**Centralized Infrastructure,
Distributed People,
and New Customer Contact Options**
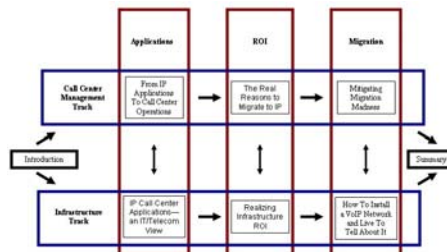
A PRACTICAL GUIDE TO TRANSFORMING YOUR CALL CENTER WITH IP TECHNOLOGY

A Digital Guidebook from CMP Media's Call Center Group

and Team Rosenberg

Art Rosenberg, Principal, The Unified View

Allan Rosenberg, Associate Editor, CMP Media Call Center Group

Questions about this Digital Guidebook? Contact:

Rick Luhmann

Associate Publisher, The Call Center Group

415-947-6328, rluhmann@cmp.com

TABLE OF CONTENTS

Introduction / Management Track / Infrastructure Track / Summary

This Digital Guide from
The Call Center Group is
Sponsored by

CISCO SYSTEMS

Introduction

You probably don't need us to tell you this, but managing top-flight call center operations is tough. Call centers are under constant pressure to reduce costs while maintaining, or even improving, relationships with customers.

The good news is the rapid pace of advancements in IP networking technology is opening the door for a fundamental restructuring of the way call centers function, providing one set of answers to the do-it-well-but-do-it-cheap conundrum. The IP revolution yields two major classes of benefits:

First, IP lets you link widely scattered operations cost effectively into a single virtual call center. The virtual center comprises call centers worldwide, home-based agents, outsourced call centers, and even employees who have specialized knowledge but responsibilities that go beyond answering phones.

The big boost here comes from moving from Time Division Multiplexing (TDM) telephone service among your various locations to an Internet Protocol (IP) telephony network (also known, generally incorrectly, as VoIP). There are, in many cases, some savings available from reduced telecommunications charges, but what IP communications really brings to the table is the ability to route calls more efficiently while reducing the costs of maintaining infrastructure by centralizing both call center applications and network management.

Unfortunately, to realize the benefits, you need to change the way your network operates, the way your call centers operate, and the applications that you run. It's a long voyage across treacherous waters, but, in this guidebook, we'll help you navigate through the shoals.

Second, IP-based technologies give customers a broader choice of modes of communication (most notably, Web self-service, interactive voice response (IVR) with or without speech recognition, email, and instant messaging (IM), in addition to telephone conversations with agents).

Providing more communication channels will improve customer service levels — and many of the options are less expensive per contact (in the case of self-service, dramatically so) than the cost of staffing a call center to do the same business by phone. We don't think that phone calls to agents will go out of style anytime soon, but turning traditional call centers into multi-modal contact centers is a rapidly expanding trend.

Unlike IP communications migrations, bringing new communications approaches to call center operations, and linking the offices together, rarely poses difficult hardware challenges — if you have a wide-area network (WAN), a virtual private network (VPN), and a good Internet connection, you've already got the basics in place. The real action in becoming multi-modal is in changing the software applications, operating procedures, and training programs. We'll show you how to reap the rewards of multi-modalism, too, while avoiding the pitfalls.

This guidebook is organized along two parallel tracks (see Figure 1). Along the first path, we discuss the business reasons for, and the operational consequences of, moving to IP. We look at the business process improvements that IP makes possible, discuss where you'll really find a return on investment (ROI), and walk you through the practical aspects of migrating, helping you to realize the maximum value while minimize the disruptions to your business. The second track addresses the same set of issues (applications, ROI, and migration paths), but with a more technical focus to help network engineers and IT/telecom managers.

The two tracks are not entirely independent. IP removes several limitations on your call center's business processes. Conversely, in the final analysis, the infrastructure you choose should be the one that best supports the ways that your firm wants to communicate with its customers. The value comes from the combination of the two. So feel free to wander wherever your interests take you.

Click on the top navigation at any time to bounce around.
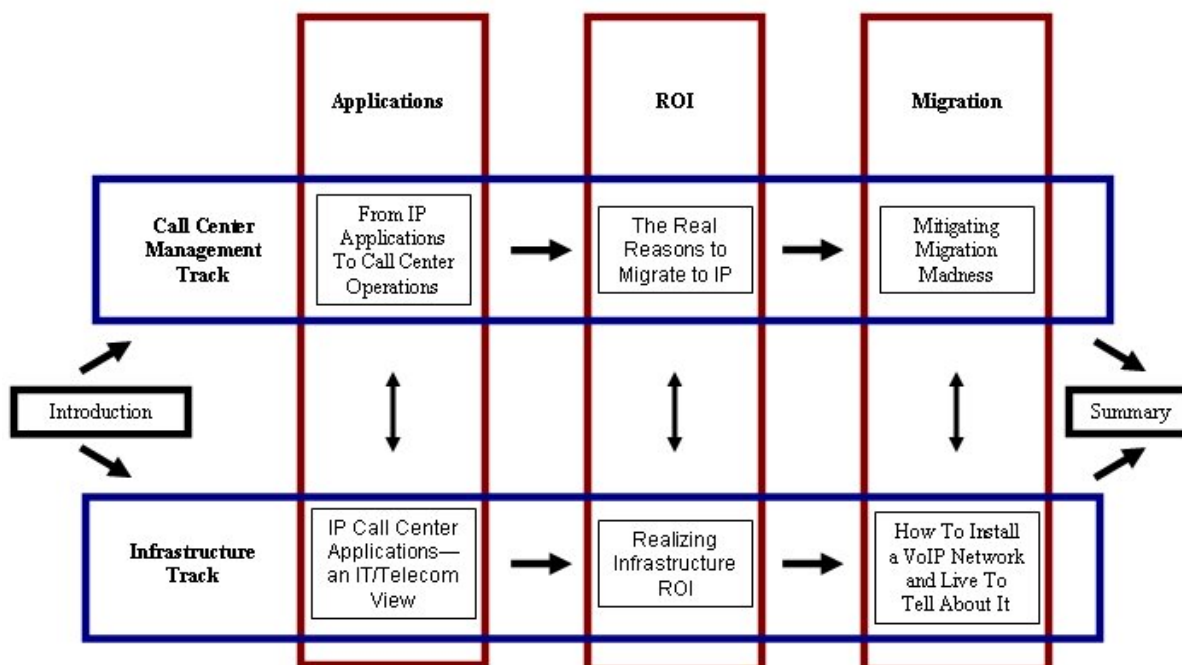
Figure 1. We've arranged our articles along two tracks, one for call center operations managers, and the other aimed at engineers and IT/telecom managers. Use the navigation in the page header to quickly move from section to section.

From IP Applications To Call Center Operations

These days, it's hard to avoid the buzz surrounding IP telephony (VoIP) and multi-modal communications technologies for call centers. There's good reason for the hype though:

According to **Art Schoeller**, Senior Analyst, CRM Strategies at **The Yankee Group**, IP technologies for enterprise communications have reached a tipping point. **Schoeller** told us that he expects as many as 80% of call center agents will be using IP telephony by 2009, up from around 10% today, with 2005 and 2006 being the years in which we'll see the major switchover.

Multi-modal communications is just as relentlessly, albeit more slowly, grabbing the attention of call center managers. Telephone calls with agents are not going to disappear, but as increasingly sophisticated applications let call centers more efficiently add email and instant messaging (IM) to their repertoire of customer assistance options, and integrate Web- and voice-based self-service more tightly with call center operations, the fully "trans-modal" IP-enabled contact center is emerging as the new gold standard for customer care.

It's no coincidence that we're seeing these two trends emerge together, since the same networking technology, communication by Internet protocol, makes both possible. The sine qua non of IP is its ability to link people — and automated systems — into information sharing networks; the Internet itself serves as the best illustration of this transformation.

In this section, we look at the applications that IP makes possible.

Of course, just because any given application is feasible does not mean it's economical to implement. The software keeps getting better, but to bring the full panoply of apps to your contact centers would take a lot of customization.

Once you understand the potential impact modern network infrastructure can have on your business operations, you'll be able to evaluate which IP-based technologies you should employ, and then execute on your IP strategy. We deal with ROI issues and implementation in the next two articles in this guidebook.

What's New In Call Center Apps

For now, we look at hot trends in Call Center applications:

The New Queue. Cutting-edge call centers of the 1990's implemented sophisticated systems that would balance a distributed organization's call load among locations and broad agent pools — and that was pretty impressive. Once everyone is on one converged network, you can move beyond the 1990's model by establishing a "universal queue."

All inbound contacts enter the virtual contact center into a single queue. A single routing system then assigns the contacts to resources by balancing availability, workloads, skills, and expenses.

Carol Blanchar, CEO and Principal of **Conexo** and a veteran of numerous IP implementations, explains: "The economics of queues says it's better to centralize routing in one queue than to have many inside the call center or out." The benefits come in the form of customer satisfaction through improved first-contact resolution and more efficient staffing across all of an organization's call centers. The single queue can select among a variety of resources:

- **Agents and supervisors** in domestic and international contact centers, agents at an IP-enabled call center **outsourcer**, and **home agents**. If your outsourcer has an agent with strong writing skills and a light workload in Mumbai, you can direct e-mail to him. If you prefer to send calls from callers in the Southern US to your

Orlando call center, and an agent is free there, your system will direct the call to her.

- **Specialists** who have duties other than responding to customer communications. This is growing rapidly in businesses with substantial branch retail operations. For example, bank branches are busiest during lunch hours, whereas a bank's call centers may receive fewer calls at the same time. For the price of a few gateways or IP phones, and a little training, the bank gets to use what was an untapped resource.

- **Self-service applications**. Since you no longer need to maintain separate instances of your IVR in multiple locations, it's easy to update your voice self-service applications, so you can rely upon them more.

The same single queue advantages apply to **predictive dialing** and similar technologies that assign outbound customer contacts.

Since your system has more contact routing options, information about the reason for the customer contact grows more valuable. This improves the return on your investment in tools such as interactive voice response (IVR) systems. Indeed, the ability of IVR to facilitate intelligent routing will reach its full flower in virtual IP Communications networks.

> **"Since your system has more contact routing options, information about the reason for the customer contact grows more valuable."**

Presence management technology is evolving into a powerful technology for maximizing the use of remote and mobile customer-facing personnel and should be a key consideration in migration planning.

Presence management has particular benefits in managing access to non-agent specialists who may be required to resolve a customer issue. In high-touch industries such as health care, the ability to immediately and efficiently bring in scarce staff resources for one-contact resolution reduces operational costs and increases customer satisfaction. The options for exploiting presence management include conferencing in a third-party specialist, consulting with a specialist offline, e.g., via IM, and transferring the customer to the specialist.

You can enhance all of these options by providing the specialist with all the necessary context information to efficiently deal with the customer's needs. It's not really here yet, but we expect to see customer-side presence information growing in importance. For example, you can hold outbound IM until the customer is online and available.

Expanding the role of the contact center. For example, **Avaya**'s **Lawrence Byrd** told us of an insurance company that uses its call center as a universal assistant for its field agents. Agents generally like to answer their own customer calls, but they aren't always available. When an agent can't take a call, the firm's customers can still deal with a trained customer service agent.

IP communications can improve performance monitoring by making it easier to monitor and record an agent's voice and data communications centrally. This is especially true in the case of home agents and outsourced agents, who are often less expensive, but always less easy to supervise, than are on-site agents.

Moving from traditional telephony to IP communications lets your voice communications and speech interfaces work better with your other computer-based business applications; this is known as **computer telephony integration** (CTI). CTI has long been a fixture of call center software, but IP turns it up several notches. In addition to the routing and agent-management benefits mentioned above, better CTI will improve caller- and

context-specific screen pops, call escalation and transfer, and call traffic activity data collection.

Using Multi-modal IP telephones. One consequence of VoIP and IP communications is that the traditional voice-only telephone is evolving into a multi-modal communication device with screen displays and text entry interfaces. This has primarily taken place through softphone software clients added to desktop PCs and handheld mobile devices.

With the advent of VoIP, desktop IP phones are also offering multi-modal interfaces, along with new, personalized contact protocols such as SIP-based presence and availability management for mobile or remote personnel. This convergence at the communication device level is another driver for integration of voice communications with messaging technologies for an enterprise's customer-facing staff.

The Multi-Modal Contact Center

Presenting new communications avenues (such as email and IM) can improve customer satisfaction. Of course, while keeping customer service requirements in mind, you'll want to try to steer your customers toward the modes that are least expensive to implement.

Processing customer contacts in these new modes requires skill that are similar to, but not identical with, the skills that make someone a good telephone agent, so you'll need to think about your hiring and agent development processes as you move toward the multi-modal agent.

> **"You'll need to think about your hiring and agent development processes as you move toward the multi-modal agent."**

Contact Center Traffic By Modality

Email: 4% Web Chat: 2%

Online Self-Service: 4%

IVR Only: 13%

Phone (with or without IVR): 77%

Source: Yankee Group 2004 Contact Center Manager Survey
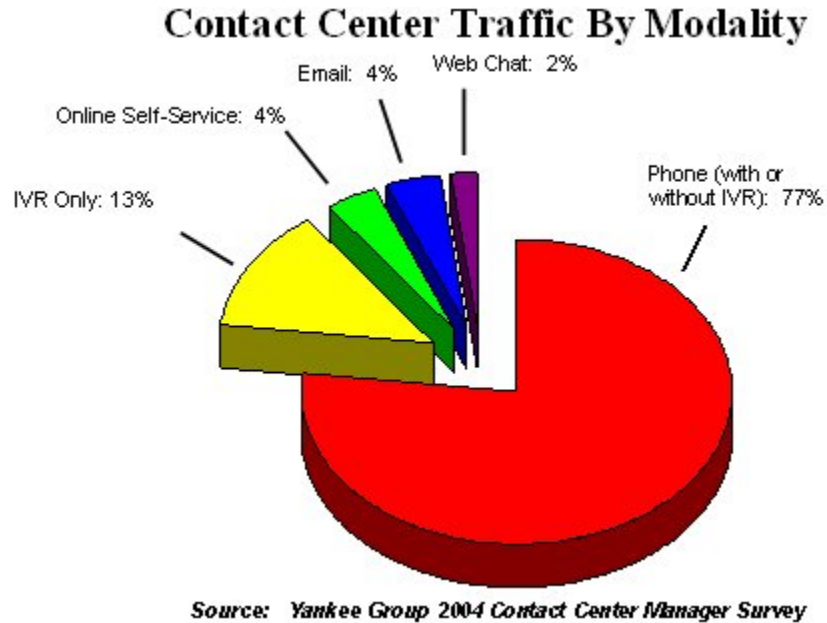
Figure 2. Breakdown of major customer contact modalities in current use in contact centers.

Here are some thoughts on the three most important new modes that IP helps you provide:

E-mail. You can improve the efficiency of customer email response by:

- Assigning agent priorities relative to incoming calls,

- Providing management controls to reassignment contacts to other agents,

- Immediately and automatically acknowledging the receipt of each message,

- Creating tools to manage the content of responses, including cut and paste text from knowledge bases, spell checkers, reference web page links, and voice message attachments for personalized comments,

- Letting agents respond using other communication modes, such as presence-based IM connections and telephone callbacks, rather than just email, and

- Developing appropriate agent performance metrics for the handling of email.

Instant Messaging. IM is particularly useful for online assistance in a help desk environment and to support web-based business applications. Eventually, you will be able to use presence technology to replace arbitrarily-timed telephone callback attempts by dynamically activating agent assistance when your system detects the customer online.

> **"We're told that a large financial investment firm now uses text chat to provide immediate access to their financial advisors."**

Although IM lets agents multi-task real-time customer contacts, the technology still demands real-time responses. Voice conversations are often more time efficient for customers, so escalating chat to a voice connection through IP telephony is a practical option.

The reverse is also true. We're told that a large financial investment firm now uses text chat to provide immediate access to their financial advisors. The text input provides a more accurate audit trail for regulatory purposes. They have found voice recordings both more cumbersome to manage and, often, hard to understand.

Click-to-talk, click-to-chat, and click-for-callback connections are useful to support website visitors with immediate call connections for online assistance. However, customer

contact management will not welcome this capability if it generates uncontrolled demands on staffing resources.

You must screen incoming communications in all modes (see Figure 4 below), just as you do incoming phone calls, intelligently to determine the purpose of the attempted contact, the value of the customer contact, and the availability of appropriate resources that can be applied. You like your customers, but, to borrow the terminology from IM, they aren't your buddies.
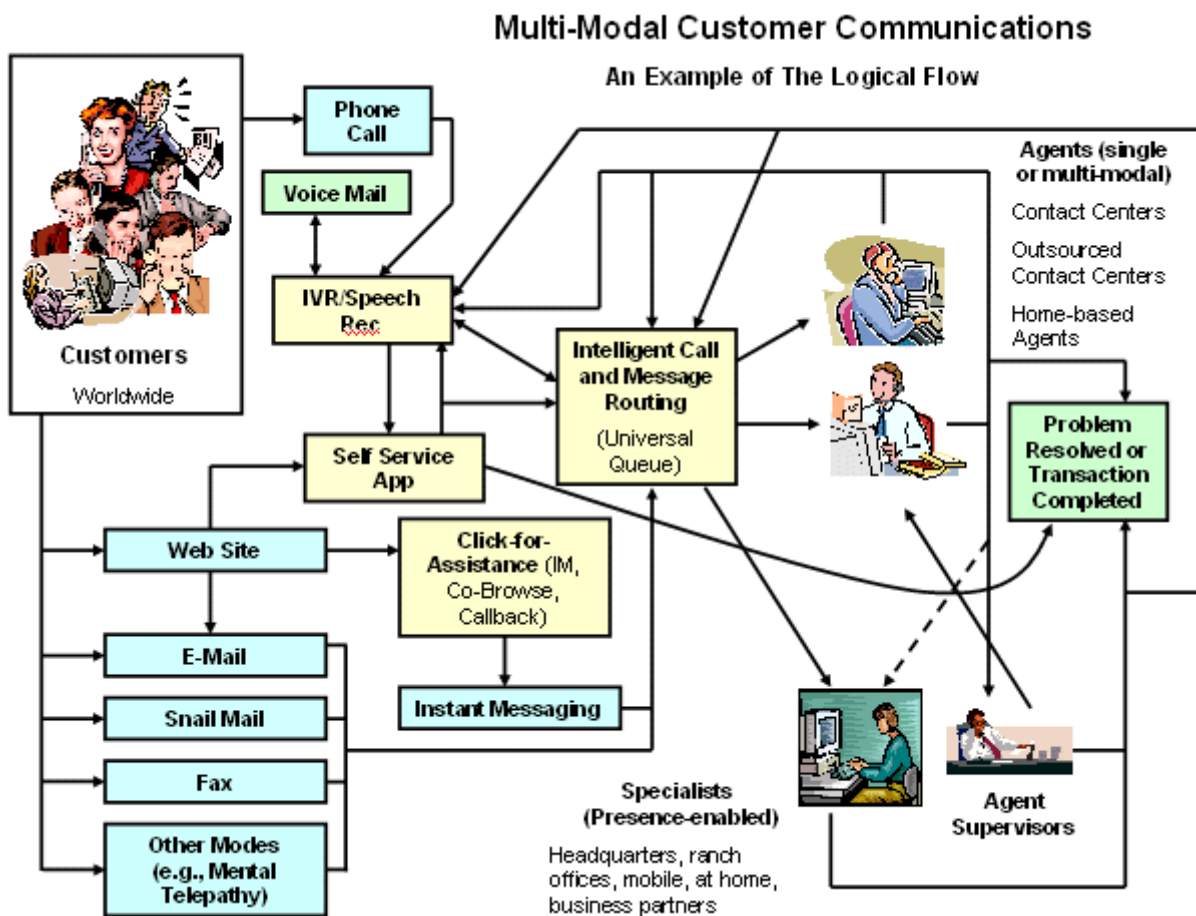
Multi-Modal Customer Communications
An Example of The Logical Flow

The Real Reasons to Migrate to IP

According to research from Purdue University's Center for Customer Driven Quality:

- "…the absence of first call resolution has been found to account for a minimum of 30% of a call center's operational cost;"

- "…customers who experience problems that are dealt with quickly and easily have a repurchase intention rate of 89%;"

- "…the inability to reach the right person with the right information drives 60% of customer dissatisfaction."

These statistics highlight key staffing problems that affect the bottom line. Smart enterprises are looking to fix these problems using new call center applications and IP infrastructure.

"First contact resolution is the new metric for competitive customer contact performance enabled by IP networking."

According to **Al Baker**, VP of **Siemens** eCRM Global Solutions, "Skills based routing is not always an effective means of achieving first call resolution, because the specific and detailed needs of customers are not known until a customer contact is handled by a live agent."

With IP networking and presence and collaboration tools, increased first call resolution can be achieved through collaborative interactions between any first-level agent and an available expert authority accessible anywhere on the network. First contact resolution is the new metric for competitive customer contact performance enabled by IP networking.

Everyone involved in planning and implementing the technologies that support customer assistance should understand the nature of the transformation of legacy telephone call centers into virtual customer contact operations.

Here are five things to remember:

- The virtual contact center is no longer a single location. It exists wherever customer-facing staff resources reside,

- The virtual contact center is not just about telephone connections. It also exploits messaging alternatives,

- Your staff can be anywhere, but you need to centralize your technology,

- The virtual contact center incorporates self-service applications that feature speech (telephone) and/or text (Web) user interfaces, with access to live assistance, and

- Virtual contact center maximizes first call/contact resolution to reduce costs and to increase revenues and customer satisfaction.

Drivers of IP Implementation

IP in the contact center is not primarily about reducing communications toll charges. The real benefit comes from more efficiently using your customer assistance staff and self-self service resources. The drivers behind IP implementations fall into three major categories:

- **Building New Installations For The Future**

  o You are opening a new branch location which will have its own customer contact staff,

o   Your current call center technology has reached the end of its operational life, or

o   You need to insure maximum business continuity and disaster recovery capabilities.

- **Reducing Infrastructure TCO**

    o   Your enterprise-wide TDM telephone network is large. It's also expensive, since you are locked into a single provider,

    o   You want to consolidate and centralize and integrate application servers,

    o   You want to centralize the management of your customer assistance applications,

    o   You want to consolidate the collection of customer contact data for comprehensive CRM analytics, and to provide more useful screen pops to agents, and/or

    o   You need to consolidate the recording of customer contacts across communication modes, either for both agent quality monitoring and coaching or to meet new regulatory audit requirements.

- **Optimizing Contact Flexibility and Minimizing Costs**

    o   You want to let your agents work from home to reduce salaries, staff turnover, and facilities costs,

o You want to outsource some of your customer contacts while retaining control over routing logic, agent performance measurement, and customer information,

o You want to achieve higher first-contact resolution by letting call handling staff conference with in-house specialists in real time using IP-based communications and presence management,

o You want to improve your online self-service by providing live assistance,

o You want to cut costs or improve service levels by replacing some telephone calls with emails and wireless text messaging.

o You want to provide 24/7 customer service,

o You want to support mobile customers who are using multi-modal handheld devices to initiate real-time contacts via voice or text, or

o You'd like to use customer presence technology to deliver time-sensitive alerts and service responses on a device-independent, multi-modal basis.

"The real benefit comes from more efficiently using your customer assistance staff and self-self service resources."

We're still all feeling our way around the problem of quantifying the advantages (e.g., what metrics should you use to evaluate email handling) of relying on more IP technologies in the contact center, but just because it's difficult to measure the benefits doesn't mean that you can ignore them. Better customer service, either through providing more communication options or reducing the number of times a caller gets

transferred, is one of the easiest ways to improve customer loyalty, so, outside any cost benefits, you ought to be thinking about beating those competitors to the punch.

> **"The trick is to put all the ROI cards on the table and establish planning priorities for your specific customer contact needs."**

Of course, just because new technology makes a new process or application feasible, that doesn't mean that the change is economical. To reap the full benefits of IP technologies, you need to change the way you operate your contact centers. The changes you make to your infrastructure and applications need to follow from the business opportunities that you want to exploit. Fundamentally, it is an operational business decision, not just a technological choice.

The trick is to put all the ROI cards on the table and establish planning priorities for your specific customer contact needs. As **Joe McFadden**, VP Marketing for **Nuasis**, told us, regardless of which kind of payoffs you are looking for from communication technologies, "'ROI' should stand for 'Real Obvious Impact' on enterprise performance."

Management Mantra: It's Not All About Call Containment

Call Center Budget Allocations

- Outsourced calls: 1%
- Other: 4%
- Real estate (floor space): 7%
- Computer software: 3%
- Computer hardware: 4%
- Telecom equipment: 6%
- Telecom phone charges: 9%
- Recruiting, screening, training: 4%
- Salaries and benefits: 61%
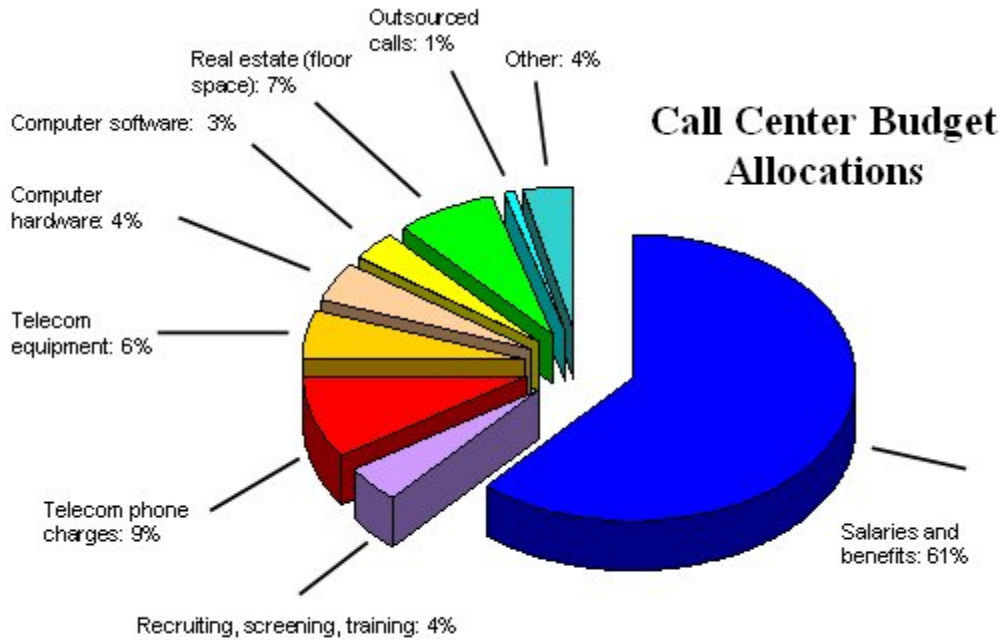
Worldwide averages, across industries.

Because more than 60% of a call center's expenses go to paying agent salaries (as shown in this pie chart), call center management often turns to self-service applications to minimize staffing requirements.

Management Mantra: Remember the ROI

As you can tell from the listed operational reasons for migrating to a converged communications environment based upon IP infrastructure, there are more ROIs for the call center than just reducing infrastructure costs. They also include benefits to various organizational stakeholders involved, including:

- **Business Management**

    o Customer satisfaction and retention

    o Better CRM analytics and business rules

    o Increased sales and revenue opportunities

    o Improved support for field sales activities

    o Lower costs of customer support

    o Efficient customer contact handling information and interfaces

    o Teleworking conveniences

    o Efficient internal communications and coordination tools

    o E-learning and coaching

    o Expertise access and conferencing

    o Efficient multi-modal customer contact handling

- **Customer Contact Operations Management**

    o Minimize use of customer-facing staff

    o Maximize use of all available staff

    o Selective control of customer accessibility to live assistance

    o Improved staff recruiting and retention

o Skills upgrading for multi-modal customer contacts

o Flexibility of remote staffing (including outsourced staffing)

o Skills-based routing

o Increased performance management capability

o Quality monitoring of staff and regulatory activity recording

o Greater workforce scheduling flexibility

- **Technology Infrastructure Support Management**

    o Increased use of application CTI because of greater simplicity and lower costs

    o Faster and less costly upgrading of application software,

    o Converged support of customer email messaging with voicemail

    o Centralized technology administration and maintenance

    o Single, converged network management

    o Consolidated help desk support across distributed locations

    o Greater responsiveness for convergence problems and changes

    o Reduced TCO

    o Reduced costs and greater flexibility for telephony network access

Mitigating Migration Migraines

Most organizations have already started migrating to IP telephony, adding IP-PBX application servers and IP phone endpoints to new offices ("greenfield" sites) or at the end of the useful life of their TDM equipment. Fewer have moved to IP in the call center, where the complexities of convergence are more challenging. We've spoken with vendors, consultants, and contact center managers. Here's our summary of their advice for overcoming those obstacles:

"You'll need an executive champion for your transitions."

Organize!

Without question, you need to organize for a converged environment. Managers on the technology side (IT and telecom, which you may want to merge) and in the business units responsible for managing customer relationships must form a unified migration planning team.

Since both major infrastructure changes and fundamental changes in the way you communicate with your customers usually require approvals from senior management, you should need to include input from the top. You'll also need an executive champion for your transitions to insure appropriate delegation of responsibilities, to be sure your efforts meet the implementation priorities your organization has established, and to back your teams decisions throughout your organization.

You'll also need to keep the needs of various users in mind, including customers, contact center agents and supervisors, customer-facing experts (specialists), and technology support personnel, including the people who man your help desks.

Migration Meat: Hard Answers You Need From Your Planning Team

How should you organize internally for cost-effective migration to VoIP networking and IP telephony applications? Who should be in charge?

What are the relative priorities for your organization's different ROIs and how can they be measured and quantified for results?

Why and when do you have to migrate to new telephony and messaging capabilities and what existing technology investments are worth protecting?

What is the logical IP telephony migration sequence to support the selective needs of different types of customers?

Will your customer contact activities be shifting from voice to multi-modal communications and, if so, how will you manage such traffic?

How can you quantify the ROI for any change, including new technology investments and agent skills?

What new outsourcing options for agent staffing, hosted technologies, and field technology support will make sense for your migration strategies?

What is the value and strategy of using VoIP networking strategies to insure business continuity for disaster recovery?

What kind of pilot testing and outside consulting services can best make up for a lack of experience and internal expertise to plan and implement the migration to IP-based customer contact management?

···

Do the Operational Homework

Before you specify infrastructure requirements and business process changes, your team will need to audit current operations, procedures, and technologies involved with customer contact activities. The operational review should answer these questions:

- o   What are our priorities for customer contact operations?

- o   Where are we falling short of fulfilling the needs of the various constituencies listed above?

- o   How can IP communications technology overcome those shortcomings? (See our Management Track applications article for possible changes that IP communications can help you implement).

- o   How should IP communications change our operations, organizational structure, staffing, and training?

- o   What will we need to do to help our customers make the transition with us?

- o   What outside consulting expertise will we need to complete the evaluation and planning?

It Won't Fly Without a Pilot

Migrating customer contact activities to IP communications occurs in many steps. Each step requires testing in a pilot environment to ensure that changes will not adversely impact the customers or the enterprise customer contact staff. You'll need to test each infrastructure change (see our Infrastructure Track migration article) before you can test the new business practices designed to take advantage of that change.

Your pilot programs are where you will gain invaluable experience. You need to get feedback from a sample of all stakeholders (IT/telecom and business side, from agents to directors/VPs, and customers). It hasn't passed the acid test if you don't have feedback from agents and customers.   You can assign a small group of experienced agents to take the kind of calls that will be handled through the new setup.

It's usually easiest to divert a particular class or percentage of contacts to the new setup, rather than trying to tag individual customers. You can achieve this using your skills based routing system (including IVR screening) or randomly selected customer contact numbers. You should survey both the agents and the customers who participate in the pilot to determine the impact of the changes in your infrastructure, applications, and operating procedures.

Migration Meat: What To Learn From Your Pilots

Here are some of the operational issues you'll want to evaluate in a pilot program (see our Technology Track Migration article for IT/telecom issues that you should address in a pilot):

- Noticeable differences in voice quality

- Problems with reliable connections

- Delays in telephony functions

- Differences in current CTI-based applications:

    o Call routing logic

    o Screen pops

    o Event data collection

    o IVR transfers

    o Quality monitoring

    o Adherence reporting

    o Supervisory controls

- Call center statistical reports

- Loss of IVR functionality for access to live assistance

Enterprise Migration to IP Communications

When moving to IP telephony, most enterprises transition their internal communications by adding IP-PBXs, before moving contact center applications. This approach often serves as a practical stepping-stone. **Gartner** predicts that IP contact center applications will generally lag behind IP-PBX adoption by two years. You should keep in mind, however,

that contact center changes will often provide higher ROIs than do other implementations of IP telephony.

Migration Meat: Checklist for Customer Contact Application Pilots

Put someone in charge of pilot test and pilot support team.

Involve new technology providers and consultants in pilot planning and support team planning.

Involve business application technology support personnel for any CTI coordination.

Select pilot location, application, and staffing group.

Select experienced agents and supervisors within the staffing group and prepare them for new changes.

Instrument all application activity data collection for pilot activity reporting and analysis, including any new event data that will be generated by the pilot applications.

Provide old system backup if new technology fails.

Insure separate technology standby support to assist with any problems that may arise.

Use internal application or use internal staff to simulate customer activity testing before involving real customers.

Select relative small group of customers (by type) for routing to pilot application. If customer activity is frequent, they can be notified in advance that there will be changes.

Survey staff after pilot usage.

Survey customers after pilot usage.

Review all results.

Make any final changes before rollout.

Choosing Vendors

Vendors offer a variety of options for implementing a migration IP telephony pilot, and it pays to negotiate the approach that will be most practical for your situation. The problem here is that the pilot exercise helps you make a procurement decision, so you can't finalize purchase commitments before you evaluate the pilot results. Some vendors offer free installation and limited time use in a try-before-you-buy approach, some will rebate any testing usage if a purchase is made, and some will offer a variety of discounts and incentives to move forward with their products or services.

> **"Some vendors offer free installation and limited time use in a try-before-you-buy approach."**

Your current application providers are a logical starting point for selecting IP communications technology, since their products may well help you preserve your existing technology investments. Nevertheless, you should also evaluate new providers, who may have developed products that will better implement your IP communications strategy. Moreover, since no single product or service serves the customer contact space, you'll need to consider all of the pieces in concert, whatever vendors you choose. You'll want any changes in technology or processes to be flexible enough to preserve the utility of your current investments and to provide for future developments.

Don't Overlook Self-Service and Multi-Modal Communications

The emergence of **VoiceXML** and **GUI-based IVR development software** is a major step towards converging the design and development of consistent self-service applications across the telephone and Web portals. In addition, features such as "click-to-talk" (or rather "click-for-assistance") will enhance online self-service applications.

Contact center use of email and instant messaging (IM) has been growing slowly, but the limitations of disparate technologies in the past did not allow centers to exploit these avenues fully. With network and applications convergence, as well as the increasing use of multi-modal devices at the desktop and for wireless mobility, the opportunity to exploit the practical benefits of messaging should be revisited as key capabilities for pilot testing in the IP environment. The fact that customers have fully adopted the convenience of messaging for person-to-person communications indicates that messaging for customer contacts has its place, if used properly. Website visitors, in particular, are the practical source of customer-initiated email and Instant Messaging (IM) to the enterprise. Here are some of the multi-modal communications issues that your pilots should explore:

- o Queuing and routing logic for all forms of messaging,

- o Response requirements for different modes,

- o Automated customer message processing,

- o The value of customer-initiated voice messaging,

- o Instant messaging and presence/availability management,

- o Escalating other forms of communication to IM or voice,

o   Responding to messages with outbound calls or voice message attachments to emails and IMs,

o   The value of application messaging notifications to customers (alerts),

o   Skill requirements for staff processing of customer messaging,

o   Management changes to assist with agent messaging activities.

"Features such as "click-to-talk" (or rather 'click-for-assistance') will enhance online self-service applications."

IP Call Center Applications — An IT/Telecom View

The essential technology that makes a call center a customer contact operation, rather than just another business office, is the way you route customer communications to self-service options, to agents, and to other personnel.

For incoming voice traffic, this is usually referred to as **automatic call distribution or direction** (ACD), though vendors are moving the terminology toward **call routing**, **intelligent routing**, or **skills based routing** (SBR). SBR also covers the routing of other forms of communication (e.g., email and chat). On the outbound side, the state-of-the-art technology for assigning outgoing calls to agents is **predictive dialing**, and similar technologies exist for assigning other forms of outbound communication.

> **"SBR is the gatekeeper to the business apps that let you help your customers."**

The fundamental business logic that underlies all SBR applications is the same — SBR simply (or, sometimes, not so simply) directs each contact from a customer automatically to the people, and the software applications, that best meet that customer's needs.

Possible destinations include:

- An agent (who may be in a contact center anywhere in the world, including an outsourced contact center, or even at home),

- An employee who only spends part of the day responding to customer communications (whom we call a specialist),

- An interactive voice response (IVR) server that presents self-service options to customers, or

- Or one of any number of other services, many of which don't exist today.

SBR is a **part of the technology infrastructure**, in the sense that it is a set of software applications that move data across your communications networks. SBR, however, is also **a set of rules**, implemented in the software, that automate the contact flows that best serve the needs of your business operations. In short, SBR is the gatekeeper to the business applications that let you help your customers. IP networking is important for contact centers precisely because it helps make SBR effective.

Most switch/router vendors (including **3Com, Alcatel/Genesys, Avaya, Cisco, Nortel** and **Siemens**) sell call routing and reporting software suites (ACDs), as do independent call center system software developers such as **Aspect** and **Concerto**.

Most of these packages can handle TDM, IP, and hybrid switches, and most have interfaces that ease integration with most CRM and back office applications such as billing and ERP. Some ACD packages handle non-voice communications better than do others; you can also purchase specialized SBR packages specifically for multi-modal customer communications. The contact center-specific aspects of a move to IP center around four sets of questions:

- Will my SBR systems (including, but not limited to, ACDs) work with the switches and routers (legacy and new) that I want to use, and give me the benefits that I want to achieve? For example, can one SBR/ACD route calls to multiple locations?

- Does the SBR/ACD support the routing of non-telephonic communications (e.g., IM, e-mail, interactive Web browsing) that I use now, or plan to use in the future?

- Will the SBR/ACD effectively lock me into one switch/router vendor, and, if so, is that a problem for me?

- What will I need to do to integrate the contact applications that I want to run with the SBR/ACD?

"The best solution for you will depend primarily on the applications that your business units want to run, and the business logic that they want to implement to connect the applications."

Unless you enjoy dealing with needless integration difficulties, you need to answer these questions in parallel. This is the main reason that we advise you to consider contact center operations issues early when you are designing or changing a data or telecom network, even if the contact center is the last operation that will make the transition.

As with most choices you make, the best solution for you will depend primarily on the applications that your business units want to run, and the business logic that they want to implement to connect the applications (traded off, of course, against the budgetary constraints that you face). At the most sophisticated level, you will have a **universal queue** that manages the priorities of selectively routing all modalities of customer communications intelligently to all relevant personnel and applications.

Here's a rundown of some of the more important contact center applications that you'll need to consider, starting with voice applications and then moving to other modes:

Voice-Related Apps in the Contact Center

Telephones. IP telephones are pretty sophisticated, often multi-modal communication devices. Even if you use TDM phones (possibly with gateways to access your VoIP

network) or PC-based softphones, you'll want to be sure they work with your network and with your other applications.

Interactive Voice Response (IVR) captures information that an ACD uses to assign a call intelligently. **Speech recognition technology**, though far from perfect, has improved dramatically in the last few years.   A well-tuned speech-based IVR application can get the information that your ACD needs to route a call effectively without subjecting your customers to an interminable series of voice prompt menus.

A good IVR application will help your customers achieve many of their goals (e.g., checking a bank balance) without requiring live assistance from a contact center agent. Conversely, a badly designed IVR with badly tuned speech recognition will frustrate your customers, which can increase the volume of agent calls while simultaneously driving your customers to your competitors. If you're going to implement IVR, it's worth putting in the effort to do it right.

One trend that's worth keeping an eye on is the rapid emergence of VoiceXML as a standard for speech interfaces. Combined with new GUI-based development tools, it's dramatically reducing the time that it takes to code an IVR's interface logic.

For outbound calls, your **predictive dialing** software needs to work with your ACD. As with other apps, IP communications can add value by letting you centralize predictive dialing across your entire network, regardless of location.

Enterprise **presence** applications help you route calls (and other communications) either automatically or, at the discretion of your agents, to specialists. Presence is also important for other real-time communication methods, notably IM. In some cases, you'll even be able to pick up customer presence information to help you time your outbound contacts.

You've probably got your **workforce management software** slaved to your ACD. IP communications will help you centralize, and get more value from workforce management, which does not pose difficult integration issues on the call side. To get the same benefits from managing your workforce's communications in other modes, you'll need specialized packages or a multi-modal workforce management package. Either way, you'll need to integrate the software with your data mode SBR systems.

Call analytics and call accounting packages, like workforce management, are usually slaved to the ACD. You will usually need to do some integration to make analytics work with data modes.

TDM-based **call monitoring and recording** applications may not work when you switch a contact center to IP telephony. If you have software that facilitates the use of email and text chat communication, you'll also want to be sure that it works well with your SBR systems.

Trans-Modal Contact Center Apps

Web self-service. After IVR, the major self-service medium that interacts with the contact center is your firm's Website.

Chances are that you've already got a site that lets customers place and track orders, check their accounts, or look for answers to their questions. Many people would rather use their browser or screen output than their telephone for information access and delivery. That translates into both operational savings (you need fewer agents) and improved customer satisfaction. Whole libraries are devoted to implementing e-business, and we're not going to try to replicate all of that knowledge here. But there are a few things we'd like to point out that can help you make the most of your converged customer service applications:

Making your **knowledge base** available on the Web is a wonderful tool for customer service. This can be as simple as posting a frequently asked questions (FAQ) page. If you've implemented knowledge management software for your customer service agents, you can generally adapt it for use by customers over the Web.

Web site click-for-assistance (both by IM and through a voice-over-the-Internet app, such as **CrystalVoice's** Click-to-Talk) and click-for-callback are gaining momentum as tools that make Web pages easier to use. You need software to implement them, and you'll have to integrate them into your contact center applications.

> **"Many financial institutions are adopting co-browsing to help customers complete online loan applications."**

Co-browsing software lets agents walk customers through online forms and Web pages, improving the quality of click-for-assistance. Many financial institutions, for example, are adopting co-browsing to help customers complete online loan applications.

There are, of course, differences between speech applications and clicking a link, but you can often reuse much of the business logic that you design for one when you're updating the other. With the advent of VoiceXML, the tools and the programming skills needed to provide voice and Web-based self-service are converging.

E-mail. There is considerable debate regarding the relative cost of e-mail versus voice. The economics will vary from company to company. You can guarantee rapid responses if the e-mail management applications you choose provide appropriate reminders and management tools. Once your customers learn that you will respond to their e-mails within a reasonable time, they will use this mode more often.

> **"Once your customers learn that you will respond to their e-mails within a reasonable time, they will start using this mode more often."**

We're not sold on the reliability of automated e-mail response technology, but that is another option to consider when choosing your contact center applications. If you process large volumes of e-mail, it makes sense to use an application that can search for key words to help with routing. You should give your agents a simple system that lets them cut and paste answers to common questions into emails. Again, once your customers learn that you will respond to their e-mails within a reasonable time, they will start using this mode more often.

You don't hear much about it today, but we expect to see agents attaching voice responses to e-mails more often. The ability to attach potentially large files (just wait until your people start attaching videos!) will increase requirements for e-mail server capacity.

Instant Messaging. The technology side of adding IM capabilities to a contact center is relatively straightforward. As with other media, SBR/ACD and CRM integration are the main stumbling blocks. IM has value in two places; first for internal collaboration between agents and specialists to help achieve one-call resolution for telephone callers, and, second, for real-time assistance for online customers. Typically, you'll want to use a Web-interface (such as a click-to-chat button) for customer-initiated IM.

Other Applications

Customer relationship management (CRM) integration is another key customer contact application consideration. IP (and, particularly, IP telephony) adds value to CRM for two reasons: First, caller ID and/or IVR data combined with CRM lookups yields information that is more valuable if you have implemented more intelligent routing logic.

Second, as IP communications consultant **Carol Blanchar** of **Conexo** tell us, moving to IP communications often dramatically increases the accuracy of customer-information screen pops that accompany calls.

Back office systems. In an ideal world, your CRM system will handle all of the ties to your order processing, billing, data warehousing, and other back office systems — but you shouldn't assume that this is true without checking. If you use middleware such as **IBM's** WebSphere to integrate business applications, you'll need to be sure that you have the appropriate interfaces in place for efficient data sharing.

Choosing the optimal set of applications to run in your contact center requires balancing business unit objectives against IT/telecom capabilities. Whatever applications you choose to run, you'll need to ensure that each application scales appropriately, that each plays nicely with the other apps on the block, and that you have appropriate business continuity capabilities to recover from disasters.

> **"Choosing the optimal set of applications to run in your contact center requires balancing business unit objectives against IT/telecom capabilities."**

Supporting Contact Center Applications

Installing the application isn't the end of your support efforts, it's just the beginning. Every new app requires ongoing support and maintenance. Many require retraining agents, supervisors, and other employees. Centralization of application servers will help you manage your applications, but to realize the full benefits of centralized management, you will often need to restructure your support teams, moving people to new locations and rethinking your in-house versus outsourced support strategy.

Realizing Infrastructure ROI—How IP Communications Can Save You Money and Common Pitfalls to Avoid

The operational advantages from IP-enabling your call center will usually outweigh any infrastructure benefits that you might realize.

Laurent Philonenko of **Cisco Systems** says that "cost savings are definitely available, but new functionality and service level improvements are vital to implementing IP in a call center." **Philonenko** adds, "I'd venture that, for each dollar saved, you can gain three or four dollars in incremental revenue."

Still, there are cost savings available on the technology side, and you should seek to squeeze out as much in savings as you can. For example, **Avaya**'s **Lawrence Byrd** says, "In larger call centers, the IP communications ROI comes from improving agent efficiency, better customer experiences, and the ease of maintaining a less complex environment." He adds, "By flattening its network, Delta is saving $10 million per year in raw infrastructural costs."

> **"For each dollar saved, you can gain three or four dollars in incremental revenue."**

Deloitte Consulting's **George Svoboda** told us: "In larger call centers, the VoIP ROI comes from improving agent efficiency, better customer experiences, and the ease of maintaining a less complex environment." In large, customer interaction-driven enterprises, the savings can be substantial.

Infrastructure ROI Categories

Here are the some distinct ROI categories we found while conducting our research:

Centralized applications. **The Yankee Group**'s **Art Schoeller** says that one of the key business cases for moving to IP communications is the consolidation of infrastructure for distributed enterprises from three network levels (LAN, carrier, and intermediate software for routing multiple ACDs) to just one.

Once you've moved a location to your converged network, you will no longer need to support separate PBX and ACD systems there. You can also consolidate applications such as call monitoring and recording and CRM.

Changing call center applications (e.g., upgrading your CRM or call monitoring and recording system) is much simpler, since you will be able to make the change in just one central hub (or perhaps two, to provide a business continuity backup), rather than in all of your distributed operations. You can also more easily integrate your IVR with Web-based self-service, and integrate your e-mail and voicemail servers.
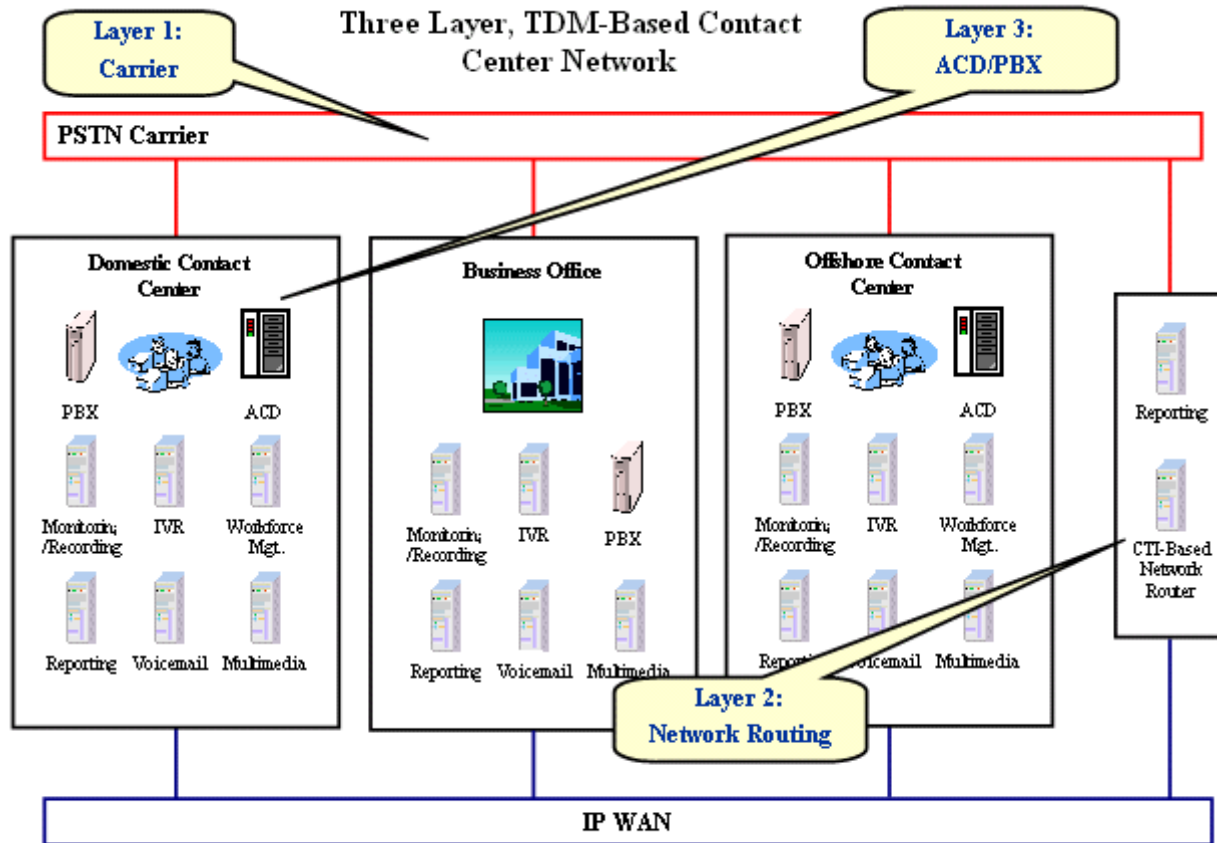
> **"One of the key business cases for moving to IP communications is the consolidation of infrastructure for distributed enterprises from three network levels to just one."**

Figure 6. The state of the art for TDM-based voice networks linking multiple sites involves three layers of call control. When directing a customer's call, or moving a call from one office to another, the voice signal will move across a telecom carrier's network (Layer 1), your network routing facilities will make a CTI connection to the destination office over your WAN (Layer 2), and an ACD and/or PBX will direct a call within each office (Layer 3). You must implement most contact applications separately at each site.
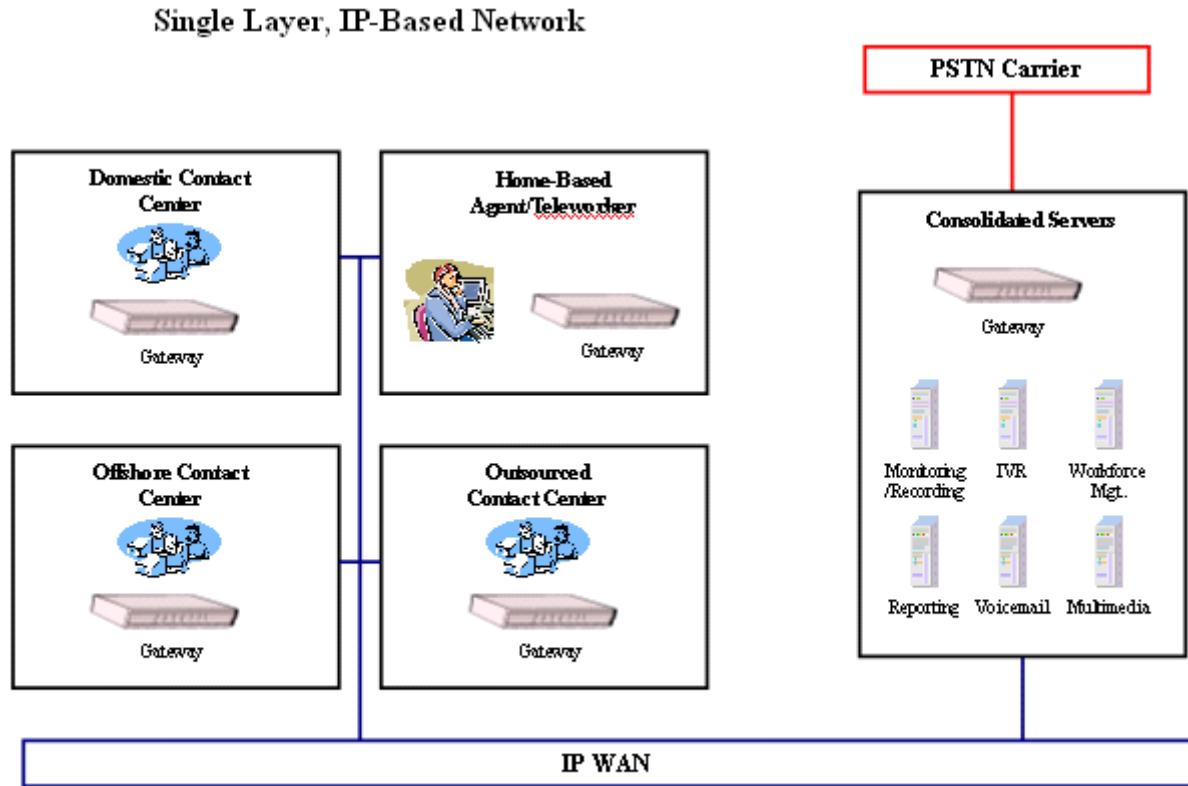
Figure 7. Once you have transitioned to IP telephony, you can receive all calls through a central queue, consolidate your servers, eliminating multiple instances of applications, and direct all calls to the best available resource across your WAN. Note that you might choose to employ a set of backup servers.

Centralized support. Moves, adds, and changes grow much simpler when you adopt fully IP communications technology.

Agents can log in from any location on the network, and telecom managers can set policies for groups and individuals from a central command post. This will let you reduce

your telecom support footprint in remote offices. In the long run, you will also realize lower cabling costs, since you do not need to run separate telephone and data lines to each workstation. Central management can also make it more practical to outsource network management.

> **"The real boost [in transport costs] of VoIP over TDM comes from being able to 'second source' the data connections between sites."**

Long distance transport charge reduction. It is less expensive to transport a call over a WAN than over a switched network. There are a couple of reasons for this: First, an equivalent call over IP uses less bandwidth than does TDM. Second, and much more importantly, you can connect your WAN through multiple carriers. According to **Blanchar**, "The real boost [in transport costs] of VoIP over TDM comes from being able to 'second source' the data connections between sites."

This is especially important if you are connecting remote and overseas offices. However, even within one city, IP telephony might save you money.

Bobby Parrish of the **City of Jacksonville, NC** says, "VoIP has shown a huge return on investment. We've consolidate our monthly phone bill, removing lots of Centrex, fax, and T1 lines."

IP can make **disaster recovery** more efficient. When you have one virtual contact center, it's easy to shift communications away from a site that has gone down due to power outages, inclement weather, and other factors outside your control, to one of your other centers, to an outsourcer, or to home-based agents.

Pitfalls

There are some ROI pitfalls to keep in mind, too. First, with TDM, it is easy to trace problems with a line to the source; troubleshooting calls on an IP network is more challenging.

Second, the QoS requirements for VoIP can increase your network support needs. In some cases, moving to VoIP can increase your support costs. **Blanchar** recommends, "Don't put up slides showing headcount reduction — you're given precious few resources in house as it is."

> **"Here's what works when you present an ROI argument to a CFO — you take the initiatives that a company needs to survive, and you embed the IP infrastructure into one of them."**

Finally, cost-control minded CFOs might not take as sanguine a view of the soft revenue advantages of upgrading your technology, particularly the benefits (which we think are very real) you can expect from increasing customer service. **Concerto**'s **Ralph Breslauer** says, "It's very hard to get a CFO to spend dollars on fluffy ROI. On its own, it almost never holds water — at best, it's a cherry on top."

If you're looking to "sell" an upgrade program to skeptical senior managers, you will want to focus on harder targets. You should, of course, include realistic infrastructure benefits in the analysis, but you will probably need to look beyond IT and telecom cost savings to get the OK.

Blanchar advises: "Here's what works when you present an ROI argument to a CFO — you take the initiatives that a company needs to survive, and you embed the IP infrastructure into one of them. The key to productivity today is the connection people-to-

people and team-to-team, not between systems. That's the 'kaching. The same math that shows how supply chains perform better with better communication can be used to show impact in CRM and in the call center."

How to Install an IP Communications Network and Live To Tell About It—Including Understanding Common Hurdles and Best Practices

There is no such thing as "one size fits all" when it comes to designing, or redesigning, a network to carry an enterprise's VoIP traffic. The endpoints take a variety of forms, from traditional telephone handsets to softphones to mobile units. Networking components also vary widely. You'll probably be facing the Herculean task of uniting disparate call managers, gateways, routers, firewalls, etc., which may use several different protocols.

Hurdles

On top of it all, VoIP requires much higher performance than most pre-existing enterprise data networks can provide. If you think that, because voice travels in packets, you can simply plug VoIP endpoints into your existing network and have it all work, you are in for a very rude awakening.

Here are a few of the major issues that you'll need to address as you manage the transition:

Multiplicity of protocols. IP communications systems today use one of two open standards for call control, channel setup, and coding/decoding/compression, H.323 and the Session Initiation Protocol (SIP), unless they run a proprietary protocol. SIP seems to be the emerging winner in the protocol wars, but, as you add network elements, you should keep interoperability issues in mind, which often means using components that support multiple protocols.

In addition to IP transport protocols, network designers need to consider the multiplicity of standards for the operation of gateways between their packet switched network and the public switched telephone network (PSTN), notably the closely related Media Gateway Control Protocol (MGCP) and Megaco/H.248. And we're only scratching the surface.

Quality of service concerns. QoS is fundamental to building a network that will meet the expectations of its users. IP breaks voice signals into separately transmitted packets. Those packets may arrive out of sequence (jitter), or they may not arrive at all (dropped packets). Either way, the quality of the voice connection is reduced.

> **"The most essential thing to remember about QoS in a network carrying VoIP traffic is that you don't have a bandwidth problem or a signal reassembly problem per se — you have an overall reliability of service problem, and you need to solve it 24/7."**

Today's network elements are quite reliable, so you can usually solve the dropped packet problem by ensuring that the network devotes sufficient bandwidth to VoIP traffic. Most data networks address the jitter problem by building a lag into packet processing, letting network elements catch up with the more slowly arriving packets to reassemble the signal. IP communications throws a monkey wrench into this solution, since voice delays beyond half a second or so translate into observable — and annoying — pauses in the conversation.

The most essential thing to remember about QoS in a network carrying VoIP traffic is that you don't have a bandwidth problem or a signal reassembly problem per se — you have an overall reliability of service problem, and you need to solve it 24/7.

Network security issues. Like other data networks, networks that carry VoIP signals are subject to hacking, hijacking, denial of service attacks, and other unauthorized use.

VoIP complicates the picture for two reasons: First, networks carrying voice packets usually establish IP addresses, port allocations, and other parameters dynamically; this gives the bad guys a lot of points to attack.

Second, firewalls, packet monitoring intrusion prevention systems (IPSs), encryption at the application level (as is seen in SRTP, the Secure Real Time Protocol) or networking level, and other security technologies that work well in a data network may introduce too much delay for the network to deliver high quality voice service. And, as **David Endler**, chairman of the **VoIP Security Alliance** (VoIPSA) and Director of Digital Vaccine at **3COM**'s **TippingPoint** division, suggests, "As VoIP deployment increases, hackers will devote more effort to cracking into converged networks."

Vendors are devoting large efforts to addressing these issues, and the technology keeps getting better, but it's still an evolving market, so you need to work through the tradeoffs among various security choices. To give just one example, you can use Network Address Translation (NAT) to hide internal network addresses behind your firewalls, but you pay a price in the complexity of establishing calls. Moreover, NATs are not compatible with the emerging IP Security Protocol (IPsec) encryption standard.

CheckList: VoIP Quality and Security Recommendations

The National Institute of Standards and Technology (NIST) has issued the following recommendations for establishing secure converged VoIP and data networks:

1. Develop an appropriate network architecture.

2. Ensure that the organization can manage and mitigate risks to information, system operations, and continuity of essential operations.

3. Give special consideration to E-911 emergency services communications.

4. Be aware that limiting physical access is especially important in securing a VoIP environment, especially when the VoIP network is not encrypted.

5. Evaluate costs for additional power backup systems.

6. Employ, and regularly test, VoIP-ready firewalls and other appropriate protection mechanisms.

7. Avoid softphones (PC-based telephones) where security or privacy is a concern.

8. If mobile units are integrated with the VoIP system, use products implementing Wi-Fi Protected Access (WPA) security standard.

9. Review legal requirements regarding privacy and record retention with legal advisors.

Source: D. Richard Kuhn, Thomas J. Walsh, and **Steffen Fries**, Security Considerations for Voice Over IP Systems, Recommendations of the **National Institute of Standards and Technology**, NIST SP 800-58, available online at **http://csrc.nist.gov/publications/nistpubs/800-58/SP800-58-final.pdf**.

Network security problems multiply if you give call center supervisors or other employees mobile access to the phone system over Wi-Fi. Hackers can crack the Wired Equivalent Privacy (WEP) standard with publicly available software. You should use equipment that implements the Wi-Fi Protected Access (WPA) standard for voice over Wi-Fi. If security is a concern, you will need to check your existing wireless endpoints to be sure they comply with WPA.

Legal issues are also looming larger in network security planning. For example, the need to comply with the financial controls requirements of the Sarbanes-Oxely Act is forcing firms to secure any networks that can provide access to financial information. VoIP

security is of special concern to firms that face legal restrictions on data security, such as healthcare firms subject to the Health Insurance Portability and Accountability Act (HIPAA).

> **"You need to get voice and data people working together; we integrated IT and telecom before we migrated. Voice people need to learn the data technology."**

Fundamental changes in IT Data Network and Telecom processes. With every infrastructure redesign, the way a data network or telecom department operates will change. Beyond changing the hardware and customer contact software applications that you run, you also need to change the way IT/telecom supports the new IP telephony infrastructure.

Diane Stenoien, Telecom Manager at **CNT**, which provides managed IT disaster recovery services, had to get the transition right, since they have promised their clients that they will be able to take service calls. She advises, "You need to get voice and data people working together; we integrated IT and telecom before we migrated. Voice people need to learn the data technology." She added, "We've found that it's easier for telecom people to learn about data than vice-versa."

> **"You need to get voice and data people working together."**

Best Practices

So how do you navigate through the shoals and emerge with a successful (not to mention career-enhancing) IP communications implementation? We've spoken with vendors of telecom and IP network components, call center software vendors, IT consultants, and managers at companies that have successfully made the transition. Here's what they advise:

Don't start your migration without the input and support of your contact center operations and business unit management. As we have advised elsewhere in (an entire section of this Guidebook), the big payoff from an IP communication migration comes, not from infrastructure costs savings, but rather from improving your organization's business operations. Your telecom systems need to meet the communications needs of your business units. The only way you can know what those are is to give the business units a voice in the migration process. There's also an opportunity here to make yourself look good by suggesting some changes that VoIP and IP telephony technology can make possible, but that operations managers have not yet considered.

Involve an experienced VoIP network consultant/integrator early in your planning. We have a very high regard for the intellectual capacity and problem solving abilities of telecom and IT managers and engineers. But even if you combine the intellect of Einstein with the technological acumen of the assembled faculty of MIT, you're not prepared to do an IP communications implementation unless you can call on the resources of someone who's done it all before. None of the managers with whom we spoke said that they thought they brought their consultants into the planning too soon.

When choosing a consultant, you're first criterion should be that the consultants who will staff your project have experience in IP communications migrations; ideally, the consultants should have worked with firms of similar size and in industries closely related

to your organization's. You should, of course, check their references. A few site visits to the clients they have helped through the process can save you a lot of headaches down the road. We also advise that you look for straight shooters rather than hard sell types who will tell you only what you want to hear.

> **"Even if you combine the intellect of Einstein with the technological acumen of the assembled faculty of MIT, you're not prepared to do an IP communications implementation unless you can call on the resources of someone who's done it all before."**

You should also call liberally upon the resources of your key vendors, particularly the firm or firms that will provide any new switches or routers that you might install. If you plan to use your IP network to integrate more closely with outsourcers, they need to be in the mix, too.

Prepare your technology implementation teams. Data people often don't understand the complexities of achieving the high reliability standards needed in telecom, whereas phone specialists often lack data networking knowledge. The two groups can learn a lot from each other, but to do that they have to talk to each other.

> **"A good place to start is the VoIP security guide recently published by NIST."**

Many firms choose to merge their data network and telecom groups into a unified organization before rolling out IP communications. It's also not a bad idea to consider IP communications experience when you're hiring new IT or telecom managers and support personnel.

There are several sources of detailed printed guidance for IP communications implementations. A good place to start is the VoIP security guide recently published by NIST (see sidebar) and the references that report cites. Don't make the mistake, however, of thinking that you can learn everything that you need to know. Outside expertise is still essential.

You also need to think about educating senior management about IP technologies, and how you think they should be implemented. That lets you set the stage before a vendor or consultant reaches your CEO with an IP communications implementation proposal. It also paves the way for a migration, since your marching orders on any major infrastructure project are going to come, ultimately, from the top of your organization.

> **"Writing a plan for an IP communications implementation will help you identify gaps in your thinking early; will let you allocate resources efficiently as the project progresses; and will avoid political difficulties."**

Write a comprehensive migration plan, and update it regularly. Drafting a comprehensive plan before engaging in a major project, and updating it regularly, is one of the keys to good engineering and project management practice.

The plan should be based upon the defined requirements specified by the business and operational management migration team. As is the case with most projects, writing a plan for an IP communications implementation will help you identify gaps in your thinking early; will let you allocate resources efficiently as the project progresses; and will avoid political difficulties by clarifying roles, responsibilities, and expectations.

The implementation plan also keeps your efforts focused on achieving results for the business and operations units that you support, aligning infrastructure decisions with their

broader technology and business strategies and priorities. A good plan will form the core of the network infrastructure budgeting process, making the forecasts of time, money, personnel, and results visible to everyone involved.

Even if you do not plan to implement IP communications in the near future, you still need an IP plan, albeit one without fleshing out implementation details. There are several reasons for this.

First, unless your company goes out of business, you will have to migrate to IP communications eventually, probably within the next five years. Second, senior executives are becoming more aware of IP communications and IP communications, and you don't want to be caught without an answer when your CEO asks, "Why aren't we doing this?" Finally, you may find as you write your plan that IP communications makes more sense for your business today than you had thought.

Perform a network assessment. Without exception, the vendors, consultants, and IT and telecom managers with whom we spoke agreed that a network assessment is critical to a successful IP communications implementation.

> **"The biggest screwups occur because a company fails to do a network assessment and to make the necessary upgrades."**

Lori Bocklund, the President of **Strategic Contact** and another veteran of several IP migrations, raises the question, "Do you have the right kinds of infrastructure to support a move to IP communications? You need updated routers with QoS and excess capacity. Most companies are not at all ready. The biggest screwups occur because a company fails to do a network assessment and to make the necessary upgrades."

John Cray of call center software developer **Apropos**, advises, "The leading IP providers will include a network analysis as part of the installation. Sometimes you can get it from them before the sale."

Think through the new IP networking technology versus legacy tradeoffs.
Perhaps the most difficult choice that you'll face is deciding whether to install a pure IP network, or whether to add IP capabilities to an existing TDM-based network. We're splitting the proverbial baby on this one — as with most complicated questions, the answer is, "it depends."

The main advantage of a hybrid network is the minimization of integration efforts. If you're just adding new boards to your TDM-based switches and PBXs, you won't have to do a lot to make all of your legacy applications work. You'll also minimize the changes in the way people use their phones, keeping the retraining needs to a minimum. And you probably won't have to discard your old phones. If you're risk averse, or you recently invested in TDM equipment, then a hybrid may have special appeal to you.

Migration Meat: Pure vs. Hybrid

Different switch/router vendors often seem to have very different views of the best network structure. **Cisco**, not surprisingly, is viewed by many as favoring pure IP networks, whereas the established switch vendors, such as **Alcatel**, **Avaya**, **Nortel**, **Siemens**, etc. are known to favor more gradual migrations based on their hybrid systems. But, if you dig a little deeper, their positions are not quite so far apart. Compare:

Laurent Philonenko of **Cisco**: "The tradeoff is between functionality, cost, and timing… by deploying Cisco Intelligent Call Management (ICM) as a network routing engine to

support legacy environments, and then progressively adding IP functionality, migration is seamless from a user point of view."

Lawrence Byrd of **Avaya**: "IP transformation is and should be independent of the applications. You should be able to mix it together, do a big bang, or any combination you want… Avaya doesn't care if your endpoints are IP."

The bottom line in a IP communications migration is that you're moving the call routing function and the agent-facing applications from a local service up to the network level. Some solutions take you there faster than others, and some take you there more smoothly. But all of the vendors with whom we spoke indicated that they want to support more than one migration path.

There are, however, good reasons to consider replacing your telephony application servers from scratch with pure IP versions (a so-called forklift upgrade) on an IP communications network:

Your **long-run maintenance costs** will be lower with a pure IP network, since you don't have to maintain separate TDM and IP skills within your organization, and you'll need fewer support personnel on-site in your remote locations.

You also won't have to invest in applications that require gateways or that support both network transports.

You'll have more **freedom to protect your network investment** as new technologies emerge, and you'll be ready when application and hardware vendors stop supporting TDM, as will inevitably happen.

A forklift upgrade is an especially strong option for new installations (aka. greenfield sites), end-of-life replacements of equipment, and IP communications implementations that are driven by the desire to save on infrastructure costs over time.

One interesting play here is shifting to **IP Centrex**, or possibly to a hosted call center. **Yankee Group**'s **Art Schoeller** does not see hosted call centers becoming the predominant model, but he does predict, "Hosted solutions will gain some share. The flexibility of IP networking makes 'Centrex ACD' more practical, and it will take share over five to seven years."

Whatever network architecture you choose, you'll also need to be sure that your existing IP telephony applications, such as IVR and voicemail systems, are able to still function.

Operate separate logical networks for voice and data. If voice quality is important to your operations, which is usually the case when you're communicating with your customers, we recommend that you stick to dedicated, privately managed data connections.

Svoboda suggests that, for networking far-flung operations, "Redundant MPLS [MultiProtocol Label Switching] networks are more reliable, though you can run over ATM [Asynchronous Transfer Mode] or other WAN structures." He also warns that, if you use a converged network architecture, " The biggest screwups occur because a company fails to do a network assessment and to make the necessary upgrades "

So even within a LAN — and especially over a WAN, which is likely to be more congested than a local network — it is usually best to separate the traffic onto distinct logical networks to ensure that voice traffic receives priority.

If your plans include home agents, we recommend using either dedicated connections over DSL or sticking with a traditional TDM line as the voice path, rather than giving in to the temptation to link across the Internet.

Run a pilot program before you go live. Time and again, managers and consultants who've gone through IP communications migrations have told us that running a pilot program before moving their organizations to IP communications was crucial; even IP communications installations at greenfield sites need pilots. Nortel's George Despinic says, "I suggest setting up your call flow in a lab environment first, to make sure that your call flow isn't affected by the introduction of IP communications in the call center."

Depending on the size of the organization, pilots will be more or less formal. For a large-scale rollout, the first step is to start a lab to evaluate network architectures and applications.

Once you're confident that the new IP technologies won't crash your business, you're ready for live testing with a small group of employees (including call center agents) and customers.

Migration Meat: Softphones vs. Hard

Deloitte Consulting's **George Svoboda** says, "A lot of companies are thinking about softphones. Using a PC was a problem when you plugged your headset into a sound card, but the quality is there today with USB headsets. Many companies don't trust their PCs the way they trust their phones, so adoption is about 50-50."

To avoid linguistic confusion, we should point out that "softphone" has two meanings. In the computer telephony integration (CTI) world, it means a PC desktop application that

controls calls. For VoIP, a "softphone" is a complete PC-based telephony application that replaces a separate telephone handset. Here, we're talking about the second meaning.

Softphones, like most elements of a network, have advantages and disadvantages:

A USB headset and a piece of software are usually $50 to $100 less expensive than a standalone VoIP handset unit. Softphones don't occupy extra space, so they'll let you squeeze a few more bodies into a call center perhaps. If you employ teleworkers, such as home agents, the softphone will unify the experience of home and office-based workers. Finally, you save on installation costs and maintenance, since you won't have to connect two separate units.

On the other hand, if a user's PC crashes, it brings the phone down with it, possibly stranding customer calls. Softphones add to PC screen clutter, though larger monitors can solve this problem. Softphones also face security issues, since spyware could subject PC-based conversations to eavesdropping. A separate phone also gives you an extra screen, though there aren't many apps that we recommend running on a phone rather than a PC.

Svoboda also points out that, "A desktop phone builds in the CTI, so you don't have to justify the cost separately."

As is the case in most of the decisions you'll make, the monetary effect of the softphone/handset decision on the users is likely to far outweigh the cost of the equipment. Working through this choice is a perfect example of the benefits of a pilot program. Once you've had feedback from members of your test group, you can make an informed decision before committing your organization—and you might even leave the decision up to individual users.

For more complex projects, you'll want to go through multiple test cycles, refining your choices based on user feedback — for call center applications, that feedback should include customer satisfaction data.

You can't just look at network performance statistics; you need to evaluate the results against the operational goals that you've set in your migration plan. Your pilots should test your people too, not just your technology.

Here's a tip that can save you a lot of money — *you can often negotiate with vendors to try their equipment and applications without charge in your lab work and live pilots*.

Roll new networks out gradually. If your operations are distributed over several sites, you'll want to roll IP communications out one location at a time. This is especially important for call centers, where it's simply too risky to switch everything at once.

There is one exception to this rule — for small organizations (e.g., single call centers). It may cost too much to switch half of the organization at a time to IP communications. One solution, that Parrish used successfully, was to "put the new phones on users' desks a few weeks before removing the old system."

Gear up to support the new systems. For an IT/telecom organization, the installation is just the beginning of the work. You technical team needs to be ready to support the new network structure and any new customer contact applications.

Building network-based applications is a process of continual refinement, not a one-time-only project. If you're linking multiple sites into one "virtual phone system," in addition to managing the network architecture, you'll probably need to reorganize your support organization to accommodate centralized control of the network. You may need to transfer some support personnel from remote offices to your headquarters.

Migration Meat: Free eSeminar On IPC Migrations

Design, Business Case & Best Practices in IP Communications Migrations
Dave Bengston, Director of Global Strategic Solutions, Avaya
Length - 24:51

An excellent down-to-earth primer on how to successfully introduce IP Communications into your center.

Click Here to Watch

Summary

The continued emergence of IP networking is creating a revolution in the way organizations communicate with their customers. Although we believe that the converged enterprise contact center is the "Killer App" for IP networking, it is also the most sensitive and complex piece of your business to migrate.

There are many stakeholders, both on the technology side and in business operations/management (and, of course, your customers). All of the stakeholders have their own ideas and requirements for the migration to IP. They all have their concerns about the transition too.

Many stakeholders do not yet understand the range of operational advantages that IP-based contact center makes possible, which means that you will probably need to educate them. Of course, everyone needs to justify their decisions on a financial basis; this gets complicated, since there are many different kinds of ROI payoffs from bringing an IP communications infrastructure to the traditional telephone call center.

In short, the challenge is both daunting and disruptive. Nevertheless, the potential benefits from a IP-based communications network and communications modalities in the call center are too significant for most enterprises to ignore.

If you're expanding rapidly, or if you want to connect widely spread contact centers (or use home-based agents), you probably want to move soon. Even if you don't plan an immediate change, you are going to have to start switching over someday — and that someday is probably within the next two to five years.

IT/telecommunications and call center operations management need to work hand-in-hand to preserve the functional capabilities of the old (TDM) technology, while evaluating

and achieving the potential operational enhancements that IP networking will make possible:

On the operations side, the first goody on your shopping list will probably be the ability to link all of your call centers, branch offices, home agents, and even outsourcers into a single, virtual contact center.

You'll be able to route calls — and other forms of contact such as e-mail, IM, and chat, which also need to be on your agenda — more efficiently and effectively. You'll need to rethink your IVR use to make the most of centralized network routing. Most importantly, you'll need to be the voice of your customers, your agents, and business unit management throughout the transition. You can learn a lot about what the technology can do from your IT folks, but they need guidance from you to build an infrastructure that supports the way you want to connect with your customers.

If you're an IT pro (either in data networking or telecom) you're going to face some big challenges, both in terms of network rearchitecture and in the way you support business operations. This is particularly true when you're migrating your call center, and the rest of your enterprise, to IP telephony.

Running voice over a data network raises a lot of complications; you'll be trading off more stringent data network QoS requirements than you're used to against security concerns and, of course, your budget. Beyond the network itself, the call center applications are the key elements that you will need to update, with skills-based network call routing (ACD), and the routing of other forms of communication, serving as the lynchpins.

You'll need to plan all migration moves carefully, working with operations management to build and manage your network in a way that will facilitate their business processes. You'll need to bring in an experienced consultant or integrator to guide you. A VoIP migration is

also a good time to converge the telecommunications staff with data networking staff, since the telephony infrastructure will no longer be separated from your data network — and you'll need all of your people to be on the same page.

Whatever your role, you must — absolutely must — carefully pilot changes to your customer contact applications; you'll have to prepare customer-facing staff — and customers — for the changes as well. This applies to existing and new telephone and online self-service applications as well.

The bottom line for every enterprise organization with existing telephone call centers, and even for new "greenfield" installations that want to exploit the benefits of VoIP networking and other cutting-edge modes of communication, is that you need to plan and organize for the changes now, even if you don't need to implement them immediately.

The technological changes taking place in communications technologies require enterprise-wide re-thinking and reorganizing, but most especially in your contact centers. If you keep your head stuck in the sand on this one, eventually upper management is going to sneak up on you with a lot of questions. You want to have the answers before that happens; that will let you manage your responsibilities, and your organization's customer contact migrations, far more smoothly.