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October 8, 2004

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Federal Communications Commission
Office of Secretary

Via Hand Delivery

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Ex Parte* Meetings in WC Docket No. 03-211 (Vonage)
WC Docket No. 03-266 (Level 3)
WC Docket No. 04-36 (IP-Enabled Services NPRM)

Dear Ms. Dortch:

On October 7, 2004, the Voice on the Net Coalition, represented by Jim Kohlenberger, VON Coalition Executive Director; Glenn Richards, Shaw Pittman; Jonathan Askin, Pulver.com; Kate Cronin, AT&T; Praveen Goyal, Covad; Margie Dickman, Intel; Brita Strandberg, Skype; Cindy Schonhaut and John Nakahata, Level 3; and Todd Daubert, USA Datanet, met with FCC staff including Michael Goldstein, Julie Veach, Terri Natoli, Tom Navin and John Stanley. At the meetings, the VON Coalition members expressed their support for the Vonage Petition and a finding that VoIP services are subject only to interstate jurisdiction. Certain of the VON Coalition members discussed the architecture of their VoIP networks and how services were provided. Handouts were provided by AT&T, Level 3, and Skype, copies of which are attached. Please direct any questions regarding this matter to the undersigned.

Very truly yours,

Glenn S. Richards

cc: Michael Goldstein
Julie Veach
Terri Natoli
Tom Navin
John Stanley

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Document #: 1436309 v.1

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IP over Broadband

Integrated Service

October 7, 2004

Market Reach

- Available nationwide
- Purchase online, call a sales agent or purchase adapter at a retail store

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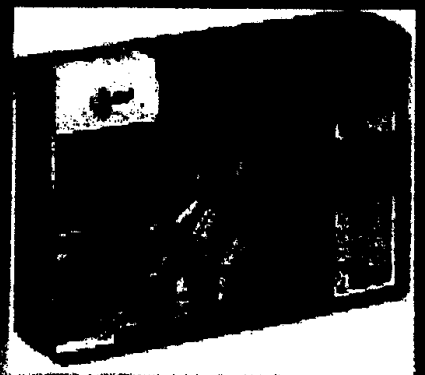
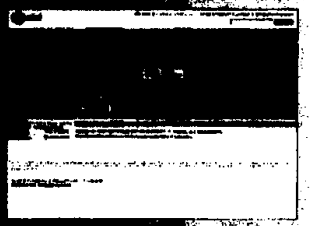
How to Order AT&T CallVantage℠



CallVantage
Starter Kit



amazon.com.

BUY

city

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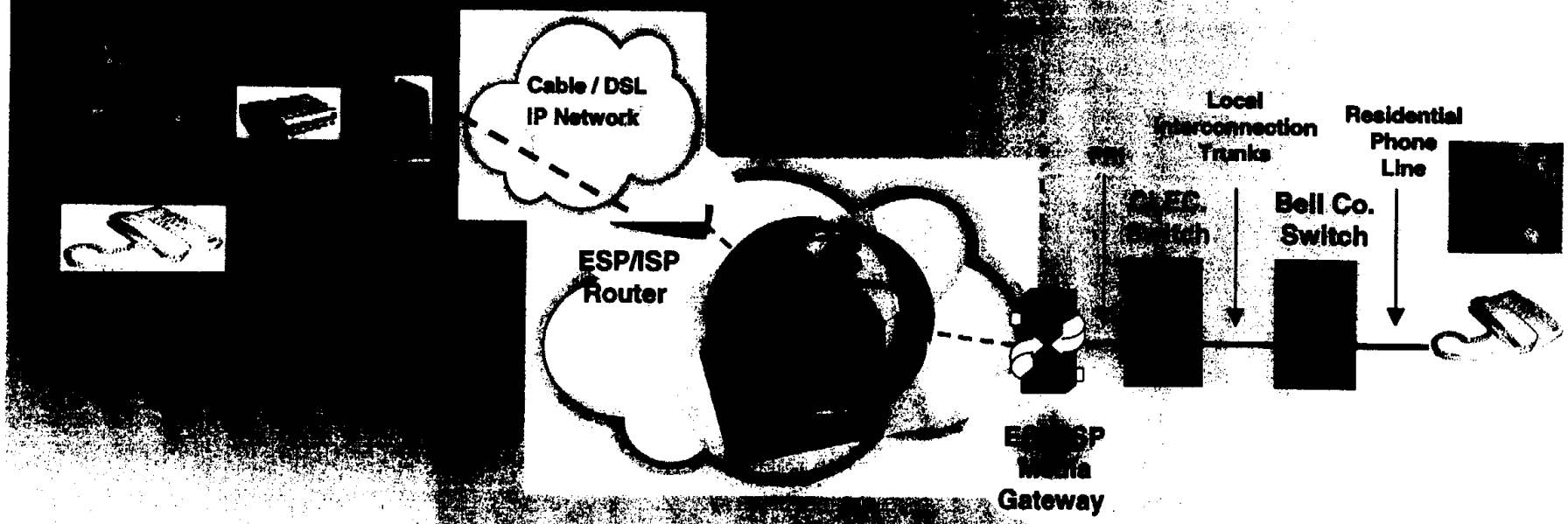
Broadband
Network (PSTN)



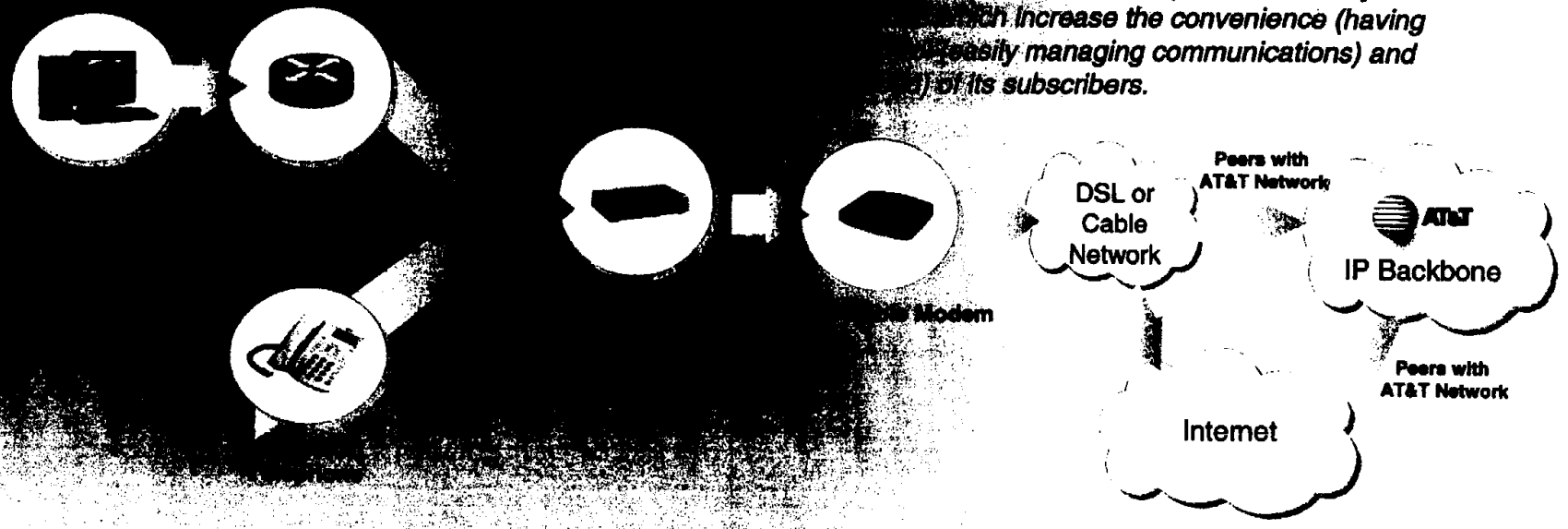
Public Internet or Private IP Network (178,000+ networks) (packet switched)

Public Switched Telephone Network (circuit switched)

Copyright AT&T 2004

[illegible] Call Vantage℠ Service

[illegible] revolutionary new broadband phone [illegible] long distance plus the industry's [illegible] increase the convenience (having [illegible] easily managing communications) and [illegible] of its subscribers.



Current Feature Set

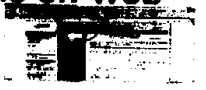
Basic Voice Capabilities

- Unlimited Local (US offer)
- Unlimited LD Calling (US offer)
- International
- Caller ID (Without Name)
- Call Waiting / Forwarding
- Three Way Calling
- Personal Address Book

Customer Premise Equipment

- Telephone Adaptor (TA) device
- Connects home phone and PC to broadband connection

Call Applications on Web



- Call Logs
- Click-to-Dial
- Do Not Disturb
- Speed Dialing
- Telephone Portal (Feature Manager)
- Voicemail with eFeatures
- Locate Me
- Personal Conferencing (Pay per Use)

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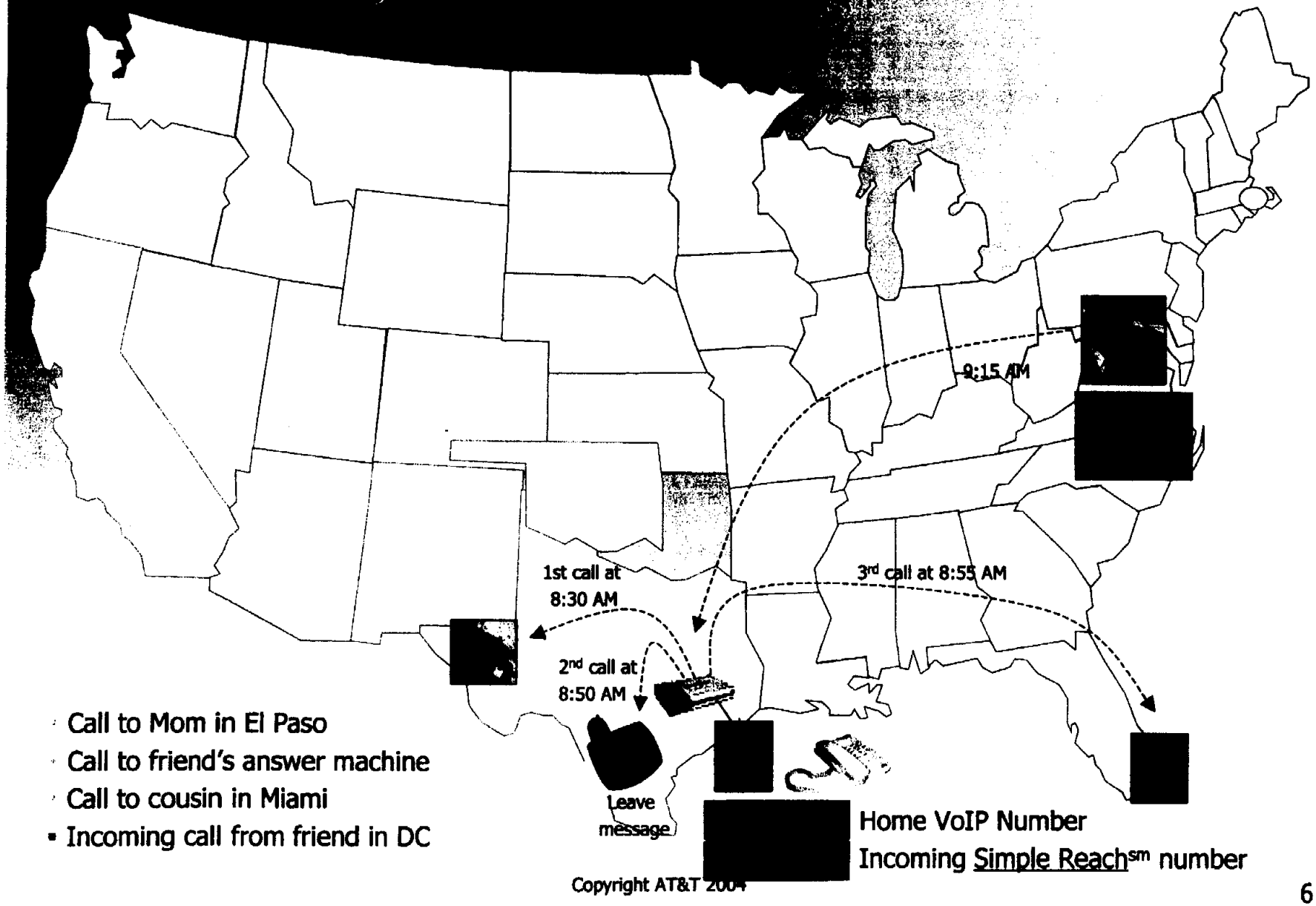
Incoming Calls to and from Home in Houston



- Call to Mom in El Paso
- Call to friend's answer machine
- Call to cousin in Miami
- Incoming call from friend in DC

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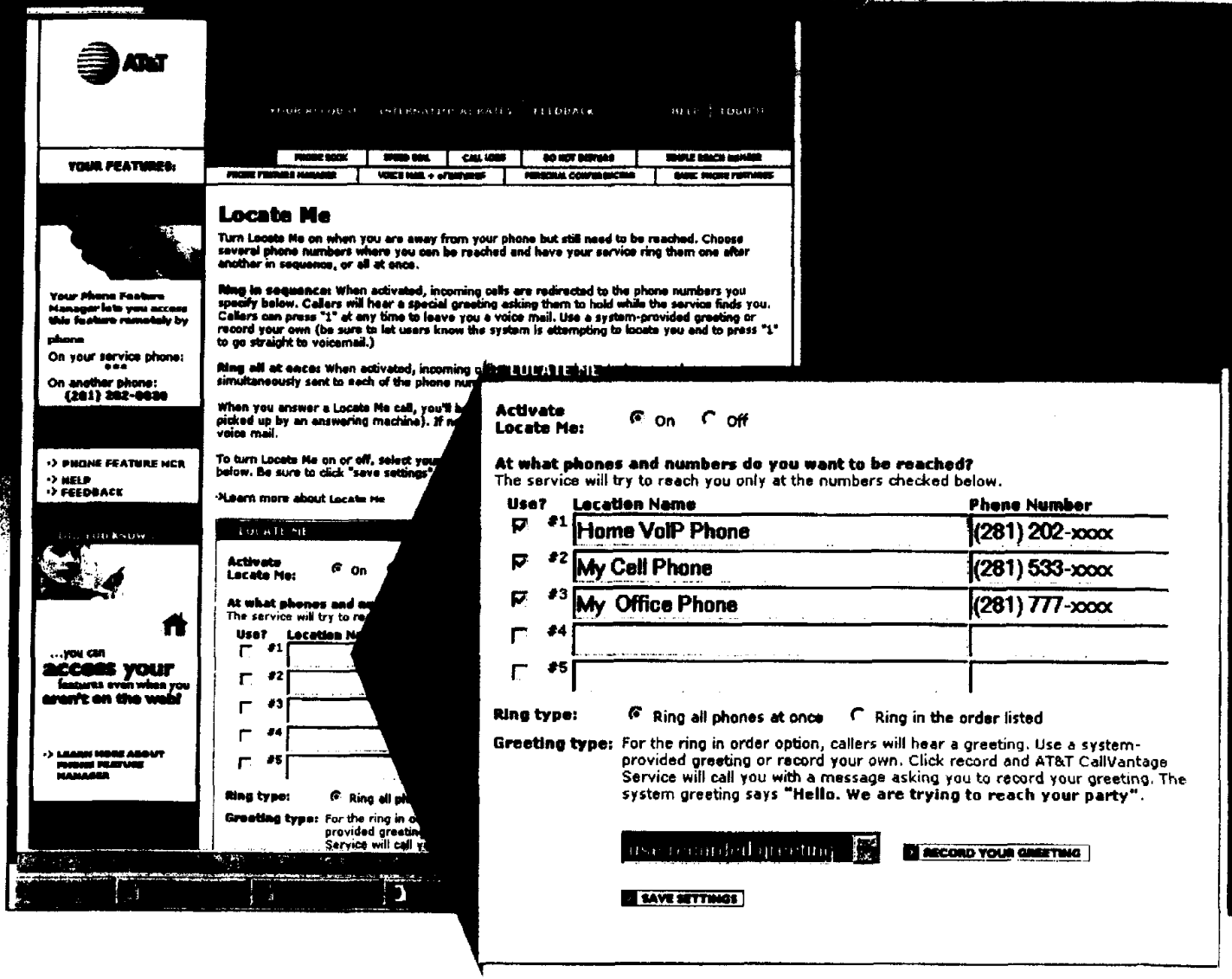
9:30 AM
[illegible] through Web Portal



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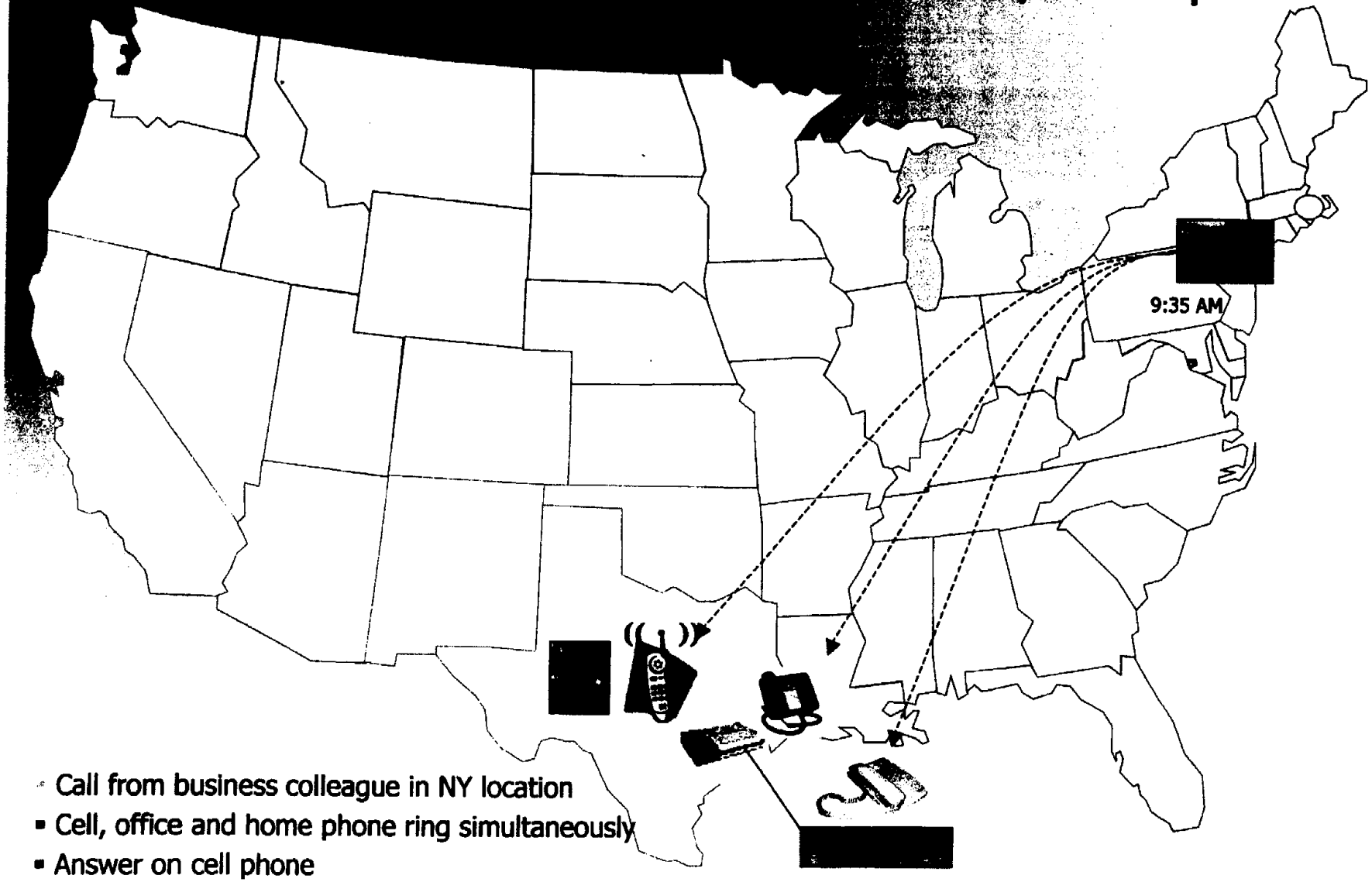
[redacted] on way to Airport



- Call from business colleague in NY location
- Cell, office and home phone ring simultaneously
- Answer on cell phone

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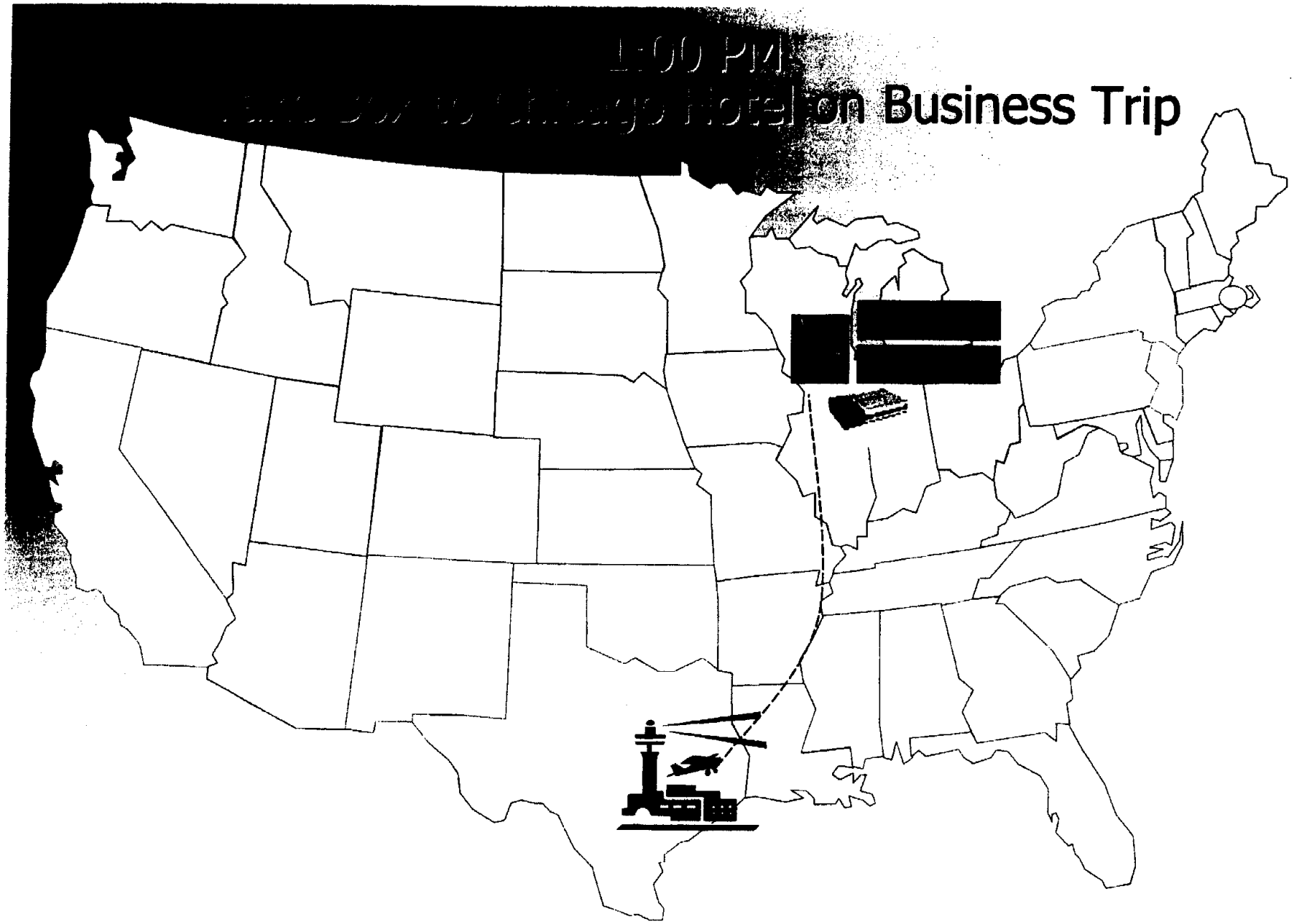
[redacted] on Business Trip



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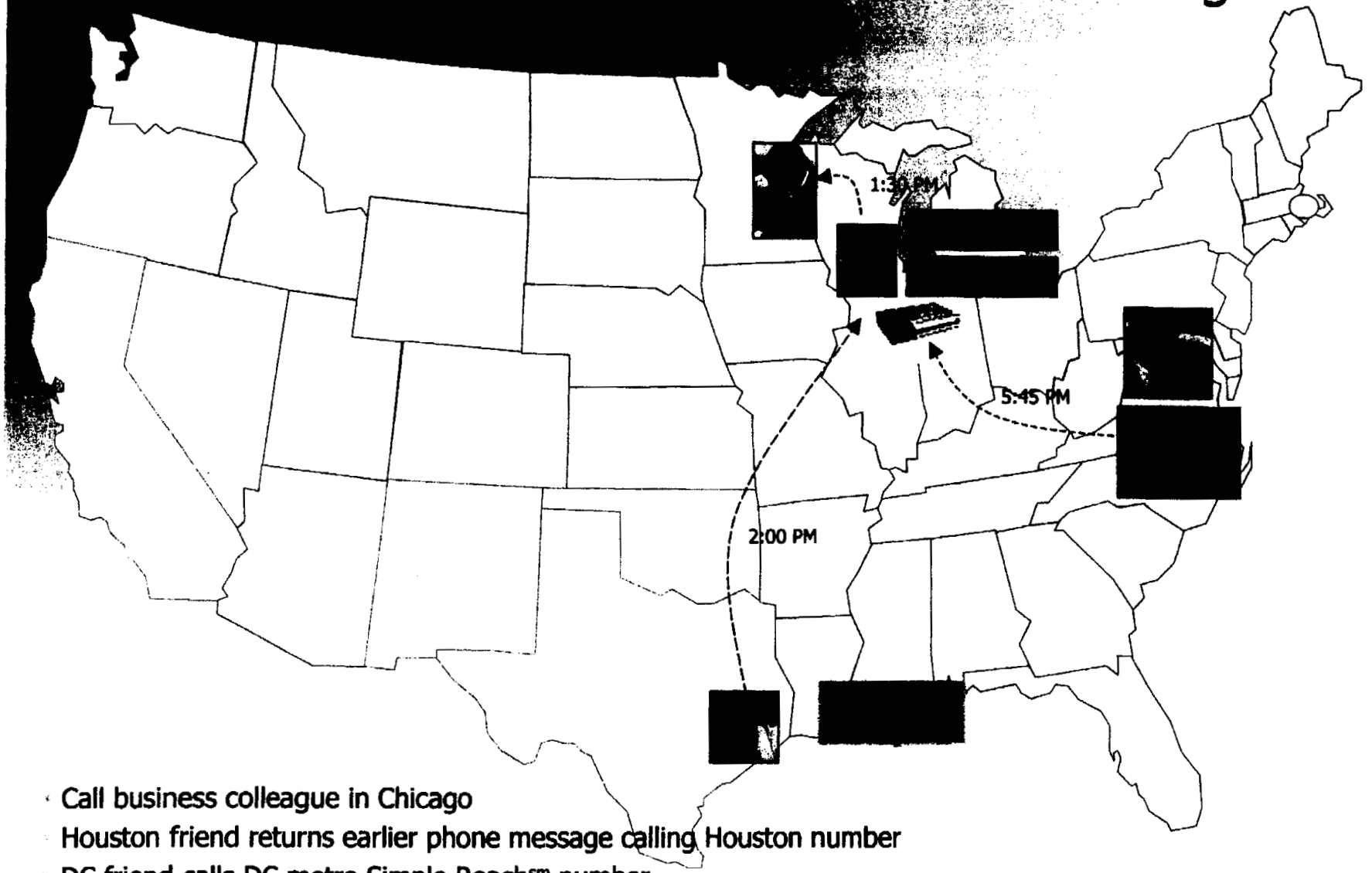
[redacted] Hotel in Chicago



- Call business colleague in Chicago
- Houston friend returns earlier phone message calling Houston number
- DC friend calls DC metro Simple Reach℠ number

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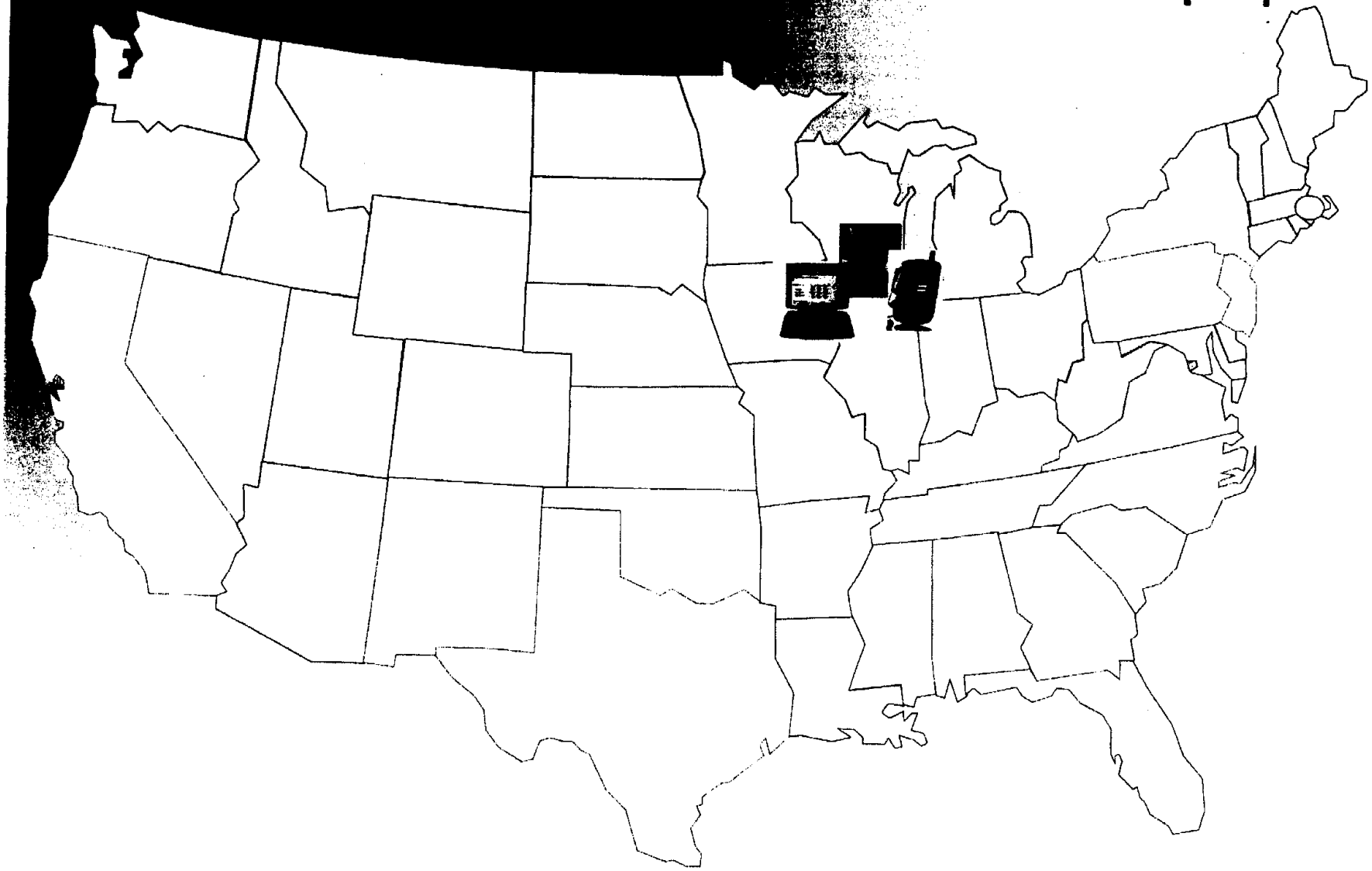
Check for Information on Wireless PDA or Laptop



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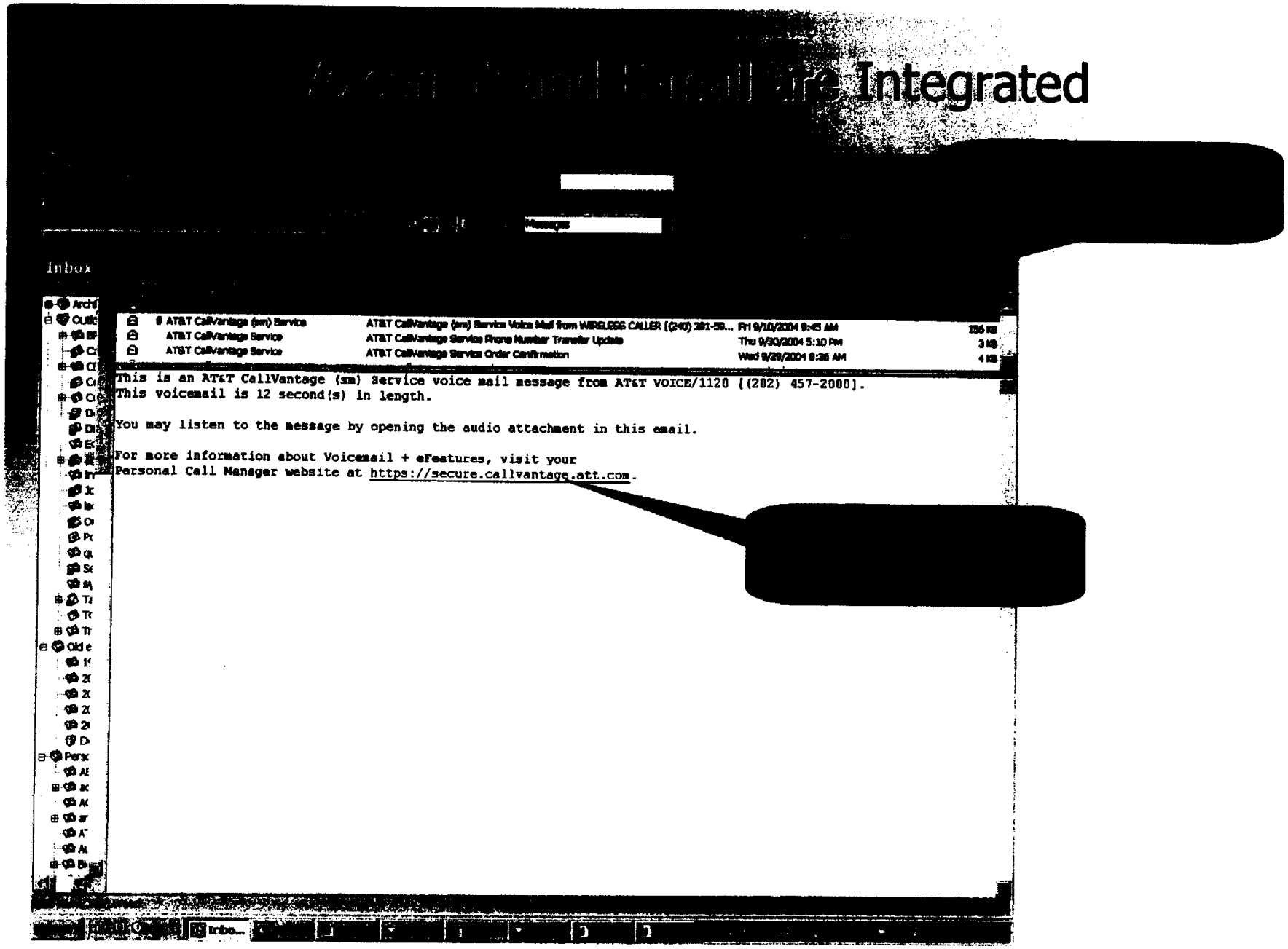
[redacted] Integrated



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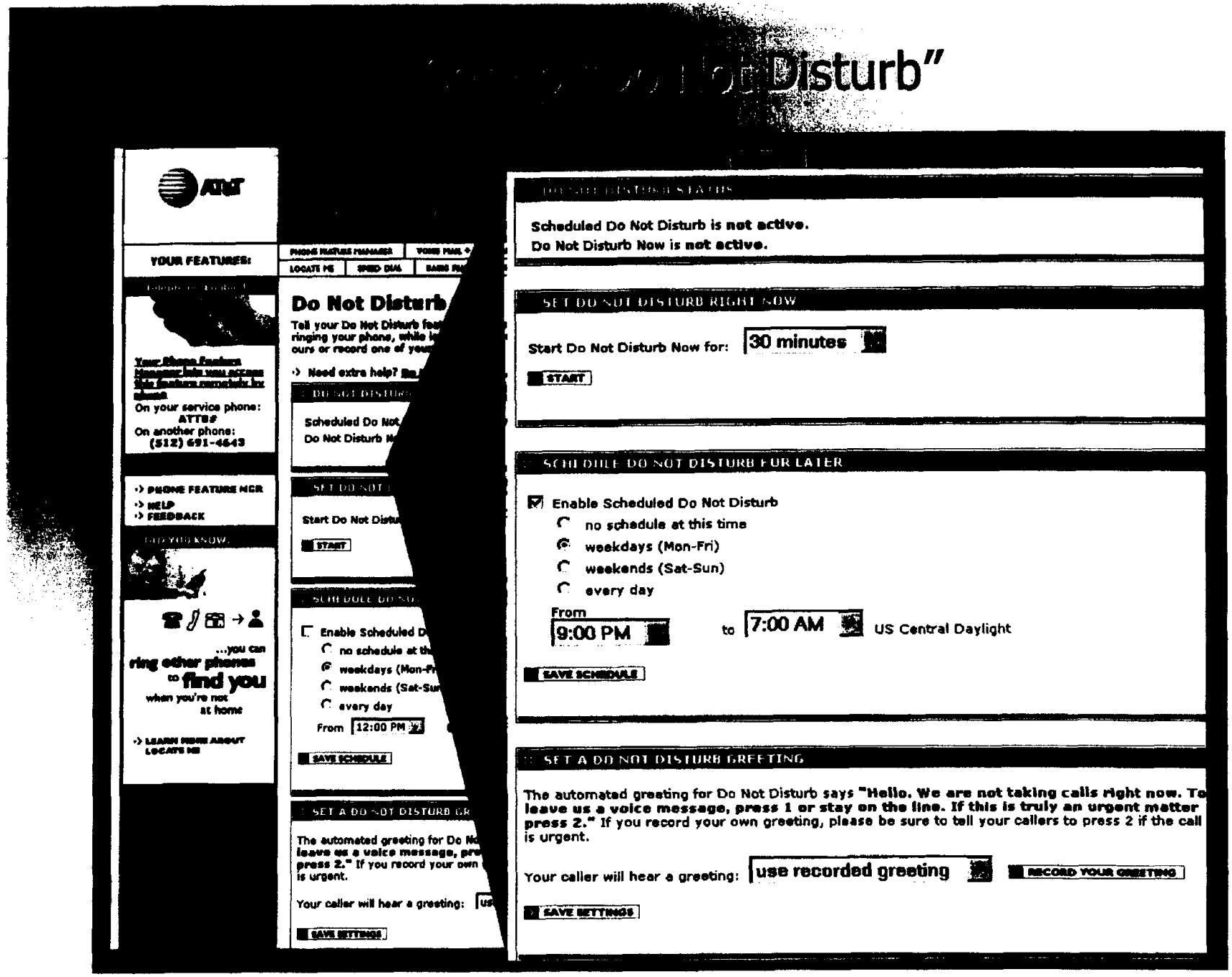
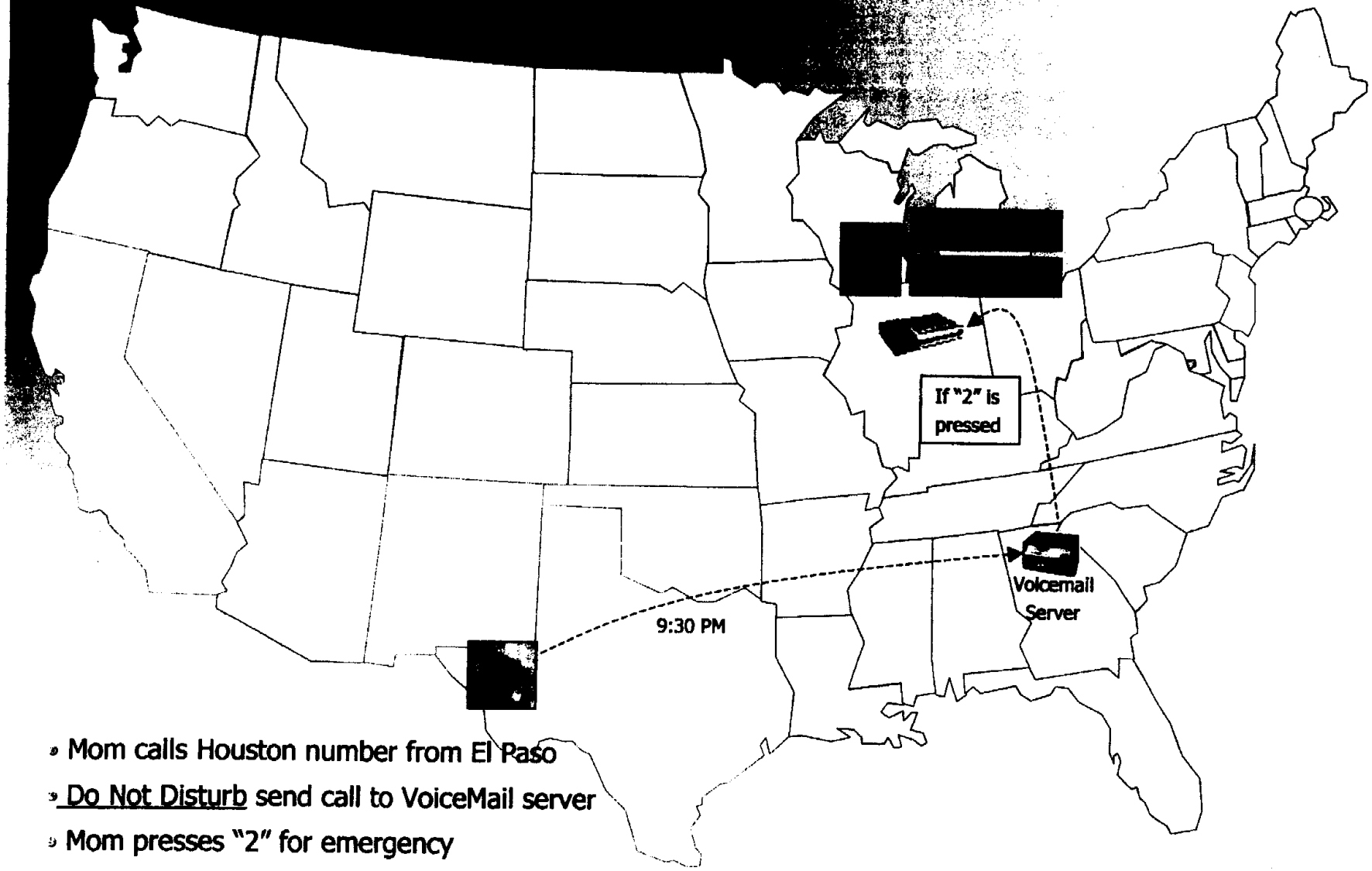
"Do Not Disturb"



[redacted] Number



- Mom calls Houston number from El Paso
- Do Not Disturb send call to VoiceMail server
- Mom presses "2" for emergency

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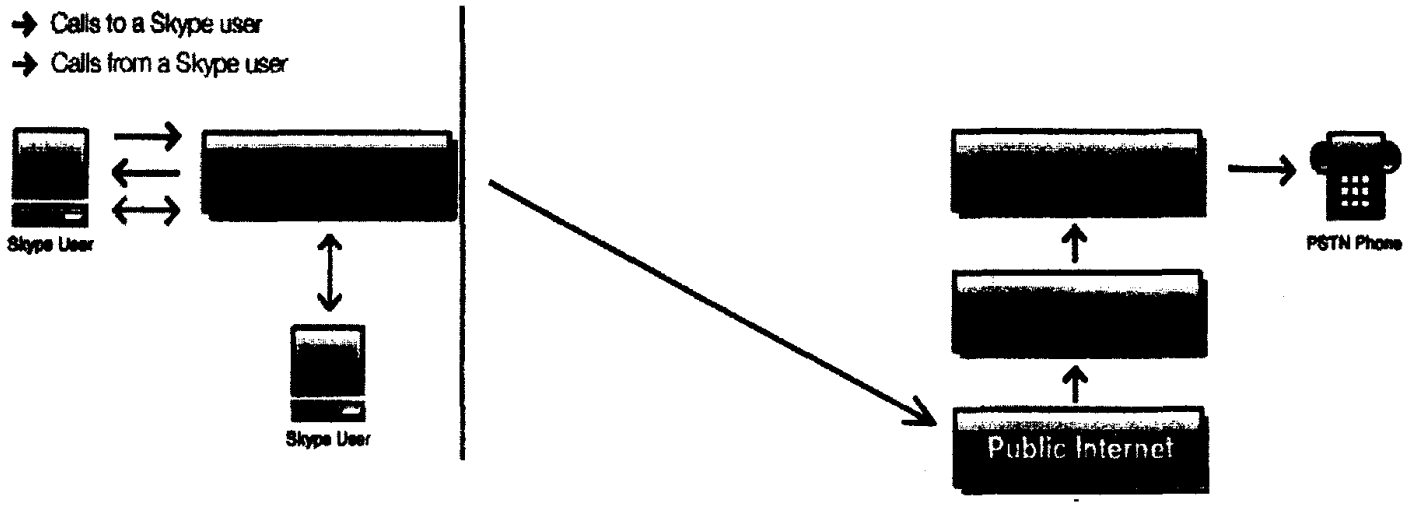
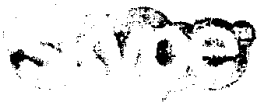
Call Network

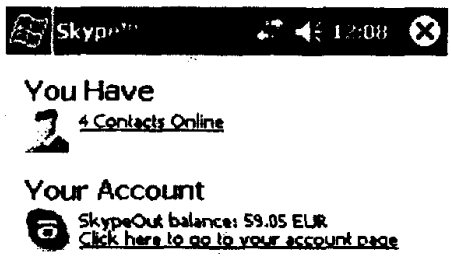
- Peer-to-Peer
- Calls to a Skype user
- Calls from a Skype user



skype

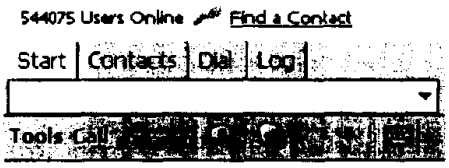


Skype screenshots for
Windows | Mac OS X | Linux | Pocket PC



Start tab

This is your home base; see any missed calls, missed instant messages etc. You'll get a quick overview of how many friends you have online and you can instantly see the status of services your subscribe to.
Next screenshot »



2 Making a call

3 Talking

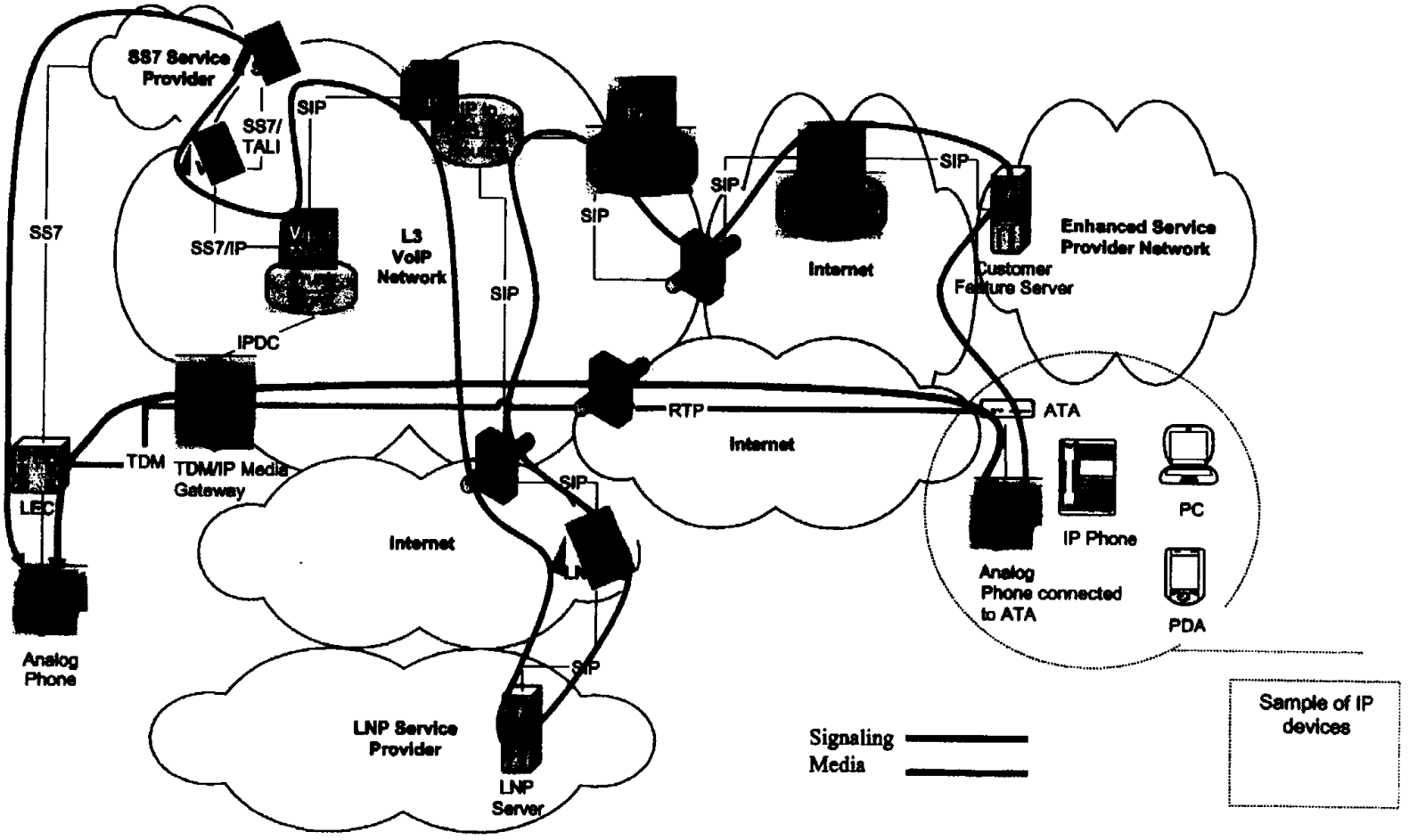
4 Call-time functions

5 Call regular phones

6 Dialpad

7 Call list

IP Enabled Services Call Flow
IP-PSTN



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Call Flow Narrative

- Call originates from a phone connected to an Analog Terminal Adapter (ATA), from a PC with a SIP Soft Client, or from an IP Phone
- Call is sent through a broadband connection to a service providers Feature Server (FS)
- The FS hands the call to the Level 3 Network at a Level 3 Edge Proxy Server (EPS)
  - The EPS is provisioned specific to a customer, so it authenticates the calls came from a specific customer
  - EPS is configured that all calls coming from that customer's FS will be classified as Enhanced Service in the SIP Invite with a Level 3 proprietary header
- EPS sends call to Core Proxy Server (CPS)
  - CPS is the network routing engine that determines how to terminate the call
  - For this case, CPS sees the Enhanced Service classification, so it will try to find a DEOT to which it can terminate the Dialed Number.
  - CPS will trigger out to do an LNP dip on any call that could terminate over DEOT
  - CPS will use either the LRN or the terminating NPA-NXX to find the correct DEOT
- CPS sends call to Media Gateway Controller (MGC)
  - MGC converts SIP to ISUP
  - MGC sees Enhanced Services classification and sets OLI to a configurable value (64 or 65 are the values being proposed)
- MGC sends call to LEC

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EX PARTE OF LEVEL 3 COMMUNICATIONS, LLC
(WCB Docket No. 03-211; 04-36)

IP-PSTN COMMUNICATIONS ARE JURISDICTIONALLY INTERSTATE

The Commission should declare that all IP-PSTN communications are interstate – and subject to the FCC's exclusive jurisdiction – for the simple and uncontroversial reason that it is impossible to determine the physical location of the IP endpoint. Classifying IP-PSTN and incidental PSTN-PSTN IP-enabled communications as interstate would prevent state commissions from asserting jurisdiction over such service, and thereby eliminate the burdensome patchwork of regulation across 51 jurisdictions that, as the Commission has recognized, has started to emerge "[e]ven at this early stage."[1]

A. IP-PSTN Communications Are Interstate For The Same Reasons That pulver.com's Free-World Dialup Service Is Interstate.

In its order granting pulver.com's petition for declaratory ruling, the FCC determines that Pulver's Free World Dialup ("FWD") service is an interstate service subject to the Commission's exclusive jurisdiction. Because IP-PSTN communications share the geographic characteristics that prompted the Commission's determination, IP-PSTN communications are jurisdictionally interstate as well.

The Commission commences its jurisdictional analysis in the *Pulver Order* by observing that a state regulator may exercise jurisdiction over communications services in only two situations: *First*, when communications "can be characterized as 'purely intrastate,'" or, *second*, when "it is practically and economically possible to separate

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1 *IP-Enabled Services NPRM* at ¶ 34 ("Even at this early stage, states have begun to diverge in their approaches to the regulation of VoIP services.").

interstate and intrastate components of a jurisdictionally mixed . . . service without negating federal objectives for the interstate component."[2]

The Commission then explains that it exercises exclusive jurisdiction over FWD because neither of the two state-jurisdiction situations applies. First, because the location of FWD "members' physical locations can continually change," the FCC explains, "it is evident that the capabilities FWD provides its members are not purely intrastate capabilities."[3] The same "evident" reasoning applies to IP-PSTN communications like Level 3's.[4] Because the IP end users in IP-PSTN communications can change their locations continually and cross from one jurisdiction to another, IP-enabled communications services are not purely intrastate.

Second, the FCC concludes that it is not practically and economically possible to separate the interstate and intrastate components of a FWD communication because only the users themselves "know where the endpoints are."[5] The Commission explains that any effort to track the location of data packets and end users for jurisdictional purposes would be impractical at best, and would "forc[e] changes on this service for the sake of regulation itself, rather than for any particular policy purpose."[6] Requiring Pulver to "comply with legacy distinctions between federal and state jurisdictions" would be

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2 *Pulver Order* at ¶ 20.

3 *Id.*

4 *See* Declaration of Jeffrey Pelletier at ¶ 13 ("Pelletier Declaration"), attached hereto. *See also* Level 3 product brochures entitled "HomeTone" and "(3) Tone Business – Hosted IP Voice Service for Business," attached hereto.

5 *Pulver Order* at ¶ 21.

6 *Id.* at ¶¶ 21, 24.

impractical and uneconomic, according to the Commission, because "such distinctions do not appear to serve any legitimate public policy purpose" in this context.[7]

The same logic applies to IP-PSTN communications, because the locations of IP endpoints are known only to the IP end users themselves.[8] As a result, any effort to separate interstate and intrastate components of an IP-PSTN communication "would involve the installation of systems that are unrelated to providing [the] service to end users."[9] As the Commission observes with respect to FWD, "[i]nvestment in such systems would improve neither service nor efficiency" in IP-PSTN communications.[10] Indeed, "imposing this substantial burden [on IP-PSTN communications] would make little sense and would almost certainly be significant and negative for the development of new and innovative IP services and applications."[11]

In addition, the *Pulver Order* establishes that IP-PSTN communications would be jurisdictionally interstate under the Commission's "mixed-use" doctrine.[12] Like FWD users, the IP end users in IP-PSTN communications have "global portability," which enables them "to initiate and receive on-line communications from anywhere in the world where [they] can access the Internet via a broadband connection."[13] Because more than a *de minimis* amount of the communication is interstate, the Commission explains, the

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7 *Id.* at ¶ 24.

8 Pelletier Declaration at ¶¶ 8-17.

9 *Pulver Order* at ¶ 24.

10 *Id.*

11 *Id.*

12 *See id.* at ¶ 22 ("Where separating interstate traffic from intrastate traffic is impossible or impractical, the Commission has declared such traffic to be interstate in nature.").

13 *Id.*; Pelletier Declaration at ¶¶ 15-16.

communications are deemed interstate under the mixed-use rule. The Commission's treatment of FWD also demonstrates that any effort by a state PUC to regulate IP-PSTN communications would likely run afoul of the Commerce Clause of the Constitution. Internet applications like FWD and IP-PSTN communications are not bound by geography, which would "render an attempt by a state to regulate any theoretical intrastate . . . component [of such services] an impermissible extraterritorial reach."[14] In this vein, the FCC rejects the counter-argument that state economic regulation would benefit the public, concluding instead that "the burdens upon interstate commerce would be significant."[15]

The key fact underlying the FCC's jurisdictional analysis – that "Internet applications like FWD . . . separate the user from geography"[16] – applies with equal strength to IP-PSTN and incidental PSTN-PSTN services.[17] Regardless of whether the locations of both endpoints are unknown (as in an FWD communication) or only one endpoint is unknown (as in an IP-PSTN communication), it is impossible track the route from one endpoint to the other. As a result, it is also impossible to ascertain whether and which jurisdictional boundaries a particular communication crosses. Without any information about the jurisdictional course, it is similarly impossible to separate an IP-PSTN communication into intrastate and interstate components. And, even if it were technically possible to track bit streams for jurisdictional purposes, it would be

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14 *Pulver Order* at ¶ 23.

15 *Id.* at ¶ 24.

16 *Id.* at ¶ 4.

17 Pelletier Declaration at ¶¶ 15-16.

impractical and uneconomic to do so because tracking the packets of an IP-PSTN communication "would improve neither service nor efficiency."[18]

B. The Commission's *IP-Enabled Services NPRM* Supports The Conclusion That IP-PSTN Communications Are Jurisdictionally Interstate.

In the *IP-Enabled Services NPRM*, the Commission seeks comment on the proper jurisdictional category for IP-enabled communications services. At the same time, however, it suggests that IP-PSTN communications services like Level 3's are jurisdictionally interstate because, according the FCC, "[p]ackets routed across a global network with multiple access points defy jurisdictional boundaries."[19]

The Commission begins its jurisdictional inquiry in the NPRM with a recap of its *Pulver Order*, reaffirming that state regulation of Internet applications like FWD "is inconsistent with the controlling federal role over interstate commerce required by the Constitution."[20] The Commission then observes that, "with Internet communications, the points of origination and termination are not always known."[21] In light of the absence of a nexus between geography and service, the Commission requests comment on the appropriate approach to jurisdiction, questioning in particular whether "the end-to-end analysis, designed to assess point-to-point communications, ha[s] any relevance in this new IP environment."[22]

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18 *Pulver Order* at ¶ 24; *see also* Pelletier Declaration at ¶15.

19 *IP-Enabled Services NPRM* at ¶ 4.

20 *Id.* at ¶ 39.

21 *Id.* at ¶ 40.

22 *Id.*

In other words, while endeavoring not to prejudge the issue on which it seeks comment, the Commission suggests that IP-enabled services like IP-PSTN communications are subject to exclusive federal jurisdiction. The Commission declares that such services "defy jurisdictional boundaries" and that state efforts to regulate such services conflict with the exclusive federal jurisdiction over interstate service established by the Commerce Clause.[23] Indeed, focusing on the practically impossible task of pinpointing the endpoints of an IP-enabled communication, the Commission questions the utility of forcing such services into geographically based jurisdictional categories, and, instead, observes that under the mixed use rule such services are deemed to be interstate "where it [is] impractical or impossible to separate out interstate from intrastate traffic."[24]

C. Parties From Disparate Segments Of The Communications Industry Agree That IP-PSTN Communications Are Jurisdictionally Interstate.

Echoing the FCC's views of IP-enabled services like FWD, a wide array of communications entities – ranging from ILECs to IP network providers, and from interexchange carriers to private research institutions – agree that IP-PSTN communications are subject to the Commission's exclusive jurisdiction over interstate services.

For instance, AT&T declares that "IP-PSTN services are unquestionably interstate services subject solely to the FCC's jurisdiction" because "it is impossible to determine

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23 *Id.* at ¶¶ 4, 39.

24 *Id.* at ¶ 39 n.130.

the geographic endpoints of the IP end of an IP-PSTN call."[25] MCI, another interexchange carrier, urges the FCC to recognize "the fact that categories like 'local' and 'long-distance,' or 'voice' and 'data,' have become historical artifacts."[26] Likewise, IP backbone provider Global Crossing argues that "IP Telephony is within [the FCC's] exclusive jurisdiction . . . [because] these services are configured in such a way that the endpoints of the communication, whether local or interstate, are not readily discernible."[27] The Progress & Freedom Foundation, a non-profit research foundation, observes that "VoIP is inherently interstate."[28] And, in an *ex parte* submission, the Telecommunications Industry Association explains that "[t]he inherently interstate (and international) nature of VoIP makes it virtually impossible to delineate between intrastate and interstate services," and that "it is necessary to have a single federal policy on VoIP, which explicitly preempts inconsistent state actions."[29]

Even the ILECs concur that IP-enabled communications are interstate. Verizon notes that "Level 3's VoIP service is an interstate service subject to this Commission's

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25 AT&T Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 4.

26 MCI Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 7.

27 Global Crossing Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 6; *see also* ICG Telecom Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 3 ("[T]he Commission acknowledged the 'difficult' and 'contested' issues involved with imposing the circuit-switched regulatory regime on VoIP services, such as whether LECs even have the ability to determine whether particular VoIP calls are interstate or intrastate in nature. Indeed, the Commission has ruled that a form of VoIP, pulver.com's Free World Dial Up ('FWD') offering, is jurisdictionally interstate.") (citations omitted).

28 Progress & Freedom Foundation Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 1.

29 Telecommunications Industry Association *ex parte* submission, Attachment at 2 (submitted Feb. 6, 2004).

jurisdiction" because "there is no simple way to determine the location of the IP caller."[30] Likewise, SBC "believes that end users who purchase IP-based services . . . are obtaining interstate information services."[31] As SBC explains in its own Petition for a Declaratory Ruling, "isolating a discrete intrastate component of an IP platform service to justify the exercise of state jurisdiction would be difficult if not outright impossible . . . [because] the technology underlying IP platform services renders the notion of an 'intrastate' call almost meaningless."[32]

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30 Verizon Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 4-5.

31 SBC Comments on Level 3 Forbearance Petition, WCB Docket No. 03-266 at 5.

32 SBC Petition at 37.

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

In the Matter of	)
	)
LEVEL 3 COMMUNICATIONS LLC	)
	)
Petition for Forbearance from Enforcement	)
of Section 251(g) and Rule 51.701(b)(1),	)
Pursuant to Section 10(c) of the	)
Communications Act of 1934 and Section	)
1.53 of the Commission's Rules	)

Declaration of Jeffrey Pelletier

On this 22nd day of December, 2003, I, Jeffrey Pelletier, declare under penalty of perjury as follows:

A. Qualifications

1. Having worked in the field for 11 years, I possess detailed first-hand knowledge of Internet-based communications in general and IP communications that embed voice applications ("Voice-embedded IP") in particular.

2. I am presently employed as a Senior Architect in the Softswitch Architecture and Engineering department at Level 3 Communications, LLC ("Level 3"). The Softswitch Architecture and Engineering department is responsible for the engineering and design of the systems and equipment needed to support Level 3's Voice-embedded IP services. As a Senior Architect, it is my responsibility to ensure that the Voice-embedded IP architecture supports the range of services that Level 3 currently offers, and that it will offer in the future, in a reliable cost effective, and high quality manner.

3. Immediately prior to my current position at Level 3, I worked as a Senior Engineer at Masergy Communications. In that position I was responsible for Voice-over IP ("VoIP") engineering and systems. This included the testing and implementation of VoIP equipment and tools. In addition, I have worked as a VoIP architectural consultant to Net2Phone, a contributor to "The VoIP Implementation & Planning Guide" issued by the United States Telecom Association, and as a Senior Manager with WorldCom/MCI responsible for VoIP network and services architecture. I have also worked for Nortel Networks as an engineer responsible for long distance switching products for the PSTN.

4. I received a Bachelor of Science degree in Computer Sciences from the University of Texas at Austin in 1992.

5. I am currently a member of the Institute of Electrical and Electronics Engineers.

B. Purpose of Declaration

6. As I explain in greater detail below, Voice-embedded Internet Protocol ("IP") applications are beginning to flourish and will do so as long as there are not significant, onerous changes, such as the imposition of legacy access charges. If permitted to develop without onerous and unnecessary regulations such as legacy access charges, Voice-embedded IP will continue to allow enterprises and consumers to communicate with one another in a flexible, interoperable environment that fuses the transmission of voice and data, and will deliver previously unimagined capabilities.

7. On the other hand, if the Commission imposes unwarranted regulations on Voice-embedded IP communications, the development and deployment of innovative Voice-embedded IP services will be severely stunted, thereby reducing consumers' options and allowing other countries' high-tech sectors to profit in this area without full U.S. competition.

C. Background of Voice-Embedded IP Communications

8. The architecture supporting Voice-embedded IP was created precisely because the existing Public Switched Telephone Network ("PSTN") is rigid, relatively closed to innovation, and unable to handle significant data transmissions on top of voice. The wireline telecommunications industry has reached a plateau for new services. The cost to develop new services for the PSTN and the cost model to deliver them is prohibitive.

9. The Internet proved to be an ideal platform for optimal creation of services and applications because it allows for the fusion of voice and data, which, in turn, opens the door for the development of a wide array of enhanced services. Because call processing and service functionality are separated from providing and maintaining the physical network, application developers operate with flexibility and efficiency in an open and competitive environment.

10. Voice-embedded IP communications can take several forms, including PSTN-to-PSTN (where one PSTN caller connects with another PSTN caller using an IP network for some of the transmission), IP-to-IP (where one Voice-embedded IP user calls another, with no connection to the PSTN), and PSTN-to-IP (where a PSTN user and a Voice-embedded IP user connect, using both the IP network and the PSTN).

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11. The existing PSTN, which has been in operation for nearly 100 years, provides users with dedicated, end-to-end circuit connections for the duration of each call. When a user places a call on the PSTN, circuits are reserved at the originating switch, any tandem switches along the route between the two ends of the call, and the terminating switch. Signaling between these PSTN switches supports basic call setup, call management, and call tear down. In recent years, PSTN voice services have been paralleled by the rise of separate networks that support data traffic. Maintaining distinct networks to convey voice and data imposes an additional burden on service providers and an additional cost on consumers. As a result, a single network that permits the convergence of voice and data signals is much more efficient and flexible.

12. A Voice-embedded IP communications system digitizes voice and data inputs and transmits them as a stream of packets over a digital data network, such as the Internet or IP-based private networks. Because of the redundancies and alternate connections that are a deliberate feature of the Internet's design, the individual IP packets are able to flow to the destination independently, each following the best path available, thereby maximizing their use of IP network resources at any given instant. This means that the packets from a single communication may reach their destination along a variety of different routes. On the destination end, the Voice-embedded IP system resolves any problems resulting from packets arriving out of sequence (or not arriving at all) and reassembles them into a useable format. The Voice-embedded IP technology also ensures the quality of arriving signals by compensating for echoes made audible due to the end-to-end delay, for jitter, and for dropped packets. This entire process occurs in real time and in full duplex (or triplex, etc.), allowing multiple parties to the communication to send and receive voice and data simultaneously.

13. In communications from a PSTN-based user to a Level 3 Voice-embedded IP user, the caller places a call on the PSTN by dialing the ten-digit number for the Level 3 customer. That call is carried over the caller's local exchange carrier ("LEC"), then handed off to Level 3 at a point of interconnection. From there, Level 3 carries the call over its common carrier transmission facilities to a media gateway. At that gateway, the communication undergoes a protocol conversion (*i.e.*, compression and conversion to packets), the ten-digit phone number is associated with a customer IP address, and a request is made of that customer for instructions for the disposition of the call; the communication is routed according to the instructions given to Level 3 by the customer to whom the call is directed. Regardless of the ten-digit phone number's apparent location, the Level 3 customer may route the communication to a terminating point within the same local calling area as the caller, or to a location in another part of the state, a different state, or different country. Such routing may change on a call-by-call basis, and it is not necessarily fixed. Customers may choose to ring multiple endpoints or applications at the same time.

14. Conversely, for computer-to-phone connections, a party on the IP network originates the communication. That party hands its traffic in IP format to an IP transmission provider, which may be a third party, a Level 3 affiliate or Level 3. The IP transmission provider directs the traffic to the Level 3 media gateway closest to wire center associated with the PSTN number at which the communication is to terminate. At the gateway, the IP-formatted communication undergoes a protocol conversion from IP to traditional circuit-switched technologies. Level 3 then carries the communication over its common carrier facilities to a point of interconnection with the LEC serving the called party.

15. Unlike wireline telephone numbers, which generally bear a relationship to the location of the wireline telephone, Voice-embedded IP numbers may be completely divorced from geography. Thus, while a Voice-embedded IP user has an assigned ten-digit number, there is no engineering reason why that number must be associated with the Voice-embedded IP user's actual location. In fact, under many applications (such as a telework system that connects remote locations to a company's IP PBX) it would severely disrupt the usefulness of a Voice-embedded IP system to try to create a unique map between telephone number and geographic locations.

16. The technical differences between IP-based communications and PSTN voice calls result in a handful of core functional distinctions between the two. For example:

    a. The IP network provides open access to users and developers, and permits services to be installed on servers other than those managed by the network provider. As a consequence, consumers are able to choose from a limitless array of applications available from developers and entrepreneurs all over the world. This openness, of course, drives innovation and competition. On the PSTN network, by contrast, users are limited to the features offered by their network provider.

    b. Generally, PSTN numbers refer to physical locations, effectively limiting users to that location for the receipt of calls. Voice-embedded IP, by contrast, has no geographic ties. A Voice-embedded IP user with a Chicago phone number, for example, can receive calls and data in Chicago or anywhere else in the world.

    c. When one PSTN wireline customer calls another, a physical circuit between the customers is dedicated to that communication for the duration of the call. With Voice-embedded IP, communications do not travel via dedicated circuits. Rather, they are "packetized," and each packet follows the best route over the IP network to the destination. As a result, Voice-embedded IP calls are less likely to be subject to circuit overloads or disconnections.

d. Voice-embedded IP's transmission mechanism – millions of packets of data following the best routes – is virtually immune from systemic breakdown. PSTN communications travel over a dedicated circuit; if that circuit is cut for any reason, the communication terminates. By contrast, in the event of a natural disaster, attack, circuit congestion, or any other event that might disrupt wireline service, Voice-embedded IP service would remain operable, as the packets would follow alternate routes to their destination.

17. The shift to Voice-embedded IP communications promises better efficiencies in the transport of voice and data, and, as a result, lower communications costs for end users. In order to meet customer expectations, Voice-embedded IP already matches almost all of the features of voice communications currently supported by the PSTN. Voice-embedded IP's real promise, however, lies not in replicating the features of the PSTN, but with the approaching wave of advanced services that will far surpass the capabilities of the PSTN.

D. Applications

18. Voice-embedded IP's technological differences from the PSTN, and the functional capabilities that the IP platform allows, create dramatic possibilities extending far beyond simple voice connections.

19. The services that are available today already represent a leap beyond the PSTN. Because Voice-embedded IP's fusion of data and voice on a single platform is relatively new, however, it is impossible to predict the full range of applications that may eventually emerge if the technology is permitted to flourish in a uniformly and reasonably regulated environment. While this is only the tip of the iceberg, brief descriptions of Voice-embedded IP applications follow:

a. **Innovative Tele-Working.** With Voice-embedded IP, employees are less tied to schedules and bricks-and-mortar offices.

- For instance, a stay-at-home parent who works in technical support could use Voice-embedded IP to direct incoming calls to his home office between the hours of 8:00 a.m. and 3:00 p.m., while his children are at school. During that "on" period, he would use his broadband connection to receive tech support calls at home, with full access to customer and product data. Periodic workers, regardless of time of day or length of availability, could log on to the network and work flexible hours.

- This flexibility will allow telecommunication intensive companies to use part-time employees spread out in areas across the country. For example, a call that originates in Denver for an airline may first go through a voice response unit owned by the

ORIGINAL

end-user. Based on staffing, call volume or other criteria that the customer selects, that communication may be sent across the country to large call center or to part time employees located in rural and urban areas.

- A physician might use the same capabilities to respond to patient emergency calls at home, with full access to patient records stored in her office, and have the ability to alert the system that she is not available for calls (they would be routed to a colleague), or direct that the "call" be forwarded to a cellphone or wireless PDA.

b. **Multimedia Conferencing**. With Voice-embedded IP, multiple users can communicate with one another via voice and video, while drawing on data sources (spreadsheets, financial statements, etc.) simultaneously. IP-PSTN voice communications would support a flexible conferencing platform, allowing some attendees to participate via traditional circuit-switched devices (such as a wireless PDA, thereby combining circuit-switched voice, such as GSM, with Internet access over Wi-Fi or GPRS), while others use voice and data capabilities embedded in an IP-capable desktop.

- Workgroups spread around the world can work collectively on specific data-oriented tasks. As one example, an engineering team with expertise spread around the world can collaborate via voice and share data and documents in real time to revise design specifications.

- A university board with trustees in different cities can meet efficiently and effectively via video-conference (again, some in person, some on the phone, others via computer). At the meeting, participants can collectively review charts, access databases, and compile reports, all in real time. Simultaneously, two or more of the participants can "instant message" each other or hold a separate and private voice conversation.

- A geographically dispersed family could meet to share family digital photos or videos of grandchildren performing in a school play, while exchanging comments as if they were together in person.

c. **High-Power Call Centers.** Voice-embedded IP communications allow entities providing customer service to provide more focused assistance to customers. For customers with broadband access to the Internet, companies can share data, instant messages, voice communications, and URLs in real time. For all customers, IP communications technology with

a voice application allows the operator to receive the customer's voice communication and relevant customer data simultaneously. The operator can access case histories, account and credit information, inventory data, shipping info, and much more instantly and automatically at the exact moment the customer makes contact (whether by circuit-switched or IP device).

d. **Unified Messaging.** Voice-embedded IP allows a user to have a single message platform for all types of communications. Rather than receive e-mail on a computer, voicemail on the phone, faxes on fax machines, and pages on a pager, Voice-embedded IP can route them all to a single unified mailbox, and users can retrieve them all from a single point of contact, whether using an IP or a circuit-switched device. A voicemail can be converted into text using voice recognition software, and an e-mail can be converted into a voice message. Users can organize, store, and prioritize these messages in the manner that suits them best, just like many computer users file e-mail messages in various folders, or screen e-mail messages from some senders and give high priority to others. Users can tell the network how, when and where they want to be notified – such as ensuring that a call from a doctor or teacher is routed to home, work, cellphone or to computer desktop, depending on where a person is, the time of day, and the devices that are actually turned on.

e. **Expanded Call Management and Screening.** Unlike the PSTN, which can handle no more than two incoming voice calls at one time, Voice-embedded IP can manage limitless incoming voice calls, video feeds, and e-mails. Moreover, Voice-embedded IP can handle these incoming communications in a variety of ways, depending on the user's preferences. The system can take a voice message, page the user, convert a voice message to text (or a text message to voice), route the communication to another end-point, or deliver the communication in another format. Moreover, Voice-embedded IP users can retrieve messages in one format (say, text) while actively using another (say, voice). Thus, while a PSTN user must wait until a call is completed to check on messages that came in while the call was underway, Voice-embedded IP allows users to convert those messages into text and get them immediately or to play them in audio format on top of the ongoing connection.

f. **Availability Awareness.** On the PSTN, callers dial a number without knowing whether the party on the other end is available, whether the caller will have to leave a message, or whether the line will just ring and ring. Voice-embedded IP, by contrast, allows users to specify their availability. In other words, Voice-embedded IP customers can indicate that they are free for a voice conversation, for video-conferencing, for e-mail, for gaming, or that they are not available at all. Voice-embedded IP customers can also use this technology to wait until people are actually

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available to receive calls before contacting them, or to alert all attendees when everyone is available for a virtual conference.

g. **Location Scheduling.** Voice-embedded IP users can create a daily location schedule (and update it anytime from anywhere) indicating where communications should be forwarded. In other words, a user could direct communications (of any form) to be directed to a mobile device during her commute, to her office during the day, to her brother's house during the holidays, and to a unified messaging center when she is eating dinner. As explained below, the user's configuration preferences stay with her wherever she may be when she accesses the network.

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h. Simplified Relocation. Voice-embedded IP makes moves and changes much less painful and less expensive. For instance, to allow an employee using a circuit-switched phone to move offices, a company must map extensions, re-program special call-handling features, and activate new phone sets, and the employee's phone configurations have to be re-modified or re-customized. Voice-embedded IP simplifies the process. Employees moving to an office in another country (or, for that matter, families moving to another state) take their customized features with them automatically because Voice-embedded IP configuration data is tied to the user rather than a physical extension.

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

Jeffrey Pelletier
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Executed on December 22 , 2003

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(3)Tone™ Business — Hosted IP Voice Service for Businesses

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A PROVEN VoIP SERVICE FOR YOU AND YOUR BUSINESS CUSTOMERS

Level 3 Communications, a Fortune 500 company and a pioneer of VoIP technology and services, now offers a voice communication solution that will bring significant benefits to you and your business customers. (3)Tone Business is a turnkey voice service that delivers reliable performance and advanced capabilities at greater margins for you than traditional voice solutions. And you can enjoy these higher margins while passing along cost savings to your business customers of up to 40 percent over most PBX, IP PBX, and Centrex services.

A BETTER COMMUNICATION PLATFORM

(3)Tone Business is a hosted voice service that combines the features and benefits of traditional voice systems with the durability and advanced functionalities of the Internet. (3)Tone Business easily connects all your customer locations and remote employees with the same dialing plan and features, creating a single extended campus that allows:

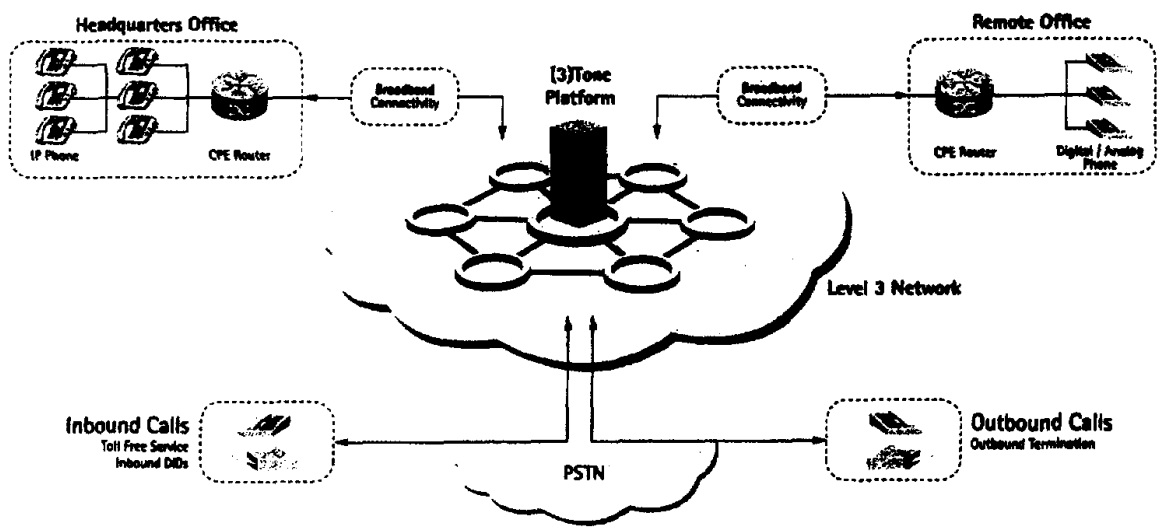
- Intra-company 4- or 5-digit dialing
- Forwarding of calls and voice mail messages between locations
- Free local and long-distance on-net calls
- Integrated corporate contact directories
- Centralized administration through any browser
- Unified messaging

(3)Tone Business delivers local and long-distance business voice services with easy-to-use management tools that make business communication more versatile, convenient, and efficient. The service is delivered to businesses over a broadband connection that directs the VoIP traffic to Level 3's nationwide and industry-leading fiber-optic network — the same network that has been serving the top ISPs, cable companies, satellite operators, wireless providers, and local and long-distance telephone companies for years.

MANAGEMENT, FEATURES, AND FLEXIBILITY

Your customers can manage their own communication needs through a Web-based portal that can be branded with your logo. All moves, additions, and changes for all sites and end users can be managed through this Web portal, which decreases operating costs for both of you. In addition, each end user has one box to manage his or her personal preferences and messaging:

- View missed, outgoing, and incoming calls
- View and listen to voice mail messages
- View and store faxes
- Set up conference calls
- Assign speed-dial numbers
- Assign personalized call treatments for incoming callers
- Manage contacts using integration capability with Microsoft Outlook® software



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(3)TONE BUSINESS SERVICE — HOSTED IP VOICE SERVICE FOR BUSINESSES

SIGNIFICANT VALUE FOR PARTNERS AND ENTERPRISE USERS

With (3)Tone Business service, you can offer your enterprise customers a low-cost replacement for costly PBX or Centrex service. (3)Tone Business creates greater value for you by:

- Custom branding the service for differentiation
- Allowing faster time to market – add new services on existing networks, today
- Minimizing operational investment – add customers and locations without platform upgrades
- Extending market reach via the extensive Level 3 Network
- Creating a new monthly recurring revenue stream

(3)Tone Business delivers feature-rich, affordable, advanced communications to your end-users by:

- Creating a "National" campus
- Simplifying the user experience through Web-based management
- Saving operating and capital expenses
- Increasing workforce efficiency and productivity

Proven Operating Experience

Level 3 owns and operates a world-class network in North America and Europe. We manage direct connectivity to more than 90% of the U.S. population. Our voice platform is 100% based on IP and has processed hundreds of billions of voice and data minutes.

Level(3)Enabled™ Partner Program

In addition, Level 3 provides sales, marketing, and implementation support for (3)Tone Business services to our Partner Program members. Level 3 is dedicated to ensuring your success and to providing the highest level of satisfaction for your customers. To become a Level(3)Enabled Partner, please go to http://www.Level3.com/voice.

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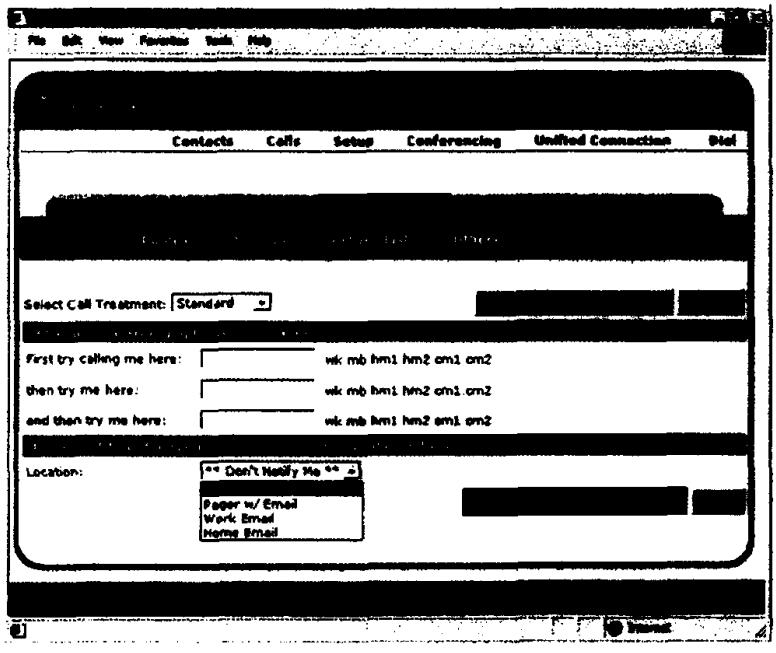

(3)Tone Business Web portal for easy communication management

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HomeTone℠

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RESIDENTIAL VOIP SERVICES FOR WHOLESALE CUSTOMERS

HomeTone service enables Level(3)Enabled™ Partners to offer residential Voice over IP (VoIP) to consumers over the consumers' cable and DSL Internet broadband connections – complete with local phone numbers, E911, call waiting, call forwarding, and many other features. The service will be available in 300 markets by the end of 2004, and approximately 60% of the U.S. population will fall within local reach of the service.

HomeTone service is ideally suited to MSOs (cable operators), ISPs, IXCs, xLECs, enhanced service providers, and other companies looking to offer a cost-effective, high-quality, feature-rich, VoIP phone service to consumers in a low-cost, timely manner with minimal up-front costs.

WHAT YOU CAN OFFER YOUR CONSUMER BASE

With HomeTone service, Level(3)Enabled Partners can offer their broadband Internet end-users:

- A choice between the standard HomeTone offering for unlimited domestic long distance *and* unlimited local service, or the HomeTone Basic option for unlimited local service with low long distance rates.
- Ability to use HomeTone service with any existing analog touchtone telephone
- Freedom from the need for traditional telephone service (their broadband Internet connection – cable, DSL, etc. – is used instead, with or without the computer turned on)
- E911 service for emergency phone calls, with the same routing used by standard telephone service providers
- Local numbers and Local Number Portability (LNP) with Port-in and Port-out capability
- Switching for CLASS 5-type features handled by Level 3

RAPID PROVISIONING AND END USER CUSTOMIZATION

- Level(3)Enabled Partner Portal for fast order entry
- End user Web portal for activating or modifying "find me," "follow me," "click to dial," and call log features

THE TOTAL SOLUTION YOU NEED TO LAUNCH VOIP SERVICE

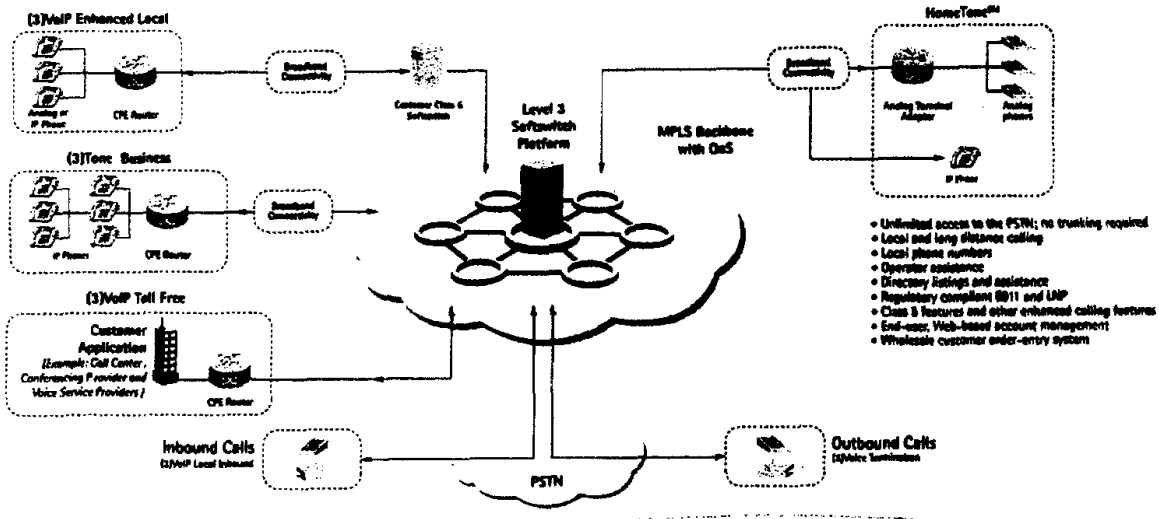
HomeTone is a broadband-agnostic, turnkey VoIP alternative to the residential local and long distance phone service traditionally offered. It offers everything a residential customer would expect from a traditional Plain Old Telephone Service (POTS), and more.

With HomeTone service, you're exempt from having to manage and operate your own CLASS 5-type Softswitch. You therefore require less capital prior to launching your service. You can go to market rapidly by relying on Level 3, but you'll still be able to manage your own end-user billing, end user equipment, and Tier 1 customer service.

TECHNICAL OVERVIEW

- **Coverage:** Provides local phone numbers, LNP, and local trunking to over 2,500 rate centers with local calling. As E911 becomes available, VoIP coverage will be expanded to reach over 300 markets and approximately 60% of the U.S. by the end of 2004.
- **Local network:** Offers low-cost, nationwide access with Level 3's CLEC status in 48 states (with 1.4 million voice-capable trunks).
- **Regulatory compliance:** Meets E911 emergency service and Local Number Portability requirements. CALEA will be supported once federal VoIP requirements are defined.
- **Neutral, wholesale VoIP strategy:** Committed to customer enablement, Level 3 will not compete against our Level(3)Enabled Partners in the retail VoIP market.

LEVEL 3 AND VOIP

Level 3 has proven its VoIP leadership and expertise since 1999, when we introduced (3)Voice® Termination, the industry's first PSTN-quality VoIP service requiring no special dialing by the end user. Our patented, proprietary Softswitch is now processing more minutes per month than many traditional long distance and local carriers.

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