 4 below.)
- Independent of the outcome of this year's legislative debate, further substantive dialogue among stakeholders is needed. A serious and substantive dialogue

among all stakeholders, separate from the public rhetoric, could help promote understanding of what practices are and are not crucial to the basic nature of the Internet. Creating such understanding will be important to the finalization of any legislative framework and, more broadly, to the continued growth of the Internet as a medium for both free expression and commerce. Dialogue, however, should inform the legislative process, not substitute for it. Internet neutrality provisions should be included in any package of telecommunications reform legislation that moves forward. (See Section 5 below.)

## 1. The Essential Elements of Internet Neutrality

Today's Internet is neutral in at least four key respects. (These core elements of neutrality are discussed in greater detail in the recent paper by Daniel Weitzner, "The Neutral Internet: Information Architecture for Open Societies.")

First, the Internet offers nondiscriminatory routing, in the sense that each user can send and receive traffic to or from any other location on the Internet. Network providers route packets to network endpoints of the users' choosing, without regard to the contents of the packets, the identities of the parties at those endpoints, or the service providers or services used by those parties.

Second, the Internet allows users to create and use new services, applications, protocols, and devices, without negotiating or even consulting with network operators. Applications such as the World Wide Web, instant messaging, and voice-over-IP were developed and rolled out over the existing Internet by innovators working independently of network operators.

Third, users have the freedom to connect to the Internet at different speeds and service levels, according to their needs and budgets. The choice lies with the user; network operators generally do not deny or limit the ability to buy bandwidth based on the identity of the user or the user's intended use.

Fourth, network operators interconnect with one another on an open basis, in the sense that no network operator is denied the opportunity to interconnect. This helps ensure that customers of different network providers can all connect and communicate with one another.

These elements are similar to, and to some extent flowed from, the nature of the telephone networks, upon which the Internet was originally based and which were legally required to be neutral under "common carrier" regulations. By way of comparison, cable systems are quite different, in that the cable operator exercises final control over the content and applications carried on its system. Anyone wishing to offer a new programming channel, on-demand service, or other application to the network's users must first negotiate with the cable operator. The dynamics of content negotiations in cable systems are quite complex, involving regulatory requirements, reciprocal demands

by content creators, and even payments by cable operators to content providers for distribution rights. In terms of television programming, we do not question that model. But it is not the Internet model; its application to the Internet would undeniably change the nature of the Internet, in ways that would be detrimental to the Internet's societal benefits, which flow not from complex negotiations over content but from speed, flexibility, and openness.

#### 2. The Roots and Benefits of the Neutral Internet

Historically – both in terms of technical architecture and initial commercial implementation – the Internet has always been a "neutral" network. At its essence, the Internet is a huge collection of computers and computer networks that have agreed to speak to each other and exchange information using an agreed set of "protocols" or formats. The core set of protocols on which the Internet is based – the TCP/IP suite of protocols – is fundamentally neutral. TCP/IP (the "Transmission Control Protocol" and "Internet Protocol" working in tandem with each other) are designed to send packets through a network from their origin to their destination wholly without regard to the contents of the packets. Thus, within the Internet, TCP receives and forwards communications, without making an assessment of what the traffic is (e-mail, Web page, voice-over-IP) or who is sending the traffic.

This approach maximizes the efficiency and speed of the network. It permits the greatest level of flexibility for new uses of the Internet. And it enables any two Internet users – individuals, companies, Web sites, etc. – to communicate with each other without any need to get permission or make prior arrangements (other than purchasing basic access to the Internet) with their network providers or any other entity in between the two end points.

The well-known history of the Internet is highly relevant here. The Internet was developed within the academic world, relying on funding from the U.S. government, as a means of supporting research and education in the sciences and engineering. Commercial interests were not initially involved. Indeed, commercial use of the Internet was restricted at the outset by a National Science Foundation "acceptable use policy" limiting traffic to non-proprietary research and education activities. When Congress moved to permit commercial traffic on the Internet in 1992, the committee report on the legislation specifically noted that the change did "not alter the goals or characteristics" of the network. The chairman of the House subcommittee that developed the legislation, Congressman Rick Boucher, explained during the hearing on the bill:

It is essential as the network is structured that all commercial providers of network services receive equal treatment and that Government policy in managing the network not favor any provider or set of providers over others.

This essential tenet of the neutral Internet – equal treatment – was embraced by all stakeholders in the nascent medium, industry and consumers alike. In 1996, a broad range of industry participants and civil society groups came together to defend the neutrality of the Internet against government interference by challenging the Communications Decency Act. The open and roughly equal nature of Internet communications and the absence of gatekeepers were elements critical to the litigation, which led to the seminal 1996 *ACLU v. Reno* decision that speech on the Internet deserved the highest level of constitutional protection. As one judge, Stewart Dalzell, concluded, the "Internet is a far more speech-enhancing medium than print, the village green, or the mails." Judge Dalzell summarized the most critical factual findings of the trial court:

Four related characteristics of Internet communication have a transcendent importance to our shared holding that the CDA is unconstitutional on its face. We explain these characteristics in our Findings of fact above, and I only rehearse them briefly here. First, the Internet presents very low barriers to entry. Second, these barriers to entry are identical for both speakers and listeners. Third, as a result of these low barriers, astoundingly diverse content is available on the Internet. Fourth, the Internet provides significant access to all who wish to speak in the medium, and even creates a relative parity among speakers.

The years since the *Reno* case have confirmed the benefits of the Internet's neutral architecture in creating a vibrant platform for new speech. For example, the explosion of blogging and other forms of political expression – including creative, innovative, and sometimes controversial videos and multimedia presentations – have had a tremendous impact on political and social discourse. Collaborative forums, such as the online reference Wikipedia, have arisen from scratch to create entirely new ways of generating and disseminating information and viewpoints. All of this has taken place without anyone needing to make arrangements with network operators or others before speaking, other than to obtain basic access services into the Internet.

The neutral Internet has also led to an astounding array of innovative technologies and applications. The technology that underlies the World Wide Web itself was created by an individual innovator, Tim Berners-Lee, working alone and without the consent or approval of any company. Similarly, technologies such as "Open SSL" (widely used to secure commercial transactions on the Web) and "SSH Secure Shell" (widely used in remote access services) were created by one or two individual innovators. Voice-over-IP ("VoIP") services were first broadly popularized by Jeff Pulver and his "Free World Dialup" service. Web-based e-mail services were first deployed by startup companies like Hotmail.com (later acquired by Microsoft). And small companies like Mirabilis were significant innovators of instant messaging technology. None of these innovators had to negotiate with network operators elsewhere on the Internet – instead, they were free to make new technologies and applications available, and users were free to try them.

The neutrality of the Internet also has been a central assumption underlying the legal landscape enjoyed by Internet service providers and users. As noted above, the *Reno* case ensured strong First Amendment protection based on the Internet's unique ability to empower individual speakers. Legislative and legal decisions protecting Internet service providers from intermediary liability (*i.e.*, liability for transmissions by users) likewise have been founded on the principle that the network operator is not exercising control over the content that passes through its network. Where network operators *do* exercise control – for example, broadcast networks – the legal regime can be quite different. A retreat from neutrality could open the door to both greater government regulation of Internet speech and greater legal responsibility on service providers for the content of third parties' Internet communications.

## 3. The Uncertain Future of Internet Neutrality

## a. Reasons for Concern about the Future of Neutrality

Despite all the benefits of openness, it is at best unclear whether a commercial network operator – particularly one with some degree of market power – would ever voluntarily choose to design and run a network with the open characteristics of the Internet. In the 1960s, AT&T fought to prevent the use on its network of customer equipment supplied by other companies; it took an FCC decision to open the telephone network to handsets and related equipment of the user's choice. When data services began to be offered over the telephone network, the FCC again stepped in to ensure that telephone network providers could not use their market power to control the new line of business. Where network operators' arguments against openness requirements have prevailed at the FCC or in the courts, open arrangements have rarely arisen on their own.

The neutral Internet itself, as discussed above, was created under government and academic auspices, not by commercial enterprises. Furthermore, the Internet rode on top of the telephone network, which was subject to common carrier regulation. As a result, the providers of the network's physical connections to end users were legally prohibited from exercising any type of gatekeeper control.

Recently, several top broadband executives have made statements suggesting that they wish to obtain payment from services (e.g., Yahoo!) used by their subscribers, or to enter into special arrangements with certain Web sites or content providers to guarantee a higher delivery priority or quality of service. These statements have raised questions about the extent to which at least some large network operators intend to maintain the neutrality of the Internet or whether they will feel it necessary to adopt a non-neutral model in which the operator, after complex negotiations, selects or prioritizes certain content or applications.

Roughly contemporaneously with these statements, legal and administrative decisions eliminated any application of common carrier rules to broadband networks. In 2005, the Supreme Court's decision in the *Brand X* case upheld the FCC's policy of classifying

cable modem service as exempt from all common carrier regulation. (As noted above, cable modem services have never been subject to common carrier regulation.) A couple of months later, the FCC classified DSL services as also exempt from common carriage obligations. As a result, there are no enforceable, generally applicable rules barring discrimination on broadband networks. (The FCC has issued a "Policy Statement" laying out four principles of openness, but this statement does not create any legally enforceable obligations. Verizon and AT&T agreed to comply with the principles in order to get approval for their recent mergers of local and long distance telephone companies, but their agreements explicitly state that those commitments last only through October 2007.)

Meanwhile, the market for Internet service has changed fundamentally over the last ten years.

In the narrowband Internet, there were once an estimated seven or eight thousand Internet service providers offering dial-up access – which meant that if one ISP lacked openness or discriminated against content or services selected by a user, the user could easily switch ISPs and almost certainly find one that offered nondiscriminatory access to all Internet content. From the consumer perspective, changing ISPs was easy in the narrowband world, where one merely had to type a new telephone number and other identifiers into one's remote access dialer. From the access provider perspective, the barriers to entry in the narrowband world were quite low. In the dial-up Internet context, even if all of the thousands of ISPs had agreed to privilege certain content, a new ISP offering nondiscriminatory service could be launched with minimal investment. Finally, as noted above, the telephone company providing the underlying physical connection to the user's premises in the narrowband world was legally prohibited from engaging in any type of discrimination.

By contrast, in today's broadband world, the telephone companies in their DSL broadband offerings are no longer subject to the neutrality obligations that came with common carriage status, and the cable companies never were subject to neutrality obligations.

It is often noted by proponents of neutrality that most consumers currently have only two, or at most only a handful, of choices for Internet access.<sup>1</sup> Our focus, however, is not on the difference between two and four or five access providers, but rather on the difference

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<sup>&</sup>lt;sup>1</sup> The FCC has found that 60 percent of Zip Codes in the United States are served by four or more broadband providers, but often those providers do not cover the entire Zip Code; while broadband Internet access options are expanding, many individuals still have only one option and many others have only two. A GAO study available at <a href="http://www.gao.gov/new.items/d06426.pdf">http://www.gao.gov/new.items/d06426.pdf</a> points out on pages 19-22 that, in the FCC study, a provider is considered to be serving a Zip Code if it serves only one person, or only serves businesses, in that Zip Code. The GAO also notes that providers of underlying telecommunications facilities who do not provide last-mile Internet access were counted in the FCC survey.

between a handful of broadband providers and the thousands of dial-up ISPs that used to exist. From the access provider perspective, the barriers to entry in the broadband world are much greater than the barriers to entry as an ISP in the dial-up world. Moreover, for us the key point is that the major broadband Internet access providers have the technical and legal ability to prioritize and otherwise control content in a way that telephone companies in the dial-up context never had. All the other emerging and potential technological options for last mile broadband service – Internet over power lines, or any of the kinds of wireless broadband – are likewise free from the nondiscrimination obligations that applied to telephone-based access in the dial-up world.

In addition, today's network operators are often part of large corporate families with broad holdings beyond just the network – including interests or ambitions with respect to various types of content or services that may be transmitted over the Internet or that may compete with Internet-based services. This means there may be strong incentives for the providers to seek to favor their own content or services, something that, again, in the narrowband context the telephone companies were legally prohibited from doing.

It is possible that consumer demand for an open Internet and competition among a small number of broadband providers will create market incentives sufficient to prevent discriminatory conduct or departures from the core principles of Internet neutrality. But that outcome is far from guaranteed. CDT believes the risk is too great to simply "wait and see." Once new, non-neutral networks and business arrangements have been put in place, overturning those arrangements is likely to be extremely difficult. Investors and corporations that make major economic decisions relating to network architecture and business plans based on a non-neutral vision of the Internet would have a reasonable argument that it is unfair to impose neutrality requirements after the fact. In short, once it is lost, reclaiming the neutrality of the Internet may be impossible. In CDT's view, it is better to establish rules of the road in advance, so that neutrality will be factored into network architecture and business plans from the start.

## b. Addressing the Network Operators' Key Concerns

In reaching this conclusion, CDT has carefully considered the concerns of network operators. One of their concerns is that the exponentially increasing demands of video services on bandwidth, left unaddressed, will swamp Internet services for all users (including for "traditional" uses like email and Web surfing). Further, they argue, building additional capacity alone will not reverse this course because new technologies like peer-to-peer file sharing will consume any available bandwidth and will "max-out" whatever new bandwidth is constructed. These concerns are indeed valid, but only if service providers insist on offering flat-rate, all-you-can-eat service levels. There are alternatives that do not produce an irreconcilable conflict with openness, including the option of charging a network's subscribers for what they consume. The bulk of broadband subscribers who want nondiscriminatory access to everything except full-length movies and who do not intend to engage in large-scale file sharing could be offered that service without any additional charge, while other subscribers (such as large-scale files sharers) could be charged more for their higher-volume usage.

We also recognize that the continued growth of the broadband Internet depends on operators' continued profitability and support from the capital markets. Network operators correctly emphasize that there are real costs to deploying new networks, installing equipment, managing bandwidth, and dealing with pirated content and other ills such as viruses, spam and phishing. We agree that network operators need to address the realities of these costs. We believe, however, that the principle of neutrality, by supporting innovation and the unlimited addition of new applications and services at the edges of the network, increases the value of the network for operators as well as users and is the best way to boost profits and attract further investment. The economic analysis complements our conclusion that it is societally desirable for operators to be precluded from maximizing profits in one narrow way, namely by discriminating among content on the Internet portion of their businesses.

## 4. Towards a Narrowly-Focused Legislative Approach

## a. The Basics of a Legislative Approach

After careful consideration, CDT has concluded that, on balance, legislation is necessary to ensure that the Internet's current level of openness – with all its resulting benefits for free expression and innovation – is retained. We have come to this position with hesitancy, and with great respect for those who are concerned about the potential stifling effects of neutrality regulation. CDT as a general rule is skeptical of, and often opposed to, legislation imposing regulatory burdens on the Internet.

It is clear that, before Internet neutrality legislation can be finalized, further work is needed and some hard questions need to be answered with clarity. Serious dialogue among the various stakeholders will be necessary. However, while finalizing legislation in this area will be difficult, that difficulty is no reason for decoupling Internet neutrality from other pending telecommunications policy reforms. If telecommunications legislation proceeds through Congress, Internet neutrality should be included in the package.

In this paper, CDT does not purport to offer complete legislative language, for we believe – in the CDT tradition – that such language can emerge only from a dialogue among affected parties. In this paper, we identify principles to guide the crafting of a balanced legislative solution, we provide some details of how Internet neutrality could work, and we highlight questions that need to be answered. Legislation should protect the core characteristics of the Internet in the least intrusive possible manner, leaving flexibility for innovation and experimentation to address increasing demand for video and other high-bandwidth applications.

An appropriate legislative framework should include some basic rules requiring network operators to preserve nondiscrimination and openness, but only on those portions of broadband networks dedicated to the Internet. The rules should be specifically focused on

the Internet offerings of network operators. Thus, just to clarify with an explicit example, CDT believes that legislation should apply only to the channel or channels of a cable system that are used to provide high-speed data services. It should be clear that the rules do not entail full common carriage obligations. While they should mandate nondiscrimination, they should clearly preclude price regulation.

These rules should be set forth in legislation, *not* left to the discretion of an administrative agency, and should be sufficiently specific to provide meaningful advance notice as to what types of behavior are and are not permitted. The legislation should clearly state what the requirements apply to and should specifically define the requirements of nondiscrimination and openness. The role of an agency – presumably either the FCC or the FTC – should be to enforce the rules through a streamlined complaint process with definite timelines.

Merely advancing generic principles and tasking an agency with case-by-case adjudication authority would leave too much discretion with the agency and would fail to provide clear protection for the essential attributes of the Internet. A prominent House-passed bill shows the shortcomings of such an approach. Instead of setting forth clear and unambiguous rules for providers, the bill relies on general FCC principles concerning what consumers should be entitled to do. It is unclear from the House bill how enforcement of these principles would work and whether the principles address discriminatory treatment or only outright blocking of content or applications. At the same time, the rules should be carefully crafted so as not to interfere with new offerings on the video or other non-Internet portion of a network operator's business. For example, if a cable system operator wants to provide a movie distributor with a separate channel to reach customers for digital movie downloads (an arrangement that some in this debate have sometimes referred to as a "virtual private network" or "VPN"), such that the download service does not harm or degrade subscribers' Internet access, that would not be precluded nor subject to Internet neutrality rules.

Nor should the rules preclude on the Internet portion of the network legitimate network management activities that are consistent with the openness that has characterized the Internet since it was first commercialized. Detailed discussions with network operators about their specific practices and concerns should inform any drafting process. Examples of practices that legislation should permit include:

- offering of caching services (by network operators and third parties) to improve delivery of certain content;
- blocking or filtering of content where the content is illegal or puts users at risk of harms such as fraud:
- notice and takedown processes or other informal and cooperative efforts for identifying and removing pirated materials; and

• prioritizing packets based on the type of traffic (video, voice-over-IP, etc.), so long as such prioritization is equally available to any content of like type and fees (if any) are assessed on end users rather than the content providers.

These and other types of legitimate network management practices would have to be defined so they do not swallow the nondiscrimination principle.

### b. Questions To Be Answered

The questions that need to be answered as the legislative process progresses include the following:

- How should the term "Internet" be defined? Legislation will require a carefully and narrowly crafted definition of what is meant by the term "Internet." For instance, the mere use of the Internet Protocol should not make something qualify as "Internet."
- How can we ensure that caching does not become a form of discrimination? One possibility to explore is requiring interconnection for competing caching services.
- How would legislation impact wireless networks? Some network operators are increasingly focused on creating and marketing content specific for wireless distribution, where bandwidth limitations are heightened. To what extent would the legislation apply to such offerings?

## c. Monitoring and Reporting by an Appropriate Governmental Entity

With respect to the non-Internet portions of broadband networks – such as the bandwidth dedicated to carrying cable television channels – CDT believes legislation should require careful monitoring and reporting, rather than imposition of binding rules. Monitoring is important because actions taken by operators on the non-Internet portion of the network may have an impact on the growth and robustness of the Internet portion.

In particular, legislation should provide for regular reports to Congress by an appropriate governmental entity on the amount of network capacity network providers are dedicating to the neutral Internet, and whether that capacity appears to be keeping pace with reasonable demands of Internet users as Internet applications and technology evolve. Reporting is also warranted on any signs that network providers, on their Internet offerings, are giving favorable treatment to their own content, applications, or services. Finally, reporting should carefully track the emergence of new competitors in the broadband Internet market, increases in overall network capacity, and any other factors that might reduce the threat to Internet neutrality to the point where rules safely could be sunset. By reporting requirements, we do not mean that network providers' ability to make business decisions about the best way to allocate and use bandwidth should be subject to any type of de jure or de facto government approval process. Any reporting should be accomplished without unjustified exposure of business plans.

Legislation also might specify that any service not complying with the neutrality rules may not be marketed using the terms "Internet," "broadband," or other terms likely to be confused with them.

CDT believes that this type of legislative framework could offer a relatively lighthanded way of preserving the essential aspects of the Internet. It would establish some basic, legally enforceable neutrality requirements for the broadband Internet. At the same time, it would leave broadband network providers free to experiment with new, non-neutral services on the non-Internet portions of their networks. And it would avoid giving any regulatory agency broad authority to devise regulations for the Internet.

The legislative framework would not seek to anticipate and preemptively address every conceivable way that a broadband network provider might seek to undermine or evade the intent of Internet neutrality rules. It would take a much more burdensome set of rules, as well as impossible foresight, to ensure in advance against any and all potentially problematic behavior. Instead, it is CDT's belief that a limited set of rules could suffice, backed up by a basic monitoring and reporting scheme that could identify other conduct that affects the neutral Internet – without imposing significant burdens on network providers following the letter and spirit of the neutrality rules.

## 5. The Need for Serious Dialogue

Serious dialogue among stakeholders, free from public rhetoric, could play an important role in a number of respects. Such dialogue should inform finalization of legislation, and it could help develop sensible conclusions on implementation and compliance issues once legislation has been enacted. It also could provide a significant supplement to any legislative framework since, as noted above, an appropriately lighthanded regime would not seek comprehensive coverage of all possible issues. CDT is prepared to work with all interested parties to convene substantive discussions aimed at promoting common understanding of what practices and characteristics are and are not essential to the Internet.

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