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## (12) United States Patent Lewis

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#### (54) SYSTEM AND METHOD FOR BYPASSING **DATA FROM EGRESS FACILITIES**

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(58)370/401, 349, 352, 389, 392, 468; 379/221, 219, 215, 211, 230, 265, 266; 709/250;

395/114

#### (56)References Cited

#### U.S. PATENT DOCUMENTS

| 4,100,377 A | 7/1978  | Flanagan 179/15 AS          |
|-------------|---------|-----------------------------|
| 4,238,851 A | 12/1980 | Takahashi et al 370/94      |
| 4,569,041 A | 2/1986  | Takeuchi et al 370/60       |
| 4,608,685 A | 8/1986  | Jain et al 370/85           |
| 4,630,260 A | 12/1986 | Toy et al 370/60            |
| 4,630,262 A | 12/1986 | Callens et al 370/81        |
| 4,661,947 A | 4/1987  | Lea et al 370/60            |
| 4,674,082 A | 6/1987  | Flanagin et al 370/60       |
| 4,679,190 A | 7/1987  | Dias et al 370/60           |
| 4,679,191 A | 7/1987  | Nelson et al 370/84         |
| 4,707,831 A | 11/1987 | Weir, deceased et al 370/94 |
|             |         |                             |

(List continued on next page.)

#### FOREIGN PATENT DOCUMENTS

| EP | 0 789 470 A2 | 8/1997 | H04L/12/66 |
|----|--------------|--------|------------|
| EP | 0 794 650 A2 | 9/1997 | H04M/3/50  |
| EP | 0 797 373 A2 | 9/1997 | H04Q/11/04 |

(List continued on next page.)

#### OTHER PUBLICATIONS

Patent Application No. 09/197,203, filed Nov. 20, 1998; Specification and Figures 1-71E from Voice Over Data Telecommunications Network Architecture, Isac K. Elliott et al., along with Preliminary Amendment filed at the U.S. Patent and Trademark Office on Sep. 17, 1999.

The Adax Advanced Protocol Controllers APC-VMEX-VMEbus (visited Mar. 7, 1997) < html document under http://www.adax.com/products/>.

(List continued on next page.)

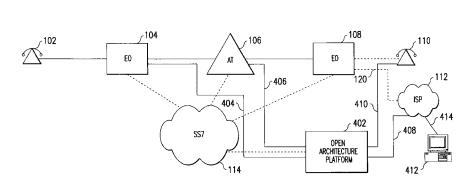
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#### (57)**ABSTRACT**

An open architecture platform bypasses data from the facilities of a telecommunications carrier, e.g. an incumbent local exchange carrier, by distinguishing between voice and data traffic, and handling voice and data traffic separately. An SS7 gateway receives and transmits SS7 signaling messages with the platform. When signaling for a call arrives, the SS7 gateway informs a control server on the platform. The control server manages the platform resources, including the SS7 gateway, tandem network access servers (NASs) and modem NASs. A tandem NAS receives the call over bearer channels. The control server determines whether the incoming call is voice traffic or data traffic, by the dialed number, and instructs the tandem NAS how to handle the call. Voiced traffic is transmitted to a switch for transmission from the platform. Data traffic is terminated at a modem NAS, where it is converted into a form suitable for a data network, such as a private data network or an Internet services provider (ISP). The converted data is sent by routers to the data network. The data network need not convert the data, as the function has already been provided by the platform. In lieu of a conversion, the modems can create a tunnel (a virtual private network) between a remote server and the data network.

#### 11 Claims, 24 Drawing Sheets

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| IIS PATENT          | DOCUMENTS                                       | 5,452,289 A                | 9/1995  | Sharma et al 370/32.1      |
|---------------------|---|----------------------------|---------|----------------------------|
| 0.5. ITHEIV         | DOCUMENTO                                       | 5,453,986 A                |         | Davis et al                |
| 4,715,026 A 12/1987 | Eberspaecher 370/1                              | 5,457,684 A                |         | Bharucha et al 370/60.1    |
|                     | Isreal et al 370/60                             |                            |         | Kruse et al 370/276        |
|                     | Berierle et al 370/89                           | 5,471,470 A                |         | Sharma et al 370/81        |
|                     | Nara et al                                      | 5,479,411 A                |         | Klein 370/110.1            |
|                     | Baran et al                                     | 5,485,457 A                | 1/1996  | Wheeler Jr. et al 379/207  |
|                     | Shimizu   | 5,521,914 A                | 5/1996  | Mavraganis et al 370/60    |
|                     | Closs et al                                     | 5,526,353 A                | 6/1996  | Henley et al 370/60.1      |
|                     | Bergman   | 5,537,403 A                | 7/1996  | Clooman et al 370/60.1     |
|                     | Hemmady et al 370/60                            | 5,541,917 A                | 7/1996  | Farris 370/60.1            |
|                     | Hemmady et al 370/60                            | 5,544,161 A                | 8/1996  | Bigham et al 370/58.1      |
|                     | Read et al 370/60.1                             | 5,544,163 A                | 8/1996  | Madonna 370/60.1           |
| 4,903,261 A 2/1990  | Baran et al 370/94.2                            | 5,544,164 A                | 8/1996  | Baran 370/60.1             |
|                     | Weik 370/60.1                                   | 5,544,168 A                |         | Jeffrey et al              |
|                     | Keeney et al 370/60                             | 5,553,063 A                |         | Dickson 370/29             |
|                     | Kokubo  | 5,568,475 A                |         | Doshi et al                |
|                     | Schreur   | 5,570,355 A<br>5,572,583 A |         | Dail et al                 |
|                     | Hemmady et al 370/60.1<br>Ferenc et al 370/60.1 | 5,572,038 A                |         | Miyahara 379/207           |
|                     | Gordan et al                                    | 5,577,041 A                |         | Sharma et al               |
|                     | Aczel et al                                     | 5,579,308 A                |         | Humpelman 370/58.1         |
|                     | Almond et al 340/825.79                         | 5,590,181 A                |         | Hogan et al 379/114        |
|                     | Farese et al 370/58.1                           | 5,592,477 A                |         | Farris et al 370/396       |
| 5,008,929 A 4/1991  | Olsen et al 379/112                             | 5,592,538 A                |         | Kosowsky et al 379/93      |
|                     | Bales et al 370/60.1                            | 5,594,732 A                | 1/1997  | Bell et al 370/401         |
| 5,018,136 A 5/1991  | Gollub 370/60.1                                 | 5,600,643 A                | 2/1997  | Robrock, II 370/399        |
|                     | Holden et al 370/109                            | 5,600,649 A                | 2/1997  | Sharma et al 370/435       |
|                     | Mozer et al 379/93                              | 5,602,991 A                |         | Berteau 395/200.01         |
|                     | Gavaras et al                                   | 5,604,737 A                |         | Iwami et al 370/352        |
|                     | Kammerl 370/60                                  | 5,608,786 A                | 3/1997  |                            |
|                     | Franklin et al 370/60.1                         | 5,613,069 A                |         | Walker                     |
|                     | Williams et al                                  | H1641 H<br>5,621,727 A     |         | Sharman                    |
|                     | Hopner et al 370/68.1 Tadamura et al 370/110.1  | 5,625,677 A                |         | Feiertag et al             |
|                     | Fujimoto et al 370/94.1                         | 5,631,897 A                |         | Pacheco et al 370/237      |
|                     | Hasegawa 370/60.1                               | 5,640,446 A                |         | Everett et al 379/115      |
|                     | Grant et al 370/58.2                            | 5,650,999 A                |         | Dickson 370/231            |
|                     | Hluchyj et al 370/94.1                          | 5,654,957 A                | 8/1997  | Koyama 370/355             |
|                     | Babson, III et al 379/201                       | 5,659,541 A                | 8/1997  | Chan 370/236               |
|                     | Kay et al 379/207                               | 5,659,542 A                |         | Bell et al 370/496         |
|                     | Hluchyj et al 370/94.1                          | 5,680,437 A                | 10/1997 |                            |
|                     | Rahman et al 370/60.1                           | 5,684,799 A                |         | Bigham et al 370/397       |
|                     | Morgan et al                                    | 5,689,553 A                |         | Ahuja et al                |
|                     | Schmidt et al 370/60.1                          | 5,692,126 A                |         | Templeton et al 395/200.02 |
|                     | English et al                                   | 5,701,301 A<br>5,706,286 A |         | Weisser, Jr                |
|                     | Van As et al                                    | 5,700,260 A<br>5,710,769 A |         | Anderson et al 370/355     |
|                     | Doll, Jr. et al 379/67                          | 5,712,903 A                |         | Bartholomew et la 379/89   |
|                     | Nici  | 5,712,908 A                |         | Brinkman et al 379/119     |
|                     | Tsuchiya 370/60                                 | 5,724,412 A                |         | Srinivasan 379/93.23       |
|                     | Steagall et al 370/58.1                         | 5,729,544 A                |         | Lev et al 370/352          |
|                     | Ohnishi et al 370/60                            | 5,732,078 A                | 3/1998  | Arango 370/355             |
| 5,379,293 A 1/1995  | Kanno et al 370/94.1                            | 5,737,320 A                | 4/1998  | Madonna 370/258            |
| 5,381,405 A 1/1995  | Daugherty et al 370/54                          | 5,737,331 A                |         | Hoppal et al 370/349       |
|                     | Shibayama et al 379/88                          | 5,737,333 A                |         | Civanlar et al 370/352     |
|                     | Yoshida   | 5,740,164 A                |         | Liron 370/316              |
|                     | Blatchford et al 379/229                        | 5,740,231 A                |         | Cohn et al                 |
|                     | Morris  | 5,742,596 A<br>5,751,706 A |         | Baratz et al               |
|                     | Newman  | 5,751,706 A<br>5,751,968 A |         | Land et al                 |
|                     | Hiller et al 370/60.1                           | 5,754,641 A                |         | Voit et al 379/354         |
|                     | Berteau   | 5,764,628 A                |         | Davis et al 370/271        |
|                     | Hiller et al 370/60.1                           | 5,764,736 A                |         | Shachar et al 379/93.09    |
|                     | Hiller et al 370/60.1                           | 5,764,750 A                |         | Chau et al                 |
|                     | Field et al 370/94.1                            | 5,764,756 A                |         | Onweller 379/242           |
|                     | Weisser, Jr 370/58.2                            | 5,777,991 A                | 7/1998  | Adachi et al 370/352       |
|                     | Tung et al 379/202                              | 5,790,538 A                |         | Sugar 370/352              |
|                     | Bowen et al 370/79                              | 5,793,762 A                |         | Penners et al 370/389      |
|                     | Rozman et al                                    | 5,793,771 A                |         | Darland et al 370/467      |
| 5,444,709 A 8/1995  | Riddle 370/94.1                                 | 5,799,154 A                | 8/1998  | Kuriyan 395/200.53         |



| 5 | ,805,587 A |   | 9/1998  | Norris et al 370/352       | WO | WO 97/50277   | A2         | 12/1997  | H04Q/11/04 |
|---|------------|---|---------|----------------------------|----|---------------|------------|----------|------------|
| 5 | ,805,588 A |   | 9/1998  | Petersen 370/356           | WO | WO 98/04989 . | <b>A</b> 1 | 2/1998   | G06F/19/00 |
| 5 | ,809,022 A |   | 9/1998  | Byers et al 370/395        | WO | WO 98/11704 . | A2         | 3/1998   |            |
| 5 | ,809,128 A | * | 9/1998  | McMullin 379/215           | WO | WO 98/13974   | <b>A</b> 1 | 4/1998   | H04L/12/28 |
| 5 | ,812,534 A |   | 9/1998  | Davis et al 370/260        | WO | WO 98/18238   | <b>A</b> 1 | 4/1998   | H04L/12/28 |
|   | ,815,505 A |   | 9/1998  | Mills 370/522              | WO | WO 98/18289   | <b>A</b> 1 | 4/1998   | H04Q/11/04 |
| 5 | ,818,912 A |   | 10/1998 | Hammond 379/94.05          | WO | WO 98/19425   | <b>A</b> 1 | 5/1998   | H04L/12/46 |
| 5 | ,825,771 A |   | 10/1998 | Cohen et al 370/394        | WO | WO 98/19445   | <b>A</b> 1 | 5/1998   | H04M/11/00 |
| 5 | ,828,666 A |   | 10/1998 | Focsaneanu et al 370/389   | WO | WO 98/20701   | <b>A</b> 1 | 5/1998   | H04Q/11/04 |
| 5 | ,838,665 A |   | 11/1998 | Kahn et al 370/260         | WO | WO 98/23067   | A1         | 5/1998   | H04L/12/64 |
| 5 | ,867,494 A |   | 2/1999  | Krishnaswamy et al 370/352 | WO | WO 98/23080 . | A2         | 5/1998   | H04M/11/06 |
| 5 | ,867,495 A |   | 2/1999  | Elliott et al 370/352      | WO | WO 98/26543   | <b>A</b> 1 | 6/1998   | H04L/12/66 |
| 5 | ,881,030 A |   | 3/1999  | Morrow et al 370/337       | WO | 0 851 653     | A2         | 7/1998   | H04M/11/06 |
| 5 | ,881,131 A | * | 3/1999  | Farris et al 379/27        | WO | 0 853 411     | A3         | 7/1998   | H04L/29/06 |
| 5 | ,889,774 A |   | 3/1999  | Mirashrafi et al 370/352   | WO | 0 853 411 .   | A2         | 7/1998   | H04L/29/06 |
| 5 | ,915,008 A |   | 6/1999  | Dulman 379/201             | WO | WO 98/28885   | <b>A</b> 1 | 7/1998   | H04L/12/66 |
| 5 | ,922,047 A |   | 7/1999  | Newlin et al 709/217       | WO | WO 98/30007   | <b>A</b> 1 | 7/1998   | H04M/7/00  |
| 5 | ,933,490 A | * | 8/1999  | White et al 379/221        | WO | WO 98/30008   | <b>A</b> 1 | 7/1998   | H04M/7/00  |
| 5 | ,954,799 A | * | 9/1999  | Goheen et al 709/250       | WO | WO 98/34391   | A2         | 8/1998   | H04M/3/00  |
| 5 | ,963,551 A |   | 10/1999 | Minko 370/356              | WO | WO 98/34399   | <b>A</b> 1 | 8/1998   | H04N/1/32  |
| 5 | ,999,525 A | * | 12/1999 | Krishnaswamy et al 370/352 | WO | WO 98/36543   | A1         | 8/1998   | H04L/12/66 |
| 6 | ,009,469 A |   | 12/1999 | Mattaway et al 709/227     | WO | WO 98/37665   | <b>A</b> 1 | 8/1998   | H04L/12/28 |
| 6 | ,026,083 A |   | 2/2000  | Albrow et al 370/347       | WO | WO 98/37688   | A2         | 8/1998   | H04M/3/42  |
| 6 | ,035,020 A | * | 3/2000  | Weinstein et al 379/93     | WO | WO 98/37688   | A3         | 8/1998   | H04M/3/42  |
| 6 | ,049,602 A | * | 4/2000  | Foladare et al 379/265     | WO | WO 98/12860 . | A1         | 9/1998   | H04M/3/42  |
| 6 | ,061,502 A | * | 5/2000  | Ho et al 395/114           | WO | WO 98/39897   | <b>A</b> 1 | 9/1998   | H04M/1/64  |
| 6 | ,084,873 A |   | 7/2000  | Russell et al 370/352      | WO | WO 98/42104   | <b>A</b> 1 | 9/1998   | H04L/12/28 |
| 6 | ,084,956 A | * | 7/2000  | Turner et al 379/230       | WO | WO 98/42107   | <b>A</b> 1 | 9/1998   | H04L/29/06 |
| 6 | ,091,722 A |   | 7/2000  | Russell et al 370/352      | WO | WO 98/42146   | A2         | 9/1998   |            |
| 6 | ,125,113 A | * | 9/2000  | Farris et al 370/389       | WO | WO 98/47256 . | A2         | 10/1998  | H04J/7/32  |
| 6 | ,134,235 A |   | 10/2000 | Goldman et al 370/352      | WO | WO 98/47256   | A3         | 10/1998  | H04I/7/32  |
| 6 | ,278,707 C | 1 | 8/2001  | MacMillan et al 370/352    | WO | WO 98/51063   | <b>A</b> 1 | 11/1998  | H04M/3/42  |
| 6 | ,324,183 C | 1 | 11/2001 | Miller et al 370/467       |    |               |            |          |            |
| 6 | ,327,258 C | 1 | 12/2001 | Deschaine et al 370/356    |    | OTHER         | PUI        | BLICATIO | NS         |
| - | 220 504 6  | 4 | 1/2000  | C' 1 4 1 250/252           |    |               |            |          |            |

### FOREIGN PATENT DOCUMENTS

1/2002 Civanlar et al. ...... 370/352

6,339,594 C1

| EP | 9 824 298 A2   | 2/1998  | H04Q/11/04 |
|----|----------------|---------|------------|
| EP | 0 829 995 A2   | 5/1998  | H04M/3/00  |
| EP | 0 841 831 A2   | 5/1998  | H04Q/11/04 |
| EP | 0 847 176 A2   | 6/1998  | H04M/3/42  |
| EP | 0 866 596 A2   | 9/1998  | H04M/15/00 |
| EP | 0 872 998 A1   | 10/1999 | H04M/3/50  |
| GB | 2 315 190 A    | 1/1998  | H04L/12/66 |
| JP | 10-23067       | 1/1998  | H04L/12/56 |
| JP | 10-51453       | 2/1998  | H04L/12/28 |
| JP | 10-164135      | 6/1998  | H04L/12/56 |
| JP | 10-164257      | 6/1998  | H04M/11/00 |
| WO | WO 96/08935 A1 | 3/1996  | H04Q/7/24  |
| WO | WO 96/15598 A1 | 5/1996  | H04J/3/02  |
| WO | WO 97/1423 A3  | 4/1997  |            |
| WO | WO 97/14234 A2 | 4/1997  |            |
| WO | WO 97/14238 A1 | 4/1997  | H04L/12/46 |
| WO | WO 97/16007 A1 | 5/1997  | H04L/12/66 |
| WO | WO 97/22216 A1 | 6/1997  | H04Q/7/22  |
| WO | WO 97/23078 A1 | 6/1997  | H04L/12/56 |
| WO | WO 97/27692 A1 | 7/1997  | H04L/12/56 |
| WO | WO 97/28628 A1 | 8/1997  | H04L/12/56 |
| WO | WO 97/29581 A1 | 8/1997  | H04M/11/00 |
| WO | WO 97/31492 A1 | 8/1997  | H04Q/3/00  |
| WO | WO 97/33412 A1 | 9/1997  | H04L/12/56 |
| WO | WO 97/38511 A2 | 10/1997 | H04L/12/64 |
| WO | WO 97/38511 A3 | 10/1997 | H04L/12/64 |
| WO | WO 97/38551 A2 | 10/1997 | H04Q/11/04 |
| WO | WO 97/39560 A1 | 10/1997 | H04M/3/00  |
| WO | WO 97/4673 A3  | 12/1997 | H04M/11/06 |
| WO | WO 97/46073 A2 | 12/1997 | H04M/11/06 |
| WO | WO 97/47118 A1 | 12/1997 | H04M/3/42  |
| WO | WO 97/50217 A1 | 12/1997 | H04L/12/66 |
| WO | WO 97/50271 A1 | 12/1997 | H04Q/7/34  |
| WO | WO 97/50277 A3 | 12/1997 | H04Q/11/04 |

#### OTHER PUBLICATIONS

The Adax Advanced Ptorocol Controllers APC-PCX-PC bus (visited Mar. 7, 1997) <a href="http://">html document under http://</a> www.adax.com/products/>.

Adax Advanced Protocol Controllers APC-EIX-EisAbus (visited Mar. 7, 1997) <a href="http://www.adax.com/products/apc/">http://www.adax.com/products/apc/</a>

The Adax Sbus Advance Protocol Controllers APC-SBX-Sbus (visited Mar. 7, 1997) <a href="http://www.adax.com/prod-">http://www.adax.com/prod-</a> ucts/apc/sbx.htm>.

Kristi An and David Powers, XCOM Technologies Creates Carrier-Class Data Network with Ascend Products (Nov. 18, 1997) <a href="http://www.ascend.com/2495.html">http://www.ascend.com/2495.html</a>.

Ascend DSLTNT Product Information (Ascend Communication, Inc. 1997).

Ascend IDSL Product Information (Ascend Communications, Inc. 1996).

Ascend RADSL Product Information (Ascend Communications, Inc. 1997).

Ascend SDSL Product Information (Ascend Communications, Inc. 1997).

DSC Signs Agreement With Unisys For Intelligent Network Measurement And Monitoring Systems (Jul. 15, 1997) <a href="http://www.dsccc.com/pr071597.htm">http://www.dsccc.com/pr071597.htm</a>.

GeoProbe: The Service Provider's Competitive Advantage (Inet, Inc. 1997).

Tim Green, XCOM Marks The Spot, Network World (Nov. 1997) <a href="http://www.engbooks.com/news/">http://www.engbooks.com/news/</a> press11-3.html>.

Microlegend MS7 SS7 Mediation System (Hewlett-Packard Company 1995).

New Telecommunications Protocols Published (Aug. 5, 1998) <a href="http://www.13.com/press\_releases">http://www.13.com/press\_releases</a>.



Oliver L. Picher, Harnessing The Untapped Information Resources Within The Telephone Network (visited Nov. 25, 1998) <a href="http://corp2.unisys.com/AboutUnisys/PressReleases/1996">http://corp2.unisys.com/AboutUnisys/PressReleases/1996</a>)jan/01085957.html>.

David Powers et al., XCOM Technologies, Inc., "The Data Phone Company," Receives First Round Funding From Battery Ventures & Matrix Partners, (XCOM News Release, Sep. 8, 1997).

Salvatore Salamone, CLEC Seeks ISP Alliances to Expand Coverage, InternetWeek, Nov. 17, 1997, at 18.

Richard Sekar, DSL Modems Fail To Deliver Data Privacy, Electronic Engineering Times, Jun. 23, 1997, at 1.

Selsius System—Home of the IP PBX (last modified Jul. 16, 1998) <a href="http://www.selsius.com/">http://www.selsius.com/</a>.

Septra: The Multi-Protocol Analyzer (Inet, Inc. 1997). Too Much Of A Good Thing? (1996) <a href="http://www.bellcore.com/BC.dynjava?GoodThingEAGeneral-Ex-bulleting-ex-bulleti

changeArticle>.

Trillium™ SS7 Product Group ISDN User Part (ISUP) Portable Software 1000029 (visited Mar. 14, 1997) <a href="http://www.trillium.com/1078029.html">http://www.trillium.com/1078029.html</a>>.

Trillium™ SS7 Product Group Telephone User Part (TUP) Portable Software 1000042 (visited Mar. 14, 1997) <a href="http://www.trillium.com/1078042.html">http://www.trillium.com/1078042.html</a>>.

Trillium <sup>TM</sup> SS7 Product Group Signaling Connection Control Part (SCCP) Portable Software 1000030 (visited Mar. 14, 1997) <a href="http://www.trillium.com/1078030.html">http://www.trillium.com/1078030.html</a>>.

Yang, C.; INETPhone: Telephone Services and Servers on Internet; Apr. 1995; pp. 1–6, Network Working Group., RFC#1789.

"Vocal Tec Introduces Full Duplex in Revolutionary Internet Phone," PR Newswire, Jun. 5, 1995, 2 pages.

"New Vendor Alliance Targets Frame Relay Over ISDN," ISDN News, vol. 8, Issue 6, Mar. 14, 1995, 3 pages. "Cascade sweeps the Internet market, creating a new internet infrastructure core for the world's largest commercial Internet providers; PSINet, UUNET and NETCOM select Casade B—STDX 9000 Switches to overcome the scalability, capacity, Quality of Service and management concerns of exploding Internet growth," Business Wire, Oct. 30, 1995, 5 pages.

"Internet Telephone Companies Racing to Market", Voice Technology & Services News, Oct. 3, 1995, 4 pages.

"Company Develops Telephone/Internet Gateway for International Callers", *Advanced Intelligent Network News*, Oct. 18, 1995, 2 pages.

"IDT Connects Internet Phone Calls to the PSTN," Network briefing, Nov. 3, 1995, 2 pages.

*Voice Over IP (VOIP)* (Copyright 1998) <a href="http://www.netrix.com/whatsnew/voip.htm">http://www.netrix.com/whatsnew/voip.htm</a>, 2 pages.

VocalTec Ensemble Architect –VocalTec Telephony Gateway Series 120 (visited Oct. 26, 1998) <a href="http://www.vocaltec.com/products/vtg/vtg\_overview.htm">http://www.vocaltec.com/products/vtg/vtg\_overview.htm</a>, 1 page.

VocalTec Ensemble Architect –VocalTec Network Manager(visited Oct. 26, 1998) <a href="http://www.vocal-tec.com/products/vnm/vnm\_overview.htm">http://www.vocal-tec.com/products/vnm/vnm\_overview.htm</a>, 2 pages.

VocalTec Ensemble Architect –VocalTec Gatekeeper (visited Oct. 26, 1998) >http://www.vocaltec.com/products/vgk/vgk-thd –overview.htm<, 2 pages.

VocalTec Ensemble Architect –VocalTec Internet Phone Lite (visited Oct. 26, 1998) >http://www.vocaltec.com/products/veaiplite/iplite\_overview.htm>, 2 pages.

NextGen Telcos –By pulver.com (Copyright 1997) >http://www.pulver.com/nextgen/<, 4 pages.

Global Carrier Services – Overview (Copyright 1996, 1997) > http://www.alphanet.net/combine.cgi?content=gcs<, 4 pages.

Press Release —AlphaNet telecom Achieves a New Traffic Milestone and Provides a Status Update on its Telecommunications Business (Oct. 23, 1998) >http://www.alphanet.net/combine.cgi?content=pr/981023<, 2 pages.

The Global Gateway Group Press(copyright 1997) >http://www.gcubed.com/g3press.htm<, 7 pages.

AT&T Products and Services(copyright 1998) >http://www.attjens.co.jp/products/phone/phone\_e.html<, 2 pages.

About Delta Three(visited October 29, 1998) <a href="http://www.deltathree.com/company/company\_body1.asp<">http://www.deltathree.com/company/company\_body1.asp<</a>, 2 pages.

Internet Telephony(visited Oct. 29, 1998) p>http://www/.deltathree.com/company/company\_body7.asp<, 3 pages.

TeleMatrix(Copyright 1997) > http://www.telematrix.co.jp/iphone.html<, 2 pages.

How VIP calling Works(visited Oct. 9, 1998) >http://www.vipcalling.com/how.tml<, 1 page.

About VIP Calling(visited Oct. 29, 1998) >http://www.vip-calling.com/about.html<, 1 page.

VIP Calling First Internet Telephony Company to Deploy DS-3(Mar. 30, 1998) >http://www.vipcalling.com/PR\_VIP-Ds30330.html<, 2 pages.

Gareiss, R., *Voice Over IP Services: The Sound Decision*-(copyright 1998) >http://www.poptel.com/newpop/eng/pages/press/data.html<, 7 pages.

Phone via Internet –and Forget the Computer(visited October 29, 1998) >http://www.poptel.com/newpop/eng/pages/press/heraldtrib.html<, 4 pages.

Interline Telephone Services(copyright 1998) >http://www.interline.aust.com/prodserv.htm<, 2 pages.

What is IP Telephony?(copyright 1998) >http://www.net-workstleephony.com/whatistelphony.html<, 2 pages.

Products (EXICOM)(Copyright 1998) >http://www.exicon.com/products.html<, 2 pages.

Voice/Fax Over IP: Internet, and Extranet: Technology OverviewMICOM Communications Corporation, 52 pages (White paper downloaded form www.micom.com).

Voice Over Packet (VOP) White Paper(copyright 1997) >http://www.telogy.com/our\_products?golden\_gateway/VOPwhite.html<, 12 pages.

Net2Phone Product Information(copyright 1998) >http:net2phone.com/2/english/geningo.html<, 2 pages.

Lucent Techologies and vocalTec Demonstrate Industry's First Interoperable Internet Telephony Gateways over ITXC Network(Sep. 14, 1998) >http://www.vocal tec.com/about/press/pr\_lucnet091498.htm<, 3 pages.

Gates, D., *Voice Phone Over the Internet*(copyright 1998) >http://www.pretext.com/mar98/shorts/short1.htm<, 4 pages.

Aras, C.M. et al., "Real-Time Communication in Packet-Switched Networks," *Proceedings of the IEEE*, vol. 82, No. 1, Jan. 1994, pp.122–139.

Weinstein, C.J. and Forgie, J.W., "Experience with Speech communication in Packet Networks," *IEEE Journal on Selected Areas in Communication*, vol. SAC-1, No. 6, Dec. 1983, pp. 963–980.

A Fundamental shift in Telephony Networks, Selsius Systems, Inc.m Mar., 1998, version 1.0, 28 pages.



Microlegend Internet Telephony Tutorial (lanst updated May 16, 1998) >http://www.microlegend.com/what-it.htm<, 2 pages.

Ascend Product Overview: MultiVoice for the Max–Release 1.0, copyright 1998, Ascend Communications, Inc., 18 pages.

Electronic mail message from 'srctran'to 'prd'regarding "Internet and telephones review document", 1995, 10 pages. Schmit, J., "Talk is cheap in high tech's fledgling market," *USA Today*, Jan. 19, 1996, pp. 1B–2B.

Gordon, J., "Overview of Internet Congestion on the Public Switched Telephone Network," *GR*–303 Integrated Access Symposium, Jul. 30, 1998, 13 pages.

Gracanin, D., "Implementation of the Voice Transfer Over TCP/IP", ITA, 1993, pp. 543–549.

Atai, A., gordon, J., "Architectural Solutions to Internet congestion Based on SS7 and Intelligent Network capabilities," Copyright 1997, Bellcore, 18 pages.

DIALOG File 347 (JAPIO) English Language Patent Abstract for JP 10–51453, published Feb. 20, 1998, 1 page.

DIALOG File 347 (JAPIO) English Language Patent Abstract for JP 10–164135, published Jun. 19, 1998, 1 page.

DIALOG File 347 (JAPIO) English Language Patent Abstract for JP 10–164257, published Jun. 19, 1998, 1 page.

DIALOG File 347 (JAPIO) English Language Patent Abstract for JP 10–23067, published Jan. 23, 1998, 1 page.

\* cited by examiner



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