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Solving VoIP Problems

Take The Crackle & Pop Out Of VoIP Calls

VoIP has come a long way since a decade ago when dropped calls were common and callers sounded like they were talking with a mouthful of Rice Krispies. No longer is VoIP a pure trade-off of quality for savings.

VoIP offers advantages beyond reduced long-distance costs. For many small to midsized enterprises, the ease of moves/ adds/changes is a major selling point. Workers simply unplug their phones from one cubicle and move to another. Fiddling in the telecom closet is no longer required for configuration.

Still, VoIP can have annoying glitches. Several experts maintain you can avoid those problems with a bit of practical engineering when the network is set up and some good monitoring once things are running.

According to Niel Levonius, senior product marketing manager at Alti-Gen (www.Processor.com/AltiGen), the simplest way to maintain VoIP quality is to ensure that switch and router QoS settings are configured properly. "IT managers should continually monitor the data traffic on their network to ensure ample bandwidth is always available," he says.

"It is a very different world with voice on the network," says James Messer, director of technical marketing at Network General (www.Processor.com/NetworkGeneral).

"Dropped calls are an issue everyone struggles with; even mobile markets are concerned about dropped calls," Messer notes. For decades, the five-nines reliability of the PBX-dominated voice network was standard. Email might get slow, the Internet might be down, but people expect voice calls to continue, even in the face of disaster. Today, VoIP networks struggle to achieve two-nines reliability. The reality on many VoIP networks is in the 97% area.

"A good metric for voice is no dropped calls," Messer says, adding that such a goal is not realistic on today's VoIP networks. "Expectations for voice will change. We are training ourselves to have different expectations of the digital world." Users will redefine "acceptable" and "typical."

Messer says a good place to start any VoIP project is with a baseline network study.

"Then implement some level of QoS," he says. "There is no one, single, best way to do

it—VoIP requires a lot of customization.” But the baseline study is vital; some vendors will not install VoIP equipment without it.

■ Making It Work

Messer says VoIP typically works better in a smaller organization. Banks, for example, put VoIP into their branches but reserve the more reliable PBX-based services for vital functions such as the customer call center at headquarters.

Many VoIP problems can be controlled. Others, especially in a distributed environment, are beyond IT’s scope. “If the same problem happens every day, it will affect the company’s ability to do business,” Messer warns.

Levonius says handling the problem of dropped calls depends on the environment. “For internal LANs, use QoS-enabled Ethernet switches,” he says. “Avoid using small, unmanaged ‘dumb’ hubs.” He also notes that a basic check to be sure LAN cables are properly wired might solve problems.

For branch offices, Levonius suggests subscribing to a VPN service with SLAs (service-level agreements) from the ISP to guarantee service quality. Another fix is simple but often overlooked. “Configure your router and firewall to prioritize voice traffic,” he says.

Dropped calls from remote users connecting through the public Internet are another common area of complaints. Handle that by having users subscribe to reliable, high-bandwidth services. Levonius also advises, “Use lower bit rate codecs.”

All of this is predicated on understanding how to adjust bandwidth and using VoIP the right way, Messer says. He notes the success of Skype and GoogleTalk. “They are crystal clear,” he says, adding that such services will change everyone’s expectations of VoIP.

■ Smoothing The Crinkle

Another common complaint with VoIP is the annoying cellophane crinkle sound that pops up now and then. Levonius says one way to reduce that problem on an internal LAN is to make sure the local network has QoS implemented on switches and routers. “Find the source of network congestion and segment it to a different LAN if necessary,” he says.

For branch offices, provision bandwidth control and make sure the overall simultaneous VoIP calls do not exceed the available bandwidth. Solving the dropped-call problem for users connecting through the public Internet often will solve the crinkly sound problem they report, too. Again, subscribing to reliable, high-bandwidth service and using a lower bit rate codec helps.

Because there is less control over QoS and bandwidth with mobile units, they are more susceptible to poor call quality. “VoIP is a real-time application where the voice must be played at precise time,” Levonius notes. “Variation in network delay may affect the voice quality, and hence a jitter buffer is implemented to offer a window to accommodate network delay variations.” Echo is another problem for voice quality, he adds. An echo cancellation algorithm must be used for every VoIP voice stream.

“Voice is driving the IT environment and changing the way businesses look at their IT goals,” Messer says. He notes the integration of traditionally voice and traditionally data

people into one group. “You no longer have silos. The network and the applications people, the WAN specialists and server teams are all working together due to VoIP.”

Part of the solution is knowing what caused a problem in the first place. Network General’s stream-to-disk technology called InfiniStream lets IT narrow a problem down to the offending packet that caused a call to be dropped.

AltiGen’s implementation lets network administrators tag voice packets so network switches and routers can treat these packets as higher priority than regular data packets. This minimizes delay and packet loss in the networks.

Levonius says there are a host of benefits to VoIP, including simplified, consolidated wiring to the desktop. “You get more productivity features, like showing user presence, voicemail, and call center workgroup real-time status on the VoIP phone,” he notes. Yet all of these benefits come with a price.

“People eventually will realize that voice is voice. It is a commodity,” Messer says. The quickest technical fix is to understand what is happening with the network and its bandwidth. “Understand how to adjust bandwidth and use VoIP the right way,” he continues. “Solve the problems on the back end first.” That means not allowing any application to hog all of the bandwidth. Queue traffic, giving high priority to voice. ■

by Curt Harler

VoIP Doubles Worldwide

VoIP subscriber numbers worldwide more than doubled last year, from 19 million to 40 million, according to the latest research from Point Topic. John Bosnell, senior analyst at the research firm, says Japan led the pack at the end of 2006 with 13.75 million VoIP subscribers. The United States followed with 8.9 million subscribers, and France was third with 6.6 million.

“If you add in the PC-to-phone and PC-to-PC clients like Skype, we estimate the global number is over 50 million regular VoIP users,” Bosnell says. The company’s statistics do not include calls carried over an IP-VPN from one business site to another site of the same business.

One factor holding back VoIP deployment in many countries is the regulatory climate, even in advanced countries. Bosnell says, “For example, VoIP is regulated in a variety of ways in the developed world. Many countries, such as Japan, the USA, France, and Sweden, have adopted a liberal approach; some countries continue to consult on how best to regulate it, and VoIP is even illegal in some developing countries.”