

Voice Over IP

By Richard W. Boss

Despite the fact that telephone calls are less expensive today than they were before deregulation, budget conscious libraries still seek to reduce their telephone bills so that they can reallocate the money to other priorities. One of the technologies a number of them are considering is Voice over IP, more often referred to as VOIP.

VOIP is a technology that allows one to make telephone calls using a broadband Internet connection rather than a regular telephone line. Initially, VOIP services only connected their own subscribers to one another, but by 2000 they began to offer connection to all users of VOIP services. Interoperability among VOIP services is facilitated by ITU H.323, a standard approved by the International Telecommunication Union for interoperability in audio, video and data transmission as well as VOIP. By 2002, most VOIP services also allowed subscribers to call any conventional telephone number: local, long distance, or mobile.

Calls may be made using a conventional telephone that is connected to a computer—usually a PC-- through an adaptor (approximately \$40); a special VOIP telephone (\$100 or more); or a microphone and speakers or headset (\$40 to \$100 or more) attached to the computer. The technology converts the analog voice signal to a digital one that can then travel over the Internet. If the call is to a conventional telephone, the signal is converted back to analog at the other end. It is possible to use the computer for other applications while talking via a VOIP connection. The computer does not have to be turned on when making calls with a telephone and adaptor or special VOIP telephone, but the Internet connection needs to be active.

All VOIP services offer software that performs the dialing and breakdown of the voice signals into tiny “packets” of digital data. Most offer the adaptor equipment; a few

offer special VOIP telephones; but microphones, speakers, and headsets are not offered because most PC users already have them or can easily obtain them.

The quality of VOIP service is generally equal to or superior to that offered by conventional telephone services. However, there is less redundancy, therefore, it is not uncommon for service to be lost during periods of Internet overload or severe weather conditions. A failure of power to the PC would also lead to a loss of service.

While VOIP is usually less expensive than conventional telephone service because calls to others with VOIP service are not subject to telco access charges, it may be necessary to continue to use conventional telephone service when the VOIP service does not offer directory assistance (411), 911, and other services common to conventional telcos. When these services are provided, there may be a separate charge for them. When 911 service is offered, it may connect the caller to a general number, rather than an emergency number. If 911 service is important, the VOIP provider must be asked whether 911 calls are routed as emergency traffic. This is called enhanced 911.

There is no charge for PC to PC calls within the scope of the service plan a customer selects. However, when a VOIP call is made to a conventional telephone that is not connected to the Internet, the VOIP service must pay a telco for the connection that it provides. The VOIP Service may absorb these costs into its subscription rates or may pass them through to the caller. The typical cost of a domestic call is \$.03 to .05 per minute. International calls outside the scope of the subscription plan are always charged to the caller. International calls cost \$.03 to \$.30 per minute, with the country destination the major factor.

Subscribers who want to support several concurrent users can configure their VOIP service with a router (\$30 or more). The router may be wireless, but wireless routers do not work well in some buildings, therefore, some testing is required before relying on a wireless router for VOIP. Only three major VOIP services (AT&T, Packet8, and Verizon) offered a PBX-type solution as of early 2006.

The rates of VOIP services are not regulated the way telco rates are, therefore, there are great differences among the rates charged by various services. There also are difference in the scope of services. It is important, therefore, to analyze needs and compare services before signing up for service.

There are scores of VOIP services, but only eight appear to have significant market share in North America. As of early 2006, some of these limited their service to residential users. That is expected to change. Two residential VOIP service providers added VOIP business services in 2005 alone, and one did so in January of 2006. Some small businesses subscribe to residential VOIP service in the name of a principal in the business. For that reason, residential or non-commercial rates are quoted.

The rates that are quoted are subject to change. The trend is for high-priced VOIP service providers to lower their rates and for low-priced VOIP service providers to raise their rates.

AT&T (www.att.com/voip) offers two plans for residential users, one for unlimited local and long distance calling for \$29.99 per month and another for unlimited local calling at \$19.99 per month and long distance at \$.04 per minute. International calls are outside the plan. There is no 911 service. A one year contract is required. AT&T provides not only the software, but also the hardware. There is a \$29.99 termination charge, but that is refunded when the hardware is returned. A business service was introduced in the fourth quarter of 2005. Rates are quoted after a potential customer responds to a needs questionnaire. The business rates appear to be higher than those of other VOIP service providers, beginning at more than \$50 per month. AT&T is one of three companies that offers a PBX-type service.

Lingo (www.lingo.com) offers a wide range of plans. The least expensive is a \$7.95 per month plan that limits calls to the Lingo customer base. For \$14.95 a subscriber has 500 minutes for calls to Canada, the US, or any one of 17 Western

European countries. Unlimited calling to Canada, the US, and Western Europe is \$19.95 per month. Business customers pay \$49.95 per month for unlimited calling to Canada, the US, and Western Europe. All of the plans include call waiting, caller ID, call forwarding, online account management, 3-way calling, and last number redial. No contract is required, but there is a \$39.95 termination charge.

NetZero (www.netzero.net) offers an unlimited use plan in Canada and the US for \$14.95. It is limited to residential users. No contract is required and there is no termination charge. The service supports only calls from computers (PC, laptop, or notebook), not from conventional telephones with adaptors. The service includes call waiting, caller ID, voice mail, 3-way calling, and call forwarding. There is a charge for international calls outside the scope of the service plan. The company offers VOIP over dial-up as well as over broadband.

Packet8 offers unlimited US-based calling to residential users for \$19.99 per month--a rate that more than doubled from the \$9.99 rate it offered at the beginning of 2005. Business users, including libraries, pay \$39.99 per month for unlimited calling and \$34.99 per month for 2,000 minutes per month. There is an international service package that offers unlimited calling to select countries for \$49.99 per month. Other international calling is charged separately. There is a \$29.99 activation fee, but no annual contract is required. The equipment is free. All plans include caller ID, call waiting, call forwarding, voice mail, and 911 service in the base rate. Packet8 offers an office PBX replacement system called the "Virtual Office" and Videophone service (unlimited at \$19.99 per month). Packet8 usually has promotions that reduce the costs quoted herein.

Skype (www.skype.com) is one of the best known VOIP services because it was one of the earliest entrants in the market. It has subscribers all over the world. The service was initially limited to PC to PC communication, but now extends to conventional telephones worldwide. The software is available for downloading at no charge. There is no activation charge, but there is a base subscription price of \$15 per year. PC to PC calling is free and unlimited. There is a "pay-per-call" charge for PC to

conventional phone connections. At \$.23 per minute, the rate is higher than that available from many long distance companies. An optional voice mail service is available for \$15 per year. Skype has users set up a deposit account using a credit card so that it does not have to prepare monthly bills. Another optional service allows one to purchase standard telephone numbers in various cities so that conventional telephone users can call the VOIP subscriber without incurring long distance charges. That service costs approximately \$30 per year.

SunRocket (www.SunRocket.com) offers only residential service at \$24.95 per month for unlimited calling. Annual prepayment reduces that rate to \$199.00 or \$16.60 per month. The adaptor is provided at no additional charge. The service includes caller ID, call waiting, call forwarding, enhanced voice mail, and distinctive ringing within the base subscription price. Two free directory assistance calls per month are included. There is a charge for international calling. The company offers a cordless phone system that can connect up to four handsets to the adaptor.

Verizon's (www.verizon.com/voicewing) residential VOIP service is called VoiceWing. It offers two plans, one an unlimited calling plan at \$29.95 per month (down from \$34.95 per month at the time of its introduction) and another offering 500 minutes a month for \$19.95 per month. There is a \$39.99 activation fee. The contract, which is for one year, requires a customer to set up a deposit account for extra services. This account is debited when long distance or international calls are made to conventional telephones. There is a \$19.95 early termination charge during the first year

The merger of Verizon and MCI led to the creation of a separate division called Verizon Business built around the former MCI company (www.verizonbusiness.com). As of early 2006, the division rolled out a comprehensive VOIP service called Verizon VOIP. It includes a plan for small to mid-size organizations called IP Flexible T-1. It combines local and domestic long distance with data services at a fixed monthly rate that is quoted on request. Rates appear to be comparable to those quoted by AT&T, typically \$50 and more per month. Customers can dynamically allocate bandwidth to data or

telephone traffic. PBX support is available. All plans include director assistance and enhanced 911 service access.

ViaTalk (www.viatalk.com) offers an unlimited plan for US customers at \$15.99 per month (down from \$22.95 per month in 2005). For \$9.95 per month it supplies 500 minutes. Business customers pay \$35.95 for unlimited minutes or \$29.95 for 1500 minutes. No contract is required, but there are significant discounts for 24-month contracts. All plans include caller ID, call waiting, and call forwarding. Calls to other countries are charged on the basis of destination and length.

Vonage (www.vonage.com) is believed to be the largest vendor of VOIP services in the world. It has more than one million customers. It offers both residential and business services. The former cost \$14.99 and \$24.99 per month depending on whether one has 500 minutes in Canada and the United States America or unlimited worldwide service. The small business service is \$49.99 per month for unlimited calling and \$39.99 for 1500 minutes of calling in Canada and the United States. There is a \$29.99 activation charge. The \$39.99 termination charge is refunded upon return of hardware. All plans include caller ID, call waiting, voice mail, and 911 service within the standard rates.

There is another company in the VOIP market that warrants mention, *Vocera* (www.vocera.com). It combines wireless LAN (802.11b), VOIP, and speech recognition technologies to enable mobile workers within buildings or campuses to communicate with one another using wearable badges. The badges weigh only two ounces each. The badge is controlled using natural spoken commands. To initiate a call, the caller merely says "call Sally Smith," or "conference Sally Smith and Dan Jones." When a live conversation is not necessary, a text message can be sent to the LCD screen on the back of another person's badge. The company quotes prices for its product on request.

The VOIP services industry is changing rapidly. It is, therefore, a good idea to access the Websites of the foregoing vendors for a current comparison of services and rates.

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