Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Implementation of the Local Telecommunications Act of 1996	)	CC Docket No. 96-98
Intercarrier Compensation for ISP-Bound Traffic	)	CC Docket No. 99-68

REPLY COMMENTS OF ICG TELECOM GROUP, INC.

Albert H. Kramer, Esq.
Allan C. Hubbard, Esq.
Jacob S. Farber, Esq.
Robert Felgar, Esq.
DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP
2101 L Street, N.W.
Washington, D.C. 20037
Telephone: (202) 785-9700
Facsimile: (202) 887-0689

Attorneys for
ICG TELECOM GROUP, INC.

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SUMMARY

Bell Atlantic compels a finding that ISP-bound traffic is "telephone exchange service" and therefore subject to the reciprocal compensation provisions of Section 251(b)(5) of Act. The ILECs attempt to wave aside the court's directive and refocus the debate on already rejected legal arguments and overblown policy claims of market "distortion." The ILECs' attempts must fail.

The ILECs, with one significant exception, point to the Commission's *Advanced Services Remand Order* as support for their argument that ISP-bound calls are "exchange access" and therefore not subject to reciprocal compensation. As that one excepted ILEC properly concedes, ISP-bound calls cannot be "exchange access" because such calls do not entail the requisite "telephone toll services." If an ISP-bound call is not "exchange access," it must – as *Bell Atlantic* explains – be "telephone exchange service."

The ILECs attempt to give short shift to the crucial definition of "telephone exchange service" by arguing that the term is irrelevant because it is not specifically mentioned in the Commission's rule governing reciprocal compensation. The *Bell Atlantic* court certainly did not share that view when it vacated the Commission's Declaratory Ruling for failure to explain "the fit of the . . . rule within the governing statute," most specifically the fit of the rule within the statutory framework of "exchange access" and "telephone exchange service."

The ILECs try but fail to breath life into the Commission's end-to-end analysis for determining whether ISP-bound calls are subject to reciprocal compensation. In addition, the ILECs tout the ESP exemption as support for their argument that ISP-bound calls are interstate

and not local. Actually, the exemption cuts the other way because it shows that the Commission consistently has mandated that ISP-bound calls be treated as local.

ISP-bound traffic is substantially identical to other local traffic in its use of the network and the costs incurred by the terminating carrier. Thus, even if the Commission found that ISP-bound traffic is not subject to 251(b)(5), the Commission should prescribe inter-carrier compensation arrangements that are the same as reciprocal compensation arrangements for other local traffic.

The ILECs also raise misplaced policy arguments. Reciprocal compensation for ISP-bound calls does not, as the ILECs allege, distort the market. To the contrary, CLEC service to ISPs has had a salutary effect on the growth of the Internet. A departure from reciprocal compensation for ISP-bound calls would have strong negative impact on that market.

Regardless of the resolution of the legal issues pending here, the Commission's polestar in this proceeding should be to ensure that inter-carrier compensation arrangements for ISP-bound calls are the same arrangements as those in place for other types of local calls.

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REPLY COMMENTS OF ICG TELECOM GROUP, INC.

ICG Telecom Group Inc. ("ICG") hereby replies to the comments submitted by various parties on July 21, 2000 in response to the June 23, 2000 *Public Notice, Comment Sought On Remand Of The Commission's Reciprocal Compensation Declaratory Ruling By The U.S. Court of Appeals For the D.C. Circuit*, in the above-captioned proceeding (the "Public Notice").

I. INTRODUCTION

Faced with the *Bell Atlantic* decision[1] which requires the Commission to find that ISP-bound traffic is subject to reciprocal compensation, the ILECs[2] wave aside the court's clear directive and attempt to re-focus the debate on a number of the ILECs' specious claims concerning the "distortions" that the ILECs allege will result from reciprocal compensation for ISP-bound traffic. The ILECs attack the competitive industry's successes in serving ISPs as if CLECs were somehow gaming the process, accusing CLECs of riding the reciprocal compensation "gravy train." Notwithstanding the ILECs' assertions to the contrary, the fact that

1 *Bell Atlantic Telephone Cos. v. FCC*, 206 F.3d 1 (2000) ("*Bell Atlantic*").

2 The "ILECs" as used herein include United States Telecom Association ("USTA"), BellSouth Corporation ("BellSouth"), Qwest Corporation ("Qwest"), SBC Communications, Inc. ("SBC") and Verizon Communications ("Verizon").

CLECs are net recipients of reciprocal compensation is simply a by-product of two competitive failures on the part of the ILECs.

First, due to a combination of monopolistic hubris and the fact that each of the ILECs has an ISP affiliate of its own, the ILECs have not competed vigorously for the ISP market. Without competitive pressures, the ILECs offered only "one size fits all" service at high rates. ICG and other CLECs, however, are able to offer ISPs an attractive combination of price and service packages that are carefully tailored to the ISPs' operations. For example, ICG offers ISPs the option of collocating ISP equipment alongside ICG equipment in ICG's central offices. ISPs have also been attracted by ICG's superior network, which consists entirely of digital switching and fiber optic transport as opposed to the ILEC's hybrid legacy networks.

Second, the ILECs have consistently sought to prevent broad competitive entry in every way possible. As a result, CLECs have been unable to achieve significant market penetration in the residential market. This means that nearly all residential Internet users are ILEC customers, and thus the ILECs are the originating carrier for almost all residential ISP-bound traffic. This fact, coupled with the CLECs' notable successes in attracting ISP customers explains why ISP-bound traffic is the one category of traffic for which the ILECs are net payors rather than net payees.

While the ILECs are slowly awakening from their competitive slumber and beginning to more actively pursue the ISP market, their primary response has been to ask the Commission and state public utility commissions for a quick regulatory fix to the problem. The bail-out the ILECs seek comes at no cost to them, and at great cost to their competitors so it is easy to see why they prefer that course.

The ILECs would have the Commission believe that the Commission must treat what they claim are symptoms of a broken market by exempting from compensation the single class of traffic where they are net payors. The ILECs attempt to deny ICG and other CLECs recovery of the costs that they incur in delivering traffic from ILEC customers to ISPs. The ILECs unfairly target this important customer CLEC base and would, if successful, leave ICG and other CLECs in the position of delivering traffic originated by the ILECs' customers without any way of recovering the costs they incur.

As the Maryland Public Service Commission found in its decision upholding reciprocal compensation for ISP-bound traffic, there would be onerous, anti-competitive costs imposed on CLECs if ISP-bound traffic is not subject to reciprocal compensation:

> We are very concerned that [denying reciprocal compensation for ISP-bound traffic] will result in CLECs receiving no compensation for terminating ISP-bound traffic. Such an effect will be detrimental to our efforts to encourage competition in Maryland. No one disputes that local exchange carriers incur costs to terminate the traffic of other carriers over their network. In the absence of finding that reciprocal compensation applies, a class of calls (ISP traffic) will exist for which there is no compensation.[3]

The success of ICG and other CLECs in attracting ISP customers has made the ISP segment one of the few key areas where competitors have managed to win any significant market share away from the incumbent LECs. If CLECs are unable to recover their costs, one of their most notable successes to date will be turned into a defeat. This in turn could have serious ramifications for competition generally. If ICG and other CLECs lose their competitive toehold and are denied the revenue stream and growth potential that ISPs represent, it will be significantly more difficult for them to continue to expand into the residential and business

[3] *MFS Intelnet of Maryland, Inc. v. Bell Atlantic-Maryland, Inc.*, Case No. 8731 (MD PUC 1999).

markets. The continued availability of reciprocal compensation for ISP-bound calls is thus critical not only to ICG and its ISPs, but to consumers who are its indirect but very real beneficiaries.

The Commission should also keep in mind that the current traffic imbalance is self-correcting, as reflected in the 25 percent drop in reciprocal compensation as a percentage of total CLEC revenue this year projected by Verizon. *See* Verizon Comments at 21 (reciprocal compensation currently accounts for 8 percent of CLEC revenue and is expected to decline to 6 percent by year's end). This is true for two reasons. First, as the ILECs begin to compete more actively for ISPs, the traffic flow is moving towards balance. Second, as more and more residential and business customers transition to DSL and cable modems – which are not subject to reciprocal compensation – there will be a corresponding reduction in payments. The Commission should not overreact to a temporary market condition. Instead, it should let the market correct itself.

This is all the more true because the bill-and-keep approach urged by the ILECs would itself create a distortion in the market by creating a disincentive for carriers to serve ISPs and other types of customers with predominately incoming calls. Bill and keep makes no economic sense where significant traffic imbalances exist and would result in terminating carriers incurring costs they cannot recover. Regulatory structures always have a market effect. The solution is not to react to every swing of the market with a new regulation that sends the market back in the opposite direction but to allow the market to regulate itself.

II. ISP-BOUND TRAFFIC IS "TELEPHONE EXCHANGE SERVICE" AND THEREFORE IS SUBJECT TO THE RECIPROCAL COMPENSATION OBLIGATIONS OF SECTION 251(B)(5)

As ICG explained in its initial comments, *Bell Atlantic* makes clear that whether ISP-bound calls are subject to reciprocal compensation turns not on the end-to-end analysis engaged

in by the Commission but on whether such traffic falls into the statutory category of "telephone exchange service" or "exchange access." Because those two statutory categories "occupy the field,"[4] ISP-bound calls must be either "telephone exchange service" or "exchange access." Because ISPs do not provide "telephone toll services" as defined by the Communications Act of 1934, as amended ("Act"), ISP-bound calls cannot qualify as "exchange access." Accordingly, ISP-bound calls must be "telephone exchange service" and thus must be eligible for reciprocal compensation under Section 251(b)(5) of the Communications Act of 1934, as amended ("Act") and Section 51.701(b) of the Commission's rules.

The ILECs (except for Qwest) argue weakly that ISP-bound calls are "exchange access" and thus are not subject to reciprocal compensation (Qwest acknowledges this argument is a loser and does not even attempt to assert it). Alternatively, the ILECs argue that it is "irrelevant" whether ISP-bound calls are telephone exchange service because the Commission's rule defining "local telecommunication traffic" does not specifically invoke the statutory definition of telephone exchange service. The ILECs also try to salvage the Commission's end-to-end analysis as a basis for denying reciprocal compensation for ISP-bound calls, and continue to point to the ESP exemption as support for their position that such calls are not subject to reciprocal compensation.

A. The ILECs Give Short Shrift to the Crucial Statutory Definition of "Telephone Exchange Service"

The ILECs, except Qwest, all point to the Commission's *Advanced Services Remand Order*[5] as support for their view that ISP-bound calls are exchange access, and thus not entitled

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4 *See Bell Atlantic* at 8.

5 *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket 98-147, FCC 99-413, released December 23, 1999 ("*Advanced Services Remand Order*").

to reciprocal compensation. USTA "Analysis of Issues on Remand in Reciprocal Compensation Proceeding" ("USTA Analysis") at 14-16; BellSouth Comments at 8; SBC Comments at 22-23; and Verizon Comments at 9-10.

As ICG showed in its comments, the *Advanced Services Remand Order* provides the ILECs flimsy material with which to shore up their position that ISP-bound calls are exchange access. The *Advanced Services Remand Order*, which has been appealed to the D.C. Circuit, relates solely to DSL calls to ISPs, not the dial-up calls at issue in this proceeding. ICG Comments at 11-12. This distinction is significant. With a DSL connection, two LECs do not need to exchange traffic to facilitate the Internet users' connection with the ISP. Thus reciprocal compensation does not even come into play as it would with two LECs who cooperate to provide a dial-up connection to the ISP. *Id.* at 12.

Moreover, as WorldCom points out, the *Advanced Services Remand Order*'s conclusion that ISP-bound DSL calls constitute exchange access service is heavily suspect:

> The *Advanced Services Order on Remand* relies extensively on the now-vacated *Declaratory Ruling* and ignores the statutory requirement that exchange access requires that the connection to the local network be provided "for the purpose of the origination of termination of telephone toll services."

WorldCom Comments at 11.

Even Qwest has the intellectual honesty to concede that ISP-bound calls are not "exchange access." "Because ISPs do not provide 'telephone toll services' to their subscribers," Qwest acknowledges that "the LEC portion of these calls do not qualify as 'exchange access.'" Qwest Comments at 12. In short, the *Advanced Services Remand Order* provides no viable support for the ILECs' argument that ISP-bound calls are exchange access rather than telephone exchange service for purposes of reciprocal compensation.

Because Qwest concedes – as it must – that it cannot rely on the *Advanced Services Remand Order* to establish that ISP-bound calls are exchange access (and therefore not telephone exchange service), Qwest attempts to argue that ISP calls fall into a third category: 'information access.'" Qwest Comments at 13. The obvious flaw in Qwest's argument is that even if ISP-bound calls were "information access," such calls still must fall in one of two mutually exclusive statutory categories of telecommunications: "telephone exchange service" or "exchange access."[6] As the court in *Bell Atlantic* pointed out, and as ICG and other CLEC parties have emphasized in their comments, the Commission itself has acknowledged that the statutory definition of telephone exchange service and exchange access "occupy the field" and "constitute the only possibilities."[7]

As an alternative to their arguments that ISP-bound calls are not "telephone exchange service," the ILECs blithely assert that the definition of telephone exchange service is "irrelevant" to the issue of whether Section 251(b)(5) reciprocal compensation obligations apply to ISP-bound calls. USTA Analysis at 14; BellSouth Comments at 8; Qwest Comments at 11-12; SBC Comments at 23; Verizon Comments at 10. The ILECs argue that the Commission did not explicitly reference the statutory definition of "telephone exchange service" in its rule defining "local telecommunication traffic,"[8] and that the statutory definition therefore is not relevant. *Id*. The D.C. Circuit in *Bell Atlantic* – a court that routinely reviews Commission rules

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6 As WorldCom explains in its comments, "information access" most likely is a sub-category of "telephone exchange service." WorldCom Comments at 14-15.

7 *Bell Atlantic* at 8.

8 The term "telephone exchange service" is co-extensive with "local service." Had the Commission intended that "local telecommunications traffic" not fall within the statutory definition of "telephone exchange service," surely the Commission would have explicitly stated as much.

and regulations for consistency with the statutory provisions of the Act – certainly thought the statutory definition was relevant. As the court stated in its discussion of the "telephone exchange service" issue:

> There is an independent ground requiring remand – the fit of the present rule within the governing statute.

Bell Atlantic at 8. For an agency fashioning rules, maintaining consistency with the enabling legislation is not only relevant but mandatory.

In short, the ILECs have maintained the weakest of attacks on the statutory analysis that is the linchpin to the determination that ISP-bound calls are subject to reciprocal compensation.

B. The ILECs Fail to Breath Life Into the Commission's End-to-End Analysis for Determining Whether ISP-Bound Calls Are Subject to Reciprocal Compensation

Bell Atlantic inflicts irreparable damage on any application of the Commission's end-to-end analysis to the issue of whether ISP-bound calls are subject to reciprocal compensation. As ICG explained, the court's view in *Bell Atlantic* is that a finding that ISP-bound traffic is jurisdictionally interstate has no bearing on whether such traffic is local telephone exchange service and therefore subject to Section 251(b)(5). *See* ICG Comments at 12-13.

The ILECs nonetheless make a futile argument that the Commission's end-to-end analysis is somehow relevant. The USTA Analysis, which is echoed by most of the ILECs, urges the Commission to strengthen its end-to-end analysis in two respects. First, USTA urges the Commission to make clear that the "end-to-end jurisdictional analysis *has* been consistently applied to circumstances involving multiple service providers, including information-service

providers."[9] Second, USTA urges the Commission to demonstrate that the "end-to-end analysis has not been confined to purely jurisdictional analysis, but has been applied as well to substantive questions concerning application of the Commission's rules."[10] The individual ILECs advance the same arguments. *See* Verizon Comments at 5-6; Qwest Comments at 3-4; SBC Comments at 9-10 and BellSouth Comments at 6-7.

1. The Commission Has Not Applied the End-to-End Analysis to Circumstances Similar to an ISP-Bound Call

USTA cites *General Tel. Co. v. FCC,* 413 F.2d 390 (D.C. Cir.) cert. denied, 396 U.S. 888 (1969) ("*General Tel.*") as an illustration of the point that the Commission has applied the end-to-end analysis to circumstances involving multiple service providers, including information service providers. USTA Analysis at 8-9. In *General Tel.*, the court upheld the Commission's jurisdiction over "channel service," a common carrier service using wholly intrastate facilities for the purpose of transmitting broadcast programming that originated in another state. USTA's point in citing *General Tel.* is that "neither the Commission nor the court accepted the attempt to split the service [television broadcast] in two: the communication was treated on an end-to-end basis." USTA Analysis at 9. USTA's point is misplaced.

As a preliminary matter, it is not at all clear that the broadcast programming in question is an information service, as alleged by USTA. Broadcast programming does not offer "a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications . . ." 47 U.S.C. 153(41). Indeed, as the court explained in describing the TV signals being transmitted: "no claim is made that the

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9 USTA Analysis at 8 (emphasis in original; footnote omitted).

10 *Id.* at 9.

program material transmitted by the TV station is materially different from the program material by the home viewer from such station." *General Tel*, 413 F2.d at n.3.

Moreover, even if broadcast programming is an information service, *General Tel.* does not apply. The fact that the Commission used an end-to-end analysis in its assertion of jurisdiction over channel service is irrelevant. In the cable service described in *General Tel*, the provider of the information service – the broadcaster – is located at the *end* of the transmission. Thus, while the service may involve multiple service providers, including an information-service provider, the service's transmissions nonetheless constitute a continuous communication from the broadcaster to the end user.

ISP-bound calls are vastly different from the cable television transmissions described in *General Tel.* As the *Bell Atlantic* court explained, ISP-bound calls the transmission from the end user to the website involves two separate services. *Bell Atlantic* at 6-7. The first, from the end user to the ISP, is telecommunications service; the second, from the ISP to the website, is an information service. ISP-bound calls, therefore, do not constitute single continuous communications from the end user to the website.

Moreover, the Commission was motivated to apply its end-to-end analysis to the cable television service in *General Tel* because of its concern that, "[t]o categorize [the local telephone company's] activities as intrastate would . . . serve merely to prevent the national regulation. That is not only appropriate, but essential to the use of radio facilities . . ." *General Tel* at 401. This concern does not exist for ISP-bound traffic since there is no question that the Commission has jurisdiction over ISP-bound traffic, regardless of whether the traffic is interstate or local for reciprocal compensation purposes.[11]

[11] *See* Section II.D. *infra*.

2. End-to-End Analysis Can Only Be Applied When Consistent With Applicable Statutes and Rules

The ILECs also attempt to breath new life into another case on which the Commission relied as the basis for its *Ruling*: the *Teleconnect* case.[12] The ILECs now assert that *Teleconnect* demonstrates that the end-to-end analysis has been applied to "substantive" as well as "jurisdictional" questions. USTA Analysis at 9-10; Qwest Comments at 4-5; SBC Comments at 10-13; Verizon Comments at 6. USTA asserts that the end-to-end analysis the Commission conducted in *Teleconnect* had nothing to do with jurisdiction, but with the "substantive application of the FCC rules." USTA Analysis at 9-10. Moreover, USTA asserts that the Court [in *Bell Atlantic*] overlooked" the fact that *Teleconnect's* end-to-end analysis was "substantive." *Id.* at 9.

USTA and the other ILEC parties miss the court's point. The court's concern with the Commission's use of an end-to-end analysis was not based on its belief that the Commission's end-to-end analysis had not been applied to "substantive questions concerning application of the Commission's rules." USTA Analysis at 9-10. Rather it was based on the fact that the Commission failed to explain why it applied the end-to-end analysis to determine whether ISP-bound calls are local, rather than applying Commission rules[13] and statutory provisions to determine whether such calls are local. *Bell Atlantic* at 6-9.

Thus, while it may be true that in *Teleconnect* the Commission applied its end-to-end analysis to resolve a dispute regarding access charges, the Commission was not faced – as is the case with reciprocal compensation – with applicable Commission rules that require the Commission to use a specific framework to determine whether a call is local. The fact that the

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12 *Teleconnect Co. v. Bell Telephone Co.*, 10 FCC Rcd 1626 (1995), aff'd sub nom. *Southwestern Bell Tel. Co. v. FCC*, 116 F.3d 593 (D.C. Cir. 1997) ("*Teleconnect*")

13 47 C.F.R. §§ 51.701(b)(1) and 51.701(d).

Commission applied the end-to-end analysis in *Teleconnect* has no bearing on whether the Commission can apply the end-to-end analysis in the reciprocal compensation context.

C. *Bell Atlantic* Makes Clear that an ISP-Bound Call Is Not a Single Continuous Communication

The court in *Bell Atlantic* emphasized that "ISPs are information service providers,"[14] and that "[e]ven if the difference between ISPs and traditional long distance carriers is irrelevant for jurisdictional purposes, it appears relevant for purposes of reciprocal compensation."[15]

The ILECs attack *Bell Atlantic's* information service provider distinction. They do so by seeking to characterize an ISP-bound call as a "single continuous communication" – the term used by the Court in *Bell Atlantic* to characterize the type of traditional long distance voice telecommunication at issue in *Teleconnect*. *See* USTA Analysis at 1 ("an Internet-bound call involves a single continuous communication") and at 5 ("there is no doubt that a call to an Internet website *is* a single, continuous communication"). Verizon emphasizes this argument, and has gone so far as to submit a technical report that purports to substantiate its views. *See* Verizon Comments at 6-9, and attached Declaration of Dr. Charles L. Jackson.

As shown in the attached Declaration of Dr. Robert Mercer, there are fundamental differences between ISP-bound calls, on the one hand, and the long distance voice calls that are the subject of the "single continuous communication" referred to in *Bell Atlantic*, on the other hand. These differences include different data link protocols, the fact that there is no notion of a connection over the Internet and thus no connection to be created or terminated, and, perhaps most importantly, no voice network equivalent of the Internet process in which multiple application-to-application sessions involving multiple sites take place sequentially over a single

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14 Bell Atlantic at 6.

15 *Id*. at 6-7.

dial-up connection. *See* Mercer Declaration at 3-4. Based on these differences, Dr. Mercer concludes that "in all key respects, a dial-up call to an ISP is a local exchange call that terminates at the ISP." *Id.* at 2.

SBC comes at the issue from a different angle, and challenges the *Bell Atlantic* information services distinction by arguing that information service, by definition, is "built on an underlying telecommunications component." SBC Comments at 16. As SBC explains it:

> [A]n information service is actually nothing more than a telecommunications service with added functionality. While a telecommunications service provider offers pure transmission service, an information service provider offers something more than pure transmission. It combines telecommunications with enhancements, such as data processing and other functions.

SBC Comments at 16.

SBC then revisits the *MemoryCall*[16] case, arguing that the case "bears special emphasis because it is dispositive of this case and because its significance somehow escaped the Court." SBC Comments at 18. In *MemoryCall*, the Commission asserted jurisdiction over BellSouth's voice mail service, finding that although that part of the service in which the call is forwarded from the called party's number to the voice mail equipment may have been performed intrastate, when an out-of-state caller is connected to BellSouth's voice mail "there is a continuous path of communications across state lines between the caller and the voicemail service." *MemoryCall* at 1620. SBC makes much of the point that voice mail is an information service, and states that "the Commission held, for purposes of determining the boundaries of a communication, a telecommunication service that connects to an information service is no different from an ordinary phone call." SBC Comments at 18.

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[16] *In the Matter of Petition for Emergency Relief and Declaratory Ruling Filed by the Bell-South Corporation*, 7 FCC Rcd 1619 (1992) ("*MemoryCall*")

SBC may be correct in suggesting that the court in *Bell Atlantic*, in distinguishing *MemoryCall*, did not appreciate that voice mail is an information service. *See Bell Atlantic* at 6-7, where the court makes no mention of the fact that BellSouth, as the provider of the voicemail service in *MemoryCall*, is functioning as an information service provider. Nevertheless, the question is "so what?" As the court explained:

> However sound the end-to-end analysis may be for jurisdictional purposes, the Commission has not explained why viewing these linked telecommunications [ISP-bound calls] as continuous *works for purposes of reciprocal compensation.*

Bell Atlantic at 7 (emphasis added).

D. SBC's Section 201 Argument Has Been Displaced by *AT&T v. Iowa Utilities Board*; the Commission Will Retain Jurisdiction Over ISP-Bound Calls Regardless of Whether Such Calls Are Interstate

SBC argues that if the Commission uses an end-to-end analysis for jurisdictional purposes, it must employ that same analysis in determining whether traffic is subject to Section 251(b)(5). As SBC stated:

> Since – as the court seems to concede – an end-to-end analysis is appropriately used to determine jurisdiction, it *must* also be used to determine the reach of the reciprocal compensation provisions of the Act. Otherwise, the commission's jurisdiction over a communication would not be coincident with its authority to establish a rate regime for that communication under section 201. [footnote]

> [footnote] With respect to ISP-bound traffic, for example, the disconnect between jurisdiction and section 201 authority would mean that the Commission would be unable to lift the ISP access charge, such as a flat-rated charge. In fact, absent a change in its interpretation of section 252(d)(2) of the Act, the Commission would be precluded from proceeding with the bill and keep proposal that is to be subject of its forthcoming Notice of Inquiry.

SBC Comments at 18.

This argument may have held water before the Supreme Court's decision in *AT&T v. Iowa Utilities Board,*[17] but that is no longer the case. As Global NAPS and RCN aptly point out in their comments, the Supreme Court, by overturning the Eighth Circuit's earlier ruling questioning the Commission's authority over intrastate calls, has fundamentally changed the status of the issues. Global NAPS Comments at 8-9; RCN Comments at 3-5. As Global NAPS explains (Comments at 9) that:

> . . . .to the extent that ISP-bound calls are jurisdictionally interstate, the Commission can direct that they be compensated under Section 251(b)(5) because it has plenary authority *both* over interstate traffic *and* over how Section 251(b)(5) works. And if and to the extent that ISP-bound calls are jurisdictionally intrastate, the Commission can direct that they can be compensated under Section 251(b)(5) because the Commission has plenary authority over how Section 251(b)(5) works, even with regard to intrastate traffic.

To the extent the Commission's objective in this proceeding is to assert jurisdiction over ISP-bound calls because of a perceived need for centralized regulation, the Commission need not be concerned.

E. The Commission's Prior Treatment of ESPs Supports, Not Undermines, the Appropriateness of Reciprocal Compensation for ISP-Bound Calls

USTA argues that the Commission's prior treatment of ESPs need not be the "embarrassment" that the court suggests that it is. USTA Analysis at 10. Accordingly, USTA urges the Commission "to explain that the ESP exemption firmly supports the FCC's prior decision as a matter of policy." *Id.* The court, however, made it clear that policy arguments were irrelevant to its concerns. It explained that, "[a]lthough to be sure, the Commission used policy arguments to justify the 'exemption,' it also rested it on an acknowledgment of the real

[17] *AT&T Corp. v. Iowa Utils. Bd.*, 525 U.S. 366 (1999).

differences between long-distance calls and calls to information service providers." *Bell Atlantic* at 8.

The Commission has not only acknowledged that there are real differences between long distance calls and calls to ISPs, it has also treated calls to ISPs differently. Specifically, the Commission has treated the calls as local in nature. For example, under the Commission's "separations" regime, costs incurred from carrying calls to ISPs are treated as local, and ISPs obtain service out of the same intrastate tariffs as other business end users. In response, USTA retorts that "this argument misconstrues the nature of the ESP exemption: just because calls to ESPs are treated as though they were local for one purpose – that is, for regulating the rate that ESPs and their end users pay for those calls – it does not follow that such calls should be treated as local for all purposes." USTA Analysis at 11. It is USTA, however, that misconstrues the nature of the ESP exemption. USTA simply fails to address the court's clearly articulated concern that the Commission's application of an end-to-end analysis for the purpose of reciprocal compensation conflicts with the Commission's acknowledgment in the context of the ESP exemption, that calls to ISPs are different from calls to IXCs. As the court and the Commission pointed out, the exemption is based in significant part on the fact that it is not clear that [information service providers] use the public switched network in a manner analogous to IXCs." *Bell Atlantic* at 8 (quoting *In the Matter of Access Charge Reform*, First Report and Order, 12 FCC Rcd. 15982, 16133 (1997)). USTA, however, argues that the exemption is based on just the opposite; namely, that the "ESP exemption is based on recognition that ESPs use the local exchange in a manner analogous to the way IXCs use the local exchange . . ." USTA Analysis at 11.

USTA argues that the Commission should not treat ISP-bound calls as local for reciprocal compensation purposes despite its treatment of such traffic as local in other contexts because "treating Internet-bound calls as if they were local for reciprocal compensation purposes leads to market distortions and suppresses competition." *Id.* Once again, however, this argument fails to respond to the court's main point which is that the manner in which the Commission treats calls to ESPs is relevant because the ESP exemption was based in part on the Commission's belief that calls to ESPs are local.

III. EVEN IF ISP-BOUND TRAFFIC IS NOT SUBJECT TO SECTION 251(B)(5), THE COMMISSION SHOULD TREAT THE TRAFFIC AS IF IT WERE AND REQUIRE RECIPROCAL COMPENSATION

A. ISP-Bound Traffic Is Substantially Identical to Local Traffic in Its Use of the Local Exchange Network and the Costs Incurred by the Terminating Carrier

Calls to ISPs are fundamentally indistinguishable from local voice calls in either their use of the local exchange network or the costs the terminating carrier incurs in terminating the traffic. There is thus no basis for treating ISP-bound calls differently than local voice calls, even if the Commission does not find that ISP-bound calls are subject to Section 251(b)(5).[18]

1. ISP-Bound Calls Use the Local Exchange Network in a Manner Substantially Identical to Local Voice Calls

[18] ICG endorses the argument made by ALTS and AT&T that the Commission should require payment of reciprocal compensation even if it determines that ISP-bound traffic is interstate. Section 251(b)(5), by its terms, applies to interstate as well as local traffic. ALTS Comments at 11-12; AT&T Comments at 12-13. In its 1996 *Local Competition Order*, the Commission excluded long distance traffic from the reciprocal compensation obligation in order to protect the access charge regime and universal service. *Local Competition Order* at 16013. The exclusion, however, serves no purpose in the case of ISP-bound calls since such calls never supported universal service. This is another reason why the Commission should find that ISP-bound calls and subject to reciprocal compensation obligations.

Calls delivered by a LEC to an ISP are no different from calls delivered to a residential or business customer in terms of how the call uses the network. Indeed, this finding was one of the principle bases under which the great majority of state commissions that considered the issue after the *Declaratory Ruling* but prior to *Bell Atlantic* held that ISP-bound calls should be subject to reciprocal compensation.

Ohio was one of the many states to require reciprocal compensation for ISP-bound traffic during that period. Attached hereto as a portion of the testimony of ICG's economist witness in that proceeding, Michael Starkey. Mr. Starkey describes how the use of the local exchange network by an ISP-bound call and a local voice call are fundamentally identical:

> [R]egardless of whether the originating customer dials either [an] ICG residential or [an] ISP customer, the call travels from the originating customer's premises to the Ameritech central office switch, which then routes the call to the Ameritech/ICG interconnection point and ultimately to the ICG switch. From the ICG switch the call is then transported to either the residential customer or the ISP customer depending upon the number dialed by the Ameritech customer.

Starkey Testimony at 27-28; *see* Starkey Testimony, Diagram 1 (showing that calls from a Ameritech customer to an ICG residential customer and to an ICG ISP customer are identical in their use of ICG's network). Thus, a "ten minute call originated on the Ameritech network and directed to the ICG network travels exactly the same path, requires the use of exactly the same facilities and generates exactly the same level of cost regardless of whether that call is dialed to an ICG local residential customer or to an ISP provider." Starkey Testimony at 27.

2. The Costs Carriers Incur in Terminating ISP-Bound Calls Are Substantially the Same as the Costs Carriers Incur in Terminating Local Voice Calls

As AT&T emphasized in its initial comments, "absent demonstrated and categorical delivery cost differences between ISP-bound and local traffic, that carriers should apply the same

pro-competitive compensation arrangements to both types of traffic. . . ." AT&T Comments at 17. Yet the ILECs would have functionally identical calls to ISPs go completely uncompensated. This runs counter to one of the most basic economic principles: Given that the costs to terminate calls made to residential customers and to ISP customers are identical, the rates associated with recovering those costs should be identical. As the Alabama Commission held in finding in ICG's favor on the issue of reciprocal compensation for ISP-bound traffic,

> calls over [LEC] facilities to ISPs appear functionally equivalent to local voice calls which are subject to reciprocal compensation. *Since the same network facilities and functions are utilized to complete both types of calls, it is axiomatic that the costs to deliver them are identical. We find that those identical costs dictate that the rates associated with recovering those costs should also be identical.*

Alabama Order at 18 (emphasis added).[19] Thus, as with ILEC-originated calls delivered to business or residential customers, ICG is entitled to recover the costs it incurs on ILEC's behalf when it delivers a call to an ISP.

SBC and Verizon have made passing attempts to demonstrate that there are cost differences between handling an ISP-bound call and other local calls. SBC Comments at 33-36, Smith Testimony and Verizon Comments at 13-19; Taylor Declaration. For the reasons explained in the Montgomery Declaration, the Smith Testimony should be given no credibility. Montgomery Declaration at 4. Indeed, SBC itself noted that it "anticipates that CLECs will criticize these studies . . . ." SBC Comments at 36.

Turning to the Verizon Comments, the purported cost differences fall into four categories: (1) call duration; (2) dedicated capacity; (3) call direction and (4) load distribution.

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[19] In re *Petition by ICG Telecom Group, Inc. for Arbitration of Interconnection Agreement with BellSouth Telecommunications, Inc. Pursuant to Section 252(b) of the Telecommunications Act of 1996,* Docket 27069, Final Order on Arbitration, (AL P.S.C. Nov. 10, 1999) ("*Alabama Order*").

As shown in the attached Declaration of William Page Montgomery ("Montgomery Declaration"), these cost differences are illusory.

As to call duration, the differences shown in the Taylor Declaration relate to spreading call set up costs over calls of greater than average duration, thereby lowering the per minute cost of longer calls. As explained in the Montgomery Declaration (at 8), there are many types of calls other than ISP-bound calls that are of longer than average duration. Whenever rates are based on costs for a call of average duration, there will be by definition calls of longer than average duration as well as calls of shorter than average duration. One appropriate solution for Verizon's concern might be to apply a two-part reciprocal compensation rate that separates call set-up costs from duration costs. *See* Montgomery Declaration at 8. Sprint proposes such a solution in its comments.

As to dedicated capacity, Verizon assumes that CLECs incur no centum call second ("CCS") costs. Verizon Comments at 26, Taylor Declaration at 15-17. Verizon confuses dedicated, non-switched facilities costs, like private lines, with the high volume ISP-bound traffic which is routed through switches and consumes switch resources at the busy period. Montgomery Declaration at 10. Also, Verizon and SBC overlook the higher costs for additional equipment including the switching fabric and additional line concentration modules. *Id*. at 13.

With regard to call direction, Verizon argues that because ISP-bound calls are all one-way, switching costs for features and functions on the originating end will not apply. Taylor Declaration at 17. Yet, as shown in the Montgomery Declaration (at 14), cost studies have never looked at "one-way" call switching costs separately from other local calls.

Finally, Verizon claims that peak traffic loads for ISP-bound calls are different than for other types of calls and that this results in different – and lower – average costs for CLECs

serving ISPs. Taylor Declaration at 17. As shown in the Montgomery Declaration at 11, Verizon's "assertion is wrong on its face because it is not the percentage (or fraction) of busy hour traffic that drives switching costs but rather the absolute load measured in CCS." The Montgomery Declaration goes on to highlight a Pacific Bell study that "[a]s Internet traffic continues to grow on the PTSN, this traffic will have an every increasing effect on peak-usage with corresponding cost increase." In short, the evidence is that network congestion is most likely to occur at the CLECs' switches that terminate calls to ISPs.

In short, the ILECs have not convincingly demonstrated any meaningful cost differences between ISP-bound calls and other local calls.

B. The ILECs' Policy Arguments Are Misguided

Rather than address the statutory test that *Bell Atlantic* announced as dispositive, the ILECs advance a number of policy arguments in support of their position that the Commission should not require reciprocal compensation. According to the ILECs, reciprocal compensation for ISP-bound traffic (1) leads to a distortion of the market, (2) discourages CLECs from providing residential service and advanced service, and (3) encourages "sham" CLECs whose only reason for existing is to take advantage of the reciprocal compensation "arbitrage opportunity." The ILECs are misguided in raising these arguments. As discussed above, there is no room for policy-making under *Bell Atlantic*. The Commission should thus disregard all of the policy arguments advanced by the ILECs. Even if the Commission were to consider them, however, they are all unavailing.

1. Reciprocal Compensation for ISP-bound Calls Does Not Distort the Market

SBC contends that reciprocal compensation is an "arbitrage opportunity" that distorts the market by shifting investment "towards that opportunity and away from others." SBC Comments at 42. SBC is simply wrong.

ICG serves ISPs to the extent that it does because they represent a technologically-advanced, fast-growing market segment with specialized needs that ICG is much better suited to address than are the ILECs. For their part, ISPs choose CLECs because CLECs offer packages of services tailored to meet ISP needs at competitive prices. The ILECs dispute this, suggesting that the real reason that ISPs choose CLECs is that CLECs pass on the benefits of the "arbitrage opportunities" created by reciprocal compensation. *See, e.g.*, SBC Comments at 44-45. ICG, however is on record that it does *not* pass through any reciprocal compensation revenue to its ISP customers.

In this regard, SBC's citation to the record in ICG's arbitration with Ameritech in Ohio is incredibly galling. SBC claims that there "ICG revealed that it offered service for free to ISPs that agreed to collocate in its switching centers." SBC Comments at 45. This is simply false—and SBC knows it. As ICG witnesses testified during the Ohio arbitration, the tariff that SBC cites in support of its claim was an obsolete tariff that had been replaced because no carriers used the service and which did not, as SBC claims, provide for free service to ISPs as a pass-through of reciprocal compensation revenue.

ISPs are also a natural market for CLECs because they are an ideal bridge to broader market entry. ISPs are high-volume users that create a significant revenue stream. That revenue stream allows CLECs to defray their capital expenditures as soon as possible, and to fund expansion into the traditional residential and business markets.

In other words, competition is functioning precisely the way it should: new entrants are targeting niche customers to gain market share and develop a revenue base that they can then leverage to expand their service into the wider business and residential markets. This is exactly how competition in the long distance and customer premises equipment markets began. There the claim was that new entrants were "cream-skimming;" today's refrain is that new entrants are on a "gravy train." But the Commission should see these complaints for what they are: once-entrenched monopolists fighting to stave off competition.

2. ICG Is an Active Provider of Advanced Services and Residential Service

The ILECs contend that reciprocal compensation for ISP-bound results in CLECs having less incentive to serve the residential and advanced services markets. SBC Comments at 40-42; Verizon Comments at 12-15. This is simply not the case.

ICG actively provides residential service. While ICG may serve relatively few residential customers, it is not because ICG has focused on serving ISPs in order to collect reciprocal compensation revenue. Rather, one of the chief reasons that ICG has not been able to serve more residential customers is the ILECs' poor track record in opening their market to competition. As a recent Denver Post article stated "providing telephone service against big monopolies such as Bell Atlantic and US West . . . never reached [its] potential, as the monopolies dragged their feet in opening local markets and profit margins for local and long distance calling grew slimmer."[20] If the ILECs had not done everything in their power to make competitive entry into its markets so difficult, ICG and other new entrants would be even further along in serving traditional business and residential customers.

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[20] Andrew Backover, *Massive Makeover: ICG's new team sees a data-services future*, Denver Post, May 15, 2000, at 1E.

As for advanced services, ICG is increasingly becoming known as a major data services company. ICG has partnered with various DSL companies to provide high-capacity Internet access, which is the quintessential advanced service. ICG is not unique in this regard. Dozens of CLECs are rushing to fill the nationwide need for advanced services.[21] Those companies had the same reciprocal compensation "arbitration opportunity" available to them as any other CLEC, yet chose not to pursue it. Were reciprocal compensation as irresistible as the ILECs make it out to be, no CLEC would rationally pursue any other strategy. This is, of course, not the case. ICG and other CLECs are well aware that broadband services are a market of the future and that it would be short-sighted to ignore that market.

3. Reciprocal Compensation for ISP-Bound Calls Does Not Lead to "Sham" CLECs

As for the ILECs' argument that reciprocal compensation leads to the creation of CLECs that specialize in ISP traffic and provide little or no genuine local exchange service, *see, e.g.*, SBC Comments at 42-44, several points are in order. First, as discussed above, ICG serves ISPs because they are a fast-growing market niche with specialized needs that ICG as a technologically-advanced new entrant is ideally suited to serve, *not* because reciprocal compensation represents an "arbitrage opportunity."

Second, ICG has over 250,000 non-ISP local exchange lines in service and expects that number to grow to 400,000 by the end of 2000. It is thus simply not the case that ICG specializes in ISP traffic to the exclusion of other local exchange customers.

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[21] Accordingly to the trade press, the Commission has just adopted a report finding that deployment of advanced services "is reasonable and timely at this time." *TR Daily*, August 3, 2000.

Finally, the ILECs' reliance on *In the Matter of BellSouth Telecommunications, Inc. v. US LEC of North Carolina, Order Denying Reciprocal Compensation*, Docket No. P-561, Sub 10 (N.C.U.C. March 31, 2000) ("*US LEC*") is completely misleading and is offensive. SBC and Verizon both cite it as proof that reciprocal compensation leads to the creation of 'sham' LECs whose sole purpose is to deliver traffic to ISPs and generate reciprocal compensation payments. SBC Comments at 43; Verizon Comments at 17-18. What SBC and Verizon fail to mention, however, is that there was no Internet traffic at issue in the proceeding; nor was there a terminating end user. Instead, the defendant carrier was simply making calls to a router that did not go past the router. This pure fraud is a far cry from ICG choosing to address the ISP market niche. The ILECs also opt not to mention that the same North Carolina Commission that decided *US LEC* also held in ICG's arbitration that *ISP-bound traffic is properly subject to reciprocal compensation and awarded reciprocal compensation to ICG. See Petition by ICG Telecom Group, Inc., for Arbitration of Interconnection Agreement with BellSouth Telecommunications, Inc.*, Docket No. P-582 Sub 6 (N.C.U.C. Nov. 4, 1999).

As for Verizon's other examples of the "bad behavior" that reciprocal compensation leads to, all they prove is that some companies engage in questionable practices, including fraud, to make money. Such behavior is nothing new in the telecommunications industry—or any industry for that matter—and does not prove that the underlying activity is "socially wasteful" as Verizon suggests. Verizon Comments at 16. Saying that CLECs should be denied recovery for the costs they incur in terminating calls to ISPs because a handful of carriers may have engaged in fraud is like saying that there should be no competition for long distance because a handful of carriers have engaged in slamming. To the extent that the Commission believes fraud is a problem it should combat that problem as it has slamming—through vigorous enforcement

actions, *not* by denying the vast majority of law-abiding CLECs the opportunity to recover their costs.

C. CLECs Are Limited in Their Ability To Raise Their ISP Customers' Prices

Notwithstanding that it is the ILECs that have the most proximate relationship with the cost-causing caller, the ILECs insist that the ISP should be responsible for reimbursing a CLEC for the CLEC's costs in delivering an ISP-bound call. SBC Comments at 49; Verizon Comments at 22-23. For the following reasons, that is not a practical suggestion.

The FCC's ESP exemption allows ISPs to take service from the LEC's local business service tariffs. *Amendments of Part 69 of the Commission's Rules Relating to Enhanced Service Providers*, *Order*, 3 FCC Rcd 2631, 2635 n.8, 2637 n.53. *See Declaratory Ruling*, ¶ 5. The ESP exemption limits CLECs' ability to look to their ISP customers for cost recovery for two reasons. First, if a CLEC sought to raise its rates to ISPs above its standard business rates, the ESPs would assert their right to buy service out of the CLEC's business tariffs.

Second, the ESP exemption effectively caps the rates that CLECs can charge ISPs. Since CLECs must compete with ILECs to win ISP customers, the prices that ILECs charge their ISP customers function as a price ceiling for CLEC. If a CLEC were to attempt to significantly raise ISP rates to recover the costs the CLEC incurs when delivering traffic from ILEC customers, the CLEC would risk losing its ISP customers to the ILECs.[22] Even though the CLEC offers ISP customers packages of services unmatched by the ILECs, it is a reality of the marketplace that CLECs must compete first and foremost on price. Furthermore, since ISPs

[22] Since ISPs can assert the right to buy out of a CLEC's local exchange business tariff, in order to raise its rates for ISPs, a CLEC would have to raise its rates across the board for *all* business customers. Given ILECs' dominant market power, doing so is not practical.

assert the right to buy out of a CLEC's local exchange business tariff, in order to raise its rates for ISPs, the CLEC would have to raise its rates across the board for *all* business customers. Given ILECs' dominant market power, doing so is not a practical business strategy.

IV. CONCLUSION

ISP-bound calls are "telephone exchange service" and therefore subject to reciprocal compensation under Section 251(b)(5) and the Commission's rules. Even if the Commission were to find that ISP-bound calls are not subject to reciprocal compensation, the Commission should prescribe the same inter-carrier compensation arrangements for ISP-bound calls that apply to other types of local calls. The Commission should do so because the characteristics and costs of handling ISP-bound calls are very similar to the characteristics and costs of handling other local calls. To establish different arrangements for ISP-bound and other local calls would result in market distortion that would impair service to ISPs and harm the growth of the Internet, all to the detriment of the consuming public.

Dated: August 4, 2000

Respectfully submitted,

By: /s/ Allan C. Hubbard
Albert H. Kramer, Esq.
Allan C. Hubbard, Esq.
Jacob S. Farber, Esq.
Robert Felgar, Esq.

DICKSTEIN SHAPIRO MORIN
& OSHINSKY LLP
2101 L Street, N.W.
Washington, D.C. 20037-1526
(202) 785-9700
Attorneys for
ICG TELECOM GROUP, INC.

CERTIFICATE OF SERVICE

I do hereby certify that I have this 4th day of August 2000 served the following parties to this action with a copy of the foregoing **REPLY COMMENTS** by hand delivery or by placing a true and correct copy of the same in the United States Mail, postage prepaid, addressed to the parties listed on the attached service list.

Magalie Roman Salas
Office of the Secretary
Federal Communications Commission
445 12th Street, S.W.
TW—A325
Washington, D.C. 20554

International Transcription Services (ITS)
1231 20th Street, N.W.
Washington, D.C. 20036

Jane Jackson
Chief
Competitive Pricing Division
445 12th Street, S.W.
TW—A225
Washington, D.C. 20554

Cynthia B. Miller
Florida Public Service Commission
Bureau of Intergovernmental Liaison
Capital Circle Office Center
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Gary L. Phillips
Roger K. Toppins
Alfred G. Richter, Jr.
SBC Communications, Inc.
1401 Eye Street, N.W.
Suite 1100
Washington, D.C. 20005

Lawrence E. Sarjeant
Linda L. Kent
Keith Townsend
John W. Hunter
Julie Rones
United States Telecom Association
1401 H Street, N.W.
Washington, D.C. 20005

M. Robert Sutherland
Richard M. Sbaratta
BellSouth Corporation
1155 Peachtree Street, N.E.
Atlanta, GA 30309-3610

Paul G. Afonso
Commonwealth of Massachusetts
Department of Telecommunications & Energy
One South Station
Boston, MA 02110

Susan Grant
National Consumers League
1701 K Street, N.W.
Suite 1200
Washington, D.C. 20006

William T. Lake
Lynn R. Charytan
Jonathan J. Frankel
Mary E. Kostel
Qwest Corporation
Wilmer, Cutler & Pickering
2445 M Street, N.W.
Washington, D.C. 20037

Robert B. McKenna
Jeffrey A. Brueggeman
Qwest Communications International, Inc.
1020 19th Street, N.W.
Washington, D.C. 20036

George N. Barclay
Michael J. Ettner
General Services Administration
1800 F Street, N.W.
Room 4002
Washington, D.C. 20405

Mark D. Schneider
Darryl Bradford
WorldCom, Inc.
Jenner & Block
601 13th Street, N.W.
Washington, D.C. 20005

Richard S. Whitt
Cristin L. Flynn
WorldCom, Inc.
1801 Pennsylvania Ave., N.W.
Washington, D.C. 20006

Mark C. Rosenblum
Stephen C. Garavito
Teresa Marrero
AT&T Corp.
295 North Maple Avenue
Basking Ridge, NJ 07920

David W. Carpenter
David L. Lawson
James P. Young
AT&T Corp.
Sidley & Austin
1722 Eye Street
Washington, D.C. 20006

Robert E. Mutschelknaus
Robert J. Aamoth
Jonathan E. Canis
John J. Heitmann
Advanced Telcom Group, Inc.
E.spire Communications, Inc.
Intermedia Communications, Inc.
Competitive Telecommunications Assoc.
KMC Telecom, Inc.
Nextlink Communications, Inc.
Kelly Drye & Warren LLP
1200 19th Street, N.W., Fifth Floor
Washington, D.C. 20036

Jonathan Askin
Association for Local Telecommunications Services
888 17th Street, N.W.
Suite 900
Washington, D.C. 20006

Lee Schroeder
Government and Regulatory Strategy
Cablevision Lightpath, Inc.
1111 Stewart Avenue
Bethpage, NY 11714

Cherie R. Kiser
Michael H. Pryor
Elizabeth B. Dickerson
Cablevision Lightpath, Inc.
Mintz, Levin, Cohn, Ferris, Glovsky and Popeo
701 Pennsylvania Avenue, N.W.
Suite 900
Washington, D.C. 20004

Christopher W. Savage
Global NAPs, Inc.
Cole, Raywid & Braverman, L.L.P.
1919 Pennsylvania Ave., N.W.
Suite 1200
Washington, D.C. 20006-3458

Renee R. Crittendon
Prism Communications Services, Inc.
1667 K Street, N.W.
Suite 200
Washington, D.C. 20006

Richard M. Rindler
Michael W. Fleming
Focal Communications Corporation
Allegiance Telecom, Inc.
Adelphia Business Solutions, Inc.
Swidler Berlin Shereff Friedman, LLP
3000 K Street, N.W.
Suite 300
Washington, D.C. 20007

David Cosson
John Kuykendall
Rural Independent Competitive Alliance
Kraskin, Lesse & Cosson, LLP
2120 L Street, N.W.
Suite 520
Washington, D.C. 20037

Leon Kestenbaum
Jay Keithly
Jon Chambers
Richard Juhnke
Sprint Corporation
401 9th Street, N.W.
Suite 400
Washington, D.C. 20004

Brian Conboy
Thomas Jones
Time Warner Telecom
Wilkie Farr & Gallagher
Three Lafayette Centre
1155 21st Street, N.W.
Washington, D.C. 20036

John Cleven Tooker
Western Telephone Integrated
Communications, Inc. *pro se*
303 East Jackson Street
Medford, OR 97501

Robin L. Redfield
Pac-West Telecomm, Inc.
Swidler Berlin Shereff Friedman, LLP
3000 K Street, N.W.
Suite 300
Washington, D.C. 20007

Richard A. Askoff
National Exchange Carrier Association
80 South Jefferson Road
Whippany, NJ 07981

Richard M. Rindler
Michael W. Fleming
RCN Telecom Services, Inc.
Connect Communications Corporation
Swidler Berlin Shereff Friedman, LLP
3000 K Street, N.W.
Suite 300
Washington, D.C. 20007

John M. Goodman
Verizon Communications
1300 I Street, N.W.
Washington, D.C. 20005

Cleo Manuel
Keep America Connected
P.O. Box 27911
Washington, D.C. 20005

Pace A. Duckenfield
Alliance for Public Technology
919 18th Street, N.W.
Suite 900
Washington, D.C. 20006

Lawrence G. Malone
NYS Department of Public Service
Three Empire State Plaza
Albany, NY 12223

/s/ Kimberly A. Dunmire
Kimberly A. Dunmire

BEFORE THE
PUBLIC UTILITIES COMMISSION OF OHIO

In re: IN THE MATTER OF ICG TELECOM GROUP, INC.'S PETITION FOR ARBITRATION OF INTERCONNECTIONS RATES, TERMS AND CONDITIONS A D RELATED ARRANGEMENTS WITH AMERITECH OHIO	Case No. 99-1153-TP-ARB

EXCERPTS FROM

DIRECT TESTIMONY
OF MICHAEL STARKEY
ON BEHALF OF
ICG TELECOM GROUP, INC.

[NOTE: PAGES 27-29 OF 76 PAGES
OF TESTIMONY ARE ATTACHED]

NOVEMBER 29, 1999

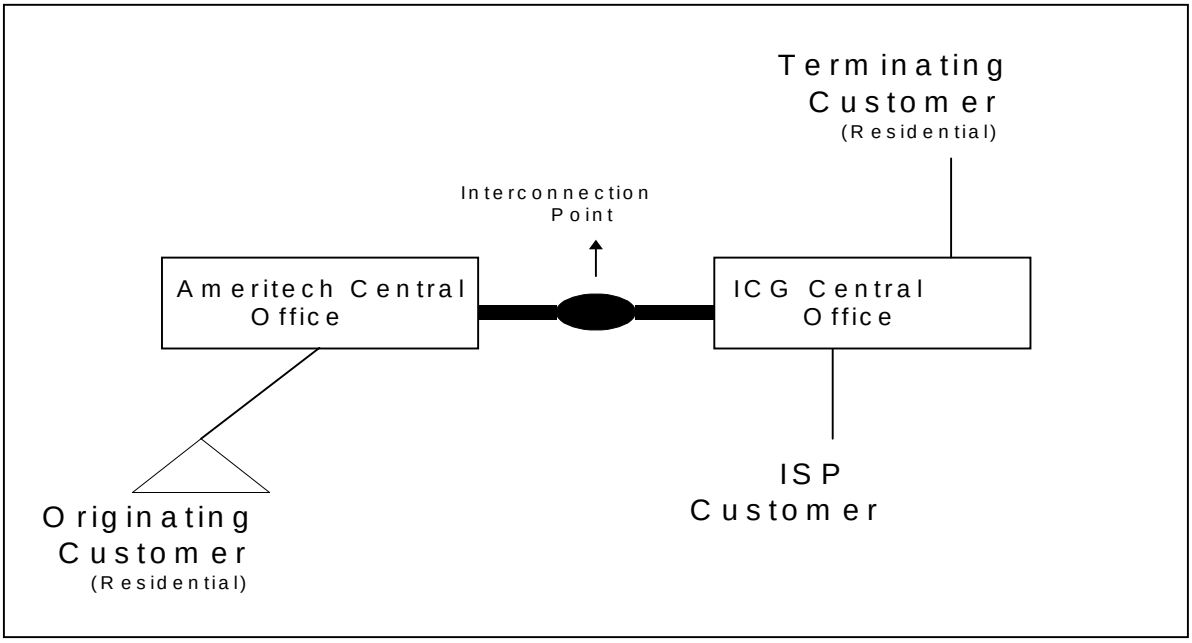
. . . customer group wherein the rates they pay for access to the network must include costs associated not only with calls they make, but also calls they receive. At a minimum, this will disrupt the ISP marketplace and is likely to send many ISPs back to Ameritech where Ameritech's more mature customer base can be used to offset the costs of terminating the ISPs traffic without raising ISP local rates.

The fact that each of these disruptions happens to benefit Ameritech should not be lost on the Commission when it considers Ameritech's rationale for refusing to pay reciprocal compensation for ISP bound traffic.

Q. PLEASE EXPLAIN IN GREATER DETAIL YOUR CONTENTION THAT CALLS DIRECTED TO ISPS ARE FUNCTIONALLY IDENTICAL TO LOCAL VOICE CALLS FOR WHICH AMERITECH HAS AGREED TO PAY TERMINATION CHARGES.

A. A ten minute call originated on the Ameritech network and directed to the ICG network travels exactly the same path, requires the use of exactly the same facilities, and generates exactly the same level of cost regardless of whether that call is dialed to an ICG local residential customer or to an ISP provider. The simplistic diagram below (Diagram 1) details one scenario by which such a call might travel.

Diagram 1



As you can see from the diagram, regardless of whether the originating customer dials either the ICG residential customer or the ICG ISP customer, the call travels from the originating customer's premises to the Ameritech central office switch, which then routes the call to the Ameritech/ICG interconnection point and ultimately to the ICG switch. From the ICG switch the call is then transported to either the residential customer or the ISP customer depending upon the number dialed by the Ameritech caller. Both calls use the same path and exactly the same equipment to reach their destinations. Most importantly, the costs to deliver the calls made to the residential customer and the ISP customer are identical. As such, the rates associated with recovering those costs should be identical. To single out the ISP call and suggest that $0 compensation should be paid for purposes of carrying that particular call and some other, non-zero rate should be applied to all other calls ignores the simple economic reality that both

calls generate costs that must be recovered by the reciprocal compensation rate paid for their carriage.

Q. WOULD THERE BE NEGATIVE ECONOMIC RESULTS FROM ALLOWING AMERITECH TO PAY $0 FOR CALLS DIRECTED TO ISPS WHILE PAYING A NON-ZERO RATE FOR ALL OTHER CALLS?

A. Of course. Given the option of receiving an amount greater than zero for carrying a non-ISP call and $0 for carrying an ISP call, any reasonable carrier would fill its switch with non-ISP calls to the extent possible. Likewise, any carrier that currently served a larger proportion of ISP customers would be a less profitable network than a network that served a smaller proportion of ISP customers. In effect, allowing Ameritech to skirt its obligation to pay for the use of an interconnecting carrier's network for purposes of carrying its local customers' calls to ISP customers will skew the supply substitutability of ISP services versus other local services, thereby making other local exchange services more attractive production alternatives. This . . . .

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Implementation of the Local Telecommunications Act of 1996	)	CC Docket No. 96-98
Intercarrier Compensation for ISP-Bound Traffic	)	CC Docket No. 99-68

DECLARATION OF DR. ROBERT A. MERCER

My name is Robert A. Mercer. I am a principal of BroadView Telecommunications, LLC. I provide strategic planning and education related to public and private telecommunications infrastructures, with a particular emphasis on local exchange competition, broadband integrated networks, intelligent networks, and private enterprise networking. Examples of my current work include the analysis of competitive alternatives for the provision of local exchange services, and advising a national association on alternative methods of obtaining and managing its telecommunications services. My previous positions have included President, Hatfield Associates, Inc.; Department Head, AT&T Laboratories; Assistant Vice President, Bellcore; and Director of Network Architecture Planning, Bell Laboratories. I have a Ph.D. in physics from John Hopkins University and a B.S. in physics from Carnegie-Mellon University. A complete statement of my qualifications is attached hereto.

I. Introduction and Summary: What Is a Dial-Up Call to an ISP?

This Declaration discusses the issue of whether a dial-up call to an Internet Service Provider ("ISP") is analogous to exchange access or to local telecommunications traffic.[23]

[23] Hereafter, I will refer to this as a "local exchange call."

Exchange access is defined by the Act as the offering of access to telephone exchange services or facilities for the origination or termination of telephone toll services." 47 U.S.C. §153(16). Under Section 51.704(b) of the Commission's rules, local telecommunications traffic is interconnected traffic that "originates and terminates within the same local service area established by the state commission." 47 C.F.R. § 51.704 (b). Termination in this context is defined as "the switching of local telecommunications traffic at the terminating carrier's end office switch, or equivalent facility, and delivery of such traffic to the called party's premises." 47 C.F.R. § 51.701 (d). From the technical perspective of this Declaration, the distinction is whether the call terminates when it reaches the ISP premises or continues across the Internet.[24]

This Declaration concludes that in all key respects, a dial-up call to an ISP represents local telecommunications traffic, notwithstanding the fact that the computer connected to the ISP by the call subsequently triggers the flow of information across the Internet. The subsequent Internet events represent a fundamentally different kind of enhanced process-to-process communications related to the information services nature of the Internet. The flow of information that takes place across the Internet during these events cannot reasonably be considered to be part of the same dial-up call – indeed, there is no such thing as a connection or call across the Internet in the first place.

The situation is analogous to what happens when a company's employees dial a local call into the company's computer network from remote locations. Such calls are connected to modems in a pool of modems provided by the company. Over the dial-up connection and through the modems, the employees' computers have access to the company's computing and database resources. Using these resources, the employees may exchange email, store and

[24] In its comments in this proceeding, ICG Telecom Group, Inc., has dealt with the issue of whether an ISP even offers telephone toll service.

retrieve data, carry out computing tasks beyond the capabilities of their own computers, and so on. Some traffic on these connections may even be directed to the company's Internet links, and subsequently traverse the Internet. Whatever the nature of the subsequent interaction, there is no sense that the dial-up calls are thereby extended across the computer network. The calls terminate at the modem pool; all of the subsequent information flow is considered to be part of the computer network's traffic, not "calls" in the sense one normally thinks of that word.

Returning to the issue of dial-up calls to an ISP, the flow of information across the Internet subsequent to the establishment of the dial-up connection to the ISP differs from a long distance call over an IXC network in all of the following respects:

The Internet operates in a fundamentally different fashion than does a long distance voice network over which the dial-up connection to the ISP is established, because voice calls transpire over a circuit switched connection[25] which is established by the calling party, maintained for a finite period, then terminated by the calling or called party, whereas there is no notion of a connection over the Internet, and thus no connection to be created or terminated;

Unlike ordinary telephone calls, the information supplied by the user to initiate a dialog with another computer is not a network address; it is an Internet "Domain Name," which must be interpreted and translated into an Internet address before the routers that are responsible for Internet transport can start routing information to the right destination;

Finally, and perhaps most importantly, there is no voice network equivalent of the Internet process in which multiple application-to-application sessions involving multiple sites

[25] Circuit switching refers to a form of network protocol in which the network commits switching and transmission resources, collectively called a "circuit," solely to a single instance of communications – two humans talking, or two computers exchanging data – and maintains that commitment until the communicating entities indicate the communication is completed.

take place sequentially over a single dial-up connection without subsequent involvement of the user.

In short, any attempt to claim that a dial-up call to an ISP, and the subsequent instances of multiple communications across the Internet using that connection, are in any way analogous to exchange access is strained and artificial.

The rest of this Declaration is organized as follows. First, I will provide a brief tutorial on the nature of the Internet and its protocol suite in order to differentiate between basic transport over the Internet and the application-to-application communications that take place using the Internet. In the tutorial, I will also describe how different is the process of conveying information across the Internet compared to a normal voice call. Next, I will describe the transactions that occur during two common Internet events – the sending of email and access to a website to obtain "pages" of information – and show that these transactions involve computer processing far different than the underlying network transport service. Based on these examples, I will expand on the above summary points in order to show there is a marked technical distinction between the dial-up call to the ISP and what happens subsequently across the Internet. In fact, the Internet situation is much more akin to a remote user making a local exchange call into his/her company's computer network and thereby accessing the company's computer and database resources than a call through the local exchange network and across an IXC network. I will therefore argue it is only meaningful to consider an Internet access call to be a local exchange call terminated on the ISP. Finally, I will critique the contrary claims laid forth by Charles L. Jackson on behalf of Verizon, demonstrating that his conclusions are based on a mischaracterization of Internet communications, and are therefore erroneous.

II. Brief Tutorial on the Physical and Protocol Structure of the Internet

A high-level view of the Internet is provided in Figure 1a. It consists of a set of interconnected physical networks, shown as clouds in the figure, that are "glued" together by routers between the networks to create an entity that to users of the Internet appears to be one logical network.[26] operates like one large network of worldwide scope. Routers are a key element; they are responsible for examining the destination Internet address contained in the control header part of each packet, or "datagram," that is being transmitted across the Internet and, based on that address, determining the next router to which the packet should be sent in order to get it closer to its ultimate destination.

Figure 1b provides a view of the Internet as it exists in the U.S. today. It shows the role of local and regional Internet Service Providers ("ISPs") in providing links between the end-users and a set of interconnected Internet backbone networks.[27] End users, shown at the bottom of the figure, access the Internet in one of two ways: they are attached to local area networks, which in turn are linked to an ISP through a router-to-router link, or they dial into dial-up Internet hosts belonging to the ISP. A dial-up host is not simply a router; it is a server that provides protocol conversion, error checking, authentication, and negotiation functions such as the assignment of a temporary IP address to the user's computer for the duration of the dial-up connection. The key conclusion to reach from this figure is that resources of the Internet are available to Internet users through their respective connections – dial-up or dedicated router-to-router links --to the ISPs that serve them.

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[26] E.g., while computers are attached to specific networks and have addresses on those networks that are only recognized by other computers on the same network, the Internet makes provision for a universal addressing scheme by which a computer is identified to all computers on all networks that are part of the Internet.

[27] There is often a considerable overlap between local, regional, and backbone portions of the Internet.

Figure 2 shows the four-level protocol "stack" employed in the Internet. At the lowest level of the stack, Internet devices—hosts,[28] servers, routers – are attached to a physical network such as a LAN, dedicated circuit, or ATM network, and must communicate with other devices on that network using the protocol(s) of that network. The network protocol (or protocols) utilized is called the network interface protocol.[29] Next up the stack is the Internet Protocol ("IP") layer, which handles the routing function whose purpose is to deliver datagrams to the correct destination IP address. A key aspect of IP that is profoundly different than the voice network is that it is "connectionless." That means each datagram is transmitted across the Internet in a best-effort, but not guaranteed, fashion. Individual datagrams can be lost, received out of order, or corrupted. IP itself will not correct for such failures, although it does contain mechanisms to inform the communicating hosts that failures may have occurred. The advantage of this approach is that it is simple and fast; the disadvantage is that the protocols higher in the stack must address such potential deficiencies or at least be robust in the face of their occurrence.

The remaining two protocol layers run in the hosts and servers attached to the Internet. The Transmission Control protocol ("TCP") provides reliable end-to-end flow of information from the sending host to the recipient host. For example, if datagrams are lost, so parts of the data being transmitted between the computers are lost, TCP is responsible for detecting the loss and ensuring the missing data is retransmitted. Similarly, because different datagrams may follow different routes from source to destination, data can be received out of order, and TCP is responsible for reordering the data so the communicating applications receive data in the same

[28] Traditionally, the computers that communicate over the Internet, including everything from PCs to mainframe computers, have been referred to as hosts. Computers serving various specialized functions such as name translation, mail processing and web hosting are often distinguished by referring to them as servers. Routers are not the beginning- or end-point of user traffic; their role is to route user traffic from its source to its destination.

[29] In some texts, this is called the host-to-network or link layer protocol.

order it was transmitted. Because TCP involves a considerable amount of overhead processing and transmission, and because not all applications require the degree of reliability guaranteed by TCP, there is an alternative protocol at the same layer of the stack, the User Datagram Protocol ("UDP"), that provides less reliability than does TCP at a considerable savings in complexity. As Figure 2 suggests, the IP layer of the Internet, and therefore routers, are essentially oblivious to the host-host dialog taking place at the higher levels.[30]

Various application programs comprise the highest layer of the Internet protocol stack. These applications communicate email and other messages, provide for the transfer of files between hosts, and allow a user at one host to log onto another host as a remote user. Since the early 1990's a key application has been the World Wide Web ("WWW"), which provides standard methods for accessing linked documents, called pages, spread across machines distributed around the Internet.

The key conclusion to reach from Figure 2 is that the Internet protocol suite, which is often called the TCP/IP suite in honor of what are arguably its two most important members, consists of two distinct parts. One part, comprising the lower two layers, deals with what one normally thinks of as data transport functions across a network. The other part, comprising the higher two layers, has nothing to do with transporting data across the network per se, but with distributed processing functions involving two or more hosts connected to the Internet. While the network transport functions may be somewhat analogous to the processes that take place in

[30] In recent years, the division between the IP and higher layers has become blurred to an extent. For instance, the IP layer may in some cases examine the content of the higher layer protocol information in order to detect the type of applications that are communicating and assign a higher priority to datagrams serving particular applications. Also, routers are sometimes themselves the origination or termination point of Internet communications, such as when they receive instructions from, or provide monitoring data to, a network management workstation.

sending information across the voice network, the distributed processing functions have no analogy in the voice network.

III. Three Examples of Internet Applications

A. Electronic Mail

Suppose an Internet user wants to send an electronic mail message to two friends, Mary Jones and Don Williams, whose mail addressees are, respectively, mjones@ISPxxx and don.Williams@ISPyyy. The user instructs his/her computer to dial the ISP; the computer is linked to the ISP dial-up host via the dial-up connection.[31] The user then opens an email program, and as prompted by the email program, enters the addressees, types the message, and identifies the file name(s) of any attachments to be appended to the message. When this information is entered, the user clicks on the SEND button on the email application screen. At that point, the email client application on the user's PC carries out a dialog defined by the Simple Mail Transfer Protocol ("SMTP") protocol with the ISP's SMTP server to convey the message's recipient, body, and attachment information to that server. When that dialog is complete, the user can terminate the dial-up connection unless there are messages to receive or additional messages to send.

At this point, The SMTP server knows only the names of the hosts (the characters to the right of the ampersand in the mail address – ISPxxx and ISPyyy in the above examples) that provide mail service to the recipients, not the Internet address of those hosts. It thus invokes another Internet process, the name resolution process described below, to translate the host name into an Internet address. The user does not initiate this process, is not involved in it, and is oblivious to it – in fact, by time it takes place, the user may have terminated the dial-up

[31] This describes the case of dial-up connections to the ISP. For users on a LAN with a dedicated connection to the ISP, the connection is already in place, and the user can immediately start using the Internet.

connection to the ISP! The process involves strictly application-to-application dialogs, and the application in this case – the name translation process – is not even the one the user originally invoked.

When the recipient host names are successfully translated ("resolved") into Internet addresses, the SMTP server enters into an SMTP dialog with the recipient mail servers over TCP sessions established between the SMTP server and the recipient mail servers. The original user's call to the ISP is thus responsible for two different sessions with two different mail servers. Again, the user did not specify the network address of the two recipient mail servers, plays no role in establishing the TCP sessions, does not participate in the structured SMTP dialog itself, and in fact is not even aware the dialog has taken place. Note, too, that if either or both recipients were on the same mail server that serves the sender, there would be no need for any information to flow across the Internet.

At the receiving end, some time later, Mary Jones (and, separately, Don Williams) establishes a connection to her ISP, opens her email program, and invokes the "check mail" function. The email software has been configured to know the so-called Post-Office Protocol ("POP") server that is holding Mary's mail, and will initiate a dialog with that server using the POP protocol to retrieve mail messages and store them on Mary's machine. At that point, they are available for her to view in a fashion defined by the email software. Note that Mary's POP server may be at the ISP premises she dials into, so she can receive her email with no further information flow across the Internet.

At no time in the process described here is there ever an end-to-end call, or simultaneous communication of any sort, between the sender and either recipient. When all is said and done, there is no simultaneity between the dial-up call to the originating ISP, the transmittal of the

message from the originating SMTP server across the Internet to the recipient mail server, or the dial-up call initiated by the recipients to receive their message.

B. World Wide Web

In the WWW application, a user opens a WWW client, or "browser." Either manually, or from a list of "bookmarked" or "favorite" sites, the user specifies the Uniform Resource Locator ("URL") of a site to be accessed. The URL contains both the name of the WWW server, the file name of the document, or "page" to be acquired, and the file access protocol to be utilized (e.g., http). The URL does not contain the Internet address of the WWW server; again, this means that the browser must invoke the name resolution process to learn the address, just as in the e-mail example, and in other Internet applications.[32]

The browser creates a TCP link to the WWW server host designated in the URL. Over that link, the WWW server transmits the page identified in the request. A page may contain text, icons, line drawings, maps, photographs, or even audio tracks and video clips. It may even contain forms that request the user to enter information; this is prevalent in e-commerce applications of the WWW.

Whatever the contents of a page, the browser interprets the contents, including formatting instructions, and displays the properly-formatted page on the screen using a graphical user interface. The display process itself is often innovative – for instance, an image that takes a long time to download and process may first be displayed with coarse resolution, then successively finer resolution until the final image appears. Or, text may be transferred and displayed first so the reader has something to look at while the more content-rich parts of the page are transferred and displayed.

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[32] A user with sufficient knowledge of the Internet may know the Internet address of a target host machine, and use that address rather than a name, thereby obviating the need for the name resolution process.

Various elements of a page may be linked to other pages residing at the same or different servers. Such links are referred to as "hyperlinks." The user can click on these hyperlinks, which typically appear as underlined text (or as instructions that may, for instance, tell the user to click on a map or other image to obtain more detail). Often, an element in a page may be only a hyperlink to another page where the information is contained,[33] and cause the browser to initiate new TCP sessions to obtain and display the linked pages.

No description can adequately capture the richness, dynamism, and flexibility of the WWW application – it has to be experienced to be appreciated. Returning to the subject of the Declaration, exercising the WWW application typically causes many different Internet information flows to occur. While some of these may be under the control of the user – for instance, when a user may optionally click on an image to magnify it or obtain more information – many occur without any action, involvement, or awareness on the part of the user.

C. The Name Resolution Process

Users typically specify target hosts – WWW servers, email servers, and the like – using their Internet name of the hosts, not their Internet addresses. These names are assigned under the auspices of the Internet Name Domain System ("DNS"), which specifies a mechanism for assigning globally unique names. Because information is routed across the Internet using Internet addresses, not names, there must be a process of translating, or "resolving," names into addresses. The DNS also describes this mechanism, which involves interactions between a hierarchy of name domain servers, each of which has translation responsibilities for some part of the internet name space. At the upper end of this hierarchy, there are "root" name domain

[33] This is common, for instance, when one website – say, the website for a news program – displays advertising for another company. The advertising part of the page may contain a hyperlink to the advertisers site where the contents of the advertisement resides, to avoid cluttering the main site with too much data.

servers for each of the major divisions of Internet names – ".edu", ".com", ".net", and so on. At the other end of the hierarchy may be a name domain server responsible for a single company or university, or even individual departments and divisions within a university or corporation.

When an application must translate a name into an address, it invokes a procedure called a "resolver," or DNS client, passing it the name to be translated. The resolver knows the address of a DNS server, to which it sends a request to translate the name. The server either knows the translation information, for instance because it has cached translation information for that name during an earlier transaction, or it sends the request to another server. The process repeats itself in what can be multiple steps that generally proceed up the DNS hierarchy to the root server for the major branch in question, then back down the hierarchy to a server that can ultimately make the translation. DNS servers generally cache the information they learn in order to respond more quickly to future requests, although cached information is purged frequently since it can quickly become outdated.

The user that invokes the original Internet application is aware of nor involved in the translation process that takes place in the fashion described. Thus, this Internet process and associated information flow takes place entirely over the Internet, and at many steps, does not correspond to any flow of data through the dial-up connection.[34]

IV. Differences Between Calls to ISPs and Long Distance Calls

[34] One might claim that a similar process occurs in the voice network when, say, toll-free 800 numbers are translated into regular telephone numbers by elements of the SS7 network. However, like many such analogies, this one is strained and inaccurate. First of all, the Internet process is translating names with multiple parts, not telephone numbers structured like all other telephone numbers. Secondly, there is often a large number of interactions involving multiple hosts required to translate a single Internet name, not a single processor as in the SS7 network. But most profoundly, the voice network translation process is done internally to the network and is invoked by the voice switches themselves, whereas the DNS process involves hosts attached to the Internet, and is invoked by applications, not by the Internet routers, which are completely oblivious to the process that is taking place.

The previous applications examples demonstrate the following points about the communications that takes place across the Internet in support of various Internet applications:

Over dial-up connections to ISPs, users invoke Internet applications. The subsequent sessions across the Internet involve application-to-application, not user-to-user, dialogs;

The user does not initiate, nor is he/she even aware of, much of the processes taking place across the Internet;

The dialogs that take place often involve an application – the name resolution process – that the user does not invoke;

The supposed end-end "connection" between two hosts or humans – say, between an email sender and email recipient – consists of more than one dialog, and the different dialogs usually do not occur at the same time, and in fact may occur after the dial-up call to the ISP has been terminated;

As shown in Figure 3, over a single dial-up connection to an ISP, the user's host is typically involved in multiple sequential internet communications to different hosts and servers; and

In the case of electronic mail via SMTP, there is communication between mail servers belonging to the originating and destination ISPs that does not involve the sender's or recipient's host computers.

These differences lead to the summary points made at the beginning of this Declaration, which are restated below with additional amplification:

The Internet operates in a fundamentally different fashion than does a long distance voice network over which the dial-up connection to the ISP is established, because voice calls transpire

over a circuit switched connection[35] which is established by the calling party, maintained for a finite period, then terminated by the calling or called party, whereas there is no notion of a connection over the Internet, and thus no connection to be created or terminated;

The Internet is a packet switching network that processes and transmits units of information on a one-by-one basis as they are sent to the network, interleaving the units from different communicating devices in the routers and over the transmission links of the network. Going even further, not only does the Internet use packet switching, it employees a connectionless version of packet switching that means there is no network awareness of any connection. During the times when an application is not sending any data, the same network resources that might otherwise be used to handle data from that application are instead are being used to handle data from other applications. In fact, if an Internet user dials a call to an ISP but then delays any subsequent action to initiate Internet communications, the Internet is oblivious to the dial-up connection – it does not monitor it in any way, and does not commit any resources to it. On the other hand, as Figure 3 shows, there can be multiple sequential (or parallel) Internet sessions that take place over a single dial-up connection.

Thus, to characterize communications across the Internet as being like one "continuous" end to end voice call is clearly a misnomer. Between the time a dial-up connection is established and the TCP or application session is established across the Internet, would the analogy with voice calls mean the call has terminated at the ISP? Worst yet, when the user's host communicates with multiple hosts to perform multiple tasks over the duration of a single dial-up

[35] Circuit switching refers to a form of network protocol in which the network commits switching and transmission resources, collectively called a "circuit," solely to a single instance of communications – two humans talking, or two computers exchanging data – and maintains that commitment until the communicating entities indicate the communication is completed.

connection, are we to picture this as a new invention of the voice network that allows the far end of an end-to-end call to be reconnected to different places multiple times?

Unlike ordinary telephone calls, the information supplied by the user to initiate a dialog with another computer is not a network address; it is an Internet "Domain Name," which must be interpreted and translated into an Internet address before the routers that are responsible for Internet transport can start routing information to the right destination;

No communication takes place over the Internet until high-level processes having nothing to do with the transport network itself (i.e., the routers) are completed. Furthermore, the user is not involved in the translation process that takes place. If one were to think of communications across the Internet as being a "call," this means that before the real call a user intends, such as acquiring data from another Internet computer, there must be what is often a long sequence of "calls" between the user's computer and various servers involved in name-to-address translation. This further emphasizes that events subsequent to the establishment of the dial-up connection do not constitute an instantaneous continuation of the original dial-up call, either in the sense of time or in the sense that the network proceeds to establish a call to the intended destination. The closest analogy to this situation in the voice world might be some sort of electronic directory service that a telephone company provided that would allow a caller to indicate electronically[36] he/she wanted to reach "Joe Smith at 560 main street in Milwaukee," a computer would search for that information in a database, determine the telephone number – which was not provided by the caller – and place the call, all without the involvement of a human operator. Such a service, if provided by the telephone company, would manifestly not be part of the basic telephone call, but would be an enhanced information service. Furthermore, it would involve the caller at every

[36] In a fashion that is barely feasible with ordinary telephone devices in the first place, due to their limited repertoire of control instructions they can convey to the telephone network – basically, twelve tone combinations, a switchhook flash, and hanging up.

step, whereas the Internet user has no involvement in or awareness of the name translation process that is occurring.

Finally, and perhaps most importantly, there is no significant voice network equivalent of the Internet process in which multiple application-to-application sessions involving multiple sites take place sequentially over a single dial-up connection without subsequent involvement of the user.

This means in effect there is a one-to-many relationship between the dial-up connection to the ISP and the sessions taking place in the Internet, and the extra sessions are outside the control of the user.[37]

Based on the foregoing, it is clear that dial-up calls to ISPs are in no meaningful way analogous to long distance calls. Long distance calls are directed to a single destination for the duration of the call based on a single number dialed. There is a one-one coupling between the originating and terminating exchange access part of the connection and the IXC part of the connection. And long distance calls do not invoke multiple applications communicating with multiple end-points during the process of the call, to which the caller is oblivious. But all of these phenomena can and do occur in the Internet.

V. Critique of the White Paper by Charles L. Jackson

As part of its filing, Verizon submitted a paper by Charles L. Jackson that purports to show that in an Internet connection, like in a telephone call, "the information flow – the content, the communication – passes unchanged from the originating computer to the destination

[37] One might claim that the credit card service offered by many IXCs, in which a user can use the # key to end one call and initiate another without breaking the connection from the user to the IXC POP or losing the billing information, is an equivalent service. But it is not – unlike the Internet process we have described, it involves the user, and it amounts to different instances of user-user communication, whereas the multiple Internet processes we have described pertain to the same user-user communication but different applications that must be invoked for that user-user communication to take place.

computer."[38] One is supposed to conclude from this that the dial-up call to an ISP is merely the initial part of an end-to-end connection, and thus essentially identical in nature to a long distance call.

The paper reaches its conclusion by pointing out what it alleges to be similarities in voice calls and Internet transactions. However, the analogies it draws are so strained as to render them meaningless.

The paper starts with a description and nature of a voice call; I have no argument with that description. Where things begin to go awry is at the end of paragraph 7. There, Jackson claims that the end-to-end communication characteristic of a voice call does not end just because the voice signal undergoes analog-to-digital and digital-to-analog conversions. I agree with him – in fact, I will go further and agree that in a dial-up connection to the Internet, there is a conversion in the form of data being transmitted from analog to digital. But this doesn't begin to scratch the surface of the profound differences between Internet communications and long distance calls I have described.

Next, in paragraphs 9-10, Jackson describes the process of making a credit card call. In paragraph 10, he claims the caller "does not generally know what occurs behind the scenes." That may be – the internal workings of a computer are a mystery to most people. But here is what the caller does know, by Jackson's own account: he/she has to dial special digits, listen to and respond to prompts, dial the intended destination number, and dial calling card and pin number. The user is aware of and involved in every step of the calling card process. By contrast, the Internet situation is quite different – processes like the name translation process involve application-to-application dialogs in which the user has no role and is unaware that they are even happening. In fact, my experience in talking to the average lay user of the Internet is

[38] Jackson White Paper, para. 12.

that most users are not even aware of the distinction between an Internet name and an Internet address, nor, therefore, do they realize a conversion process must take place.

In paragraph 11, Jackson asserts "When a dial-up customer connects to the Internet, these connections typically are routed around the country (and often around the world) and finally terminate at a distant location on a web server." My question is: what connections are we talking about – there are no "connections" in the Internet. The Internet is connectionless. The closest one comes to a "connection" is the TCP session that may be established by the communicating computers, or the "query-response" dialog that is taking place between applications. Neither of these involve the network – the routers in the network have no cognizance that there is a TCP or application dialog taking place. They know only that they are receiving individual datagrams, each containing a destination address towards which the routers are supposed to route the datagram. This is very different than the voice network, where switches are aware of and maintain actual network connections. Furthermore, neither TCP nor the application dialog involve the user – all of this is going on in the background, and requires no actions by the user.

I have no argument with the paragraph 11-12 description of how a given application transaction takes place. But, the conclusion reached in paragraph 13, that the dialup connection "is part of a single integrated or end-to-end Internet communication or call," is flawed. Again, it totally ignores the facts that 1) there is no Internet "call" because there is no network connection across the network; and 2) several processes – "calls," in Jackson's vernacular – may and often do take place in succession over a single dialup connection to the ISP. Thus over one circuit switched connection between a user and the ISP, there may be multiple sessions to different domain name servers, and multiple sessions involving, say, different email recipients or different computers identified in WWW pages containing links to other pages. Jackson himself acknowledges this possibility in paragraph 14 when he says "Of course, as in the calling card

example above, a customer may communicate with a number of different web sites during any given session." But the situation is very different than the calling card example. Credit card verification takes place once, at the beginning of a call. The user is fully involved in the credit card verification process. By contrast, in the case of the Internet, the user takes no action to initiate multiple sessions – he or she does not redial, does not have to set up a conference session, etc. What is the voice equivalent of such a process-intensive dialog with multiple parties at multiple locations during a single connection to the Internet? There is none.

The description of end-end transparency, security, and traceroute in paragraphs 15-21 are intended to support Jackson's notion of the end-to-end communications that take place in the Internet. I agree that there is such end-end transparency on any one session between two hosts. But the description conveniently fails to explain how multiple transactions are taking place over a single dial-up connection to the ISP. Again, there is no equivalency between long distance calls involving user-to-user connections and the Internet dial-up call that carries information pertaining to multiple sessions involving multiple destinations.

VI. Conclusion

A dial-up call to an ISP represents local telecommunications traffic. This is true because there is no connection across the Internet corresponding to the dial-up call. There cannot be such a connection, because, fundamentally, the Internet is connectionless. The lack of correspondence is further demonstrated by the fact that at various times during a single dial-up call there may be 1) no flow of information across the Internet, even though information is flowing over the dial-up connection; 2) no flow of information over the dial-up connection even though there is information flowing across the Internet related to the application the user invoked; 3) flows between multiple points in the Internet, either simultaneously or sequentially; and 4) flows that take place at different times for different phases of an application.

The right way to characterize the situation is that a dial-up call to an ISP triggers communications across the Internet that are a fundamentally different kind of enhanced process-to-process communications. The best analogy is with a telecommuter or other remotely-located employee dialing into his/her company's computer network and triggering various processes within that network. These processes do not represent a continuation of the dial-up call, and in fact cannot reasonably be described as "calls" at all. And, even if the corporate network were spread across disparate geographic locations, one would not certainly not attempt to describe the flow of information across the dial-up connection and the computer network as a long distance call.

The foregoing statements are true and correct to the best of my knowledge, information, and belief.

/s/Robert A. Mercer
Robert A. Mercer

August 4, 2000
Date

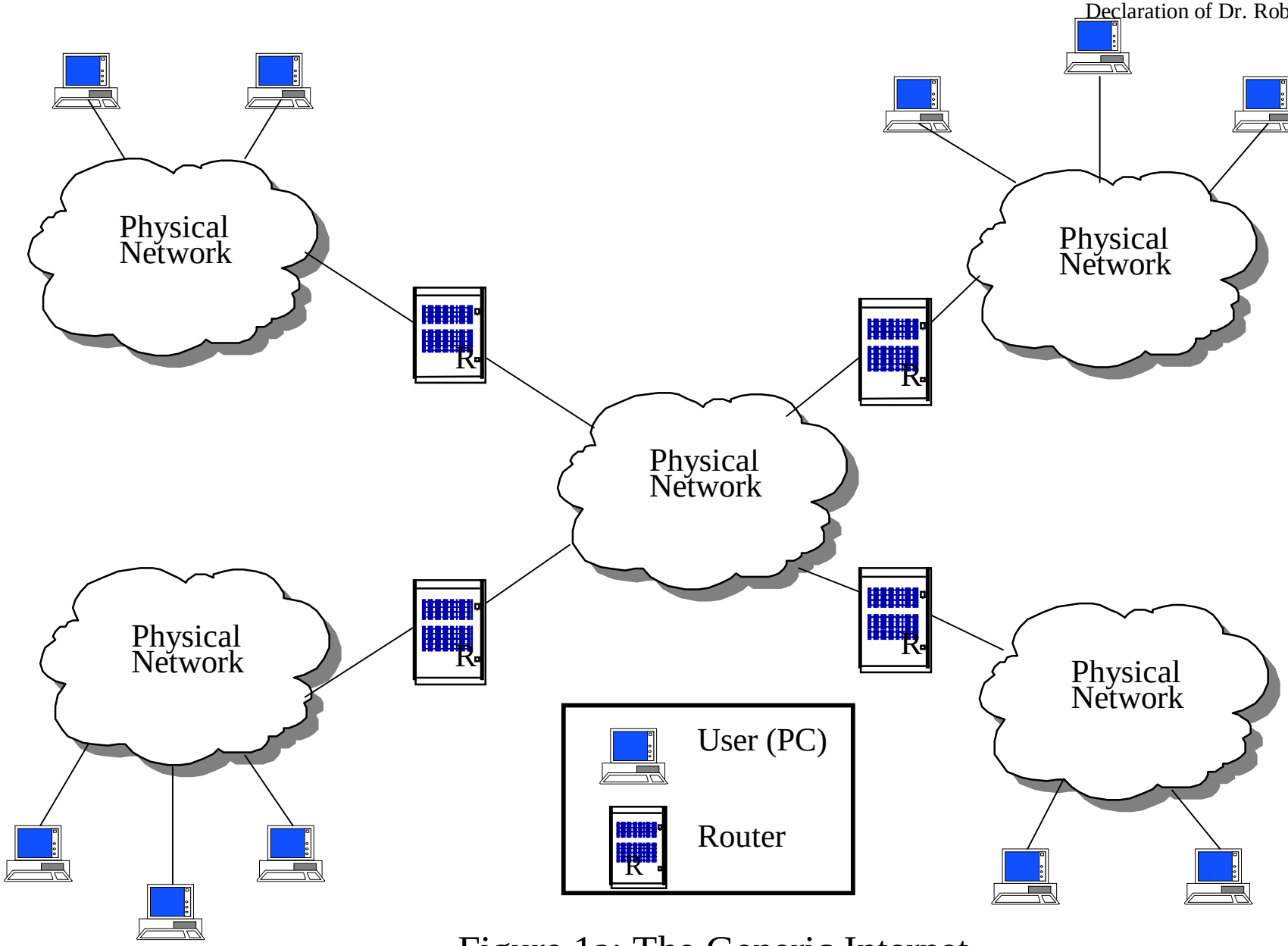

Figure 1a: The Generic Internet

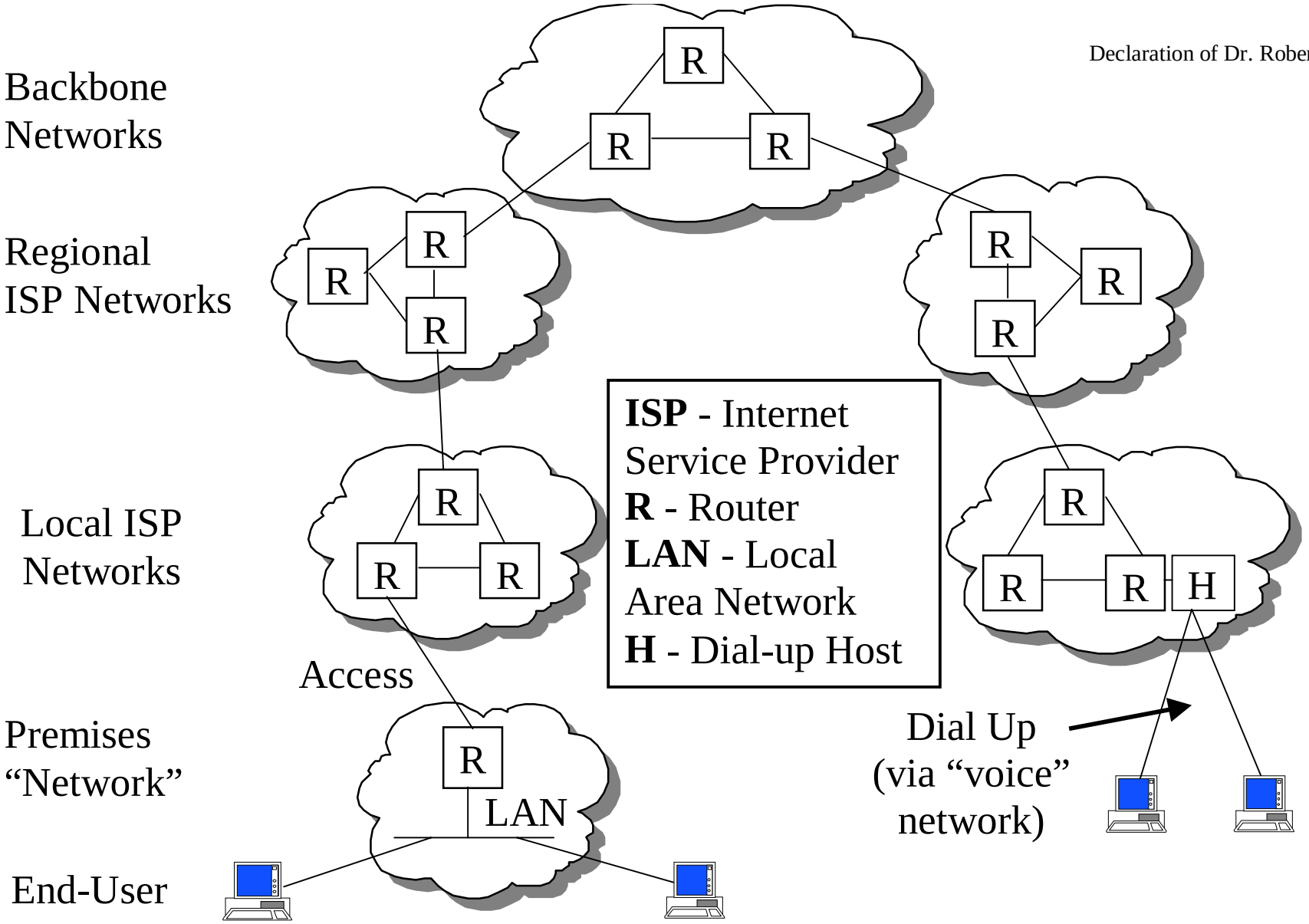

Figure 1b: The U.S. Internet

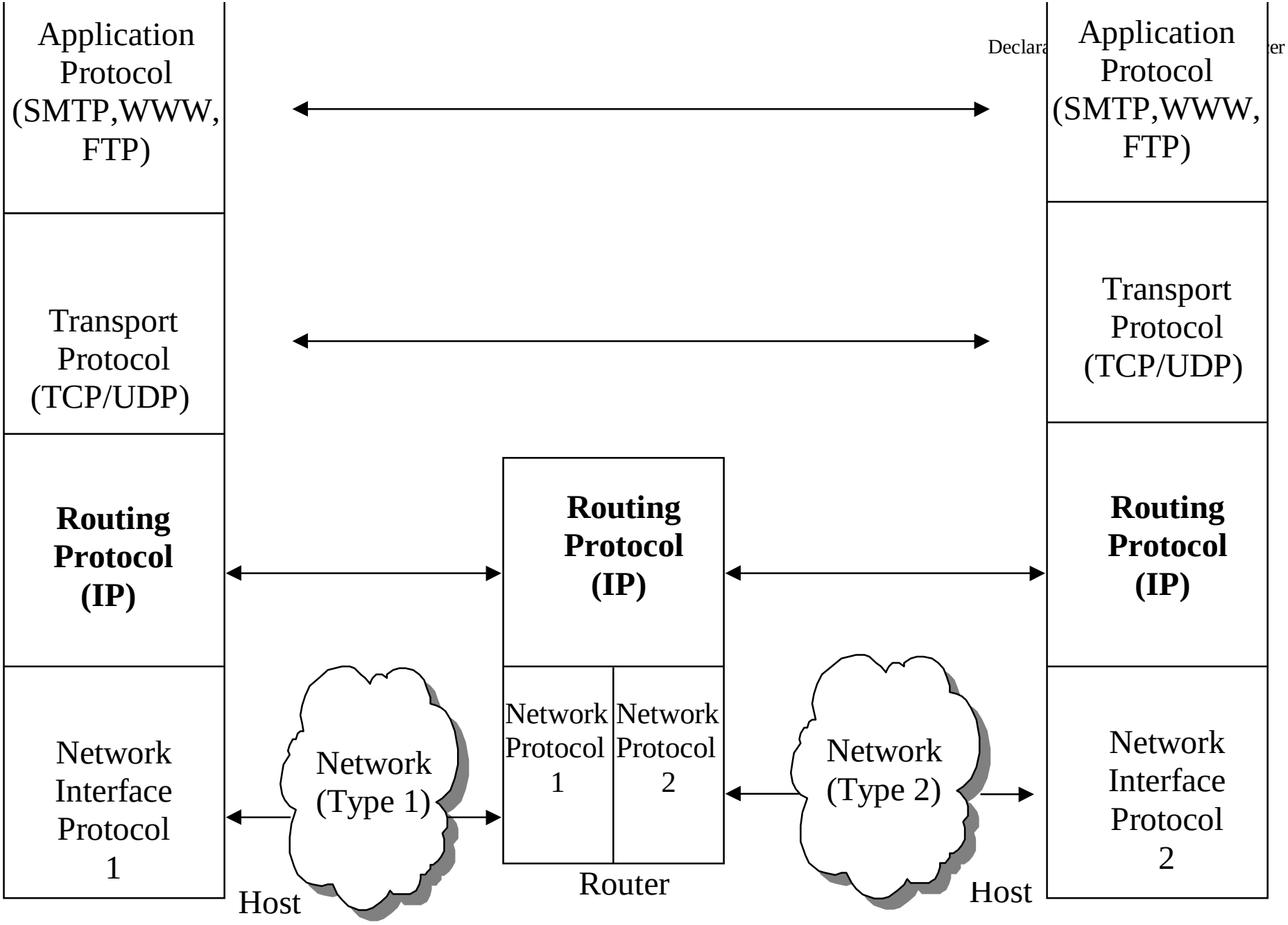

Figure 2: Internet Protocols

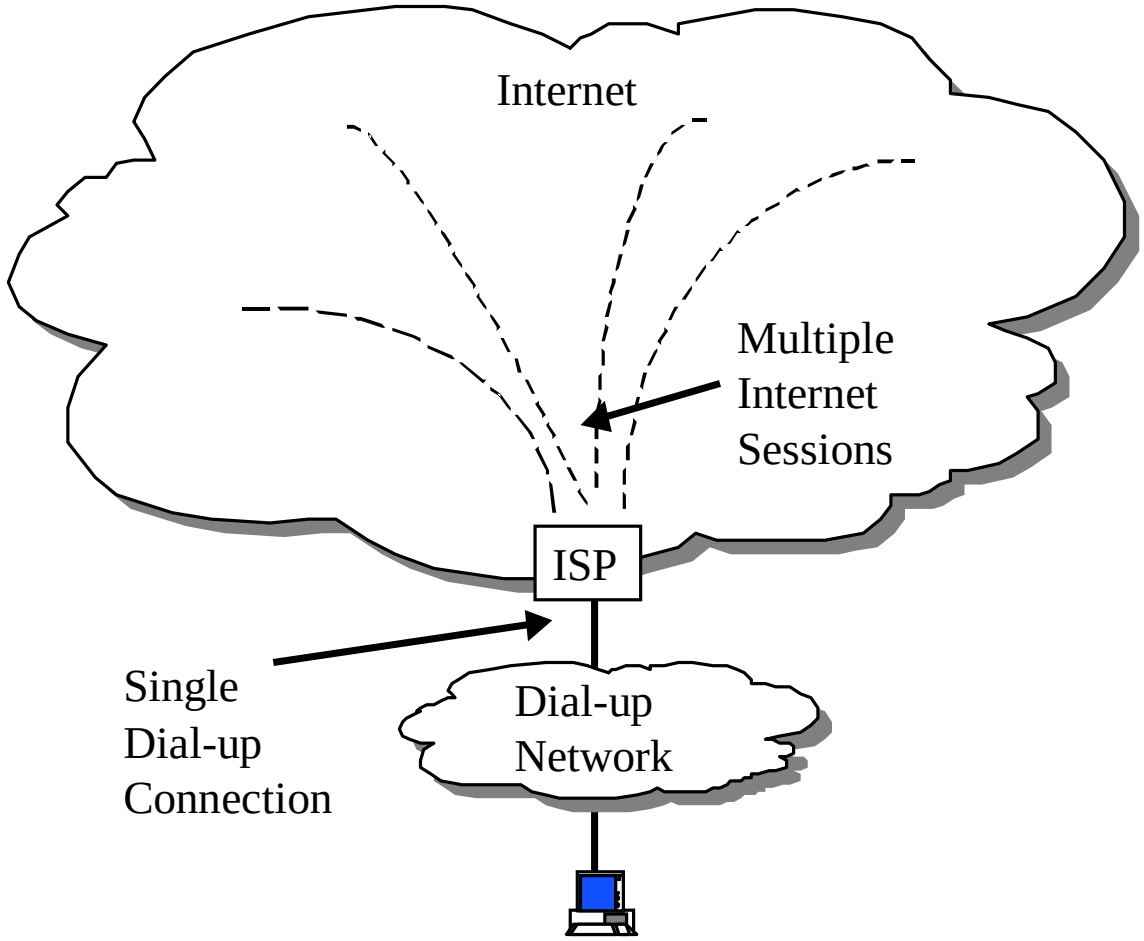

Figure 3: Internet Sessions over Dial-Up Connection

BEFORE THE

Federal Communications Commission

WASHINGTON, D.C.

In the Matter of	)	
	)	
Implementation of the	)	CC Docket No. 96-98
Local Competition Provisions	)	
of the Telecommunications Act of 1996	)	
	)	CC Docket No 99-68
Inter-Carrier Compensation	)	
for ISP-Bound Traffic	)	

DECLARATION OF WILLIAM PAGE MONTGOMERY

INTRODUCTION

1. My name is William Page Montgomery. I am the principal of Montgomery Consulting in Laguna Beach, California, which I founded in 1993 after 16 years with the consulting firm of Economics and Technology, Inc.

2. I have been involved in telecommunications public policy and regulatory matters since 1974. I have provided consulting services in over 100 common carrier matters before the Federal Communications Commission (FCC). I have also participated in several hundred state-level telecommunications proceedings, and have submitted expert testimony before 30 state regulatory commissions. I have had considerable experience in the development of regulatory mechanisms designed to create improved efficiency incentives for monopoly local telephone companies; as well as policies and practices to increase competition in the telecommunications industry. I have been involved in extensive analysis of rates, costs and cost accounting systems. I have degrees in law and economics from Duke University and Butler University respectively.

3. In the last five years, I have been actively involved in local exchange competition proceedings and interconnection arbitrations in a number of state jurisdictions and the FCC, including CC Docket No. 96-98 and its investigations of reciprocal compensation in CC Docket No. 99-68. I have testified in Arizona, Colorado, Connecticut, Illinois, Indiana, Iowa, Kentucky, Maryland, Massachusetts, Michigan, New Mexico, Ohio, Oregon, Pennsylvania, Texas, Utah, Washington and Wisconsin. I have testified on reciprocal compensation issues involving Internet Service Providers (ISPs) in nine states, including the specific proceedings I discuss below, and each state has approved compensation for ISP-bound calls.

4. ICG Telecom Group, Inc. (ICG) asked me to review and comment on two submissions by incumbent local exchange carriers (ILECs) in response to the Commission's June 23, 2000 Public Notice (FCC 00-227). I have previously analyzed the factual assertions in the two submissions in state regulatory proceedings. One document is the Direct Testimony of Barbara A. Smith of Southwestern Bell Telephone Company ("SWBT"), submitted as Attachment B to the Comments of SBC Corporation, Inc ("SBC Cost Attachment"). The other document is the Declaration of William E. Taylor, attached to the Comments of Verizon Communications ("Verizon Cost Attachment").

COMMON CHARACTERISTICS OF THE SBC AND VERIZON DOCUMENTS

5. Both of these cost attachments have several things in common. Both documents make allegedly factual assertions concerning the cost incurred by competitive local exchange carriers (CLECs) to terminate high volume, long duration ISP-bound traffic. Both documents try to raise issues which appear to be quite peripheral to the specific, albeit complicated, jurisdictional issues addressed in the Public Notice. Thus, both the Verizon and SBC Cost Attachments seem to try to point the Commission away from the Public Notice issues towards somewhat superfluous policy issues, that might better be investigated after the specific jurisdictional issues in this remand proceeding have been settled. Both documents thus raise issues and assertions that could best be tested in full evidentiary hearings.

6. The analyses in both the SBC and Verizon Cost Attachments try to base assertions about the lower costs that CLECs allegedly confront for ISP-bound traffic based on the ILECs' existing costs for terminating local traffic. SBC and Verizon then simply removed various cost components that are supposedly avoided by CLECs who transport and terminate this type of traffic. Both attachments make these fairly complex factual assertions without detailing the inputs, assumptions and calculations behind their analyses. Both Cost Attachments thus highlight the value of full evidentiary processes, with written discovery, oral depositions, open evidentiary hearings and detailed review by regulatory staffs experienced in detailed cost analysis.

7. Such an evidentiary review has been completed in the case of the SBC Cost Attachment.

A number of the points made in the Verizon Cost Attachment have been disputed in other proceedings. It should be no surprise, then, that the majority of state regulators who have reviewed such complex cost assertions in detail have determined to continue the reciprocal compensation regime for ISP-bound traffic (apart from the jurisdictional issues remanded to this Commission). Indeed, the few contrary state opinions on reciprocal compensation for ISP-bound calls are in jurisdictions that either have not (yet) engaged in full scale reviews of the costs of terminating ISP-bound calls,[39] or are based on facts about a specific situation involving a single carrier.[40]

8. The Texas Public Utility Commission has declined to rely on the cost analysis in the SBC Cost Attachment, the Smith testimony.[41] Ms. Smith sponsored SWBT's Internet Bound Traffic (IBT) study. The Texas Commission found that:

> All parties agree that the SWBT IBT cost study should not be used to set reciprocal compensation rates. The Commission concludes that the SWBT IBT cost study is not a TELRIC study and also cannot be used to

[39] See MCI WorldCom v. Bell Atlantic -- Massachusetts, Massachusetts Department of Telecommunications and Energy, Docket No. 97-116-C, Order, May 1999, discussed at page 23 of the Verizon Cost Attachment. This remand proceeding is not the place to debate the merit or lack thereof of specific state decisions, whether those decisions are minority rulings against reciprocal compensation for ISP-bound calls – as is this case – or the much larger majority of decisions that have ruled the other way.

[40] See BellSouth Telecommunications Inc v. US LEC, North Carolina Utilities Commission, Docket No P-561, SUB 10, March 31, 2000, discussed at page 26 of the Verizon Cost Attachment.

[41] Public Utility Commission Of Texas, Proceeding To Examine Reciprocal Compensation Pursuant to Section 252 Of The Federal Telecommunications Act Of 1996, Docket No. 21982, *Arbitration Award*, July 14, 2000 ("Texas July Arbitration Order").

> justify differentiating ISP-bound traffic and voice traffic for costing purposes.[42]

The Texas outcome demonstrates, I think, that the FCC should continue to accord significant weight to state regulatory commissions who can adjudicate factual issues such as those raised in the Verizon and SBC Cost Attachments, although this observation is not directly germane to the issues covered by the Public Notice (as are neither the Verizon or SBC Cost Attachments in the first instance).

SBC AND VERIZON ASSUME THAT ISP TERMINATING SWITCHES ARE "STRIPPED DOWN" EQUIPMENT

9. Both the SBC Cost Attachment and the Verizon Cost Attachment are very deficient in their methods and assumptions. Both Cost Attachments produce alleged rates for terminating ISP-bound traffic that are about 55% to 65% (independent of call duration effects) below the respective state tariffed rates used as a starting point. In both instances, these additional reductions are accomplished by "stripping away" otherwise legitimate switching related costs that the two Attachments claim are not involved in terminating ISP-bound traffic. Neither Cost Attachment constructs an affirmative serving arrangement for ISP-bound traffic. Neither study tries to develop serving arrangements that SBC or Verizon might claim were "optimized" to terminate ISP-bound traffic. By

[42] Texas Arbitration Order, p. 47; emphasis added. With the concurrence of the vast majority of the CLEC parties to the Texas arbitration proceeding as well as SWBT, the Texas PUC decided to convert the existing reciprocal compensation rate into a two-part or "bifurcated" rate so as to separate the costs of call set-up from the cost of the duration of the call. The bifurcation allows calls with shorter holding times and calls with longer durations, like ISP-bound calls, to be priced on a non discriminatory basis. The bifurcation involved a significant reduction in the reciprocal compensation price for terminating ISP-bound calls. For a 30 minute call the price reduction in Texas was about the same as the change in the "cost adjusted for holding time" shown in the Verizon Cost Attachment, p. 31, Table 1

(footnote continued on next page)

simply stripping off various cost components, both Attachments present results that have been cobbled together simply so that the ILECs can try to assert that CLECs realize extraordinarily lower costs in terminating ISP-bound traffic.[43]

10. The study in the SBC Cost Attachment, for example, strips away end office switching costs associated with vertical features like Call Waiting and the costs to connect remote switching modules to the primary circuit switch through investment in umbilical trunks.44 The Verizon Cost Attachment accomplishes the same type of "stripped down" reconfiguration of a local switch ostensibly by eliminating all costs associated with line-side traffic handling, expressed in centum call seconds or CCS.45 Thus, both the SBC and Verizon Cost Attachments create switch configurations that are entirely hypothetical in nature.

11. It is far from clear that service providers can even buy switches from vendors without the capability of providing vertical features, or without the capacity to modify line

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[43] As I discuss below, the assertion that switching costs for ISP-bound calls are much lower than costs for other local traffic is at odds with these claims that these ILECs and most other ILECs have made to the Commission over many years in an attempt to apply interstate switched access charges to call terminations to ISPs.

[44] These features of the SWBT/SBC are not found in the actual FCC submission, but were instead revealed through discovery in the Texas Arbitration Case, in SWBT responses to requests for information (RFIs) propounded by the Texas CLEC Coalition (numbers 1-14 and 2-2) – illustrating again that a forum which provides for full evidentiary review of cost studies is necessary for proper analysis.

[45] Verizon Cost Attachment, pp. 16-17. I say "ostensibly" because there is a serious factual question about how the Verizon Cost Attachment applied the Line CCS to tandem switching as well as end office switching costs, as I discuss below. Absent a detailed review of the workpapers supporting the study, one cannot conclude that the adjustment was implicated correctly even in a mechanical sense.

concentration ratios over time as busy hour CCS traffic changes.[46] It might be more costly for the switch vendors to write new software to block features, or to redesign the architecture of the switch fabric to somehow be insensitive to offered traffic loads. It is simply not rational for either vendors or service providers to try to develop switch architectures and configurations that might match the hypothetical switches posited in the Verizon and SBC Cost Attachments.

12. Even if these hypothetical switches were available in the equipment marketplace, however, the assumptions behind the Verizon and SBC Cost Attachments are not competitively neutral. The ILECs' assumptions about "stripped down" switches seem to imply that CLECs should not be compensated for the costs of general purpose equipment; CLECs should be confined to purchasing special, stripped down equipment rather than general purpose switches. The assumptions also imply that the revenue flows that CLECs need in order to grow should be limited, so as to box in CLECs from expanding their customer bases and networks. The effects of the ILECs' trying to exclude legitimate cost components from CLECs' serving arrangements for ISP-bound traffic ultimately have serious anti-competitive impacts.

VERIZON'S ASSERTIONS ABOUT THE COST DRIVERS FOR ISP CALLS ARE INCORRECT

13. The Verizon Cost Attachment tries to draw a link between the costs of ISP-bound calls

[46] CCS, or centum call seconds, is the measure of each one hundred (centum) seconds of traffic load offered to a switch.

and four possible characteristics of such calls that Verizon claims affect cost causation: Call duration, the use of dedicated capacity, call direction and load distribution.47 In fact, however, none of these characteristics demonstrate that termination costs of ISP-bound calls are significantly lower than terminations of the equivalent seven-digit local voice calls.

14. Call duration. Verizon claims that ISP bound calls are less expensive to terminate because these costs often have longer durations than other calls. The longer duration means that call set up costs, which are different than the costs of handling a call through its duration, are collected over a longer time period – until the call is disconnected. If the call terminating cost is expressed by means of a single-part rate in which set up and duration costs have been averaged, continued recovery of the set up over a longer duration results in an excessive price for the long duration call. However, this characteristic has nothing per se to do with ISP-bound calls. The same phenomenon applies to all longer duration calls, irrespective of where they originate or terminate. Telephone companies with single-part local measured service retail tariffs, usage based extended calling prices and one-part "local-toll" rates will over-recover the costs of longer duration calls made by talkative teenagers, for example.

15. If this type of rate structure distortion exists, the appropriate, and non-discriminatory remedy is to apply a two-part rate that separates the call set up costs from the duration costs. A number of states already have two-part rates in effect for reciprocal

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47 Verizon Cost Attachment p. 4 and following.

compensation; as noted, the Texas Commission just approved this rate structure change – without changing the reciprocal compensation costs it had approved previously.[48] Therefore, when Verizon claims that ISP-bound call costs should be differentiated based on call duration it is merely noting a possible change in rate structure, which can be effected without discriminating between ISP-bound calls and other local calls.

16. The Verizon Cost Attachment first claims that longer-duration calls to ISPs are always less expensive for CLECs to handle, but later notes that the Commission established different default compensation rates for paging calls.[49] In fact, Verizon's assertions are inconsistent, because the Commission determined that shorter duration paging calls were less expensive than other local calls.

> A paging network's "configuration is distinctly different from either LEC wireline networks,..." and "most calls terminated by paging companies are brief (averaging 15 seconds) in duration and contain no voice message, but only an alpha-numeric message of a few characters." [50]

Thus, Verizon would have one believe that shorter-duration paging calls cost less and so do longer-duration ISP-bound calls.

17. Dedicated capacity. The Verizon Cost Attachment claims that CLECs incur no line CCS

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[48] See Texas Arbitration Order, p. 48. Compare: Public Utility Commission of Texas Petition of MFS Communications Company, Inc. for Arbitration of Pricing of Unbundled Loops Agreement Between MFS. and Southwestern Bell Telephone Company, Docket No. 16189, *et al*, Arbitration Award (Dec. 19, 1997), Attachment A. ("Second Texas Mega-Arbitration Award").

[49] Verizon Cost Attachment, p. 27.

costs if the CLECs provision non blocking primary rate interface (PRI) connections for ISP-bound calls. "Since the circuit is dedicated to the ISP line, the use of the facility does not impose congestion costs on other users, and no rationing or call blocking is imposed on the network as a result of the ISP line being in use."51 This rationale confuses dedicated, non-switched facilities costs, like private lines, with the high volume ISP-bound traffic, which – unlike private lines – is routed through switches and consumes switch resources at the busy period. At the switch, this traffic does impose potential call blocking on other traffic.

18. Verizon confuses "non traffic sensitive" as it may be used in a pricing sense (i.e., since the dedicated line is not shared, its costs are not allocated) with the traffic engineering effects associated with different levels of busy hour offered traffic loads. If a voice configuration with a line concentration of perhaps 6:1 imposes traffic sensitive costs on the switch, a lower concentration ratio of 2:1 or even 1:1 does not change the burden on switch to "non-traffic" sensitive costs.52

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50 Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, First Report and Order, August 19, 1996, paragraph 1092.

51 Verizon Cost Attachment, p. 17. The Line CCS adjustment reduces Verizon's estimated switching costs by about 60% compared to the rates adopted in the six Bell Atlantic states used in the Verizon analysis.

52 The "traffic sensitive" versus "non traffic sensitive" distinction for arcane regulatory purposes like jurisdictional separations was acceptable, albeit imprecise, in its time because local carrier switches served only voice calls that had stable, long standing characteristics like a fixed 6:1 or 4:1 line concentration ratio. Since all calling exhibited these stable patterns, the costs of local exchange line concentration could be arbitrarily labeled "non traffic sensitive." Even under jurisdictional separations, however, interexchange message circuit costs were treated as traffic sensitive and separated on the basis of conversation-minutes. 47 CFR 36.126(e)(3)(i).

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19. In addition, the Verizon Cost Attachment seems to have misapplied its removal of all line CCS costs from the standard switch cost models because the adjustment also lowers the estimated tandem switching unit costs shown on Table 1 by over 50%. But tandem switching is engineered according to the total traffic offered via incoming and outgoing trunks and thus line CCS volumes are irrelevant. The Verizon adjustment should not affect tandem costs so drastically, if at all. Without a thorough review of the calculations supporting the Verizon adjustment, however, the source of this apparent anomaly cannot be analyzed.

20. Traffic load distribution. The Verizon Cost Attachment makes another error similar to its misinterpretation of the engineering cost effect of high volume ISP-bound traffic offered over dedicated facilities. Verizon claims that Internet traffic is less costly to serve because it is likely to have a flatter peak load, so that "the fraction of usage falling in the busy hour is smaller for Internet-bound and voice traffic..."[53] This assertion is wrong on its face because it is not the percentage (or fraction) of busy hour traffic that drives switching costs but rather the absolute load measured in CCS. Nevertheless, Verizon's current assertion contradicts what its Bell Atlantic unit told the Commission:

> The growth of the Internet has, however, dramatically changed the overall usage patterns in many offices, throwing out the window many of the traditional statistics on telephone company facility needs. In particular, standard telephone lines serviced by "typical" central offices are each in use about 5 minutes during the busy hour. By contrast, recent

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[53] Verizon Cost Attachment, pp. 17-18.

> measurements in offices that service [i.e., terminate calls to] large ISPs show that the lines to those ISPs are in use more than 45 minutes in the busy hour.[54]

Although the SBC and Verizon cost attachments now claim that ISP-bound calls are less expensive to serve, three years ago these companies, as well as most other ILECs, insisted that handling ISP traffic was so expensive that local rates could not cover the costs and that usage-sensitive access charges should apply. Previously, a July 10, 1996 letter from NYNEX's Director, Federal Regulatory Matters to the Chief, Competitive Pricing Division made similar assertions.55

> It is important to note that dial-up connections for this [ISP-bound] traffic require dedicated links through the switch and the network for the duration of the call...[T]his incremental demand is already beginning to impact the quality of voice telephone service...
>
> Bell Atlantic's traffic studies demonstrated new peak load costs, because "the CCS or occupancy data indicate that this traffic is incremental to normal voice traffic, not complimentary. Occupancy levels in excess of 20 CCS per hour are realized in most cases by 10:00 AM, and this load is sustained throughout the day...

21. Similarly, in 1997, SBC's subsidiary, SWBT, suggested that ISP-bound traffic should be subject to end office switching charges of 0.637 cents56 -- much higher than reciprocal

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[54] Usage of the Public Switched Network by Information Service and Internet Access Providers, CC Docket No. 96-263, Joint Comments of Bell Atlantic and NYNEX, March 24, 1997 ("Bell Atlantic ISP Comments"), p. 5.

[55] See Attachment D to Bell Atlantic's March 24, 1997 ISP Comments. Emphasis in original.

[56] Usage of the Public Switched Network by Information Service and Internet Access Providers, FCC Docket No. 96-263, Comments of Southwestern Bell Telephone Company, March 24, 1997 ("SWBT ISP Comments"). The actual rates SWBT advocated for this traffic were set out in SWBT's

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compensation rates for ISP-bound traffic in the current generation of interconnection agreements. SWBT claimed that terminating costs for ISP-bound traffic were higher:

> Today, when Internet traffic is handled via the circuit-switched network, the traffic originating from clusters of subscribers is funneled to a few high traffic points in the network. This "funneling/concentration effect" raises the average traffic volumes beyond the normal switched access parameters. .... The traffic from these clusters of users creates a real traffic overload on the line side equipment of a given switch.
>
> The results of this growth in traffic terminating to ISPs are busy-hour and busy-day shifts, larger magnitude and more frequent blocking in certain central offices (especially those serving ISPs) congestion in interoffice trunk groups and congestion in internal modules of SWBT's switching systems.57

On reply, SBC reiterated that "[a]s Internet traffic continues to grow on the PSTN, this traffic will have an ever increasing effect on peak-usage with corresponding cost increases," and that even if ISPs purchased trunk side switch connections from ILECs "congestion still occurs on interoffice facilities and terminating end office switches." 58 Of course, when a CLEC handles the ISP-bound traffic, the CLEC rather than the ILEC operates the terminating office, where calls to ISPs are concentrated and the possibility of switching congestion is the

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January 29, 1997 Initial Comments in FCC Docket No. 96-262, Access Charge Reform, at Appendix A and Attachment 1 thereto.

57 SWBT ISP Comments, pp. 7, 9 emphasis added.

58 Usage of the Public Switched Network by Information Service and Internet Access Providers, FCC Docket No. 96-263, Comments of Southwestern Bell Telephone Company, Pacific Bell and Nevada Bell, April 23, 1997 ("SWBT ISP Reply Comments"), citing Pacific Bell whitepaper "Surfing the 'Second Wave'".

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greatest.

22. Thus, a correct understanding of the traffic characteristics of ISP-bound calls supports a precisely opposite conclusion that Verizon's statement about the "fraction" of traffic in the busy hour. The lower concentration ratios that are required by CLEC switches that terminate high volumes ISP-bound calls require higher outlays for additional equipment including the switching fabric and more concentration modules. The added costs associated with lower concentration ratios, other modifications in the CLEC's switches to accommodate high busy hour loads and differences in network architecture are driven by the traffic characteristics of the lines that terminate at ISP modem banks. These are all traffic sensitive costs in the engineering sense, and should be reflected in the inter-carrier compensation rate.

23. **Call direction.** Finally, Verizon notes that the volume of inbound calls terminating to an ISP is substantially greater than the volume of outgoing calls. Like the duration of calls discussed above, directionality per se neither serves to differentiate ISP-bound calls from other calls -- all calls have both an originating and terminating end, by definition – nor proves in any way that ISP-bound calls experience dramatically lower costs, as Verizon alleges. Like the call duration point, Verizon is really distinguishing a rate structure issue and then claiming the difference is an affect on ISP-bound call costs. ILECs' own switching cost studies have never studied "one-way" call costs separately from other local calls although a number of reciprocal compensation rates are bifurcated into originating and

terminating interoffice and inter-carrier rate elements.[59] In its discussion of call direction, like that of call duration, Verizon is really just dealing with a rate structure that separates originating and terminating call costs, as many retail, access charge, and reciprocal compensation tariffs do currently. Verizon provides no basis for discriminating between ISP-bound calls and other local calls.

VERIZON'S CLAIMS ABOUT ECONOMIC EFFICIENCY ARE INCORRECT

24. Although Verizon's attempt to depict ISP-bound call duration, direction and traffic load as the drivers of lower costs for these calls is incorrect, it also draws the entirely erroneous that CLECs who find ways to reduce the costs of ISP-bound calls harm economic efficiency, or receive some sort of "subsidy." This Commission has recognized correctly that competing service providers should have the economic incentives to seek out lower cost-serving arrangements, so that competition can benefit consumers. Efficient competition requires that a new competitor should be able to provide its services at least at the same price levied by the incumbent. If the newer provider can do better, i.e., operate more efficiently, then over time the marketplace will drive down prices to reflect this sustainable, efficient cost. In its Local Competition decision, the Commission explained this policy objective as follows:

[59] The ILECs' own switching cost studies have never studied "one-way" call costs separately from other local calls although a number of reciprocal compensation rates are bifurcated into originating and terminating interoffice rate elements. In addition, when discussing the possible cost differences between paging calls and other types of local traffic, *supra*, the Commission did determine that whether calls are one-way or two-way was a cost causing factor.

> [The cost] benchmark of forward-looking cost and existing network design most closely represents the incremental costs that incumbents actually expect to incur in making network elements available to new entrants. Moreover, this approach encourages facilities-based competition to the extent that new entrants, by designing more efficient network configurations, are able to provide the service at a lower cost than the incumbent LEC.[60]

25. Preliminary analysis also suggests that the recent decision of the U.S. Court of Appeals for the Eighth Circuit61 does not affect this core economic policy requirement in any way. The Court agreed with the Commission that interconnection and UNE costs should be based on incumbents' forward looking costs. It rejected costs based upon completely hypothetical equipment configurations, like those developed in the SBC and Verizon Cost Attachments. Indeed, using entirely hypothetical switch configurations to estimate the ILEC competitors' costs of reciprocal compensation for ISP-bound calls would create a double standard with respect to any costs intended to be forward looking. It would be economically and logically inconsistent to set the costs for reciprocal compensation of ISP-bound calls so as to penalize a CLEC for possibly developing a more efficient network. Penalizing a possibly more efficient network obliterates the correct test for efficient competition which demands only that the CLEC be at least as efficient as the incumbent, as the Commission recognized.

26. The premise of the Verizon and SBC Cost Attachments, however, is that the Commission overturn this principle, thereby imposing a moral hazard on CLECs: If CLECs have to pay

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[60] Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, First Report and Order, paragraph 685, emphasis added.

[61] *Iowa Utilities Board et al. v. FCC*, July 18 2000.

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incumbents for use of necessary interconnection and unbundled network elements, the CLECs must pay the ILECs' costs, even if the ILECS' "existing network design" is sub-optimal. But if CLECs can build more efficient serving arrangements, CLECs must charge a lower price than incumbents. The Verizon Cost Attachment even goes so far as to claim that CLECs should not be allowed to lower prices to their end users -- if the CLECs' costs are lower than the ILECs -- because this activity would indicate a "subsidy":

> the CLEC could then funnel back some of the excessive compensation so received to the ISP or the Internet user through, e.g., lower monthly charges for Internet use, then the net price paid for the ISP call would be below the cost imposed on the originating ILEC. This would be equivalent to receiving a subsidy.62

Thus, what most economists would see as a process by which consumer prices are bid down over time by the competitive marketplace, Verizon would prefer to have the Commission view as a market failure. The Commission point quoted above recognized that the purpose of introducing competition is to give competitors incentives to lower costs over time. The pricing standard was designed to "encourage" CLECs to design more efficient network configurations, and be able to provide the service at a lower cost than the incumbent LEC. If

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62 Verizon Cost Attachment, p. 20. Verizon claims that failure to flow through all CLEC cost efficiencies would stimulate demand for Internet services inefficiently. The Commission, on the other hand, has stated that one goal of the 1996 Telecommunications Act is to "preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services," and has found that it has a Congressional mandate to foster and preserve the dynamic market for Internet-related services. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98; Inter-Carrier Compensation for ISP-Bound Traffic. CC Docket Nos. 96-98 and 99-68, Declaratory Ruling, at paragraph 6.
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a CLEC could realize lower costs, competitive policy requires that the CLEC and the CLEC customers should benefit from such efficiencies. Any other pricing rule would have anti-consumer effects.

ILECS ARE NOT "VICTIMS" OF RECIPROCAL COMPENSATION, AND THEY REMAIN DOMINANT SERVICE PROVIDERS

27. Finally, in a manner that has come to typify the incumbents' public policy advocacy in recent years, the Verizon Cost Attachment includes assertions that seem to try to depict the dominant ILECs as "victims" of the current reciprocal compensation regime for ISP-bound traffic. The Verizon Cost Attachment does this in at least two ways. Of course, like the cost assertions themselves, these issues are far removed from the issues on which the Commission sought comments in the Public Notice. The Verizon Cost Attachment suggests that ILECs are victims of the current regime because ILECs are not involved in the "cost causation" between callers to ISP modem banks and the ISPs themselves.63 Second, the Verizon document suggests that eliminating reciprocal compensation of ISP-bound calls would be "competitively neutral" compared to the current situation, where the ILECs' remaining control of 95% of end users (i.e., callers to ISPs) provides incentives to ISPs to contract with CLECs for the transport and termination of ISPs' inbound calls.64 Aside from the utter irrelevance of these points to the remanded issues before the Commission, both assertions are wrong.

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63 Verizon Cost Attachment, pp. 7-8.

64 Verizon Cost Attachment, pp. 22-23.

28. The Verizon Cost Attachment attempts to develop a new-found concept of "cost causation," in which ISPs would be treated like interexchange carriers (IXCs). The proposal suffers from many problems in addition to being impossible to implement under the current ISP exception. This new notion of "cost causation" (a) violates established definitions of cost causation; (b) confuses mere billing arrangements that have been applied to long distance traffic with true cost causation; and (c) at best, simply masks any problems that some ILECs may have with respect to existing retail service pricing.

29. In telecommunications, cost causation has always been assigned to the originating caller. The only exception is 800-type numbers, where the called party voluntarily assumes responsibility for payment. Even commercial mobile telecommunications services in the United States are moving to the "calling party pays" model, which has long applied to such services in Europe and other parts of the world. The standard notion of cost causation is reflected in the Telecommunications Act's requirement that the cost causer's carrier should pay compensation to another carrier if the second carrier happens to assume the cost of terminating the call. The Commission recently confirmed this same cost causation relationship.65 Verizon's attempt to analogize ISPs to interexchange carriers with respect to access charges fails, because access charge practices merely reflect the telephone monopoly "settlement" practices that had to be replaced when long distance and local operations were separated at the AT&T divestiture. It is true that local carriers send IXCs a bill for access charges and the IXCs pay it. This condition is not "cost causation," however. Many other

business telephone users market their services by means of telecommunications to ILEC customers and are not subject to being treated like IXCs, even though some of these users' marketing efforts may generate incoming traffic volumes similar to those of an ISP. Basically, then the new "cost causation" test provides no set of coherent standards which regulators could actually use.

30. The attempt in the Verizon Cost Attachment to suggest that ILECs are victims of the current reciprocal compensation regime for ISP-bound calls, because of the ILECs' continued dominance over telephone customer who use the Internet, is a case of seeing a glass as 5% empty, when all others see the glass as 95% full. ILECs remain many times larger than their CLEC counterparts and serve masses of originating end users. These end users' rates are designed to recover, on average, the ILECs' costs of originating and terminating calls as well as to recover costs and often very large margins for other vertical and usage-based services. CLECs have yet to realize any of these market advantages. CLECs lack the ILECs' scale and CLECs are strictly price-takers in the marketplace. When an ILEC end user dials up an ISP served by the ILEC, the ILEC recovers costs that approximately compensate it for handling the end-to-end call – both originating and terminating costs. The ILECs' retail rate structures were set before competitive carriers might assume the terminating function for some calls, so the retail rates reflect both originating and terminating use. It may be true that these retail rate structures are not perfect, and that some high usage customers are "subsidized" by low usage customers, but this condition, besides residing in the ILECs' retail

[65] TSR Wireless, LLC, et al, v. U S West Communications, Inc., et al File Nos. E-98-13, E-98-15 And
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rate structures over which no CLEC has any control, simply reflects the general effects of rate averaging. Averaged prices are by definition better for some customers and worse for others.

31. As long as the ILEC is compensated overall for its originating and terminating costs by average if imperfect rates, an ILEC obtains an economic advantage over all CLECs merely because of its traditional monopoly position. To use the percentages noted in the Verizon Cost Attachment, if, say, 95% of the users of dial-up Internet services are an ILEC's residual monopoly customers and 5% are CLEC customers, the ILEC will be compensated much more completely for both call origination and termination costs, even for calls that a CLEC terminates. Ninety-five percent of calls to ISPs will provide the ILEC both originating and terminating compensation (albeit perhaps not perfectly), and the CLEC will receive full compensation, at best, only 5% of the time. The CLEC receives originating and terminating compensation absent reciprocal compensation, only if no other CLEC is involved.

32. A CLEC that terminates ISP-bound calls placed by customers of other CLECs would be just as disadvantaged by the elimination of reciprocal competition, as if the calls were originated by ILEC customers. If the CLEC serves relatively more ISP customers, the originating carrier is spared some of the terminating costs for its customers. If the originating carrier is an ILEC who still serves 95% of all customers, the ILEC will experience large windfall gains, while the CLEC realizes a deficit with reciprocal compensation. This condition is inherent in the ILEC's dominant market position, unless carriers compensate each other

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E-98-16, E-98-17, E-98-18, Memorandum Opinion And Order, June 21, 2000 (FCC 00-194).

symmetrically and reciprocally for the terminating component of the ISP call.

CONCLUSION

34. For all of the reasons discussed above, I recommend that the Commission give no weight whatsoever to the claims made in the SBC and Verizon Cost Attachments.

I declare under penalty of perjury that the foregoing is true and correct.

/Signed/ William Page Montgomery
August 3, 2000

Dr. Robert A. Mercer, PhD.

Experience

Principal, BroadView Telecommunications, LLC, March, 2000-Present

Provides strategic planning and education related to public and private telecommunications infrastructures, considering technologies, network architectures, providers, and services supported. The work is currently focused on local exchange and long-haul competition, broadband integrated networks, and private enterprise networking. Specific examples include the analysis of competitive alternatives for the provision of local exchange services, assessing the state of long distance facilities and services competition, and advising a national association on alternative methods of obtaining and managing its telecommunications services.

Conducts telecommunications policy analyses, with particular current emphasis on the interconnection, unbundling, resale, and universal service aspects of the 1996 Telecommunications Act. This focuses on evaluating the cost of local exchange service provided by incumbent telephone companies and other competitive entities, and includes extensive involvement as an expert witness in federal and state regulatory proceedings.

Serves as an adjunct faculty member in the Interdisciplinary Telecommunications Program (ITP) at the University of Colorado, where he has taught a course in advanced data communications and computer networking. Directs and participates on Master's thesis committees in the ITP, and also participates in effort to define and coordinate the program's curriculum, particularly as it pertains to data communications. Has previously developed and taught courses on telecommunications infrastructure directions, multi-protocol networking, TCP/IP, Asynchronous Transfer Mode (ATM), Open Systems Interconnection (OSI), network management, and telecommunications standards, and has presented numerous public seminars and talks on a variety of telecommunications topics.

President, and formerly Senior Vice President, Hatfield Associates, Inc., and HAI Consulting, Inc., 1987 – March, 2000.

Provided strategic planning, analysis, and education related to the telecommunications infrastructure, with a particular emphasis in the late 1990's on federal and state regulatory proceedings dealing with implementation of the 1996 Telecommunications Act. Other work included extensive involvement in FCC and state proceedings on Open Network Architecture (ONA) and Video Dial Tone (VDT), and testimony before state regulatory bodies on the conditions necessary for local exchange competition to flourish, and analyses of telecommunications opportunities available to electric utilities. Was co-author of the well-known "Hatfield Report" and "Hatfield II Report" on the ONA concept, and of a report titled "The Enduring Local Bottleneck," which deals with the ability of alternative providers to enter the local exchange telecommunications business.

Department Head of Datakit Systems Engineering, AT&T Bell Laboratories, 1986-1987

Directed systems engineering of the Datakit product, a virtual circuit switching data communications product of AT&T Technologies. Participated extensively in AT&T planning of its data communications architecture, and the products and services resulting from that architecture.

Senior Executive, BDM Corporation, 1985-1986

Planned data communications networks for various defense agencies. Served as a consultant to several clients on data protocol issues. Developed market projections for secure LANs.

Assistant Vice President of Network Compatibility Planning, Bell Communications Research (Bellcore), 1983-1985

Directed Bellcore support of the Bell Operating Companies (BOCs) in meeting the technical Equal Access requirements of the Modified Final Judgement. Conducted technical fora with the Inter-exchange Carriers and other carriers on behalf of the BOCs. Managed the North American Numbering Plan. Directed Bellcore's involvement in standards-making efforts, and played a key role in the formation of a new U. S. standards committee, Committee T1. Managed the "technical regulatory" work at Bellcore, which analyzed technical aspects of various FCC proceedings, including the ISDN Inquiry, the consideration of how the Computer II rules applied to the divested BOCs, and Computer III. With respect to the latter, was heavily involved in the work on the Comparably Efficient Interconnection concept, which later led to the Open Network Architecture (ONA) concept.

Director of Network Architecture Planning, Bell Laboratories, 1981-1983

Managed early Bell System planning for the Integrated Services Digital Network (ISDN). Provided project management to two key data network planning and implementation activities. Managed Bell Laboratories involvement in several U. S. and international standardization activities. Participated in planning for the Bell Laboratories reorganization in preparation for the AT&T Divestiture.

Division Manager of Network Services Standards, AT&T, 1979-1981
Managed the effort to describe the interface and performance characteristics of the Bell System network, particularly as necessary to meet the terms of the FCC Registration Program. Directed several components of the Bell Systems participation in international telecommunications standards committee CCITT.

Supervisor and Member of Technical Staff, Bell Laboratories, 1973-1979

Analyses of network performance issues and customer perceptions of performance, highlighted by direction of a pioneering study of customer retrial and abandonment behavior during long-distance telephone calls. Planning for operational processes and operations support systems associated with new Bell System services.

Education

Ph.D., Physics (1969), Johns Hopkins University.

Doctoral Dissertation Title:

$K^+ \bullet\ ^-$ Scattering and Related Effects in the Reaction $K^+p \rightarrow K^+ \bullet\ ^-\_^{++}$ at 5.43 BeV/c (1969).

B.S., Physics (1964), Carnegie Institute of Technology (now Carnegie-Mellon University).

Other Activities and Awards

Former member of the Board of Directors, American National Standards Institute. Member of the Institute of Electrical and Electronic Engineers (IEEE) and Sigma Xi, the scientific research society.

Graduate Courses Taught

ATM Overview
Broadband Applications Essentials
Computer Communications Essentials
Advanced Data Communications
Internetworking and TCP/IP Overview
Multi-Protocol Networking
Network Management
TCP/IP Architecture
Telecommunications Industry Essentials
Voice Applications Essentials
ATM Technology
Broadband Wide Area Networks
Computer Networks
Data Communications Essentials
Local Area Network Overview
Networking Trends and Directions
T1/T3 Networking Principles
Telecommunications Essentials
Telecommunications Standards

Publications and Talks

Written Testimony filed by AT&T with the New Jersey Board of Public Utilities dealing with the use of HM 5.2a to estimate the cost of unbundled network elements provided by Bell Atlantic – New Jersey, Newark, New Jersey, July, 2000.

Testimony on network technology issues in a Colorado Public Utility Commission arbitration proceeding on the interconnection of the local exchange networks of US West and ICG Telecom Group, Inc., Denver, Colorado, June, 2000. Proceeded by written rebuttal testimony.

Testimony in an Alaska Public Utility Commission arbitration proceeding dealing with the use of the FCC Synthesis Cost Proxy Model to estimate the cost of unbundled network elements provided by Alaska Communications System (ACS) to GCI Communications Corporation, Anchorage, Alaska, May, 2000. Preceded by an affidavit filed with the Alaska Public Utility Commission dealing with the reasons why the HAI Model is the appropriate methodology for providing unbundled network elements than is the cost model submitted by ACS.

Written direct testimony filed by AT&T and MCI WorldCom with the New York Public Service Commission dealing with the use of HM 5.2-NY to estimate the cost of unbundled network elements provided by Bell Atlantic - New York, Albany, New York, February, 2000.

Testimony before the Oregon Public Utility Commission dealing with the use of the HAI Model for estimating the cost of universal service, Docket UM 731 Phase IV, Salem, Oregon, October, 1999. Preceded by written direct testimony and rebuttal testimony.

Declaration concerning directions changes in telecommunications technology and networks, co-authored with A. Daniel Kelley, filed by MCI WorldCom and Sprint Corporation with the Federal Communications Commission in connection with the proposed merger of the two companies, Washington, DC, November, 1999.

Declaration concerning the potential for technical discrimination by Bell Atlantic filed by MCI WorldCom with the Federal Communications Commission in connection with Bell Atlantic's application for authorization to provide in-region interLATA services under Section 271of the 1996 Telecommunications Act, CC Docket No. 99-295, Washington, DC, October, 1999.

"Access Technologies," presentation to the ICA Network Technology Institute, Boulder, Colorado, August, 1999.

"Where Telecommunications Technology and the Industry are Heading," presentation to the Law Seminars International Conference on Local Telecommunications Infrastructure Options, Dallas, Texas, June, 1999.

Written direct testimony and rebuttal testimony filed with the State Corporation Commission of the State of Kansas dealing with the use of the HAI Model for estimating the cost of universal service, Topeka, Kansas, April, 1999.

"Utilizing the Total Element Long Run Incremental Costing Models (TELRIC) to Price Network Services," panel discussion session at the conference "Controlling and Allocating Costs in Telecommunications," Washington, DC, January, 1999.

Testimony before the Nevada Public Utilities Commission dealing with the use of the Nevada HAI Model to estimate the cost of unbundled network elements provided by Nevada Bell, Reno, Nevada, November, 1998. Preceded by written testimony and presentations to several workshops on the Nevada HAI Model.

Testimony before the Texas Public Utilities Commission dealing with appropriate inputs values to be used in the HAI Model Release 5.0a for estimating the cost of universal service, Austin, Texas, September, 1998.

Testimony before the Washington Utilities and Transportation Commission dealing with the appropriate methodology for estimating the cost of universal service, Olympia, Washington, September, 1998. Preceded by written testimony and rebuttal testimony.

Testimony before the Nevada Public Utilities Commission dealing with the use of the Nevada HAI Model to estimate the cost of unbundled network elements provided by Centel, Carson City, Nevada, August, 1998. Preceded by written testimony and presentations to several workshops on the Nevada HAI Model.

"Future Directions in Telecommunications," seminar for the University of Denver Telecommunications Workshop for ICG-Netcom, Denver, Colorado, July, 1998.

"The Internet and the Telecommunications Infrastructure: If It's Broken, Fix It," presentation to the ICA Summer Program, Boulder, Colorado, June 1998.

"Practically Applying the HAI Model and the Benchmark Cost Proxy Model," with Kevin Deno-Duffy, workshop at the conference "Exploiting Cost Allocation Strategies in Telecommunications," San Diego, CA, June, 1998.

Testimony before the Texas Public Utilities Commission dealing with the use of the HAI Model Release 5.0a to estimate the cost of universal service, Austin, Texas, June and March, 1998. Preceded by written direct testimony, rebuttal testimony, supplemental rebuttal testimony, supplemental testimony, and reply to supplemental testimony.

Testimony before the Minnesota Public Utilities Commission dealing with the use of the HAI Model Release 5.0a to estimate the cost of universal service, St. Paul, Minnesota, February, 1998. Preceded by written testimony, supplemental testimony, and rebuttal testimony.

"Hatfield Model Release 5.0 Model Description," principal author, published by the International Transcription Service, Washington, DC, December, 1997.

"The Emerging Telecommunications Infrastructure," Telecommunications Reports seminar, Washington, DC, December, 1997.

Testimony before the Colorado Public Utility Commission dealing with the use of the Hatfield Model 4.0 to estimate the cost of universal service, Denver, Colorado, December, 1997. Preceded by written direct testimony, supplemental direct testimony, and rebuttal testimony.

Presentation to the Oregon Public Utilities Commission workshop on cost proxy models dealing with the Hatfield Model 4.0, Salem, Oregon, November, 1997.

Testimony before the New Jersey Board of Public Utilities dealing with the cost of universal service and interexchange carrier access, Newark, New Jersey, October, 1997. Preceded by written testimony filed September, 1997.

Presentation to a Pennsylvania Public Utility Commission Universal Service Workshop dealing with the Hatfield Model 4.0, Harrisburg, Pennsylvania, October, 1997.

"Practical Applications of the Hatfield Model and Benchmark Cost Proxy Model," with James Dunbar, workshop at the conference "Exploiting Cost Allocation Strategies in Telecommunications," Atlanta, GA, September, 1997.

"The Great Debate: Exploring the Applicability of 'The Models'," participation in a panel discussion at the conference "Exploiting Cost Allocation Strategies in Telecommunications," Atlanta, GA, September, 1997.

"Hatfield Model Release 4.0 Model Description," principal author, published by the International Transcription Service, Washington, DC, August, 1997.

Presentation to the Colorado Public Utility Commission Staff and the Office of Consumer Counsel dealing with the Hatfield Model, Release 4.0, Denver, CO, July, 1997.

Testimony before the Washington Utilities and Transportation Commission dealing with the appropriate methodology for estimating the cost of unbundled network elements provided by incumbent local exchange carriers, Olympia, Washington, July, 1997. Preceded by written testimony, rebuttal testimony, and surrebuttal testimony.

Testimony before the Virginia State Corporation Commission dealing with the cost of unbundled network elements provided by Bell Atlantic of Virginia, Richmond, Virginia, June, 1997. Preceded by written testimony and rebuttal testimony.

"Emerging Telephone Networks and the Internet," Telecommunications Reports seminar, San Francisco, California, May, 1997.

Written Final Testimony submitted to the Colorado Public Service Commission dealing with the cost of universal local exchange service provided by local exchange carriers in Colorado, Denver, Colorado, May, 1997. Preceded by written Initial Testimony submitted in April, 1997.

Presentation to the Nevada Public Service Commission Cost Workshop dealing with the appropriate methodology for estimating the cost of universal local exchange service, Carson City, Nevada, April, 1997.

Presentation to the Colorado Public Utilities Commission Staff High Cost Fund Task Force dealing with the appropriate methodology for estimating the cost of universal local exchange service, Denver, Colorado, March, 1997.

"Hatfield Model Release 3.1 Model Description," principal author, published by the International Transcription Service, Washington, DC, February, 1997.

Presentation to the Washington Utilities and Transportation Commission staff dealing with proxy cost models, and Hatfield Model Release 3, Olympia, WA, February, 1997.

Presentation to the Federal-State Joint Board on Universal Service dealing with Version 3 of the Hatfield Model, Washington, DC, January, 1997.

Testimony before the New Jersey Board of Public Utilities dealing with the cost of unbundled network elements in connection with the generic arbitration proceeding, Newark, NJ, January, 1997. Preceded by written testimony.

Testimony before the Washington Utilities and Transportation Commission dealing with the cost of unbundled network elements in connection with MCI's arbitration case vs. U W West, Olyumpia, WA, November, 1996. Preceded by written testimony.

Testimony before the Commonwealth of Massachusetts Department of Public Utilities dealing with the cost of unbundled network elements in connection with MCI's arbitration case vs. NYNEX, Boston, MA, November, 1996. Preceded by written testimony.

Testimony before the New Jersey Board of Public Utilities dealing with the cost of unbundled network elements in connection with MCI's arbitration case vs. Bell Atlantic of New Jersey, Morristown, NJ, November, 1996. Preceded by written testimony.

Testimony before the Texas Public Utilities Commission dealing with the cost of unbundled network elements in connection with AT&T's and MCI's consolidated arbitration case vs. GTE, Austin, Texas, November, 1996. Preceded by written testimony.

"Emerging Telephone Networks and the Internet," Telecommunications Reports seminar, Washington, DC, October, 1996.

Testimony before the New York Public Service Commission dealing with the cost of unbundled network elements in connection with MCI's arbitration case with NYNEX, Albany, NY, October, 1996. Preceded by written testimony.

Testimony before the Washington Utilities and Transportation Commission dealing with the cost of unbundled network elements in connection with three arbitration cases: AT&T vs. U S West, AT&T vs. GTE, and MCI vs. U S West, Olympia, WA, October - November, 1996. Preceded by written testimony and rebuttal testimony.

Testimony before the Utah Public Service Commission dealing with the cost of unbundled network elements in connection with AT&T's arbitration case vs. U S West, Salt Lake City, UT, October, 1996. Preceded by written testimony.

Presentation on the Hatfield Model to the arbitrator in the Massachusetts arbitrations of AT&T and MCI vs. NYNEX, Boston, MA, October, 1996.

Testimony before the Texas Public Utilities Commission dealing with the cost of unbundled network elements in connection with AT&T's and MCI's consolidated arbitration case vs. Southwestern Bell, Austin, Texas, October, 1996. Preceded by written testimony.

Testimony before the California Public Utilities Commission dealing with the cost of unbundled network elements in connection with four arbitration cases: AT&T vs. Pacific Bell, AT&T vs. GTE, MCI vs. Pacific Bell, and MCI vs. GTE, San Francisco, California, September - October, 1996. Preceded by written testimony and rebuttal testimony.

Local Telecommunications Cost Modeling: Theory and Practice, coauthored with Richard Chandler and A. Daniel Kelley, presented at the Twenty-Fourth Annual Telecommunications Policy Research Conference, Georgia, September, 1996.

Testimony before the New Jersey Board of Public Utilities dealing with the cost of unbundled network elements in connection with AT&T's arbitration case with Bell Atlantic of New Jersey, Newark, New Jersey, September, 1996. Preceded by written testimony.

Testimony before the New Jersey Board of Public Utilities dealing with the cost of basic local exchange service, Newark, New Jersey, September, 1996. Preceded by written testimony and rebuttal testimony.

Testimony before the California Public Utilities Commission dealing with the state of local exchange competition, San Francisco, California, August, 1996. Preceded by prefiled written testimony and rebuttal testimony.

Presentations on the Hatfield Model to the staffs of the Federal-State Joint Board on Universal Service, Iowa Department of Commerce Utilities Board, Texas Public Utilities Commission, New Jersey Board of Public Utilities, and New York Public Service Commission, July-August, 1996.

"Overview ... Let the Games Begin," Participation in a panel discussion at the Telecommunications Reports Conference on Interconnection and the Competitive Checklist, Washington, DC, June, 1996.

"Local Loop Competition," talk presented to ICA Summer Program, University of Colorado, Boulder, CO, June, 1996.

Testimony before the Utah Public Service Commission dealing with a methodology to estimate the cost of universal service provided by U S WEST in the state of Utah, Salt Lake City, Utah, May, 1996. Preceded by prefiled written testimony and surrebuttal testimony.

Testimony before the California Public Utilities Commission dealing with the estimated cost of basic telephone service provided by Pacific Bell and other local exchange carriers in the state of California, San Francisco, California, May, 1996. Preceded by prefiled written testimony, rebuttal testimony, and surrebuttal testimony.

Testimony before the Maryland Public Service Commission dealing with the cost of local exchange service in the state of Maryland, in conjunction with MCI's Competition Plus initiative, Baltimore, MD, April, 1996, preceded by prefiled written testimony and surrebuttal testimony.

"A Look at the Future: Business and Industry Experts Discuss the Implications of the Act," participation in a panel discussion at the conference "The Telecommunications Act of 1996," Denver, Colorado, March, 1996.

Presentation to the Ministry of Communications and Transportation of Mexico on Telmex' costs to provide interconnection to long distance carriers, Mexico City, Mexico, March, 1996.

Testimony before the Pennsylvania Public Service Commission dealing with a methodology to estimate the cost of universal service provided by Bell Atlantic of Pennsylvania and other local exchange carriers in the state of Pennsylvania, Harrisburg, PA, March, 1996. Preceded by prefiled written testimony, rebuttal testimony, and surrebuttal testimony.

Testimony before the Colorado Public Utilities Commission dealing with a methodology to estimate the cost of universal service provided by U S WEST and other local exchange carriers in the state of Colorado, Denver, Colorado, February, 1996. Preceded by prefiled written testimony.

"Overview of Enterprise Network Developments," IEEE Communications Magazine, January, 1996, p. 30.

Testimony before the Washington Utilities and Transportation Commission dealing with the cost of local exchange service provided by U S WEST in the state of Washington, Seattle, Washington, January, 1996. Preceded by prefiled written testimony, amended testimony, and surrebuttal testimony.

Testimony before the Maryland Public Service Commission dealing with Bell Atlantic's cost of providing basic local exchange service in Maryland, August, 1995. Preceded by prefiled written testimony.

"Modeling Basic Universal Service for Pennsylvania," with A. Daniel Kelley, presentation to the staff of the Pennsylvania Public Service Commission, Harrisburg, PA, July, 1995.

"A Model For Determining the Cost of Basic Universal Service in Pennsylvania," with A. Daniel Kelley and R. Chandler, paper submitted to the Pennsylvania Public Service Commission in Docket L-00950101, Harrisburg, PA, July, 1995

"ONA: A Promise Not Realized -- Reprise," with A. Daniel Kelley, paper filed by MCI Communications Corporation and others in the FCC's Notice of Proposed Rulemaking in the Computer III Remand Proceeding, Washington, DC, April, 1995.

Declaration (no title) filed by California Cable Television Association with the Federal Communications Commission in connection with Pacific Bell's Section 214 Applications to construct Video Dialtone facilities, Washington, DC, April, 1995.

"Emerging Carrier Technologies & Architectures," Telecommunications Reports seminar, Washington, DC, March, 1995.

"Evolving the Physical Network," seminar session at the ICA Annual Conference, Anaheim, CA, March, 1995.

Affidavit (no title) filed by California Cable Television Association with the Federal Communications Commission in connection with Pacific Bell's Section 214 Applications to construct Video Dialtone facilities, Washington, DC, January, 1995.

"Fast Lane or Frontage Road: The State of the Infrastructure," Experts' Panel Discussion at the Convergence '94 Conference on Opportunities on the Information Superhighway, Washington, DC, November, 1994.

"Telecomm Fundamentals," pre-conference seminar presented at the Convergence '94 Conference, Washington, DC, November, 1994.

"Telecommunications Technology" and "Utility Applications of Telecommunications," chapters in report titled "Business Opportunities and Risks for Electric Utilities in the National Information Infrastructure," published by the Electric Power Research Institute, Palo Alto, CA, October, 1994.

Testimony before the Illinois Commerce Commission dealing with AT&T's proposal on conditions to test the potential for local exchange competition, and Ameritech's proposed Customer First Plan, Chicago, IL, October, 1994. Preceded by prefiled written testimonies concerning the two proposals, rebuttal testimony, and surrebuttal testimony.

"Predictions and Outlook for Reinventing the `Last Mile' in View of New Applications and Technologies," Experts' Panel Discussion at the Telecommunications Reports Conference on New Local Loop Technologies and Applications, Washington, DC, October, 1994.

"Emerging Local Loop Technologies and Architectures," Telecommunication Reports seminar, Washington, DC, October, 1994.

"VSATs Link Far-Flung LANS," with S. Kroder, Business Communications Review, October, 1994, p. 51.

"Emerging Local Loop Technologies and Architectures," Telecommunication Reports seminar, Washington, DC, October, 1994.

"VSATs Link Far-Flung LANS," with S. Kroder, Business Communications Review, October, 1994, p. 51.

"The Cost of Basic Universal Service," talk presented to the National Association of Regulatory and Utility Commissioners (NARUC) Summer Meeting, San Diego, CA, July, 1994.

"Technical and Economic Issues in the Further Notice," with A. Daniel Kelley, paper filed by Time Warner Entertainment Company in the FCC's Further Notice of Proposed Rulemaking, Docket 94-28, Washington, DC, July, 1994.

"Applying Network Architectures," talk presented to ICA Summer Program, University of Colorado, Boulder, CO, June, 1994.

"Evolution of Access Providers and Carrier Technologies," talk presented to ICA Summer Program, University of Colorado, Boulder, CO, June, 1994.

"The Vision and Reality of Cable Television Company Entry into Telecommunications," paper prepared for and filed by the Maryland Cable Television Association in connection with Maryland Public Service Commission Case No. 8587, Baltimore, MD, June, 1994.

Affidavit (no title) filed by the California Cable Television Association with the Federal Communications Commission in connection with Pacific Bell's Section 214 Applications to construct Video Dialtone facilities, Washington, DC, June, 1994.

"Choosing an Effective Network Migration Strategy," talk and panel moderator for session at ICA Expo '94, Dallas, TX, May, 1994.

"Management of the Enterprise Network: SNMP, SMP, CMOT," talk presented to the ICA Expo '94, Dallas, TX, May, 1994.

"The Information Superhighway: The Next Business Frontier," Denver Business & Economics Council panel discussion involving self and others, Denver, CO, April, 1994.

"Telecommunications Developments," talk presented to Canadian Cable Television Association Strategic Planning Committee, Nassau, Bahamas, April, 1994.

"Emerging Local Loop Technologies and Architectures," Telecommunication Reports seminar, Washington, DC, April, 1994, with D. Hatfield.

"Telecommunications Technology - Today and Tomorrow," talk presented to the EFT Association Annual Conference, Tysons Corner, VA, March, 1994.

Affidavit (no title) filed by California Cable Television Association with the Federal Communications Commission in connection with Pacific Bell's Section 214 applications to construct Video Dialtone facilities, Washington, DC, March, 1994.

"The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers," with Economics and Technology, Inc., published report, February, 1994.

"Emerging Local Loop Technologies and Architectures," Telecommunication Reports seminar, Washington, DC, December, 1993, with D. Hatfield.

"Understanding Telecommunications Technology for the Cable Television Professional," post-conference tutorial presented at the Convergence '93 Conference, Washington, DC, November, 1993.

"Regulatory Parity and Public Policy," paper filed by Time Warner Entertainment Company as part of its Reply Comments in FCC docket MM Docket 93-215, September, 1993, with A. Daniel Kelley.

"Further Views on the Role of CEI/ONA," paper filed by Unitel Communications Inc. as part of its Amendments to Evidence in the Canadian Radio-television Telecommunications Commission (CRTC) Public Notice 92-78, September, 1993.

"The Basics of Numbering, Dialing, and SS#7-Based Call Routing," tutorial presented at the Telecommunication Reports Conference on Telecom Numbering and Portability, Washington, DC, August, 1993.

"Overview and Analysis of Numbering Issues," talk presented at the Telecommunication Reports Conference on Telecom Numbering and Portability, Washington, DC, August, 1993.

"Enabling Technologies for the Cable-Based Electronic Superhighway," talk to the CableLabs Conference on Visions of the Electronic Superhighway, Breckenridge, CO, July, 1993.

"Data Communications and Network Developments," CableLabs, Inc. seminar, Denver, CO, July, 1993.

"Emerging Hybrid Network Environment," talk presented to the ICA Summer Program, University of Colorado, Boulder, Colorado, June, 1993.

"Understanding Telecommunications Technology for the Cable Television Professional," pre-conference tutorial presented at the Convergence '93 Conference, Denver, CO, May, 1993.

"Technological Perspective: Advances in Technology That Have Formed the Basis for Local Competition," talk presented at CompTel's Educational Seminar on Competitive Local Access, New Orleans, LA, May, 1993.

"Cross-Subsidy Concerns Raised by Local Exchange Carrier Provision of Video Dial Tone Services," paper filed as part of a petition by the National Cable Television Association to the Federal Communications Commission, Washington, DC, April, 1993, with A. Daniel Kelley.

"AIN Interconnection -- A Non-Regulated Provider View," talk presented at the AIN ComForum session on the regulatory and policy aspects of AIN, Denver, CO, March, 1993.

Rebuttal testimony on behalf of the Georgia Cable Television Association concerning Southern Bell's Open Network Architecture tariff filings, prefiled and presented to the Georgia Public Service Commission in its Docket 4018-U proceedings, Atlanta, GA, February, 1993.

Testimony on behalf of the Georgia Cable Television Association concerning Southern Bell's Open Network Architecture tariff filings, prefiled and presented to the Georgia Public Service Commission in its Docket 4018-U proceedings, Atlanta, GA, January, 1993.

Prefiled testimony and rebuttal testimony submitted to the Oregon Public Utilities Commission dealing with the comparability of services offered by Electric Lightwave, Inc., U S WEST, and GTE Northwest, Portland, Oregon, January-February, 1993.

"IIA/AMIS Forum" session at Voice '92 Conference, Atlanta, Georgia, November, 1992, Moderator and speaker.

"Cracking the Telecom Code," CableLabs, Inc. seminar, Denver, CO, November, 1992, with Dale Hatfield and A. Daniel Kelley.

"Emerging Local Loop Technologies and Architectures," Telecommunication Reports seminar, Washington, DC, November, 1992, with Dale Hatfield.

"A General Approach to Local Exchange Carrier Pricing and Interconnection Issues," presented at the Twentieth Annual Telecommunications Policy Research Conference, Solomons Island, Maryland, September, 1992, A. Daniel Kelley.

"Frame Relay: `Caveat Emperor' (Let the Buyer Be Wary of the Leader)," Telecom Data Report, August 1, 1992, p. 14.

"LAN Basics," Intertec Publishing Corp., Chicago, IL, ISBN 0-917845-20-X, May, 1992, co-authored with Roberta Martine.

"Transmission Control Protocol/Internet Protocol (TCP/IP) Architecture," seminar presented in the International Communications Association Master the Fundamentals of Telecommunications Symposium, Atlanta, Georgia, May, 1992.

"New Local Exchange Technology: Preserving the Bottleneck or Providing Competitive Alternatives?," principal author, paper filed by MCI in FCC's Advanced Intelligent Network Inquiry, April, 1992.

"The Audio Messaging Interchange Specification (AMIS)," chapter in Managing Voice Networks, Datapro Information Services Group, McGraw-Hill, Inc, Delran, NJ, 1992.

"Alternative Broadband Networks," seminar presented in the University of Colorado Telecommunications Program, November, 1991.

"The Technology of Broadband Networks," chapter in book "Integrated Broadband Networks - The Public Policy Issues," North-Holland, Amsterdam, Netherlands, 1991.

Interconnection of LANs in the 1990s, talk presented to the ICA Summer Program, University of Colorado, Boulder, Colorado, June, 1991.

"Telecommunications Technology: An Introduction and Discussion of Future Developments," talk presented to the Annenberg Washington Program Summer Faculty Workshop, Washington, DC, June, 1991.

"Local Loop Technologies and Strategies," a Telecommunication Reports seminar, Atlanta, Georgia, May, 1991, also presented on four prior occasions during 1990-1991, with Dale Hatfield.

"AMIS Launches a New Era in Voice Messaging," Business Communications Review, October, 1990, p. 41.

"The Opportunities of the Regional Bell Operating Companies Under Current Market Conditions to Discriminate Against Competing Information Services," Affidavit filed by the National Cable Television Association and the American Newspaper Publishers Association with the United States District Court for the District of Columbia in Civil Action 82-0192, Washington, DC, October, 1990.

"ONA: The ISDN Connection," talk presented to the Information Gatekeepers Conference on ISDN Now, Denver, Colorado, June, 1990.

Testimony on behalf of Florida Cable Television Association concerning Southern Bell's plans for the Broadband Integrated Services Digital Network, prefiled and presented to the Florida Public Service Commission, Tallahassee, Florida, March, 1990.

"The ONA Connection," Proceedings of the National Communications Forum, 43, No. 1, October, 1989, p. 339. Talk presented at the conference, Chicago, Illinois, October, 1989.

"AMIS: Soon to be Famous," Business Communications Review, May, 1989, p. 50.

"An ESP Perspective on ONA," presentation to the State of Colorado Public Utilities Commission, January, 1989.

"The Policy Challenge of ONA," panel discussion at the sixth annual Telephone Issues for the States, sponsored by Consumer Federation of America, Washington, DC, November, 1988.

"ONA as a Motivator of Enhanced ISDNs," Proceedings of the National Communications Forum, 42, No. 1, October, 1988, p. 602. Talk presented at the conference, Chicago, Illinois, October, 1988.

"ONA: Why Should Users Care?," Business Communications Review, September-October, 1988, p. 50.

"The Technology of Broadband Networks," paper presented at the Integrated Broadband Networks conference sponsored by the Columbia University Center for Telecommunications and Information Studies, New York, New York, September, 1988. Paper submitted for publication in the conference proceedings.

"A Response to the ONA Reply Comments of Shooshan and Jackson,"written ex parte submission filed with the Federal Communications Commission in connection with Third Computer Inquiry proceeding (CC Docket No. 85-229), July, 1988, with Dale Hatfield.

"Open Network Architecture: A Promise Not Realized," Telecommunications Magazine, July, 1988, p. 64, with Dale Hatfield.

"Unbundling - A Key ONA Requirement Not Met," Network World,
July 11, 1988.

"Network Control Systems and Software," seminar presented at the ICA Summer Program, University of Colorado, Boulder, Colorado, June, 1988.

"Open Network Architecture: A Promise Not Realized," paper filed with the Federal Communications Commission in connection with Third Computer Inquiry proceeding (CC Docket No. 85-229), April, 1988, with Dale Hatfield.

"Understanding Open Network Architecture: A Tutorial for Policymakers," seminar at the Annenberg Washington Program, Washington, DC, February, 1988, with Dale Hatfield.

"Common Carrier Computer Networks," paper presented at the Pacific Bell Conference on Applied Research in Network Technology, San Ramon, California, November, 1987.

"ONA: Motivator of a Full ISDN," Proceedings of the National Communications Forum, 41, No. 1, September, 1987, p. 481. Paper presented at the conference, Chicago, Illinois, September, 1987, and the Eastern Communications Forum, Ryetown, New York, May, 1988).

"The Future of T-1," panel discussion at the ICA Summer Program, University of Colorado, Boulder, Colorado, June, 1987.

"ONA: Recovering from a Shattered Illusion," Perspective article, Communications Week, April 13, 1987.

Affidavit (no title) filed on behalf of the National Cable Television Association in Civil Action 82-0192 (USA vs. Western Electric Company and American Telephone and Telegraph Company), March 13, 1987.

"Telecommunications Research in the Competitive Industrial Environment," panel discussion at the University of Colorado Conference on Educating the Telecommunications Professional, Boulder, Colorado, November, 1986.

"Issues in the Migration of Military Communications to an ISDN," 1986 IEEE Military Communications Conference, Monterey, California, October, 1986, with W. Edwards.

"ISDN: A Technology Looking for a Place to Happen," seminar presented at the ICA Summer Program, University of Colorado, Boulder, Colorado, June, 1986.

Comments and subsequent Reply Comments of the BDM Corporation, filed in the FCC Third Computer Inquiry (Common Carrier Docket 85-229), November, 1985, and January, 1986.

"Influence of Regulation on Network Evolution," paper presented at the 10th Michigan Conference on Public Utility Economics, Ann Arbor, Michigan, November, 1985.

"The Role of Network Planning at Bellcore," testimony presented to the Vermont Public Services Board, April, 1985.

"Equal Access - 1984," session chaired at the National Communications Forum, Chicago, Illinois, October, 1984.

"Quality of Service Activities in the CSO," paper presented at the IEEE Globecomm Conference, San Diego, California, November, 1983.
"What Equal Access Means to Telcos," Telephone Engineering and Management, November, 1983 (adapted from a paper presented at the National Communications Forum, October, 1983).

"Data Communications Performance Standards," talk presented at the International Conference of Communications, Denver, CO, June, 1981.

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