# Horizontal Integration: A New Architecture for Customer Contact

## Executive Summary

Seismic shifts in business trends are causing a dramatic increase in the strategic importance of the call center.

These include:

- Business-to-business e-commerce
- Globalization
- · Reduced order-to-delivery cycles
- · Virtual supply chains
- · Heightened customer expectations

New technologies enable the transition of call centers to contact centers, including:

- Multi-channel (voice, text chat, Web collaboration, e-mail, video) services on converged networks
- Customer relationship management (CRM) and business applications
- IP networks and voice-over-IP (VoIP) applications

These new contact centers promise bottomand top-line competitive advantage, driving organizations to deploy them. Established enterprises and service providers have attempted to compete in this new environment while taking advantage of their sizable existing investments. Infrastructures in place are typically based on time-division multiplexing (TDM) networks, deployed for voice services under the traditional call center paradigm. They have added additional, if ultimately limited, functionality such as automatic call distributor (ACD) and computer telephony integration (CTI) through a vertically integrated architecture.

The inherent limitations in these systems place them at performance, functional, operational, and fiscal disadvantages to new world infrastructures that feature horizontal integration, a multi-tiered architecture based on open industry standards. Such platforms support multi-channel customer communications and best-in-class CRM and business applications. This architecture is designed to offer advantages across key areas:

- Customer interactions
- Advanced routing
- Multi-channel services
- Agent productivity
- Scalability
- Extensibility
- Protection of traditional methods

To remain competitive, these organizations face the need to migrate effectively from traditional, vertically integrated, stovepipe environments to the new, horizontally integrated model. New entrants must build this horizontally integrated system on a "green field."

This white paper examines these business dynamics and emerging technologies in the contact center. It articulates a likely



migration path from current TDM environments to mixed TDM and IP and pure IP environments. Finally, it introduces and summarizes Cisco Intelligent Contact Management (ICM) and the Cisco IP Contact Center (IPCC), which incorporate an open, horizontally integrated communications architecture to manage multi-channel customer interactions.

#### Trends: From Call Center to Contact Center to Customer Interaction Network

The traditional call center was based on proprietary hardware, a private branch exchange (PBX) that included core ACD functions. This closed architecture—although it promised to work right out of the box—hampered enterprises and service providers in two ways: it created a marketplace that could support only a few hardware vendors, and it forced customers to return again and again to the original vendor for additional functionality or capacity. The bundling of software on these proprietary platforms slowed the pace of technology innovation because products and processes were technology constrained.

During the 1990s, computer software began to transform the call center. CTI linked the ACD to the computing environment. CTI enabled delivery of caller data to agents, synchronized with the customer's phone calls, and enabled agents to become more efficient and to improve customer service levels. CTI became a platform for ancillary applications—workforce management, quality monitoring, and reporting—that provided increased control and decision support capabilities to call center managers.

The advent of the Internet and e-commerce created the need for e-mail response management and live Web interaction solutions. With CTI, these early solutions became the building blocks of the multi-channel contact center. Yet the vertically integrated, traditional ACD remained a bundled, closed hardware and software product, with limited application integration capability. It was not designed as a true contact center service delivery platform.

Finally, responding to customers today requires more than staffing a call or contact center. Organizations that truly differentiate themselves by their customer service make customer responsiveness an attribute that pervades the entire organization. So, the customer service function is not limited to 500 customer service agents all located in a single contact "center." Instead, to deliver exceptional customer satisfaction, enterprises use multiple contact centers across different geographic areas, incorporate outsourced contact centers, and extend their service capabilities to temporary knowledge workers as needed in a Customer Interaction Network.



# The Opportunity: Putting the Customer First

Business-to-business e-commerce demands a new, strategic role for contact centers. Companies have reconfigured themselves as distributed entities using intranets—and sometimes as "virtual" organizations, with a network of trading partners united over extranets. The contact center is a competitive necessity, transformed from being merely a cost of doing business to a source for new revenue. The Gartner Group forecasts that 70 percent of North America's call centers will migrate to multi-channel contact centers by 2005.

The coming of age of contact centers, in turn, has created a new challenge: to reach new levels of responsiveness, while maintaining a high level of operational efficiency. Partners and customers who do business over the Internet demand more control over their relationships. They have access to more information and the opportunity to do business when they want it, how they want it, and from whom they want it. Frequently, this means that they demand instant access to the most useful source of information or business function.

This forces organizations to put the customer first and develop processes that provide added value and ease of doing business to both customers and trading partners. In addition, highly trained customer service representatives require advanced tools to make their jobs easier and more efficient. This ranks with location independence as a crucial agent retention strategy.

The contact center that delivers these benefits is not constrained by technology limitations or channels, but driven by customer need—delivering fast, seamless access to the optimal agent, through superior routing capabilities and truly integrated multi-channel services. Assistance can be delivered based on priority, type, customer tier, or a host of criteria. Table 1 shows one method of prioritizing customer assistance

Priority	Type of Assistance	Contact Channel
Highest	Real time	<ul><li>Live voice</li><li>Live text chat</li><li>Live Web collaboration</li></ul>
Intermediate	Deferred	<ul><li>E-mail</li><li>Online forms</li><li>Voice mail</li></ul>
Lowest	Self-service	<ul><li>Interactive voice response (IVR)</li><li>E-mail auto-response</li></ul>

 Table 1
 Customer assistance matrix example

Whereas the Internet has let businesses reorganize key functional areas based on customer needs and employee optimization, the traditional ACD has limited this kind of change within the contact center. Furthermore, global organizations provide 24 x 7 customer service through distributed contact centers. These centers must, in the words of the Gartner Group, be "physically decentralized (in terms of personnel and infrastructure) but logically grouped (in terms of customer databases, customer service and support applications, information management systems, and business processes)." But traditional systems typically make optimized routing across the enterprise awkward (if not impossible), hinder the development of standardized best practices, and offer poor overall operational management support.



#### The Constraint: Current Contact Center Architectures

In addition to their inability to support distributed contact centers, vertically integrated traditional architectures present five key obstacles to the deployment of a new world contact center.

• Limited integration capability

The CTI-enabled ACD was not designed as a platform for integration. Indeed, adding multiple applications to the architecture can turn it into a costly support nightmare. Vertically integrated applications (ACDs and point solutions for e-mail or text chat) provide out-of-the-box solutions, but they lack flexibility and slow innovation within the core product functionality.

• Proprietary interfaces

Hardware and software bundling keeps control of product enhancements under the authority of the switch vendor—and prevents third parties from enhancing its capabilities. In addition, each switch vendor has implemented propriety CTI features, making the development of standardized call center application interfaces impossible.

· Long development cycles

The absence of standardized architectures places roadblocks in the path of development teams, limits the potential talent pool for developers, raises market entry barriers, and deters innovation and competition. These factors slow down development of new contact center software applications.

• Dual network administration

Separate voice and data networks are expensive to deploy and maintain. Dual networks also complicate the deployment of integrated multi-channel services that rely on integration between voice and data applications.

• Expensive maintenance

Held back by the limitations of the ACD as a platform, a decade of CTI integration has caused long and complex development projects. These integrations are very difficult to maintain. Indeed, for most chief information officers, the existing contact center infrastructure represents a serious bottleneck for flexibility and a sinkhole for capital expense.

#### Figure 1: The Problem with Vertical Integration



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Contact centers must overcome these impediments if they are to respond effectively to changes in the competitive landscape—or satisfy increased customer expectations.

## The Enablers: Three Key Technologies

Currently, three major technology shifts are making a profound impact on the development of new world contact centers:

- The ubiquity of IP networks and the ability to migrate efficiently from TDM environments to these new, converged voice and data networks
- The ability of IP-enabled networks to support integrated, multi-channel (voice, e-mail, text chat, and Web collaboration) customer interaction
- The widespread adoption of CRM software

The advent of VoIP promises dramatic changes in both technology and process for contact centers. IP-enabled contact centers will deliver true location independence, allowing distributed agents to function optimally and seamlessly for superior customer service, supporting multi-channel contact; and enabling centralized contact center operations management, maintenance of business rules, and network administration. Because these solutions are platforms based on open industry standards—not on proprietary TDM infrastructure—they can accommodate new and upgraded capabilities more quickly, cost-effectively, and at diminished risk, than traditional systems.

Because traditional systems represent a significant investment, companies moving from TDM to IP need an effective way to manage that transition—minimizing downtime, enabling interoperability between TDM- and IP-based agents and applications, phasing in the new system according to the company's needs and timelines, and easing training problems. Organizations need to unify emerging IP-based technologies and traditional TDM applications into one architecture for optimum flexibility and functionality during the TDM-to-IP transition period.

CRM software has emerged as a tool for pulling together disparate customer contact information and consolidating customer data. CRM software provides a centralized repository for customer data and a focal point for managing business processes around customer relationships. An effective CRM deployment will interact with all customer touch points, maximizing the value of each customer interaction.

But CRM deployments are unnecessarily prolonged because the vertically integrated legacy infrastructure is overly complex. Integrating the CRM system with multiple customer touch points is expensive and time-consuming—especially through legacy ACD hardware. Often, the result is a tangled web of CTI application software that is difficult to maintain and to modify. As a result, the full potential of the CRM solution cannot be realized because of the limited capabilities of the contact center infrastructure.

Multi-channel customer interaction—managing each contact through the channel (or channels) preferred by the customer—has rendered obsolete the old, single-channel call center. In addition, organizations themselves can streamline the customer contact process and decrease queue times by deploying multiple interaction channels, based



on call and customer priority, or any business rules they may choose to apply (refer to Figure 2). They can maintain a customer data repository and exploit it across contact channels. Companies need a superior way of offering integrated voice, e-mail, text chat, or Web collaboration. The IP convergence of voice and data—plus its open standards and open interfaces—makes this possible.

The convergence of the voice and data infrastructures will not only offer the cost savings of a single infrastructure, it will also force the restructuring of the telephony architecture in the contact center. As an open, standards-based communication infrastructure, VoIP will force the uncoupling of the ACD software from the telephony hardware. This reconstruction will result in the implementation of a horizontally integrated systems approach to contact center solutions.

#### The New Architecture: Horizontal Integration

The migration of contact center technology to horizontally integrated architectures based on standard application layers promotes a market-driven, competitive environment at each distinct layer within the architecture. For example, the Web is based on many layers for functions—IP transport, servers, server operating systems, Web server software, Web applications, and content. This model delivers flexibility and encourages competition at each layer of the system architecture, in turn promoting innovation and better solutions for end users. This is the concept behind the evolving multilayered, horizontally integrated contact center platform.

#### Figure 2: Multi-channel Contact Center Layers



The multiple layers include the communications network infrastructure, the customer contact center software platform, and the CRM and business applications layer. The network infrastructure is the foundation—and it can include traditional TDM, mixed TDM and IP, and pure IP networks. In traditional environments, this network infrastructure includes a proprietary circuit-switched digital voice network as well as an IP infrastructure for data



communications. In many cases multiple traditional ACD vendors may be involved, each with separate proprietary circuit-switched digital voice networks. In the horizontally integrated contact center, the infrastructure can migrate to a converged voice and data network on IP—supporting multi-channel interactions.

Cisco ICM Enterprise and Cisco IPCC Enterprise integrate with both the legacy and the new world network infrastructure, interoperating with value-added software applications that monitor and manage the overall effectiveness of contact center operations—such as recording and monitoring, agent performance measurement, workforce management, and consolidated reporting systems.

CRM applications—such as customer care, marketing automation, e-commerce, and sales force automation—contain the customer data and business processes that are triggered by customer events. Because customer contact software must support best-in-class CRM offerings from multiple vendors, and because the system must accommodate a high degree of customization unique to each implementation, there must be a broad range of integration points between the customer contact platform software and the CRM applications.

The initial business benefits of the multi-tiered, horizontally integrated contact center architecture include:

- · Consistent CRM application integration points for mixed infrastructure environments
- · An elegant migration path from TDM to IP networks
- · Competition at each layer to accelerate the development of emerging applications
- · Standards-based interfaces that will offer investment protection

#### The Cisco TDM-to-IP Strategy: Cisco AVVID

Traditional investment protection is a critical issue. According to IDC, \$2.53 billion worldwide was spent between 1997 and 1999 on customer support and call center applications alone. Many organizations are just coming off very expensive PBX upgrades to ensure Y2K compliance. Thus, for today's call center, the most crucial question in considering next-generation contact center infrastructures is how the migration from TDM to IP networks can be supported. Cisco Systems has developed a foundation technology that provides a standards-based, open systems architecture for building converged networks: Cisco AVVID (Architecture for Voice, Video and Integrated Data).

Cisco AVVID solutions are designed to enable server and agent-level IP telephony to coexist with traditional TDM networks that support ACDs, PBXs, and IVR systems and desktop applications. The Cisco AVVID architecture is supported by an Internet ecosystem that thrives on open standards, encouraging the development and interoperability of multi-vendor and multi-product solutions. These solutions provide a seamless migration path from the traditional call center to the IP-powered, multimedia contact center, enabling an organization to incrementally add IP telephony, IP-based services, new contact channels, and IP-based applications at its own pace while taking advantage of its existing IP data infrastructure and preserving traditional system investments.

Cisco contact center solutions, an integral part of Cisco AVVID, support unified user interactions that bridge the worlds of IP and telephony. These solutions enable multi-channel customer contacts originating from different contact channels to be intelligently distributed to agents or resources over traditional circuit-switched and IP networks—providing a seamless migration path from a traditional call center infrastructure to an IP-enabled, multi-channel contact center.



#### **Cisco ICM Enterprise and Cisco IPCC Enterprise**

Designed as a fundamental technology platform of the new world contact center, Cisco ICM Enterprise and Cisco IPCC Enterprise represent one of the first implementations of a horizontally integrated solution, delivering intelligent, multi-channel contact routing, including voice, VoIP, e-mail, text chat, Web callback, and Web collaboration. Cisco ICM Enterprise and Cisco IPCC Enterprise combine multi-channel media processing capabilities in one integrated platform. The interface between the core platform and the media applications is based on a published application programming interface (API), which will allow the expansion of the contact center with future applications from Cisco or third-party vendors.

With its use of Cisco AVVID technology, Cisco ICM Enterprise and Cisco IPCC Enterprise support mixed TDM and IP configurations, so that businesses can make a smooth transition to converged IP voice and data networks. Unique integration capabilities with public-switched-telephone-network (PSTN) carriers support prerouting and network IVR, saving money for multi-site contact centers by reducing telephone call transfers. Such integration can be deployed in both circuit-switched and IP telephony environments.

Cisco ICM Enterprise and Cisco IPCC Enterprise offer a cooperative integration strategy with traditional ACD systems, allowing contact centers to implement some multi-channel blending in traditional ACDs, while migrating advanced applications that require more flexible agent control to the converged over voice and data infrastructure. In addition, Cisco ICM Enterprise and Cisco IPCC Enterprise enable organizations to extend the capabilities of their single-channel interaction solutions into a horizontally integrated system.

## Managing Multi-channel Customer Interactions

The queuing and routing capabilities of Cisco ICM Enterprise and Cisco IPCC Enterprise provide flexibility in managing multi-channel contact center blending. Cisco IPCC Enterprise can be configured to manage a single universal work queue for all interaction requests and deliver contacts in the order in which they arrive, or prioritized based on customer value. Agents can be designated as "universal"—handling all media types, and potentially switching media type on a task-by-task basis. Alternatively, Cisco ICM Enterprise or Cisco IPCC Enterprise can be configured to segment interaction types and customize routing behavior based on the media type and agent skills to maximize agent productivity. Contact center managers can design these business rules to balance the degree of blending through the scripting environment of the platform. In addition to synchronous task-by-task blending, Cisco IPCC Enterprise can permit interruption for specific media types. For example, urgent real-time requests may be configured to "interrupt" agents responding to a lower-priority medium, such as e-mail. With such flexibility, contact center managers can use all means necessary to meet the service-level goals of real-time interactions, with minimal impact on the service-level goals for messaging interactions.

Cisco ICM Enterprise and Cisco IPCC Enterprise enable an extensible suite of multi-channel customer interactions. These currently include:

- · Inbound telephone call management
- Web callback
- Web collaboration
- Blended collaboration
- · Multi-session and single-session text chat
- E-mail

Cisco ICM Enterprise and Cisco IPCC Enterprise also provide open programming interfaces for extending support to new media applications. For example, Cisco technology partners have integrated their VoIP software into Cisco IPCC Enterprise—enabling voice communications to pass through firewalls and across the public Internet. Such extensibility lets contact center managers take advantage of software investments by sharing core services among all communication applications.

This open platform architecture also provides the opportunity to quickly adopt new communication technology, as it becomes available, such as voice over public Internet, fax, and video. Finally, Cisco ICM Enterprise and Cisco IPCC Enterprise consolidated reporting—providing data on total contact center performance, or "drilling down" for performance by media type, agent skill group, and through customizable categories—enables effective multi-channel contact center management. It also can respond to real-time contact center events, by dynamically changing routing rules to balance customer need and agent availability across sites, media types, and skill groups.

#### Summary

As contact centers increasingly become the "face" of an organization, and as they are embraced as builders both of revenue and new channels of distribution, they will continue to grow in strategic value. New applications (such as wireless) and multi-channel interactions will combine with new best practices to create and sustain competitive advantage. A horizontally integrated architecture based on open standards provides a means of exploiting the power, flexibility, and efficiency of IP. This architecture will accelerate the pace of innovation in the contact center, while coexisting with traditional TDM infrastructure, and it represents the foundation for the next-generation multi-channel contact center.

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