

**THE STATE OF NEW HAMPSHIRE**  
**BEFORE THE**  
**PUBLIC UTILITIES COMMISSION**

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**Petition for Investigation into the Regulatory** )

**Status of IP Enabled Voice Telecommunications** )

**Service** )

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**Docket No. DT 09-044**

**PREFILED REPLY TESTIMONY OF DAVID J. KOWOLENKO**  
**ON BEHALF OF COMCAST PHONE OF NEW HAMPSHIRE, LLC**

December 4, 2009

1 **I. INTRODUCTION AND PURPOSE OF REPLY TESTIMONY**

2 **Q. Please state your name, position and business address for the record.**

3 A. David J. Kowolenko, Division Vice President-Voice Services, Comcast, North Central  
4 Division, 25 Industrial Drive, Chelmsford, Massachusetts.

5

6 **Q. Are you the same David J. Kowolenko who prefiled Direct Testimony in this docket  
7 with Beth Choroser on October 9, 2009?**

8 A. Yes.

9

10 **Q. What is the purpose of your Reply Testimony?**

11 A. The purpose of this Reply Testimony is to provide the Commission with Comcast's  
12 rebuttal to inaccurate factual information contained in the prefiled direct testimony  
13 submitted by Douglas Meredith and Valerie Wimer on behalf of New Hampshire  
14 Telephone Association ("NHTA").

15

16 **II. REPLY TO PREFILED DIRECT TESTIMONY OF DOUGLAS DUNCAN**

17 **MEREDITH**

18 **Q. Have you reviewed the testimony filed in this docket on October 9, 2009 by Douglas  
19 Duncan Meredith?**

20 A. Yes, I have.

21

1   **Q.    Do you agree with the facts recounted in Mr. Meredith's prefiled testimony?**

2    A.    Not entirely. Most of Mr. Meredith's factual claims are about the regulatory environment  
3        surrounding VoIP services. I will defer to my colleague, Beth Choroser, who is more  
4        familiar with the regulatory and legal matters surrounding VoIP, to address the regulatory  
5        environment surrounding VoIP.

6  
7        In several areas of his testimony, however, Mr. Meredith relies upon high-level  
8        generalizations about interconnected cable VoIP services that are inaccurate. For example,  
9        he states that interconnected cable VoIP is the "basic transmission of information" (page  
10        7); that the information is transmitted "without a change in the form . . . of the information  
11        as sent and received" (page 6); and that for both POTS ("plain old telephone service") and  
12        interconnected cable VoIP, "what goes into the network is what comes out of the network"  
13        (page 11-12).

14  
15        I will address these statements and the particulars of this argument in my reply to Ms.  
16        Wimer's testimony below. However, even at the high level of generality at which Mr.  
17        Meredith is testifying, he fails to note that with VoIP calls, there is a change in the "form"  
18        of the information sent from a CDV or BCV customer to a POTS customer (and vice  
19        versa). What goes into Comcast's network is different from what comes out of its network.

20  
21        With POTS calls, a call enters a carrier's network in the Time-Division Multiplexing  
22        ("TDM") protocol, and leaves the network in TDM. Some POTS providers may rely on

1 Internet Protocol ("IP") to transmit voice data, usually by converting the call from TDM to  
2 IP for transport, then back to TDM for termination. This is known as "IP in the middle."  
3 But at the end of the day, POTS providers are delivering calls in the exact same protocol as  
4 they are receiving them, i.e. in TDM.

5  
6 Interconnected cable VoIP providers, on the other hand, are different. Calls originating  
7 from and terminated to Comcast VoIP customers are in Internet Protocol ("IP"). Calls  
8 originating from and terminated to POTS customers are in TDM. In order for calls to  
9 travel between Comcast VoIP and POTS customers, they must be changed in "form": they  
10 must experience a net change in the protocol of the data in the call from TDM to IP, or vice  
11 versa. Comcast's VoIP services perform this conversion. As my colleague Beth Choroser  
12 explains in her testimony, there is legal significance to this distinction.

13  
14 **Q. Do you agree with the conclusions Mr. Meredith reaches in his prefiled testimony?**

15 **A.** Mr. Meredith's conclusions about the regulatory treatment of VoIP are all legal opinions.  
16 Since the purpose of my testimony is technical and factual in nature, I will defer to my  
17 colleague with regulatory expertise, Beth Choroser, to describe Comcast's legal position on  
18 the topics Mr. Meredith addresses, and to the post-hearing briefs that Comcast's attorneys  
19 will be filing.

20

1 **III. REPLY TO PREFILED DIRECT TESTIMONY OF VALERIE WIMER**

2 **Q. Have you reviewed the testimony filed in this docket on October 9, 2009 by Valerie**  
3 **Wimer?**

4 **A. Yes, I have.**

5  
6 **Q. Do you agree with the facts recounted in Ms. Wimer's testimony?**

7 **A. Although some parts of her description of the POTS and VoIP networks are accurate, there**  
8 **are some points on which Ms. Wimer's explanation of the networks contains inaccuracies**  
9 **or is incomplete. Accordingly, I would like to provide the Commission with additional**  
10 **information on these points.**

11  
12 **Q. Do you agree with the conclusions Ms. Wimer reaches in her prefiled direct**  
13 **testimony?**

14 **A. As with Mr. Meredith, Ms. Wimer offers a number of opinions on legal questions about**  
15 **how VoIP services should be classified. Since the purpose of my testimony is technical**  
16 **and factual in nature, I will defer to my colleague Beth Choroser, who is more familiar with**  
17 **the regulatory and legal matters surrounding VoIP, to outline Comcast's position on the**  
18 **topics Ms. Wimer addresses. Comcast's positions on those topics will also be covered in**  
19 **more detail in its post-hearing briefs.**

20

1 **Q. On page 5 of her prefiled testimony, Ms. Wimer states that “the end user experience in**  
2 **making and receiving calls is the same for Cable VoIP and regulated local exchange**  
3 **service.” Do you agree?**

4 A. Broadly speaking, no, and the user experience with Comcast’s cable VoIP service will grow  
5 increasingly dissimilar to POTS as Comcast continues to introduce additional features and  
6 services enabled by IP technology.

7  
8 As described in my previous testimony, CDV and BCV already include a number of features  
9 that are integrated with the voice service that are not part of a POTS end user’s experience  
10 making and receiving calls. These integrated services (which I describe on pages 24-27 of  
11 my direct testimony) include, for example, caller ID information displayed simultaneously on  
12 a CDV customer’s television and computer screens (for customers who also subscribe to  
13 Comcast’s video and High-Speed Internet services) and integrated voicemail and email.  
14 Comcast has also integrated its CDV voicemail and call management functions, known as  
15 SmartZone™, into a wireless iPhone® and iPod Touch® application, allowing users to listen  
16 to voicemails, review call logs, change account features, and even return calls directly from  
17 their mobile phone. CDV and BCV also incorporate a number of “user experience” features  
18 that are not standard or familiar aspects of POTS, although some POTS providers claim to be  
19 able to offer them as separate add-on services, such as call forwarding and access to call  
20 information, account features, and voicemails via an Internet portal or mobile phone. Many  
21 of these features integrated into CDV and BCV that go beyond the abilities of POTS – such  
22 as integrated voicemail and email, the ability to access voicemail and call management

1 features through the SmartZone(tm) web portal, and the ability to interact with accounts  
2 using mobile telephones or iPhone®/iPod Touch® devices – make use of the Internet to  
3 enhance the abilities of the service.

4  
5 The differences between the experience of a POTS customer and a CDV customer are  
6 increasing as Comcast continues to roll out additional advanced products. In 18 markets  
7 (including Denver, Colorado; Pittsburgh, Pennsylvania; Philadelphia, Pennsylvania;  
8 Jacksonville, Florida; and Houston, Texas) Comcast is now offering “HomePoint,” a service  
9 that includes a wireless, Session Initiation Protocol-based (“SIP”) home handset device with  
10 a small color LCD screen from which CDV customers can check Comcast.net e-mail  
11 accounts; access their online address books and click to dial phone numbers; see a visual list  
12 of voicemail messages; access local phone directories; get a weather forecast; and scan news,  
13 sports and daily horoscopes. The base device functions as a wireless Internet router, station  
14 for wireless handsets, and eMTA all in one. Among other things, the “HomePoint” service  
15 will make it possible (with the appropriate service offering) to send and receive short  
16 message service (“SMS”) messages (known colloquially as “text messages”) from their  
17 home phone. These features differ substantially from the user experience with POTS.  
18 Comcast expects to begin offering this service in New Hampshire in 2010.

19  
20 Ms. Wimer is correct in that some features of the user experience are common to cable VoIP  
21 and POTS, such as use of a POTS-compatible handset, dial tones, and the association of  
22 users with ten-digit numbers. None of these features are necessary aspects of cable VoIP

1 service due to the differences in the network, although so-called “over-the-top” VoIP  
2 providers, such as Vonage and Skype, which are also not regulated by state commissions,  
3 include many of these features as well.

4  
5 **Q. On page 5 of her prefiled testimony, Ms. Wimer states that Comcast customers “may**  
6 **not move the eMTA.” Is that accurate?**

7 **A.** Yes, although as I explained in my original testimony, this is a business decision and not a  
8 technological one. Like over-the-top providers, Comcast could offer CDV and BCV as  
9 nomadic services. In the roll out of this service, Comcast has chosen to disable this feature.

10  
11 **Q. On page 6 and again on page 8 of her prefiled testimony, Ms. Wimer states that**  
12 **Comcast customers use a telephone as their customer premises equipment, and that**  
13 **they do not purchase specialized customer premises equipment (“CPE”). Is that**  
14 **accurate?**

15 **A.** Ms. Wimer’s testimony is only partially accurate. As described in my original testimony,  
16 CDV and BCV require specialized CPE at the customer’s premises – the embedded  
17 multimedia terminal adapter (eMTA). Although customers do not presently purchase their  
18 own eMTAs, they do rent them from Comcast (and are assessed a separate charge on their  
19 monthly statements for such rental). Comcast plans on soon offering customers the option of  
20 purchasing the eMTA from Comcast. In addition, Comcast will soon be offering other CPE  
21 options in New Hampshire, such as the “HomePoint,” a device which, as mentioned, operates  
22 as the eMTA, wireless router for home Internet access, and base station for wireless handsets

1 with integrated Internet access. CPE options are continuing to evolve as Comcast leverages  
2 the IP-based abilities of CDV and BCV services to offer more features.

3  
4 **Q. Are Ms. Wimer's descriptions of the "general technical functions" of cable VoIP and**  
5 **POTS calls on pages 7-8 of her prefiled testimony accurate?**

6 A. Most of what she describes is fairly accurate, although she mischaracterizes some aspects of  
7 the cable VoIP network in order to analogize elements of that network to elements of the  
8 POTS network when in fact these elements work differently. I discuss those areas below.

9  
10 Loop. First, the loop used by POTS providers and the cable drop used by cable providers  
11 (see page 7 and pages 10-11 of Ms. Wimer's testimony), which are both used to connect a  
12 customer's premises to the provider's network, work differently. A cable drop is not the  
13 same as a loop. Although both connect the customer's premises to the network, loops are  
14 dedicated to particular customers, whereas drops can be shared and can handle simultaneous  
15 traffic from different sources (voice, video, Internet, as well as simultaneous use by multiple  
16 customers). Even when POTS providers use a digital loop carrier (DLC) to multiplex traffic,  
17 they require a dedicated line (whether copper, fiber, or otherwise) for the final connection to  
18 the customer's premises.

19  
20 Switch. Second, Ms. Wimer's description of the switching facilities used by POTS and VoIP  
21 providers (on pages 7-8 and 12-13) glosses over engineering differences between the  
22 services. Unlike POTS calls, which must transverse a switch, VoIP calls are not necessarily

1 transmitted to a “switching center.” The soft switch on an IP-based network provides routing  
2 and signaling; the packets constituting the voice data itself never traverse the switch if a call  
3 is to a number served by the same soft switch. They are routed directly from point-to-point  
4 via a private IP network, as I discussed in my initial testimony at pages 15-17.

5  
6 Transport. Third, unlike POTS calls, which follow a hub-and-spoke model (with different  
7 switches connected to one another through trunks), VoIP calls from customers served by  
8 different soft switches are not transmitted over “interoffice transport trunks” dedicated  
9 exclusively to voice traffic, as Ms. Wimer describes on pages 13-14 of her prefiled  
10 testimony. Instead, calls between callers served by different soft switches can take a variety  
11 of call paths, using a mesh of routers shared by data and video traffic; indeed, packets from a  
12 single call may arrive at their destination by a multitude of different call paths using different  
13 routers.

14  
15 **Q. Is Ms. Wimer’s description of the “interface” between cable VoIP carriers on page 13**  
16 **of her prefiled testimony accurate?**

17 A. Her description of interfaces between VoIP providers is misleading in that it unreasonably  
18 calls into question both the reliability and quality of Comcast’s VoIP network. Comcast  
19 reliably uses such IP-based interfaces in many markets throughout the country. Since these  
20 IP networks carry video, voice and data IP packets, they are tested regularly to ensure  
21 security and quality, not because they are somehow unreliable. Although it is true that  
22 Comcast’s network converts some calls to TDM and uses circuit-switched networks to hand

1 them off to other VoIP carriers, that has nothing to do with the technological limitations or  
2 reliability of IP-based interfaces. Rather, it reflects much more mundane business realities: it  
3 is not always economical or efficient for both parties, nor are network resources always  
4 available, for Comcast to directly peer with every other VoIP carrier in every market. In  
5 New Hampshire, Comcast does not peer with any other cable VoIP providers, so all  
6 intraLATA calls to and from subscribers of those providers are converted to TDM and  
7 transverse the PSTN between Comcast's network and the other providers'.

8  
9 **Q. On page 14-15 of her prefiled testimony, Ms. Wimer describes the signaling used on**  
10 **VoIP as well as POTS networks. Is her description accurate?**

11 A. Yes; although I would add that "over-the-top" VoIP providers such as Vonage and Skype use  
12 the same kinds of signaling as cable VoIP providers.

13  
14 **Q. On page 16 of her prefiled testimony, Ms. Wimer claims that there are "changes to the**  
15 **transmission format" of calls on both VoIP and RLEC networks. Do you agree with**  
16 **Ms. Wimer's description?**

17 A. No, Ms. Wimer's testimony is unclear, because it confuses some important distinctions.

18  
19 First, Ms. Wimer's testimony incorrectly lumps together changes in "protocol" with other  
20 changes in format. A protocol consists of a hierarchy or set of rules that govern the format  
21 of the messages and data that are exchanged. As defined by Newton's Telecom Dictionary,  
22 a "protocol" is "a specific set of rules, procedures or conventions relating to format and

1 timing of data transmission between two devices.”<sup>1</sup> Thus, changes to data from IP to TDM  
2 and vice versa are changes in protocol. On the other hand, for example, the formatting of  
3 analog voice signals into digital signals does not constitute a protocol conversion, as it is  
4 not governed by a specific set of rules, procedures or conventions. Similarly, the  
5 formatting of electrical signals to optical signals (and vice versa), while preserving the  
6 rules, procedures and conventions governing the information being transmitted, is a signal  
7 conversion but not a protocol conversion.

8  
9 Second, Ms. Wimer’s testimony incorrectly lumps “net” changes in protocol with “in-the-  
10 middle” changes in protocol. “In-the-middle” changes are changes to a call’s protocol that  
11 are within a network, whereas “net” changes are those where the protocol of the call enters a  
12 network in a different protocol than the one in which it exits the network.

13  
14 By confusing these two distinctions, Ms. Wimer overstates the similarities between changes  
15 to the call format made by VoIP providers and changes to the call format made by POTS  
16 providers. Both VoIP providers and POTS providers may make “in the middle” changes to a  
17 call format that do not affect the call protocol, such as converting a signal from electrical to  
18 optical for transit, and then back to electrical again. And some POTS providers may convert  
19 the protocol of calls to IP, but only “in the middle,” as they do not originate or terminate calls  
20 in IP. Only interconnected VoIP providers (whether they are cable VoIP providers or over-  
21 the-top VoIP providers) make “net” changes to call protocol when exchanging traffic with

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<sup>1</sup> NEWTON’S TELECOM DICTIONARY 896 (25th ed. 2009).

1 the PSTN. This “net” protocol conversion is not simply something that the provider does for  
2 purposes of its own network management; it is actually offering a specific service feature to  
3 its customers: the ability to communicate with users on a different network.  
4

5 **Q. On page 18 of her prefiled testimony, Ms. Wimer states that there is no change in form**  
6 **or content of the information sent or received in Cable VoIP service. Do you agree?**

7 A. No. As I describe in my previous answer, calls from Comcast VoIP customers to PSTN  
8 customers enter Comcast’s network in IP and leave in TDM. The same is true, in reverse,  
9 for calls from PSTN customers to Comcast VoIP customers. Calls to and from customers of  
10 VoIP providers with whom Comcast lacks a peering relationship work the same way.  
11

12 **Q. On pages 18-19 of her prefiled testimony, Ms. Wimer supports her claim that there is**  
13 **no change in form or content of the information sent or received in Cable VoIP service**  
14 **because users on both ends use analog handsets. Do you agree?**

15 A. No. Ms. Wimer’s discussion of customer handsets incorrectly focuses on the functions  
16 performed by certain pieces of a user’s CPE – which necessarily occur outside of the network  
17 – rather than those performed by the networks themselves. This kind of focus is not only  
18 erroneous; it would yield odd results. As Ms. Wimer herself admits in footnote 26 to her  
19 testimony, not all handsets are analog; some are digital or SIP-based CPE. Indeed, many  
20 businesses use digital phones. By Ms. Wimer’s logic, a call would experience a net change  
21 in form from analog to digital simply because it was made from a residential customer using  
22 an analog handset to a business customer using a digital handset, irrespective of the

1       underlying service used. I will ultimately defer to Comcast's attorneys to explain the  
2       relevant legal standard in their briefs, but Ms. Wimer's approach would make the regulatory  
3       classification of calls turn on the CPE instead of on the functions actually performed by the  
4       provider.

5

6   **Q.    Does this conclude your reply testimony?**

7   A.    Yes.

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