Attachment C

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

In the Matter of	)	
Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers	)	CC Docket No. 01-338
Implementation of the Local Competition Provisions in the Telecommunications Act of 1996	)	CC Docket No. 96-98
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147

DECLARATION OF CHRISTOPHER J. BOYER
ON BEHALF OF SBC COMMUNICATIONS INC.

I. BACKGROUND

1. My name is Christopher J. Boyer. I am General Manager – Network Regulatory Policy and Planning – Broadband for SBC Management Services L.P. In my current capacity, I am responsible for researching and developing SBC Incumbent Local Exchange Carrier ("ILEC") 13-state network policy positions from both a technical and regulatory perspective with respect to broadband network architectures. Further, I am responsible for representing SBC before federal and state regulatory bodies on planning, engineering, and regulatory aspects of issues related to broadband and xDSL and, in particular, SBC's Project Pronto initiative.

2. I have a Bachelor of Science - Business Administration degree from the University of Kansas in Lawrence, Kansas, and a Master's of Business Administration degree

from the University of Houston in Houston, TX. I have completed internal company training related to telecommunications networks and special services provisioning, maintenance and repair.

3. From 1993 through 1998, I held various positions within SBC Industry Operations. In that capacity, I was part of an organization responsible for special access service provisioning and maintenance within Southwestern Bell Telephone Company ("SWBT"). In late 1998, I moved to the SBC Wholesale Marketing organization, the primary responsibilities of which are to develop and manage wholesale products and services offered to Competitive Local Exchange Carriers ("CLECs").

4. As part of this function, in late 1999, I was assigned product management responsibilities related to Project Pronto and was charged with the development of SBC's Broadband Service offering to CLECs (SBC's offering to CLECs over the Project Pronto network architecture). This function included leading an inter-disciplinary team from across SBC representing various entities, such as Network Operations, Network Planning and Engineering, IT, Process Integration, Network Implementation and New Technology Introduction (among others) in the introduction of the product offering. I assumed my current responsibilities in December 2000.

5. I have filed written and/or provided live testimony as a subject matter expert on SBC's ILEC networks before state regulatory agencies in Arkansas, California, Illinois, Indiana, Ohio, and Texas and before the FCC.

II. INTRODUCTION AND SUMMARY

6. The purpose of this declaration is to respond to the declaration provided on behalf of AT&T by Irwin Gerszberg. In his declaration, Mr. Gerszberg proposes a new nationwide electronic loop provisioning ("ELP") system for the sole purpose of avoiding the manual work associated with changing a customer from one facilities-based local service provider to another, *i.e.*, hot cuts. AT&T and Mr. Gerszberg further suggest that until Mr. Gerszberg's scheme is implemented—as long as the hot cut process remains in place—the Commission should continue to require ILECs to provide unbundled switching and UNE-P. Mr. Gerszberg and AT&T argue that the Commission should require ILECs to provide UNE-P until all voice traffic provided over every ILEC network is packetized (along with data traffic), in order to enable facilities-based CLECs to access loops using a software-controlled process rather than the hot cut process in place today. Mr. Gerszberg and AT&T imply that this task could be accomplished with little modification to the ILECs' existing networks.

7. Mr. Gerszberg and AT&T are incorrect on both counts. The impacts of Mr. Gerszberg's proposal would be substantial. There are significant and costly modifications that would have to be made to ILEC networks in order to implement this proposal. Further, these modifications would dramatically alter the manner in which traditional end user POTS service is provided and provisioned. Indeed, while Mr. Gerszberg attempts to portray his architecture as a modest proposal, *the complete packetization of every single voice line in the entire public switched telephone network* ("PSTN") is anything but modest.

8. My declaration will explain at a high level the network architecture proposed by Mr. Gerszberg, contrast this network architecture to existing ILEC loop plant, discuss the order of magnitude of the changes that would have to be implemented to enable such a network, and provide an overview of the potential costs involved. Further, I will discuss how this network architecture would dramatically impact the manner in which traditional telecommunications services such as POTS are provisioned and provided.

III. PROPOSED NETWORK ARCHITECTURE

9. Mr. Gerszberg proposes a network architecture that, in Mr. Gerzsberg's opinion, would create the capability to provide what he refers to as "electronic loop provisioning" or ELP. This network architecture, as proposed by Mr. Gerszberg, involves packetizing both voice and data traffic.

10. The fundamental basis of this proposal is what Mr. Gerszberg refers to as "true" Next Generation Digital Loop Carrier ("tNGDLC") that would convert traditional voice signals, presumably provided over a copper facility, into an "ATM packet format" that could then be transported (over fiber) to an "ATM Module" in the central office.[1] The ATM Module would be used to route the voice and data packets to various providers of service (*e.g.*, CLEC or ILEC data or voice networks). Thus, under Mr. Gerzsberg's scheme, both voice and data traffic would be

[1] The "ATM Module" in this context is similar to the Optical Concentration Device ("OCD") that SBC is using for its Project Pronto deployment. Project Pronto OCDs are used as routing devices, reading header information on the various packets inbound from remote terminal ("RT") sites and subsequently routing those packets to the appropriate service provider (*e.g.*, CLEC). Project Pronto OCDs are essentially streamlined ATM switches that can read and route packets to any number of providers of end user service. The ATM Module proposed by Mr. Gerszberg appears to function in much the same manner, reading and routing voice and data packets to the appropriate service provider and/or routing voice packets through the VoATM Gateway to an ILEC Class 5 switch.

"packetized" at the tNGDLC location, and both signals would then be capable of being routed within the packet network to any corresponding point along that network, including an ILEC or ILEC affiliate for the provision of data service,[2] an ILEC voice gateway for the provision of voice service,[3] or a CLEC network providing both voice and data services.

11. The end result of this proposal is a virtual or packetized hand-off to any facilities-based provider whenever a customer changes service providers. Because both voice and data are packetized in this scheme, no provider of service, CLEC or ILEC, would have to migrate physical connections when acquiring a customer from another provider. To explain, within packet networks, packetized voice and data are routed over what are commonly called "Virtual Circuits" ("VCs"), which essentially provide a path to a specific destination as determined by the routing information contained within the packets themselves. Thus, under the scheme advanced by Mr. Gerszberg, there would be no need to change the physical connections within a central office or even in the loop plant when a customer changes carriers. The only migration that would occur would be a re-mapping of the customer's VC to another carrier for integration into its network architecture.

[2] Mr. Gerzsberg's declaration and attached diagrams illustrate data packets going to an ILEC data network. Today, SBC provides packetized data services (*e.g.*, DSL) through its advanced services affiliate. In the scheme proposed by Mr. Gerszberg, the method of delivering packets to an ILEC's advanced services affiliate would be the same as that for any other competitive carrier – essentially routing the packets from the "ATM Module" (fundamentally an ATM switch such as that used in SBC's Project Pronto network architecture) to the carrier.

[3] A voice gateway is a device that is capable of converting packets (*e.g.*, ATM-based packets) into a traditional signal that can interface with a traditional circuit switch. Because today's PSTN that is used to provide standard voice services is largely comprised of a set of interconnected ILEC, CLEC, and IXC circuit switches, it would be necessary for ILECs – in order to continue to use their circuit switches – to convert "packetized voice" signals, as would be created under Mr. Gerzsberg's proposal, into signals that function properly with traditional circuit switches.

12. While Mr. Gerszberg's scheme may theoretically be possible, the Commission should not consider such a fundamental shift in the manner in which services are provisioned in the absence of the practical impacts of that shift. The Commission should consider the burdens of implementing Mr. Gerzsberg's scheme compared to its proposed benefit of eliminating the need for hot cuts, particularly in light of the questionable premise that the hot cut process is in any way deficient.[4]

13. Simply put, the radical alteration of network architectures proposed by Mr. Gerszberg would be an overwhelming challenge that would take a substantial period of time to perform and create enormous costs for ILECs. While this hypothetical architecture may be desirable to an inventor such as Mr. Gerzsberg, it would be a sizeable challenge to those individuals and companies that would actually have to build, deploy, support and invest in this architecture.

IV. MR. GERZSBERG'S NETWORK ARCHITECTURE WOULD INVOLVE SIGNIFICANT & COSTLY NETWORK MODIFICATIONS

14. The modifications to the existing ILEC networks necessary to implement the ELP architecture proposed by Mr. Gerzsberg and AT&T would be substantial. Mr. Gerszberg and AT&T ignore these considerations entirely in putting forth their proposed network. Mr. Gerszberg claims that even "customers that require only voice services may continue to use their

[4] In the declaration of John Berringer and David R. Smith, SBC documents that it has in place well-established, well-documented, and well-tested processes that allow it to efficiently, reliably, and timely provision unbundled hot cut loops; and demonstrates that it provisions CLEC hot cut orders on a timely basis, with minimal disruption to end users. SBC also demonstrates in the declaration of Messrs. Berringer and Smith that SBC has the capacity to meet any reasonably foreseeable increase in demand for stand alone unbundled loops (*i.e.*, loops that are not ordered as a component of UNE-P) that might result from increased usage of competitive switching resulting from the elimination of SBC's obligation to provide unbundled switching.

existing equipment, but get the benefits of competition." To the contrary, there are a number of technical concerns impacting ILEC loop plant and ILEC central offices in introducing Mr. Gerzsberg's hypothetical network.

ILEC NETWORK ALTERATIONS

15. Mr. Gerszberg seems to assume that a majority of ILEC customers are already served by digital loop carrier ("DLC") systems that could easily be converted to his tNGDLC. At least for SBC, that assumption is inaccurate. There are two types of DLC that SBC has deployed or is deploying in its network. First, there is the traditional DLC that SBC has deployed for a number of years. This type of traditional DLC is commonly referred to as a "pair gain" system on a local loop.

16. In operation, a traditional DLC system derives multiple channels (typically 64 Kbps voice-grade) from a copper based circuit (*e.g.*, a DS1 or DS3) or from a fiber optic-based circuit (*e.g.*, OC-3 or above) that is deployed from a central office to a remote terminal, where it terminates in matching electronics. In the remote terminal, those electronics allow the circuit to interface with individual voice-grade copper facilities, which extend to end user customer premises. This type of DLC traditionally has been used in situations where the cost of the equipment is offset by the savings generated by reducing the costs associated with providing voice transmission over long copper feeder facilities (*e.g.*, typically greater than 18 Kft in length).[5] In most instances, traditional DLC has proven to be more economical at longer loop

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[5] Portions of the generic description above were taken from Harry Newton, Newton's Telecom Dictionary (16th Expanded & Updated Edition) (2000).

lengths than the deployment of home run copper facilities. Examples of this form of DLC include Lucent SLC Series 5, Marconi DISC*S and Alcatel Litespan 2000 (prior to release 10.1).

17. The second general form of DLC is next generation digital loop carrier ("NGDLC"). As part of its Project Pronto initiative, SBC is deploying an NGDLC architecture that is considered to be "next generation" in that it provides what is referred to as time slot interchanger ("TSI") functionality[6] and also supports the provision of xDSL service.[7] In total, both of these types of systems (traditional DLC and Project Pronto NGDLC) serve only a small proportion (somewhere around 17%) of SBC's estimated 59 million access lines. Therefore, in terms of the necessary changes to its outside plant network, and assuming its current DLC and NGDLC systems are compatible with Mr. Gerzsberg's proposed architecture, SBC would be

[6] TSI functionality enables switching protocols such as GR-303 to provision voice service from a remote terminal back through a central office terminal ("COT") over Time Division Multiplexed facilities. To explain, in traditional DLC, whenever an end user goes off-hook, that end user is assigned to a specific channel within the DLC system (*e.g.*, within a T1 before being multiplexed to a DS3, OC3 or higher capacity facility). In most instances, the channel assigned to that end user will be the same channel each time he or she goes off hook. In contrast, TSI provides that when an end user goes off hook, the line is assigned to the first available channel in a T1. Therefore, instead of dedicating each line to a specific channel and having to provide an equivalent number of channels (*i.e.*, electronics) to match the number of lines subtending the DLC system, TSI allows for multiple end user lines to share the available number of channels over the system. This permits service providers to benefit from a concept that is typically referred to as statistical gain and/or concentration. TSI thus allows service providers to take advantage of the fact that all of the end users subtending each DLC system will not go off-hook at precisely the same moment in time, allowing the service provider to spread those end users over a smaller set of associated electronics rather than a dedicated 1:1 ratio of channels to end users. A typical concentration that is used by SBC where it deploys NGDLC is a 4:1 concentration ratio. The end result of TSI functionality is that it enables more efficient use of transport from the DLC site through the COT and back into the switch. It does not, however, packetize voice as required by Mr. Gerzsberg's architecture.

[7] Traditional forms of DLC and even most NGDLC systems do not support xDSL service. Some newer NGDLC systems, *e.g.*, the Alcatel Litespan 2000 system (release 10.1 or greater) and the AFC UMC-1000 system, will support both TSI and xDSL.

required, at a minimum, to install Mr. Gerzsberg's tNGDLC to serve the remaining 83% of SBC's access lines (nearly 49 million) that are not served by any form of DLC today.[8]

18. Moreover, the vast majority of traditional DLC and NGDLC currently deployed by SBC does not support "voice cell processing" capability[9] and is thus incompatible with the architecture proposed by Mr. Gerszberg. Accordingly, SBC would most likely have to upgrade nearly ***all*** its currently deployed traditional DLC and NGDLC systems to accommodate Mr. Gerzsberg's proposal, assuming such systems are capable of being upgraded.[10]

19. In short, in order to build the new network proposed by Mr. Gerszberg, at a minimum, SBC essentially would have to deploy new tNGDLC equipment at literally tens of thousands of RT sites throughout its entire network and, where DLC or NGDLC exists today,[11] upgrade tens of thousands of these sites to tNGDLC. It would take years to perform a network alteration of that magnitude.

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[8] Furthermore, the implementation of Mr. Gerzsberg's architecture would impact not only SBC's access line volumes, but also would require the migration of the significant volume of access lines now served by CLECs either as UNE loops, UNE-P, or resale.

[9] "Voice cell processing" is a fundamental tenet of Mr. Gerzsberg's proposal. It appears upon reading his proposal that Mr. Gerszberg refers to this functionality generally as being the "packetization" of voice traffic, which subsequently would be multiplexed over the same facility as data traffic (which would also be packetized within the tNGDLC system). This functionality is different from TSI functionality in that TSI allows for concentration across traditional SONET-based facilities and does not packetize voice for transport over an ATM or other packet-based form of transport. The majority (greater than 95%) of SBC's Project Pronto deployment consists of Alcatel Litespan 2000 equipment prior to release 10.1, which does not support voice cell processing. SBC is also deploying, on a more limited basis, the AFC UMC-1000 system, which does provide voice cell processing capability and may, therefore, be compatible with Mr. Gerzsberg's proposed architecture.

[10] Before it could even begin to upgrade its equipment, SBC would have to work with its vendors to introduce voice cell processing functionality.

[11] This assumes that the vendors of the majority of SBC's DLC or NGDLC equipment can even introduce "voice cell processing" capability in their equipment. If not, SBC would be left with no alternative but to place all new RT sites and essentially write off its embedded base of DLC and/or NGDLC.

ILEC NETWORK MODIFICATION COSTS

****BEGIN PROPRIETARY AND CONFIDENTIAL****

****END PROPRIETARY AND CONFIDENTIAL****

SYSTEM IMPLICATIONS

27. Implementation of the ELP architecture would fundamentally alter the manner in which SBC provisions voice services. Today, SBC provides a typical POTS service using systems, processes, and methods and procedures that have been established over time, designed to create an efficient and low cost process to provide reliable and timely service to end users. By packetizing voice, introducing voice cell processing, VoATM gateways, possibly IADs, and ATM transport, the ELP architecture would fundamentally change the manner in which these services are provisioned and maintained.

28. These factors would likely impact a wide variety of SBC's service ordering, provisioning and maintenance systems and processes. Just as there is massive network capital investment that would be required to implement Mr. Gerzsberg's ELP architecture, there would clearly be significant costs associated with changing all affected systems and processes.

V. CONCLUSION

29. The end result of Mr. Gerzsberg's proposals would not only be a massive build out project that would dwarf even SBC's $6 billion Project Pronto initiative, it also would represent a fundamental shift in the manner in which the most basic of all telecommunications services, POTS, is provided–all for the sole purpose of creating a virtual loop provisioning system to eliminate hot cuts.

30. The hypothetical efficiency that Mr. Gerszberg and AT&T hope to gain by providing this virtual hand-off scheme is dwarfed by the costs and additional complexity that

would be created in provisioning and maintaining service. Indeed, one could expect that the time to make the virtual changes to re-route traffic between providers of service could be as complex and take just as long as the physical changes that are done today (*i.e.*, hot cuts) to produce the same end result. And of course hot cuts do not entail a complete restructuring of the legacy network.

31. This concludes my declaration.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on July 17, 2002.

Christopher A. Boyer

Christopher A. Boyer