

# Cost Control And Converged Networks

Robert Lee Harris

**Whether you charge back every single packet and port, or bill it all to IT, you'll probably wind up paying more attention to invoice management once your network runs voice and data together.**

One of the early PC-based call accounting programs had a demo disk that also included a little game called "Catch the Falling Dollars." Telemangement vendors of that era—when domestic long distance rates were 30 cents per minute or more and overseas calls even higher—claimed that employees would stop making unauthorized calls if they thought that a call accounting system had been installed.

That marketing claim may have been a bit exaggerated, but the systems did make it easier for office managers and phone system administrators to play "phone cop." There was no need to get personal about it: Send usage printouts to the department managers and let them handle the enforcement. Big savings could be had for a relatively small investment and soon nearly everyone was "catching the falling dollars."

Getting individual employees to curtail their personal use of expensive long distance was the first justification for call accounting systems. Since then, carriers have introduced much lower prices and package deals for voice calling, but enterprises continue to use call accounting to validate these charges and to look for patterns of excessive calling.

Beyond call accounting, telemangement vendors have tried to market additional functions to help enterprise customers manage equipment and wiring inventories, change order processes and service provider billing invoices. Customers have shown less interest in the detailed usage, invento-

ry and change order management solutions than they have in invoice management, especially as billing problems increase and voice over IP (VOIP)/network convergence projects loom.

Few enterprises have fully converged their voice and data networks yet, but when and if they do, their interest in charging back VOIP and other application usage will depend less on convergence itself and more on the kinds of billing invoices they will get for these services. Cost control probably will take priority over detailed chargeback when they need to validate a single bill for what used to be separate voice and data charges.

In the meantime, invoices for existing services are becoming more problematic, and most customers, whether planning for convergence or not, are taking a greater interest in cleaning up their bills and managing their costs.

## How Carrier Billing Drives Telemangement

For example, a client recently justified implementing an invoice management system based on a savings of less than 5 percent per month—around \$50,000—by detecting and correcting recurring errors on hundreds of carrier bills. It's a fact of life that these bills are fraught with errors, including inappropriate late fees, unauthorized or non-contract long distance charges and incorrect circuit charges (see *BCR*, June 2004, pp. 66–65).

Moreover, since the divestiture of the Bell System, companies have sprung up that simply game the carrier billing system, by assessing and collecting money for excessively-priced long distance charges. They count on eluding corporate customers long enough to make money—at least until complaints about them surface at the FCC and they are shut down.

The number of billing errors on data circuits and services tends to be fewer, but they are usually much more expensive. For example, a client with a 13-site frame relay network relocated a branch office a few years ago. After the move, the carrier continued to bill for service and equipment at both the old and new locations for nearly a year before the customer detected the error. This kind

---

Robert Lee Harris is president of Communications Advantage, Inc., a telecommunications consulting firm, specializing in strategic technology acquisition and implementation. He is a member of the Society of Telecommunications Consultants and can be reached at robert.harris@comadvantage.net

of duplicate billing, and continuing to bill for disconnected services, are the two most common data invoice errors.

As customers substitute VOIP for traditional PSTN calling and converge their voice and data networks into IP-VPNs, billing issues and invoices will become more complicated. The latest VPNs can carry multiple traffic types—voice, video, various types of data—on the same service, and they can have multiple service level agreements (SLAs) for the different types. Throw wireless LANs and cellular traffic into the mix, plus the ability to roam between them, and you could have some very confusing billing and cost modeling scenarios.

Consider the Motorola/Avaya/Proxim jointly-developed wireless LAN (WLAN) solution scheduled to debut this September. It will give users the ability to initiate a call from their extension off an Avaya PBX, which will travel over the Proxim Orinoco WLAN, and can be transparently handed off when out of WLAN range to a cellular network equipped with Motorola Mobility. There are three or four potential costs for this type of solution:

- Calls from the WLAN, through the PBX and out to a PSTN destination or over a tie line to another enterprise site will be captured as a traditional SMDR (station message detail record).
- Calls from the WLAN over the corporate data network or VPN would have no direct cost and would not necessarily be tracked, depending on the customer's view of VOIP usage.
- Calls from the cellular network back to the enterprise would appear on the cellular bill.
- Calls that begin over the WLAN and switch to cellular mid-call, or vice versa, would be partially billed by the mobile carrier, if the product works as advertised.

How will enterprise customers handle these new cost and billing challenges? Some may follow the traditional voice long distance model, charging converged network usage back to departments or individuals.

#### **Usage-based Charge Back**

"We want to get closer and closer to real costs," said David Samuels, global voice communications manager with HP/Compaq, "so that HP—both as a customer and as an outsource supplier—is able to bill everybody based on real usage, but that's a long term goal."

With over a half a million devices on the HP network, it's a challenge to create a usage-based cost model, Samuels said. "Which do you bill for data utilization—an application or an end user?" he asked, noting that end users can't control the amount of traffic that applications generate. Nonetheless, he said HP is working toward billing applications for their network usage, then billing the users of each application for their portion.

HP already does this with its VOIP tie lines. Samuels uses HP Openview to provide network statistics, and CDR reporting from Telesoft Corp.'s Call Accounting Solution to accurately charge for the service. "Since we are using VOIP over a point-to-point connection, we look at the cost of providing that connection, including the hardware, and the amount of bandwidth being used," said Samuels.

"We divide those costs by the number of minutes being carried on a normal month and apply that cost to each of those calls." Calls are then charged back to each cost center based on this cost model.

Tools are available to collect and group data network usage for chargeback, although

few enterprise customers are doing this. "Approximately 10 percent of customers are charging back [for data network usage]," said Gnanesh Dhoklakia, consulting product marketing manager with Concord Communications. "They are using this capability [of the Concord eHealth Suite network management application] to get the breakdown, and then they export it to a billing system in order to distribute the cost."

"We can group ports, devices or links—whatever you want to report on," he explained. "We capture and aggregate the information into reports, giving a breakdown on which application, which user, which department is utilizing what amount of bandwidth."

If 10 percent of enterprises are charging back for data network utilization, the billing systems they use don't seem to be those of the telemanagement vendors, according to Jon Good, president of Symphony Services Cost Management Group.

"We haven't seen the demand yet that we anticipate for the merging of voice and data costs," he said. "We believe that there is a business case to do that, though, and we've opened up our solution to take in feeds from almost anything. We can take those transactions and integrate them so that each individual could have an integrated bill."

**Customers  
are more interested  
in high-level cost control  
than in charging back  
for detailed costs  
and usage**



**Costs tend to creep back up when no one is responsible for managing them**

The ability to take in different feeds and to group different call record elements together has become critical in converged IP telephony system management, according to Kevin Ziesig, Symphony's sales director. "Nortel's system will put out event records. You have to take all the events of a call and marry them together into a single call record," he said. "In the Cisco world, they have CDR but they also have call management records (CMR)—the diagnostic records associated with the call. We do integration of the CMR and CDR to create a single call record and report the quality of service on the call."

What are the other 90 percent of enterprises doing? Most create a cost model for infrastructure costs based on head count instead of usage, and they charge back the costs on this basis. A few simply aggregate all the infrastructure costs under an IT cost center: They don't charge them back to business units, applications, sites or departments.

#### **Cost Awareness Does Not Equal Cost Savings**

Opting not to charge back will simplify and reduce administrative tasks. One network manager told me, "At a high level, we need to be able to establish a cost structure to understand how much of the company's money we are spending at each location to support various capabilities, but we are not planning on charging back for VOIP."

He acknowledged that direct chargeback would force users to take more responsibility to rein in costs, but "we prefer to provide them the information [about where the IT costs are] and then trust them to keep costs down," he said.

The key drawback to this approach is the tendency for costs to creep up when no one is responsible for managing them. The same network manager disclosed, "We don't do a very good job of making the excessive costs visible, and that's why we are looking at additional tools that will give us more visibility at the cost-center level."

Others confirmed the ineffectiveness of this "cost awareness" approach. One network manager, who has tried both direct chargeback and cost awareness to control costs, said, "Using cost awareness to keep costs down does not work because, at the end of the day, while everyone complains about the cost, nobody will fix it because they don't benefit from it. You save money by not having to run the systems that do the billing, but the costs start creeping up because nobody feels responsible."

#### **The Importance Of Invoice Management**

Whether enterprises will want to charge back their newly-converged network costs or not, they will need to manage their bills—first, to be certain the convergence pays off, and also to be sure that monthly billing actually stops on all the old circuits that are disconnected.

Beyond that, there are two good reasons for customers to maintain a billing database with

exception reporting capability and to perform regular billing reviews:

- The more complex SLAs and bills that are anticipated for IP-VPNs.

- The carriers' poor track record for accuracy.

The larger the organization, the more sense it makes to handle regular billing reviews and exceptions in-house, perhaps automating them with an invoice management system. Simple rules for exception reporting are best—such as "no long distance charges on local phone bills." Then the exceptions fall out for staff review. Auditing services are an option, but these companies typically keep 30 to 50 percent of the erroneous charges they recover. Hire the auditors to occasionally review the more complex savings opportunities, such as tax errors and regulatory refunds.

Nearly every leading call accounting/telemangement application provider has some strategy or partnership in order to provide invoice management. Almost a dozen responded to a recent client RFP. For most organizations, the ability to identify and correct billing errors promises more direct cost reduction than catching the shipping clerk on a personal voice call, website or email.

Many telemangement systems will let you import and manage the billing data from Web-based billing services, CDs or electronic data interchange (EDI). One of the best I've seen is the Telesoft Corp. Invoice Processing System (IPS), which the company built as an integrated part of its telemangement database product, Telmaster, and sells as a hosted service or as a product. Part of the hosted service is to get all the EDI billing feeds and do the first level of dispute resolution: If an erroneous charge is detected, an email is automatically sent to the carrier, and the database tracks and reports that.

Beyond the importance of invoice management, there are three practical reasons for assessing VOIP costs in particular, even if you do not plan to charge them back. The first is because, in many cases, VOIP is replacing an existing service and, without a cost model, there is no way to evaluate the economy of the VOIP application.

The second reason flows from the special operational attention that VOIP requires. In particular, the quality of service (QOS) requirements to minimize latency for VOIP are greater than any other common data network application. Since network managers are forced to care about VOIP (prioritize it, monitor it, report on it) more than other applications, it is more appropriate to assess a cost for VOIP than for the routine or non-priority network traffic associated with other programs.

Finally, voice calls were always expensive and subject to employee abuse, while the need to monitor the data network is fairly new. Prior to the Internet, MP3s and Web mail, there weren't many reasons for employees' personal use of the data network. Moreover, viruses, worms and other security issues that were unfathomable on the

## From Phone Cop To Network Police

**D**ecades ago, being the “Phone Bill Police Force” was just another part-time diversion for an office manager. I remember sifting through phone bills looking for 30-cent-per-minute long distance calls that had been made for personal rather than business reasons.

One investigation revealed a salesman’s daily call to a 976 astrology line. His sales manager informed him that the astrological forecasts evidently weren’t helping, since he wasn’t meeting his quota, and he would have to refrain from calling at the company’s expense.

Another time I spotted a slew of 30-cent-per-minute calls to what turned out to be the marketing manager’s home phone number in a nearby city. After hours of investigation, I proudly brought my findings to our finance

director, who said, “Leave him alone. The guy is here until 7:30 every night and his wife is having a baby in four weeks. You have better things to do with your time.”

Fast forward to just a few years ago, when my son Nigel was working far too late at night on his 8th grade “Reptile Report.” After browsing my home network router log the next day, I printed out my findings and brought them to his attention.

“You spent 20 minutes looking at reptile sites,” I said, “and two hours reading about Playstation games.”

“Oh,” said Nigel. “I guess you’re right.”

Five pages of hard evidence, and all he could say is “Oh, I guess you’re right”? At least his mother didn’t tell me to “leave him alone—you have better things to do with your time.” □

**The extra network care that VOIP requires may make an extra charge for it more appropriate**

voice network have recently appeared on the data network. To a large extent, the network police have now replaced the phone bill police (see “From Phone Cop to Network Police”).

### Conclusion

It will be a while before a single product is developed that will manage all elements of a converged network. In the meantime, there will be a lot of crossover in capabilities between traditional voice, data and administrative billing solutions. The CMR records created by Cisco for its voice traffic are an early example of a telemanagement solution providing a redundant function: Collecting information about data latency and service quality has traditionally been the function of a LAN management tool.

Such redundancies are likely to continue for a while—until the knowledge base of voice and data support personnel has a chance to converge, too. Although many enterprises have merged the support staff, this is fairly recent, so much of the knowledge is still segregated. When the *organizational convergence* matures, there will be immediate recognition of the tools that are redundant, and perhaps new demands will emerge for a single tool for converged telemanagement.

The product capabilities, for the most part, are already here—some in the telemanagement solutions, some in the invoice processing systems and some in the data network management platforms—waiting for that demand.

In the short run, charging back for data utilization will probably follow the carriers’ pricing and billing models. HP’s David Samuels and others told me that MPLS and IP-VPNs should improve their ability to assign costs, because it should be easier (than with frame relay) to calculate based

just on a point of network entry, the access speed and the SLA information. Most enterprise network managers interviewed for this article are not yet charging for application usage (including VOIP) except for the more traditional facilities and applications, such as tielines.

If future applications require special circuits, or special SLAs on shared IP-VPN and Multiprotocol Label Switching (MPLS) services, the extra attention that they require operationally will create more incentive to charge back. One thing that has not changed—and probably will not in the future—is that invoices drive telemanagement. As enterprise networks converge with carrier networks (e.g. cellular to PBX, managed IP networks) the invoice will become more important than the CDR as a telemanagement data source □

### Companies Mentioned In This Article

Avaya ([www.avaya.com](http://www.avaya.com))

Cisco ([www.cisco.com](http://www.cisco.com))

Concord Communications  
([www.concord.com](http://www.concord.com))

Hewlett Packard ([www.hp.com](http://www.hp.com))

Motorola ([www.motorola.com](http://www.motorola.com))

Nortel ([www.nortelnetworks.com](http://www.nortelnetworks.com))

Proxim Corporation ([www.proxim.com](http://www.proxim.com))

Symphony Services Cost Management Group  
([www.symphonysv.com](http://www.symphonysv.com))

Telesoft ([www.telesoft.com](http://www.telesoft.com))