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**AFFORDABLE IT :** VoIP FOR SMBs

# CHEAP TALK

A hosted IP PBX can deliver affordable VoIP to your small or midsize business

**BY SEAN DOHERTY**

» Voice over IP is receiving a lot of attention lately. Enterprises are looking to upgrade their TDM (Time Division Multiplexing) PBX switches to IP PBX switches to save money on toll and access charges for local and long-distance calling. They also want to integrate voice with data to streamline business processes across one IP network.

But what about SMBs (small to midsize businesses) that lack the resources to buy IP PBX switches? If they host their own systems, they must devote resources to set up, configure and maintain an on-site IP PBX.

The solution is the hosted IP PBX, which delivers VoIP services to subscribers with all the same cost reductions and improved business processes, and the clients need not be tied to the switch. The architecture of a hosted IP PBX is much like a Centrex system or KTS (Key Telephone System), with one main difference: A service provider rather than a local phone company provides switching along with the gateways to the PSTN.

In a hosted IP PBX environment, a subscriber uses the broadband IP network as a telephone as well as a data service, without the management and overhead of owning a telephone switch. CPE

(Customer Premise Equipment) for VoIP services only requires IP phones or analog-to-digital converters for analog phones.

With new VoIP premise-based and hosted services on the rise, the TIA (Telecommunications Industry Association) predicts a reduction in Centrex, KTS and conventional TDM-based PBX lines through the year 2008.

To assess this prediction, we created CollectIT, a fictitious debt-collection service based in Metropolis. The small business currently uses a Metropolis Monopoly KTS with 25 dedicated phones. CollectIT also has a broadband cable network supplied by Metropolis Media with business-class service—3 Mbps downstream and 512 Kbps upstream. It only uses the broadband connection for Internet searches to find delinquent debtors. CollectIT has been hearing all the vendor hype about how VoIP over broadband for residential services can drastically reduce phone bills, and

it's wondering about the availability of a business-class VoIP service over broadband using cable or DSL technology.

To help CollectIT explore its options, we invited 10 vendors that supply VoIP services for SMBs using a hosted IP PBX solution—one not tied to their own broadband networks, such as a regional carrier or a local cable company—to participate in tests at our Real-World



Labs® at Syracuse University.

Covad Communications, 8x8 and Velocity Networks signed on. Each could use CollectIT's current broadband provider. Nuvio was interested in participating but did not respond to our survey in time. Sunrocket and Vonage have no VoIP program for SMBs, and AT&T and Verizon Communications have no VoIP services for SMBs over DSL. Broadview Networks bundles its VoIP services with its leased T1 lines, and while it recently signed an agreement with Verizon to provide VoIP services off its network, it was too late for this review. And Lingo responded long after our testing was completed.

We sent each participant a survey to see what's in store if the TIA's VoIP prediction is accurate. We focused on features (see chart on page 3) and price, but we were also concerned about QoS (quality of service) for voice calls.

Covad and Velocity Networks have QoS strategies, but they only apply if the broadband service is bundled with the VoIP service. Their end-to-end QoS between the phones and the hosted IP PBX switch does not work on another provider's broadband network.

When you choose an agnostic VoIP service over a broadband cable network, end-to-end QoS will not be part of the equation. In the case of cable, the network is a shared medium, rate-limited by the provider, who may offer a QoS strategy with its own bundled VoIP service, but will not support another provider's QoS scheme. Do the math: Calculate the number of phone extensions and the bandwidth requirements per call.

Most VoIP calls use 90 Kbps (G.711 codec) for high quality, but you can get by with a lot less bandwidth using the G.729 or G.729 Annex A codec. The G.729 codecs use 30 Kbps of bandwidth with some additional overhead from the IP protocol. All the products we tested support G.729 using either MGCP (Megaco Protocol) or SIP (Session Initiation Protocol) signaling. So CollectIT would not have any immediate worries about bandwidth provisioning on its business-class cable service—all CollectIT's phones could be in use simultaneously on its broadband connection. But a cable provider's best efforts may not be sufficient to replace PSTN-quality calls. CollectIT may temper its forklift upgrade from a KTS to a VoIP service by staging a VoIP pilot and assessing the outcome. But we went full speed ahead.

### Virtual Chase

None of the participants offer encryption with their VoIP services. If you must secure voice packets, you may have to go it alone with a

cryptographic module on the switch and phones. However, all do provide secure access to their management portals for account and call management.

Each vendor also supplies a Web portal to manage accounts and configure individual extensions. These portals provide GUI utilities for admins to engage moves, adds and changes to extensions. For users, it's easy to configure telephony services and quickly adopt new and sophisticated phone services. All in all, each vendor provides a feature set you'd expect to find in mature IP PBX switches—from three-way calling to Call Park (putting a call on hold to retrieve at any location), to complex Find Me, Follow Me algorithms—but the basic packages vary.

For account and call administration in our tests, each vendor provided an unlimited calling plan to dial numbers in the United States and Canada, as well as virtual numbers for clients or customers to call CollectIT using a local number. Velocity's package, however, included virtual numbers as an add-on. Also, both 8x8 and Velocity Networks could continue CollectIT's three- or four-digit extension dialing plan, and Covad and Velocity included account and authorization codes for billing and accounting, while 8x8 was silent on the matter.

8x8's package included an operator's console, Velocity Networks offered it as an add-on, while Covad did not offer it at all. Covad did, however, include ACD (automatic call distribution) in its deal, while Velocity made it an add-on, but you can get the same results using hunt groups (multiple extensions grouped by equivalents tasks, such as the next available customer service agent picking up a call) supported by all the vendors.

Covad, 8x8 and Velocity Networks address network outages coming and going. In coming, each sets up their IP PBX switches in failover modes within fully redundant data centers. In going, each VoIP service lets users configure their phones and route calls to an alternate VoIP phone, a PSTN phone or their cellular service if the Internet connection goes south.

As for E911 initiatives, each of our participants has a plan to address the Federal Communications Commission's requirement that VoIP providers supply enhanced 911 emergency calling capabilities. For 8x8's Virtual Office, each extension has a unique 911 dialing plan, and the vendor passes on E911-compliant information for every emergency call. Covad uses a third-party turn-key solution. Velocity Networks rebrands Broadsoft's Broadworks solution and relies on its E911 support.

## REAL-WORLD LABS® REPORT CARD: VoIP FOR SMBs

	8x8 Packet8 Virtual Office	Velocity Networks Hosted PBX	Covad Communications vPBX Voice Service
<b>FEATURE SET (30%)</b>	5	4	4
<b>PRICE (30%)</b>	5	4	3
<b>CALL ADMINISTRATION (20%)</b>	3	4	5
<b>CALL MANAGEMENT (20%)</b>	4.5	4.5	4
<b>TOTAL SCORE (100%)</b>	4.50	4.10	3.90

A≥4.3, B≥3.5, C≥2.5, D≥1.5, F<1.5  
A-C GRADES INCLUDE + OR - IN THEIR RANGES. TOTAL SCORES AND WEIGHTED SCORES ARE BASED ON A SCALE OF 0-5.

A-

B+

B

**FEATURE SET:** overall feature set for base package

**PRICE:** monthly subscription rate, features-price ratio

**CALL ADMINISTRATION:** account management (accounts, codes), Web-based portal

**CALL MANAGEMENT:** features applicable to call management and routing

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At the finish line, 8x8's Packet8 Virtual Office took our Editor's Choice award for its rich feature set and low subscription price. Like Covad, 8x8 uses MGCP signaling and supports the G.729 codecs. Second-place finisher Velocity Networks focuses its service on SIP signaling and support for both G.729a and G.711 codecs.

**8x8 Packet8 Virtual Office** Although it doesn't have as strong a feature set for account administration, Packet8 offers



the best tools for call management of the products we tested and includes an operator's console and preprogrammed phones at the lowest subscription price of \$1,066 per month.

The extensions (phones) come in three flavors: unlimited calling, metered calling and virtual extensions. The first two options speak for themselves. Since CollectIT would use the phones heavily in the U.S. and Canada, we went with the unlimited extension option. Our fictitious managers do not want to micromanage the call minutes by user. Also, CollectIT passed on the virtual extension, which allows a caller to select a dedicated extension (not tied to any phone in the office) from the auto-attendant. The dedicated extension can provide voice instructions for directions, for instance, and can be forwarded to a PSTN line for 3.9 cents per minute.

The unlimited extension option weighed in at \$39.95 per phone, per month. The start-up costs are \$156.95 per phone. For CollectIT's 25 extensions, the total cost for equipment, shipping and activation was \$4,990. That includes the first month of unlimited local and

long-distance calling with a ton of features, along with business-class voicemail. The monthly service costs \$1,066 (including fees and taxes)—not including international calls.

Unlike the other participants, 8x8 is not an ISP and does not offer a bundled broadband connection with a VoIP service—it is truly agnostic in regard to the broadband provider. Despite its third-party nature, 8x8 provides a measured service and tracks the quality of all calls between the switch and the extension. But in the event of call degradation, it would not be able to prioritize traffic between the switch and the extensions.

To get started, CollectIT must buy at least three analog business phones (RJ-11 connectors) from 8x8 for \$99 apiece. The phones come with adapters to convert analog signals to digital and transmit calls over IP. If you need more than that, you can buy them



from 8x8, use your own existing phones with an adapter or an IP phone from another vendor. There are a number of advantages to buying 8x8's phones: Troubleshooting system problems, for instance, is easier if the phones are familiar to the support team, and these phones will offer the full feature set, which generic phones may not support.

Although any analog phone can be used, 8x8's phones come with preprogrammed soft keys that enable a standard feature set for end users. Although these phones are not from the likes of Cisco and Polycom that Covad and Velocity support, little training is

## VoIP FOR SMBs FEATURES

	8x8 Packet8 Virtual Office	Velocity Networks Hosted PBX	Covad Communications vPBX Voice Service
<b>3- or 4-digit extension dialing</b>	Y	Y	Y
<b>3-way calling</b>	Y	Y	Y
<b>Account codes</b>	N	Y	Y
<b>ACD (Automatic Call Distribution)</b>	N	N <sup>1</sup>	Y
<b>Authorization codes</b>	N	Y	Y
<b>Auto attendant</b>	Y	N <sup>1</sup>	Y
<b>Call forwarding</b>	Y	Y	Y
<b>Call last party called</b>	Y	Y	Y
<b>Call park/call pickup<sup>2</sup></b>	Y	Y	Y
<b>Call waiting</b>	Y	Y	Y
<b>Caller ID</b>	Y	Y	Y
<b>Conferencing (conference bridge)</b>	Y	Y	Y
<b>DID (Direct Inward Dialing)</b>	Y	Y	Y
<b>Distinctive ring tones</b>	Y	Y	Y
<b>E-911 compliance</b>	Y	Y	Y
<b>Find Me, Follow Me</b>	Y	Y	Y
<b>Hunt groups</b>	Y	Y	Y
<b>International calling plans</b>	Y	Y	Y
<b>Local time-zone management</b>	Y	Y	Y
<b>Music on hold</b>	Y	N <sup>1</sup>	Y
<b>Operator's console</b>	Y	N	N
<b>T.38 Fax over IP</b>	N	Y	N
<b>Blind transfers</b>	Y	Y	Y
<b>Managed transfers</b>	Y	Y	Y
<b>Virtual numbers<sup>3</sup></b>	Y	N <sup>1</sup>	Y
<b>Voicemail</b>	Y	Y	Y
<b>Web-based management portal for accounts, plans, extensions</b>	Y	Y	Y

Y=Yes, N=No <sup>1</sup>Add-on products to the base package. <sup>2</sup>Pick up parked phone from another location. <sup>3</sup>Callers dial a local, rather than a long-distance number.

needed to operate them. The soft keys provide ready access to voice-mail and let users configure options easily. For example, soft keys enable and disable DND (Do Not Disturb), set and cancel call forwarding and provide a fast path to the conference bridge.

8x8 supplies a full-featured conferencing bridge to use with Virtual Office extensions and outside callers. An unlimited number of conference calls can be scheduled and simultaneously held at no extra cost. Also, the service provides automatic e-mail and voice-prompt confirmations of conference bridge reservations.

**Packet8 Virtual Office, \$4,990. 8x8, (866) 879-8647.**  
[www.packet8.net](http://www.packet8.net)

**Velocity Networks Velocity Hosted PBX** Velocity Networks came in second because of its higher subscription and start-up costs.

**B+** It includes the venerable Polycom SoundPoint IP phones, account and authorization codes for billing and accounting, as well as Microsoft Outlook integration, but its call-management feature set was not as strong as Packet8's, and its console attendant software was an add-on to the base package.

With its SIP signaling and SIP-supported IP phones, the Velocity Hosted PBX is at the cutting edge of technology. It supports the FoIP (fax over IP) T.38 standard laid down by the ITU (International Telecommunications Union) and provides a Web alternative to manage incoming and outgoing calls using Comm Pilot Call Manager.

The Comm Pilot includes Outlook integration, but would require CollectIT to buy "Gold seats" (licenses) that costs \$64.95 per month, per extension. Even the Bronze seat at \$49.95 per month, per extension is more than 8x8's Virtual Office unlimited extensions at \$39.95 per month, per extension. Both the Gold and Bronze seats include unlimited calling in the United States and Canada, voice-mail and DID (Direct Inward Dialing) support, like the others, but Velocity does not provide free virtual numbers to enable callers to dial a local number. This is not a great concern for CollectIT—not many people are inclined to call a collection agency back—but it might be a big problem for some small businesses.

Velocity's VoIP service supports the 25 extensions in CollectIT's office using the existing broadband solution. It also was willing to review the existing broadband connections. For example, it might suggest installing a Cisco router to priority-tag voice packets so they can be forwarded without loss if there is congestion. Without QoS enforcement on the external broadband network, this strategy only works forwarding the packets from the internal router—that's why Velocity would recommend that CollectIT lease its T1 line. With the full-duplex 1.54-Mbps connection, CollectIT would not have to worry about bandwidth constraints, but the higher-quality, dedicated bandwidth of a PVC or T1 would cancel out the benefits of a low-cost cable solution.

Velocity can use analog phones and adapters just like Packet8, but it would recommend IP phones, specifically the SoundPoint IP 501 Desktop Phone. At an estimated cost of \$202 per phone, the SoundPoint IP 501 comes with a 160x80-pixel LCD display that shows multiple line appearances and facilitates local three-way conferencing. The IP phone has 18 dedicated hard keys and four context-sensitive soft keys. It also has PoE (Power over Ethernet) IEEE 802.3af support so you don't need to plug in an extra power supply on the desktop. Although this cost is well over the \$99 per phone supplied by 8x8, these phones would give CollectIT personnel an expert edge in their collection work, but it would take more time to get up to speed than with an analog phone.

Velocity, like the other two participants, provided a conference

bridge in the base package. There's an additional cost of 6 cents per minute, per user for local calls and 13 cents per minute, per user for toll-free calls to the bridge. The Web portal sets up, manages and monitors conferences. Velocity uses SSL and password protection for conferences and includes support for audio and Web conferencing as well as Web collaboration. The package also includes PIM (Personal Information Management) integration, standard reporting, and recording and playback of individual conferences.

The start-up costs for Velocity were \$5,050, which exceeded 8x8 and Covad because Velocity included the cost of IP phones in its estimate. In fact, the IP phones were the only start-up and nonrecurring costs in Velocity's quote—Covad ignored the cost of phones and 8x8 went with analog phones. The auto-attendant costs an extra \$21.99 per month. With Bronze seats, the total monthly subscription rate is a midland \$1,285.74.

**Velocity Hosted PBX, \$6,345. Velocity Networks, (800) 626-6515.** [www.vel.net](http://www.vel.net)

**Covad Communications vPBX Voice Service** Covad trailed 8x8 and Velocity, but not by much. Like Velocity, Covad has strong

**B** account-admin tools, but fell short on features and price. And it did not recommend or quote a phone for us.

Covad uses a nifty Web dashboard for phone configuration and call management. Like Velocity's Comm Pilot, the dashboard integrates with Microsoft Outlook contacts. You can use it to visually track voicemail, configure Find Me, Follow Me rules, schedule conference calls and even engage in Instant Messaging chats.

Phone options were left open for CollectIT. Covad includes the option to use analog phones and adapters like 8x8, but without Packet8's preprogramming support. It also has a list of IP phone support that includes the Cisco 7940 and 7960, the Polycom SoundPoint IP 500 and the Swissvoice IP 10S VoIP phones. The phone options translated to a range of \$150 to \$350 in greenback. Any way you cut that, Covad's \$1,485 monthly subscription cost for vPBX does not beat Velocity's monthly subscription of \$1,285.74.

Covad VoIP charges per seat and includes both per-minute and flat-rate pricing. Per-minute pricing ranges from 25 cents to 45 cents based on volume, plus \$26 to \$32 per extension, per month. CollectIT preferred flat rates, which range from \$34.95 to \$54.95—depending on the number of stations—with unlimited local and long-distance calling. As with the others, international dialing was an additional cost.

Like Velocity, Covad would like to bundle its VoIP service with its broadband service to ensure call quality with QoS. Without that, CollectIT may just be talking in the wind. With its leased T1 line and SDSL (Synchronized Distributed Service Line), Covad can provide end-to-end QoS with VOA (Voice Optimized Access) by separating voice from data traffic and giving voice priority tagging when forwarding through routers and switches. But on another provider's network, the best it can do is, like the other vendors, make its best effort with no guarantees.

**vPBX Voice Service, \$2,685 without phones.**

**Covad Communications, (408) 952-6400.** [www.covad.com](http://www.covad.com) 

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