

Spring 2000

## **Media and Telecommunications Regulation and The Internet: Regulate or Strangulate?**

Lewis E. Schnurr

## MEDIA AND TELECOMMUNICATIONS REGULATION AND THE INTERNET: REGULATE OR STRANGULATE?

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### The Internet: The Environment, Technical Legal and Commercial

It is currently fashionable to discuss the Internet and its aspects of content, delivery, and infrastructure. This is hardly surprising; the growth of users regularly connecting to and using the network has been of impressive proportion<sup>1</sup> not only in the United States but also more generally world-wide.<sup>2</sup>

Alongside this growth of the user population there has also been a significant expansion of enterprises generating content of a diverse nature and vast proportion.<sup>3</sup> The growth of “e-commerce” has become over the last few years a salient factor across the service industry, from the provision of expertise to generate source material to the technology to make that material accessible to users. Media-based industries are heavily involved in developing products for Internet distribution; on-line retail sales in California alone reached nearly \$6 billion in 1999.<sup>4</sup>

The impact upon industry generally of e-commerce activity is impressive indeed.

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<sup>1</sup> Compare the figures quoted by Stephen Shapiro, *One and the Same: How Internet Non-Regulation Undermines the Rationales Used to Support Broadcast Regulation*, 8 MEDIA L. & POL'Y 1, 1 (Fall 1999), with more recent comment generally available but particularly, *It's a Small World*, PC MAGAZINE, April 18, 2000, at 87. It is commonly accepted that Internet connectivity population world-wide more than doubles quarterly.

<sup>2</sup> *Id.*

<sup>3</sup> The proliferation of commercial activity on the Internet is characterized by, *inter alia*, the rise of “dot-com” companies in the corporate environment as well as the increase of web pages available. See for example, *B2B e-commerce*, PC MAGAZINE, April 18, 2000, at 179.

<sup>4</sup> *Supra* note 1.

### The Internet: Technical Realities

The Internet as an information and commercial vehicle is broadly unparalleled as a transmission and transaction medium. It is instructive to reflect upon its character and the differentiation from other mechanisms of information dissemination and collection alongside which it now exists EDIA discussing its environment and the nature of regulation appropriate to that environment.

First, the Internet supports information transmission to (and equally where appropriate, from) a distant point in near real time,<sup>5</sup> rather similar to a telephone-based communication exchange. Unlike the telephone, however, the Internet dialogue is text-based; information is written, recorded, and perhaps archived as a basic process of information exchange. This 'storage' aspect as an intrinsic property of using the medium carries grave implications in both the social and commercial dimensions.

Second, the technology used to receive information is of itself able to send information. Users receiving information from others also connected to the Internet are also able to send (and inescapably do send) information from

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<sup>5</sup> The basic mechanism of data transfer on the Internet requires the binary data stream containing information to be divided into independent and separate segments, each of which is of the order of a few microseconds in length (and often of much shorter duration), to add to each of these segments (technically termed 'packets') its own set of destination and origin addressees and signal synchronization and sequencing information, and then to send each of these ensembles so created (technically termed 'frames'), in effect, to all other computers throughout the world (including the destination computer) simultaneously. [Modern network technology groups, or 'routes', the frames down hierarchical paths toward the destination computer. These paths are dynamically determined; in fact (the reader will not be surprised to note), not all frames from every computer to every other computer appear on every network in the world]. The path from source to destination computer varies from frame to frame. It is common to find that earlier-sent frames arrive at their destination later than those sent subsequently from the source. The destination computer then effects the tasks of storing later-sent frames until the earlier-sent frames arrive and of shuffling and then of re-constituting the original data stream. Frames arriving at a computer without a matching address are ignored by that computer. This entire process cannot in any sense be considered 'real-time' transmission. However, since frames are of short duration and processing occurs at a fast rate, delays of the order of 1/2 to 120 seconds are normally experienced, depending upon the type of information sent and network congestion at any given time caused by other frames traveling from other sources to other destinations.

their terminals to one or more others.<sup>6</sup> Dialogue -- also in near real time -- is a fundamental capability and a basic part of ( and inseparable from) equipment used to enable connection to the Internet, even if the connection initially intended simply to receive or to transmit information.

Third, the Internet itself is, at least in the developed world, as pervasive on an international basis as virtually any other communication or dissemination technology.<sup>7</sup> The segment of population in any given geographical area able to connect to the Internet (or, indeed, generally making regular use of such connections) is approaching penetration figures applicable to those of the telephone itself.<sup>8</sup>

Fourth, the mechanism of information transfer between terminals connected to the Internet does not of itself carry geographic distinction. The user is superficially unaware of the location of information origin (unless, of course, the nature of the content suggests a particular origin by means of, for example, language or context). Moreover, receipt of information by the user may be from one or more sources with physical locations not necessarily related to the location reasonably expected by that user.<sup>9</sup>

Fifth, information sent using Internet technology is not of itself secure. Rather, it is again a fundamental aspect of Internet technical architecture itself that all information generated and sent by any given user is receivable and in

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<sup>6</sup> See *supra* note 5. Information in the form of, for example, a web page, the content of which is to be displayed on a target computer, is sent in such a way as to cause the destination computer regularly to return other frames to the source computer validating receipt of the frames which ultimately will form the whole of the web page requested. Hence, computers 'handshake' and in effect all transmission by any computer connected to the Internet is both-way to enable this method of data transmission.

<sup>7</sup> See *supra* note 1.

<sup>8</sup> *Id.*

<sup>9</sup> Part of the data exchange arrangements used by a user to request a given web page permit the destination computer to inspect the frames, re-address them, and forward them on to another computer; this is commonly done. It can be that this processing action is sufficiently rapid to prevent the user from discerning the 're-direction.' This mechanism is regularly used even within what the user perceives to be the same web site address; for example, as a substitution for one or more web pages normally found at a single web address.

fact is received by every other user.<sup>10</sup> Information intended to be secure must be the subject of particular treatment specifically directed toward that end and invoked specially by the user or 'local host provider.'

The utility of a medium which is generally available at minimal cost, virtually world-wide in distribution, and which supports interactive (or 2-way) transmission has not escaped the imaginations of the commercial community.<sup>11</sup> Its unparalleled growth, given the services it can (and does) support, is easily understood.

What has not, it would appear, been grasped altogether is its unique nature and the need for unique solutions to the problems of managing its infrastructure and the content it might carry.

### **The Internet: Legal and Regulatory Concerns**

Since the evolution of the Internet as it now exists from a limited-access privileged scientific research tool a decade ago,<sup>12</sup> commercial interests and legislators alike have struggled to find a workable balance between its ability to support expansion of traditional business and creation of new enterprise alongside the possibilities of social and commercial misuse.<sup>13</sup>

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<sup>10</sup> See *supra*, note 5. Although computers are programmed normally to disregard frames not containing the target computer address, test and measurement equipment and, indeed, the target computer itself (or another, co-located) can be programmed to deal with any frames received in virtually any manner the programmer desires. A wide range of user-invoked encryption software is widely available, and Internet service providers also offer such user-based capability. Note, however, that addresses cannot be encrypted or altered in any way. Complete anonymity is impossible.

<sup>11</sup> This is well known, but see, for example, *Pipeline*, PC MAGAZINE, April 18, 2000, at 88.

<sup>12</sup> For an excellent and referenced historical treatment of Internet origins, see Claudia Oliveri, *Congress Wrestles with the Internet: ACLU v. Reno and the Communications Decency Act*, 6 MEDIA L. & POL'Y 1, 12 (Fall 1997).

<sup>13</sup> See *id.* at 12-13.

These concerns focus upon the content delivered to and extracted from the Internet.<sup>14</sup> The provision of the technical infrastructure essential to Internet information transmission has been left largely to market forces stemming from the potential rewards an Internet infrastructure might enable. Internet “regulation” is a topic of high fashion; whether to ‘regulate’ and if so, how and to what extent currently occupies the minds of many. A number of alternative approaches to regulation have been advanced, in the main building upon the history of traditional telecoms regulation methods.<sup>15</sup>

Current U.S. telecom regulatory initiatives centre around attempts to achieve a meaningful implementation of the Telecommunication Act of 1996<sup>16</sup> and the confused complication of implementing the Communications Decency Act of 1996,<sup>17</sup> although other legal mechanisms concerned with a range of issues from intellectual property to commercial liability are becoming increasingly applicable to the commercial Internet environment.<sup>18</sup> These initiatives are largely related to content, its delivery and its consumption. Moreover, there remains the unanswered question of how to address information of a media kind which is Internet-distributed. Internet content providers which stream real-time video or audio (whether the source is in fact in real-time or from pre-recorded material) may or may not be considered as ‘broadcasters’ in the normally accepted legal sense of the word.<sup>19</sup>

The implications of this situation are significant. Without a stable, predictable and clearly understood regulatory regime, opportunists may well attempt to enter the market quickly, to profit short-term, and to remove

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<sup>14</sup> There have been many activities concerned with Internet content, particularly relating to challenges to the Communications Decency Act (1996). For a tacit summary, *see id.* at 14.

<sup>15</sup> *See* FRIEDEN, *NEW WORLD NEW REALITIES* (2000).

<sup>16</sup> Legislative confusion of the meaning of the Telecommunications Act of 1996 is summarized in a general sense by Justice Scalia in, *ATT v. Iowa Util. Bd.* 119 S. Ct. 721 (1999).

<sup>17</sup> This Act, following a number of challenges and a recent Supreme Court judgement, has currently a problematic status; *see* Oliveri, *supra* note 14.

<sup>18</sup> *See* Lyndon Hong, *Videostreaming Content Over the Internet*, 8 MEDIA L. & POL’Y 1, 55 (Fall 1999); *see also* George M. Perry et. al., *Personal Jurisdiction in Cyberspace: Where Can You Be Sued, And Whose Laws Apply?*, 7 MEDIA L. & POL’Y 1, 1 (Fall 1998).

<sup>19</sup> For a clear and comprehensive treatment of broadcasting on the Internet, *see* Eric Slater, *Broadcasting on the Internet: Legal Issues for Traditional and Internet-Only Broadcasters*, 6 MEDIA L. & POL’Y 1, 25 (Fall 1997).

themselves from the market (and from risk), only to re-enter the market in a different guise with a similar motive. More established commercial initiatives aimed at medium-term gain, perhaps as an extension of known 'bricks and mortar' corporations, may be suppressed by the risk (whether real or perceived) of unknown commercial liability not only in the sales and marketing arenas but also in the regulatory environment relevant to their use of the Internet as a commercial medium.<sup>20</sup>

It could be argued that legal and regulatory uncertainty inhibits commercial investment of a kind destined to provide balanced economic growth or perhaps directs that investment to activities not wholly consistent with the maintenance of balanced market forces. In such an environment, both seller and buyer might conceivably be adversely affected.<sup>21</sup>

Within the United States, for example, the current 'state of play' suggests this situation to exist. The "dot-com" market over the last few years has proven to be highly volatile. Buy-outs, buy-ins, take-overs and mergers are common.<sup>22</sup> The legal mechanisms which might normally provide a known and stable base upon which business can be built are, themselves, a moving target.

It is perhaps worth observation that often legal and commercial concerns expressed about Internet activity generally relate to the content carried by the Internet, that is, commercial activities undertaken between persons using the Internet as a vehicle for those activities. It is possible (and indeed common) to refer to the "Internet" as such when discussing issues relating in the main to the content carried by that infrastructure. Indeed, the distinction is blurred to the extent that the phrase "bought it on the Internet" is really a contraction of the reality of "bought it in a marketplace of goods and services carried by the

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<sup>20</sup> This is recognized generally, but also forms one of the key concerns of the European Union Commission in their latest report on Internet regulation. CEC COM (1999) 539, at 14 (2000).

<sup>21</sup> The telecoms aspects of market behavior in an environment of regulatory flux is explained clearly in section 2 of NEW WORLDS NEW REALITIES, at 19. *See supra* note 15.

<sup>22</sup> This information is well known, but note the recent mergers of AOL and Time Warner, and of MCI/Worldcom and Sprint, which emphasize the "other side of the coin". Internet trading companies, the "dot-com" group of recent market entrants, continue to affect significantly 'high-tech' market activity; their performance is currently the subject of regular comment in the media generally.

Internet.”<sup>23</sup> The separate concepts of Internet content, which makes up the goods and services offered thereby, and the Internet itself, as a neutral infrastructure able only to transfer information, appear to be blurred.

It is argued here that this diffusion of the one into the other is not only unhelpful but also a significant impediment to the development both of the infrastructure and of the commercial environment created by the information that infrastructure carries. Nonetheless, the issues of the management of commerce upon the Internet have been addressed and in some measure have been successful.<sup>24</sup> It may, however, be helpful to summarize (for the purposes of analysis) the principal legal structures currently seen to apply specially to *Internet-delivered* goods and services; that is, to Internet content.

### **The Internet: Content and Commerce**

The nature of Internet content is diverse, and this applies to commercial activities which that content supports. These activities might usefully be grouped into the several categories of broadcasting, commercial practice, and ownership of property. While these categories involved overlap (as would, it could be argued, any grouping chosen) they also involve activities in the main separable one from the other.

### **Internet Broadcasting: Broadcasting?**

Broadcasting regulation finds itself the product of history. It was common (and, arguably, was essential to the growth of broadcasting itself) to establish guidelines for the use of the frequency spectrum (asserted without any real dissent to be of finite extent)<sup>25</sup> as well as for the context of material sent by way of that medium to a consuming public.<sup>26</sup> This history has coloured in

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<sup>23</sup> This phenomenon is currently incorporated in the family of “dot-com” commercial advertising widely experienced. For a review of the diffusion of conduit and content may be found. See Alain Gardrat, *Another Look at European Internet Law*, 7 MEDIA L. & POL’Y 1, 27 (Fall 1998).

<sup>24</sup> *Id.*

<sup>25</sup> Teeter et al, LAW OF MASS COMMUNICATION (1998), sets out a comprehensive history of broadcast regulation and its evolution in the US, from the creation of the Federal Radio Commission in 1927 to the present day.

<sup>26</sup> *Id.*



various ways recent case law applied to the Internet environment. Perhaps most generally applicable is the finding of the Reno Court in its consideration of the Communications Decency Act.<sup>27</sup>

Comparing the traditional “free-space broadcasting” environment to that of the Internet, the Reno Court concluded that spectrum scarcity -- or, indeed, scarcity [of the infrastructure] *per se*, did not and was unlikely to apply to the Internet.<sup>28</sup> This conclusion has found a mixed response; while many agree with the conclusion, a number of others question whether such a statement can be generally applicable.<sup>29</sup> Moreover, the Reno Court extended the scarcity argument to the wider argument of not only available spectrum (use of a ‘channel’ without suffering from or causing to another harmful interference) but also the cost of ‘broadcasting’ -- distributing to the Internet generally -- programs or content.<sup>30</sup> It is certainly true that the cost of connecting to the Internet and streaming information from an Internet ‘address’ is minimal indeed. It is, however, much less likely that the information presented thereby might attract a wide audience.<sup>31</sup> This reality was forecast in the early days of Internet development.<sup>32</sup>

The Reno Court’s deliberations point out an important fact: that traditional broadcasting [distribution of programming material in one direction only from one source to many recipients using free space-borne electromagnetic radiation] is used as a ‘bench-mark’ in the consideration of a ‘similar’ Internet-based activity [distribution of programming material within a bi-directional (both-way) channel from one source to possibly many recipients using electrical signals passing along a cable connected to other cables]. While this comparison is perhaps the only meaningful one that can be drawn given the paucity of Internet-specific broadcasting ‘rules,’ the parallel is both technically and functionally strained.

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<sup>27</sup> ACLU v. Reno, 929 F. Supp. 824 (E.D. Pa. 1996). Various aspects of the opinion are widely further discussed in the literature.

<sup>28</sup> Reno v. ACLU, 521 U.S. 844, 870 (1997).

<sup>29</sup> Charles W. Logan, Jr., *Getting Beyond Scarcity: A New Paradigm for Assessing the Constitutionality of Broadcast Regulation*, 85 CAL. L. REV. 1687 (1997).

<sup>30</sup> Reno v. ACLU, 521 U.S. 844, 870 (1997).

<sup>31</sup> See Shapiro, *supra* note 1.

<sup>32</sup> Jonathan Weinberg, *Broadcasting and Speech*, 81 CAL. L. REV. 1103 (1993).

It is also content-directed; the infrastructure *per se* is largely assumed to pre-exist as a neutral environment. This assumption, given the evolving nature of goods and services the Internet infrastructure now carries, and given the increasing number of users, can be seen to be incorrect. Expansion of e-commerce must be accompanied by expansion of the medium upon which it is carried.

The distribution of information using the Internet as a medium of conveyance is sufficiently dissimilar to any other current mechanism that a fresh look, starting from the reality of what the Internet is (and may become) as an infrastructure and taking into account the information retrieval parameters of its user population is needed. It may indeed be helpful to discriminate between regulation (and management) of the infrastructure and its development and regulation (and legal definition) of the commercial and social aspects of the content and its use. These issues are clearly different in kind. Nonetheless, it is unsettling that general initiatives in these areas seem not to be visible.

### **Internet Content: Commercial Practice**

Commercial practice in today's 'bricks and mortar' marketplace rests on a millennia of experience, tempered by the 'trial and error' of adjudication and process. It is founded upon the assumptions that goods are real, their origins are readily determined, the point of sale (and hence taxation) are identifiable, buyer and seller are known to one another to the extent that a transaction requires that knowledge, and that (in the case of services) the service bought by and rendered to the buyer by the seller can in some way be physically experienced by both.<sup>33</sup>

Internet commerce carries few (if any) of these realities as intrinsic components. It is a 'virtual' medium with 'virtual' experiences as its business 'bottom line'. Nonetheless, today's body of commercial law is sufficiently flexible to address many of the procedures appropriate to Internet-enabled commerce<sup>34</sup> when transactions proceed as expected and neither buyer nor seller are subsequently aggrieved. This situation alters to the point of confusion when transactions are less than straightforward; issues of jurisdiction can be

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<sup>33</sup> See Perry, *supra* note 18.

<sup>34</sup> See Gardrat, *supra* note 23.

hopelessly unclear and redress to an aggrieved party perhaps ultimately impossible.<sup>35</sup> Taxation is a general problem which conventional approaches fail adequately to clarify and which currently is a matter of some debate.<sup>36</sup> Moreover, one can easily imagine customs tariffs and duties, as well as customs control generally, to fail utterly in the area of Internet sales of intangibles, from the purchase of temporal information to the transfer of money.

Again, one can see clearly the problems involved in attempts to apply 'yesterday's' marketplace rules to today's Internet-based market. A fundamental 're-think,' incorporating as fundamental parameters the characteristics of the commercial environment [the Internet *per se*] in which goods are bought and sold, is required. Linked to the sale of goods and services is the fundamental concept of ownership. Without clear rules of 'who owns what when', it can be argued that any basic commercial transaction environment lacks sufficient clarity to ensure a balance of market forces.

### **The Internet and Intellectual Property**

Although the existing body of law provides a stable basis for the determination of intellectual property ownership, the Internet as a market environment complicates the application of that law.<sup>37</sup> Indeed, some assert that the law extant is "grossly inadequate in protecting the interests of owners involved in electronic commerce"<sup>38</sup> due largely to difficulties in identifying to whom intellectual property is disseminated and the uses that might be made of that transmitted information which represents the intellectual property in question.

Although a large body of national and international law addresses these issues, it fails specifically to deal with the mechanism of how and to whom intellectual property might be transferred, the liability of that entity acting as the source of the information which contains the intellectual property, and the

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<sup>35</sup> See Perry, *supra* note 18.

<sup>36</sup> Auri Weitz, *WWW.Foreign Corporation.Com: The United States Taxation of International Business Transactions Conducted Over the Internet*, 9 FORDHAM I. P., MEDIA & ENT. L.J. 1035 (1999). See also, Sandi Gwen, *State Sales & Use Tax on Internet Transactions*, 51 FED. COMM. L.J. 245 (1998).

<sup>37</sup> See Gardrat, *supra* note 23.

<sup>38</sup> *Id.*

jurisdictional issues of which laws can be applied to which of the various actions which comprise collectively the transfer (or dissemination) of intellectual property using the Internet as a commercial medium.<sup>39</sup>

Calls for co-ordination of the many national and international laws relating to this situation have been made. The observation that it is more likely that too many laws with overlap rather than a shortage of legal mechanisms contributes to the confusion of intellectual property ownership is interesting, indeed.<sup>40</sup> In such a situation, it can perhaps reasonably be argued that a new look is likely to prove more successful than an attempt to draw analogies or inferences from existing law which itself arises from and relates to other (dissimilar) commercial environments.

Thus the current legal mechanisms in place to structure and hence to stabilise the commercial activities which the Internet supports stem from original stimuli not necessarily related to that medium, relate reasonably to that medium only in part, and struggle with many of the fundamental components needed to develop a stable marketplace. Of principal interest are issues of jurisdiction, liability, and commercial practice. The message seems to be: a fresh look is needed. That 'fresh look' is indeed a fresh look -- at a new marketplace and how and to what extent within that new marketplace goods and services are distributed, traded, and consumed.

### **The Internet: Conduit and Its Management**

It is difficult to imagine how the legal environment, appropriate to commercial and social activity within this marketplace, can involve the components from which it is physically built. Few laws appropriate to the sale of food, for example, relate directly to the size of the shop from which that food is purchased or to the range of products the shop might carry, or for that matter, the size and position and accessibility of the shop's interior to the general public. In a similar way, Internet-enabled commerce, e-commerce, should be subject to legal strictures appropriate to and relevant to that activity. While the Internet itself, its wires cables and digital processing components, may well be the subject of revised legal initiatives, those initiatives are sensibly directed

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<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

specifically toward that Internet infrastructure.

### Conduit and Its Architecture

The Internet is commonly described as a 'network of networks'.<sup>41</sup> While this is true, the phrase does not describe the entire truth. Millions of users connect via existing telephone networks to computers which in turn are interconnected by means of dedicated private leased circuits to others which in their turn are similarly interconnected to still others. It is in fact this "interconnection of interconnected computers" which forms the avenue of Internet-borne data and information flow,<sup>42</sup> and this flow in turn conveys the information which determines the nature of the Internet content users buy, sell, or otherwise consume or experience.

It is therefore the case that Internet infrastructure availability pivots entirely upon the ability to use leased lines and the computers to which they are connected and in large part, upon the availability of local telephone network resources to provide the final link from the user's terminal (typically a computer) to some 'gateway' computer which by virtue of its being interconnected to others, forms a principal constituent of the Internet itself. It is because of this reality that the legalities of Internet content and telecoms regulation become entwined, and this is perhaps a significant factor in causing the "Internet" *per se* to be considered in the light of not only commercial law but also of telecoms regulation.

The growth of e-commerce is linked tightly to the user population (both in number and in individual purchasing power) and the nature of that population is in turn related directly to cost and ease of access to the Internet infrastructure upon which e-commerce subsists.

There can be little doubt that the number of users connecting to the Internet within the U.S. has been driven almost exclusively by the prevailing telecommunications policy of 'free' local telephone calls.<sup>43</sup> With only minimal

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<sup>41</sup> See Perry, *supra* note 18.

<sup>42</sup> *Id.*

<sup>43</sup> The 'non-timed' local call, ubiquitous in the US, is not at all common elsewhere in the world. Imagine the effect of imposing a charge for local calls of the order of 5 to 10 US cents per minute (a typical cost elsewhere) upon the dial-up Internet user population. This concern has been

cost of access and no additional 'time-related' or recurring costs, users can make use of Internet content in a way which is consistent with their own particular circumstances. Many users, perhaps with a dedicated second telephone line, dial up and access the Internet and subsequently may well remain so connected for extended periods. There is no structure to limit access time.

Although 'dial-up' technology has evolved over the last few years and now enables connection using the conventional telephone network at data speeds nearly as high as physical limits permit<sup>44</sup> (and virtually all Internet-connected users using 'dial-up' connections today make use of such technology) these speeds do not make possible convenient use of many of the services now commonly offered. The evolution of greater sophistication and a wider range of information services -- a natural consequence of product differentiation which is an intrinsic part of competition-led markets -- now means to the user with a 'dial-up' connection that a longer time is needed to connect to and to interact with many Internet-borne services.<sup>45</sup>

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expressed by the European Commission, which has announced a number of measures to put into place a 'non-time charge' connection regime across that continent. It is asserted that time-charge connection arrangements are likely significantly to impair the growth of e-commerce in Europe. Indeed, pressure stemming from the US "non-charge time" connection arrangements have already given rise to limited 'non-charged connect time' arrangements in the United Kingdom. Pressure is likely to continue, and the goal for the introduction of 'non-charged' Internet connection methods is to achieve European-wide access in the next year or two. It is currently a matter of high priority.

<sup>44</sup> The laws of physics, when applied to the transmission of digital data within a telephony channel and through modern telephone exchanges, invoke a trade-off between data speed and noise susceptibility. The most recent international standard for analogue-borne digital data, ITU-T V.90, permits, in a noiseless environment, speeds to a distant computer of 56 kbits per second and to that distant computer speeds of 33 kbits per second. In the practical case, even the minute amounts of noise present on, say, high-quality cable plant cause those ideal values to be reduced up to 50%.

<sup>45</sup> See *supra* note 5. Lower data speeds simply mean that data frames last for a longer time. Since the formation of text or images (or both) into a coherent web page require a certain number of frames for their composition, the length of time it takes to form a web page image is related to the length of time taken for all relevant frames to be received. It is commonly (and mistakenly) thought that images will be formed more quickly if higher data speeds are used for Internet connection. While this is broadly true to a point, the speed of production of image frames by a source computer and the rate at which these frames are able to be received by the destination computer (in the presence of millions of other frames intended for others) also produce delays. These delays are normally attributed to 'dial-up' or connection restrictions by users, who are not

These factors combine to generate an e-commerce 'cul-de-sac.' Higher connection speeds are required for the delivery of new products which e-commerce might offer, yet current methods of Internet connection cannot be further developed to meet that need without a new approach to that connectivity.

This apparent impasse can be circumnavigated by replacing conventional telephone network connection methods with direct connections, routed from the user's equipment to an Internet-connected computer and thereby bypassing the telephone network link referred to earlier.<sup>46</sup> While such connections have been for several years used to connect, for example, corporate networks to an Internet-connected host computer, they require the use of a separate wire or cable from the user's location to the host computer's location and it is common to find that such cables do not physically exist. This is hardly surprising, wires and cables connecting premises to a telecommunications-type service were originally installed to serve those premises with telephone service. They run physically from a point requiring such a service to a central location where the telephone exchange equipment able to provide that service is located. Moreover, these wires and cables are the property of the local telephone service provider; they represent not only considerable installation cost but also the end result of an involved scientific design process intended to identify which wires and cables might be provided throughout an area for the purpose of offering conventional telephone service.<sup>47</sup>

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immediately aware of the frame arrival rates at their computers.

<sup>46</sup> This approach of directly connecting users to host computers which themselves are connected to and are part of the Internet infrastructure is becoming more common as wires and cables are becoming available to support such connections. In densely-populated areas, where the number of connected users per cable length is a high number, companies owning Internet-connected host computers are funding the laying-in of special cables for this purpose. In less-densely populated areas, users must await either the un-bundling of the local loop or the (considerable) investment to fund others to lay in special cables. A growing number of users are taking advantage of direct connectivity offered by cable TV companies, who have adopted their cable TV infrastructure to provide this service alongside their distribution of TV programs.

<sup>47</sup> The routing and capacity of cable plant installed by a telephone service provider represents the 'Lion's Share' of their capital assets: figures of up to 80% are common. Hence there is great concern about not only unnecessary duplication of capacity but also of marginal capacity (which requires on-going civil works to correct). Cable plant extant represents capacity requirements carefully calculated and based upon telephone service needs, which Internet connectivity as an addition to that service has confounded. The 'local loop' is by no means infinite in extent and many engineering solutions to increase capacity without involving the extensive civil works

This collection of wires and cables -- termed 'cable plant' by telephone engineers -- is referred to in telecommunications regulation as the 'local loop'.<sup>48</sup> Clearly, without the ability to use such a resource to provide electrical connections from one point to another, that is, from a user's premises to those where an Internet-connected host computer might be located, an entirely new Internet connection regimen must emerge.<sup>49</sup>

### Conduit: Regulate?

The Telecommunications Act of 1996 addresses this matter squarely. This is exactly the "unbundling of the local loop" action to which it referred and which it empowered. It is no doubt realised by the reader that at the time of writing this initiative remains largely unaddressed.<sup>50</sup>

This connectivity issue -- and its linked concerns of the availability of cost-effective means to provide inter-computer connectivity with increased capacity and density -- is a key factor, perhaps the key factor, to a growing and developing e-commerce environment. It is also in the main a matter of technical complexity. Alterations, additions or alternative approaches to the method of connectivity are engineering issues with an attendant price tag of immense proportion. Moreover, it is difficult to see how technical solutions (with a number of competing vested-interest parties in industry as well as in the telecoms provider sector) and investment capital (from a sector expecting considerable financial return perhaps even in the short- or medium-term) can come together to create a uniform pervasive infrastructure providing equitable

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involved in physically laying-in new or more cable plant are currently in place. This aspect of telecommunications is in fact a real and appropriate candidate for arguments of infrastructure (economic) scarcity.

<sup>48</sup> The legal and other implications of this 'local loop' are discussed earlier. *See supra*, note 44.

<sup>49</sup> A number of wireless and fibre-optic cable approaches have been used to supply 'cable plant' alternatives for Internet connectivity. Microwave and fibre-optic solutions are common and successful in the main. Other wireless schemes have come to grief both technically and commercially and have been abandoned. There is currently much emphasis on Internet infrastructure connectivity using mobile (or cellular) services. The data speed for such connections, however, is limited to such an extent that special web page structure with minimum information content has emerged in sympathy.

<sup>50</sup> Recent opinions have enabled the various commercial interests to begin the unbundling process in various areas.



affordable and generally available connectivity without a focused national strategy to encourage such a development.<sup>51</sup>

These are, surely, matters for primary legislation rather than appropriate to ad hoc treatment of particular grievances with adjudication tools from history which themselves only relate to (or are seated within) the content of the e-commerce environment itself.

“Regulation” of the Internet, or perhaps more accurately, regulation of the telecommunications environment in the light of the Internet and the e-commerce it enables, is a topic which has attracted the interests and imaginations of academics and scholars throughout the world.<sup>52</sup> Regrettably, much of the deliberations and thinking fail to draw distinction between the Internet infrastructure and the e-commerce and other social services which are independent of but linked to and carried by that infrastructure.<sup>53</sup>

Although much political energy, particularly in the United States, is currently directed toward the re-structuring and re-definition of the social and commercial environment of the Internet and its e-commerce component, it might be said that rather more analysis using historical measures than synthesis considering fundamental realities is undertaken.

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<sup>51</sup> The FCC has recently taken steps to encourage industry to develop common standards for infrastructure use. An example of such a step is the agreed common standard for the ‘V-chip’. Other initiatives have been less successful. Direct TV standards remain problematic and a strategy to develop equipment to support the technical development of a uniform National Information Infrastructure (politically an issue of some prominence nearly a decade ago) seems yet to be unborn. Activities of this kind elsewhere in the world have been under way for some years. Europe articulated debated and agreed plans of this kind over a decade ago; they have given birth to a number of technological solutions to *inter alia* the problem of Internet connection and use and have spawned consequent economic development and growth. Perhaps the best known of these is ‘GSM’, the global wireless telephony infrastructure.

<sup>52</sup> See *supra*, note 15.

<sup>53</sup> The concept of ‘conduit-content’ distinction in the telecommunications environment was, earlier, a topic which attracted some interest. See McLaughlin, various works, which include an ‘Information-business’ area in which conduit-content and product-service mapping is meaningfully undertaken in the light of regulation and other factors. This work arose from the Harvard University Program on Information Policy Research some 10 years ago. See Lew Schnurr, *The Telecomms Resource Environment*, ITU 4th World Forum Proceedings, (1982), in which the conduit-content concept is outlined alongside the description of a telecommunications infrastructure generally.

One may well question, then, whether the current approaches are simply a palliative to suppress a symptom and if so, what alternatives might be likely to enable the generation of a new environment in which the Internet as an infrastructure and the e-commerce which it effects can grow and flourish and when it might be likely that these alternatives will be identified and considered in depth.

Part of the solution to this dilemma may well rest in the development of a legal and administrative mind-set in which regulatory separation of conduit and content, with distinctive and separate initiatives appropriate to each, is used to re-define in new terms appropriate to its dimensions its place in the socio-economic order.

