

# Internet Protocol Contact Center (IPCC)

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### **Abstract**

This paper provides an introduction to Contact Center technology. This paper describes technical and functional overview of Cisco IP contact center with business benefits for the same. This paper also presents a single site call flow in Cisco IP contact center.

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## PREFACE

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### **The HP Intel Solutions Centre Objectives**

Increase Hewlett Packard and Intel revenue in the Telecom market segment by demonstrating the viability and relevance of Hewlett Packard IA-based platforms solutions in these market spaces.

### **The HP Intel Solution Centrer Programmes and services**

The HP Intel Solutions Center reinforces the links already in place in between the two organizations to position and promote Intel based architectures in the Telecom segment, and to drive high-end computing into the future. It will benefit from structures, organizations and programs already in place on the HP Grenoble campus.

Technical pre-sales activities as well as fee-based Services incl. ASC and POC services, will be provided to customers and partners to position HP Intel solutions as the preferred technical choice.

Others services will include:

- Application and Solution Porting
- Benchmarking
- Solution architecture validation
- Systems and architecture optimization
- Sizing tools
- Access to shared resources
- Incl. HP hardware. HP and non-HP software.

## Revision History

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| 1.0 | 23 November 2001 | Anwar Sayyed<br>Terence Gomes | Initial draft |
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## **Business Issues**

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Companies today are challenged with improving customer service, increasing productivity, maximizing flexibility and reducing operational costs all at the same time. Companies need to expand their existing traditional channel of customer interaction to cement customer loyalty and maintain competitive advantage. The Internet provides heightened business opportunities by enabling a completely new realm of interaction channel beyond traditional telephone calls and face-to-face interactions. However, the problem continues, as customers are demanding freedom and flexibility to contact and interact with businesses with medium of their choice.

Integration of PSTN and Web-based communication channel is key to optimizing customer service and improving customer retention rates. However, many companies are finding it difficult to implement within the confines of proprietary TDM based voice equipments, which can be difficult to integrate with newer IP based interaction channels. As a result, meeting customer service objectives with this call center based on TDM alone can be both cumbersome and expensive, which may significantly affect companies overall customer care, 66 percent customer defects due to poor customer care claims Yankee group.

## **Contact Center Solution**

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The solution is not a traditional TDM based Call centers but a Contact center, which can leverage the existing investment of voice equipments and is based on the next generation technologies. Contact center solutions are expected to grow by more than 100 percent annually from 2001 to 2004, predicts Gartner. A contact center is a central point in an enterprise from which all customer contacts are managed. The contact center typically includes one or more online call centers but may include other types of customer contact as well, including e-mail, web site inquiries and chats. The contact center is governed by a single set of business rules regardless of customer interaction channels, which significantly reduces management and administrative requirements. A contact center is generally part of an enterprise's overall customer relationship management (CRM). Using contact center businesses

can achieve highest level of customer care, which may subsequently lead to an increase in customer retention rate. According to Harvard business review, a 5 percent increase in customer retention can increase profit by 100 percent.

The financial benefits of contact center results from increased efficiencies in doing business and include cost savings from streamlining operations, additional income from bringing new products to market more quickly and cost avoidance from not having to hire more people to get the job done. The business flexibility offered by contact center solution consequently reduces the business and opportunity costs related with customers interaction and opens the door for new innovative ways for companies to conduct business.

## **Introduction to Cisco IP Contact Center (IPCC)**

Cisco's IPCC represents a major step toward a completely unified user interaction by providing a bridge between the worlds of IP and telephony. The Cisco IP Contact Center (IPCC) solution combines data and voice technologies to facilitate geographic independent multimedia customer interaction. Cisco technology enables customer interactions from any kind of contact channel like voice, e-mail, web site enquires and chat to be intelligently distributed to agents or resources over both a traditional circuit-switched and an IP infrastructure. Cisco's IPCC customer can create an open communications platform leveraging voice and data technologies to facilitate geographic and media independent customer interaction. Through these applications, companies can move into the New World at its own pace while preserving the investments already made on telephony-only infrastructure.

The IP Contact Center technology will do away with the separate, incompatible technologies of the past by providing a converged IP network infrastructure that can accommodate data, voice, and video on a single network and support new classes of applications, which will be to take advantage of these multiple media types. According to recent research conducted by Datamonitor, 65 percent contact center will be IP based by 2005. Cisco IPCC architecture provides a seamless migration path from the legacy call-center infrastructure to the IP-empowered, multimedia contact center. IPCC deployment can be incremental, adding IP telephony, new media channels, and new IP-based services at a rate that meets business demands and budget

constraints. As existing solutions mature and new customer-interaction requirements emerge, such as Web collaboration, Internet voice, and e-commerce, the IPCC architecture will provide a seamless and flexible path for migration. The Cisco IPCC delivers a uniquely rich set of customer and transaction-specific information collected from the Internet, carrier networks, IVRs, databases, and other applications to the targeted agent desktop with every call enabling the full utilization of corporate data at the point of customer contact.

An integral part of Cisco AVVID (Architecture for Voice, Video and Integrated Data), the Cisco IPCC capabilities include intelligent contact routing, automatic call distribution (ACD), interactive voice response (IVR) integration, network-to-desktop computer telephony integration (CTI), web collaboration, e-mail response management and real-time and historical reporting. The Cisco IPCC delivers an integrated suite of proven solutions including Cisco ICM, Cisco CallManager, Cisco IP-IVR, Cisco VoIP gateways and Cisco IP phones that combine Cisco IP telephony and contact center solutions. The IP-centric architecture of IPCC utilizes existing IP network thus optimizing investments in wide area network (WAN) infrastructure and lowering administrative expenses. The Cisco IPCC is designed for implementation in single-site and multi-site contact centers as well as service provider hosting environments.

## **Business benefits of IPCC**

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- Enhanced productivity and profitability through new IP-based applications such as integrated multimedia queuing
- Enterprise-wide contact management based on a single set of business rules and supported by normalized consolidated reporting
- Geographic independence of both agent resources and IP-based application servers through the ubiquity of IP transport
- Lower total cost of ownership, lower capital-equipment investment, single network, and single support staff eliminating the overhead of multiple diverse data, voice, and video networks

- Leverages the existing WAN backbone in multi site deployment scenarios
- Preserves the value of existing technology investments
- Significantly enhanced competitive advantage through rapid solution deployment, many times faster than traditional TDM solutions

## Targeted Market

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The solution is targeted towards enterprise customers like financial institutions, online traders, government organizations, telecom service providers and portals.

## IPCC Components

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Cisco combines three major components with IP phones, IPCC soft phones and Voice gateways to form the IPCC system. These major components are:

- Cisco Intelligent Contact Management (ICM) Software
- Cisco Call Manager (CCM)
- Interactive Voice Response Unit (IVR)

The following sections provide an overview of the IPCC components.

### Cisco Intelligent Contact Management Software

Cisco ICM software enables a company to interact with its customers via the Internet or PSTN across an enterprise of ACDs, IVRs, Web and e-mail servers, desktop applications, and more. At the network level, ICM software profiles each customer using data such as dialed number and calling line ID, caller-entered digits, data submitted on a Web form, and information obtained from a customer-profile database. At the time, the system knows which resources are available to meet the customer's needs based on real-time conditions continuously gathered from contact-center platforms and agent desktops. This combination of customer and contact-center data is processed through user-defined routing scripts that reflect a company's business rules enabling ICM software to route each

contact to the optimum enterprise resource. Simultaneously, the Cisco platform delivers customer-profile information to the targeted agent desktop.

As part of the IPCC, ICM software provides ACD functionality including monitoring and control of agent state, routing and queuing of contacts, CTI capabilities, real-time data for agents and supervisors, and historical reporting for management.

Specific ICM system components include:

- **ICM software peripheral gateway (PG)**

A PG provides an interface between ICM software and a system component. The IPCC includes PG software for Cisco CallManager, the IVR, and the ICM software CTI server. PGs collect information from a peripheral and make this data available to the ICM platform for Pre-Routing and Post-Routing functionality. Each PG tracks events on a per-agent and per-contact basis.

- **ICM software CTI server and agent desktop**

The CTI components of ICM software enable users to deploy a complete network to desktop CTI strategy, including comprehensive functionality at the agent's workstation. At the server level, the ICM platform manages the availability of real-time and historical information provided by the Internet, carrier networks, ACDs, IVRs, Web servers, business applications, databases, and the ICM platform itself. The CTI server delivers agent, contact, and customer data in real time to a server or workstation application as events occur throughout the life of a call. At the desktop, the Cisco solution includes a complete agent softphone using ActiveX controls and Java that provides full access to the CTI server while abstracting the underlying details of the telephony system.

- **ICM software admin workstation (AW)**

The ICM admin workstation is the user interface into the ICM environment, enabling customers to define, modify, or view routing scripts; manage the system configuration; monitor contact-center performance; define and request reports; and ensure system security. Tools are designed to interact with company personnel in an intuitive manner using familiar terminology using simple GUI on windows based machines.

## **Cisco CallManager**

Cisco CallManager is an IP based call processing software providing traditional PBX telephony features and functions (basic call

processing, signaling, and connection services) to packet telephony devices. Cisco Call manager functions as an IP PBX for devices such as Cisco IP phones and VoIP gateways. Supplementary and enhanced services including hold, transfer, forward, conference, automatic route selection, speed dial, last number redial and more can be provided. Call admission control ensures that voice quality of service (QoS) is maintained if WAN links become constrained, and automatically diverts calls to the PSTN when WAN bandwidth is unavailable. Cisco CallManager software is preinstalled on the Cisco media convergence server (MCS).

### **Interactive Voice Response Unit**

Within the IPCC, an IVR can act as a routing client, as a managed resource, and as an information source for consolidated real-time and historical reports. In addition, the IVR provides the queue point for the IPCC solution. If an appropriate agent is not available when a call is received, the IPCC utilizes the IVR for call treatment such as playing announcements, collecting digits, or offering alternate routing options before redirecting the call to a targeted answering resource. A variety of IVR options is available, including the Cisco IP-IVR as well as premises-based systems and network-based solutions from Cisco ecosystem partners. Cisco IPCC solution can leverage the existing TDM based IVR available in the infrastructure.

### **Cisco VoIP Gateway**

Each IPCC solution includes a Cisco VoIP gateway, which provides a connection path between the PSTN and the Cisco AVVID IP telephony network by converting analog and digital voice into IP packets. The gateway is managed, controlled, and administered through Cisco CallManager. Cisco offers a range of VoIP gateways to meet individual business requirements. Existing router's investment can be leveraged for providing the gateway functionality. Cisco supports various standard based protocols in their family of VoIP gateways like H.323, MGCP, SIP and Cisco Proprietary protocol Skinny Gateway Protocol. Gateway Protocol selection is dependent on various factors like Call manager cluster support available, Supported CODECs, Proxy Support etc.

### **Cisco IP Telephones**

Agents connected to the IPCC utilize the Cisco IP Telephone 7960. There are many other series of Cisco IP Telephone, which can be integrated in IPCC design. This full featured, second-generation

voice instrument uses IP transport technology to permit the consolidation of data and voice into a single network infrastructure including a single cable plant, a single switched Ethernet fabric for campus or branch offices. The Cisco 7960 provides six programmable line/feature buttons and four interactive soft keys that guide a user through call features and functions.

### **IPCC SoftPhone**

Cisco IPCC desktop includes a fully functional softphone that enables agents to perform telephony functions from the desktop. The IPCC softphone provides third party call control and screen pop. The IPCC softphone controls includes Answer, Hold, Transfer, Conference, Set ready, Make not ready, Wrap UP. The IPCC softphone provides agents with CTI functionality while requiring the minimum of training, administration and management costs.

## **IPCC Capabilities and Benefits**

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### **Skills-Based Pre-Routing Function**

The Pre-Routing ® function makes a routing decision for each call while it is still in the IP network or Public Switched Telephone Network (PSTN) and before it is sent to an agent or other target enabling the IPCC to segment customers and deliver each call to the best answering resource the first time. To ensure optimum routing decisions, IPCC agents are grouped according to skills. The system receives real-time skill group and status information directly from each agent's desktop and can even reserve an IPCC agent to ensure availability. The scripting environment provides a set of standard route-selection criteria as well as tools to easily customize call distribution to meet business requirements.

### **Skills-Based Post-Routing Function**

The Post-Routing ® function provides the intelligent distribution of calls already connected to an agent, ACD, private branch exchange (PBX), or IVR system. IPCC agents take advantage of the Post-Routing function from the agent desktop. When a call requires redirection, ICM software applies the same business logic used in the Pre-Routing function and instructs the peripheral to send the call to the best available enterprise resource. The new target can be

another agent, a skill group or service within the IPCC, or a skill group or service on another ACD.

### **Network-to-Desktop CTI**

The Cisco IPCC delivers a uniquely rich set of customer- and transaction-specific information collected from the Internet, carrier networks, IVRs, databases, and other applications to the targeted agent desktop with every call enabling the full utilization of corporate data at the point of customer contact.

Specific capabilities include:

- **Data-rich screen pop**—Screen pops enable agents to spend more time servicing customers and less time collecting information. Cisco Intelligent Contact Management (ICM) software delivers call and customer data to the IPCC agent's business application, allowing a screen pop to be delivered to the desktop coincident with call arrival. The Cisco solution delivers identical screen-pop data to both IPCC and traditional ACD agents, ensuring that a consistent level of customer service is maintained throughout the enterprise.
- **Customizable agent desktop**—The IPCC desktop CTI functionality includes a fully functional softphone that enables agents to perform telephony functions from the workstation. Contact-center managers can easily customize this softphone by dragging and dropping controls such as answer, hold, set ready, and so forth into the configuration of choice thus creating a softphone with a look and feel that meets business requirements. Alternatively, to present agents with a single application interface that includes telephony functions, administrators can simply drag and drop the softphone controls into existing customer relationship management (CRM) applications, providing agents with CTI functionality while reducing training, administration, and management costs.
- **Third-party call control**—The IPCC third-party call-control features allow agents to control telephony functions such as answer, hold, transfer, and conference from within a desktop application. For example, voice and data collected by an IPCC agent can be transferred within the IPCC or across multi vendor switches, allowing customer and transaction data to accompany a call from agent to agent or site to site as required. This capability improves customer service and increases contact-center efficiency by eliminating time spent verbally soliciting information that is already available.

- Agent statistics—Each IPCC agent can be provided with immediate feedback through a visual display of personal statistics such as number of contacts handled, average call Work time, average talk time, cumulative available time, and total login time. This functionality offers agents, who are often compensated based on performance, with Real-time incentives to meet or exceed goals.

### **Consolidated Reporting**

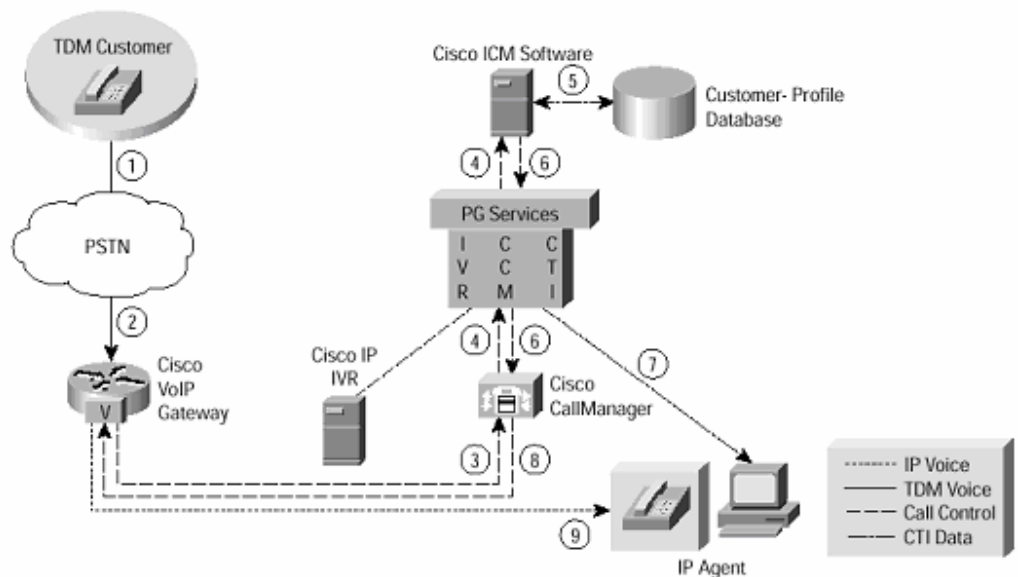
The open architecture of ICM software allows for the consolidation of timely and accurate information from the Internet, carrier networks, Cisco CallManager, ACDs, IVRs, agent desktops, and other resources. This information is stored in a Microsoft SQL Server (Structured Query Language) database for use in real-time and historical call-center reporting. The ICM system reporting package enables users to generate reports using provided templates; add specific, monitored thresholds to particular data elements; drill down to more granular reports; and schedule reports to run at specified intervals. Users can build customized reports using the report writer provided with ICM software, use any number of third-party database access tools to manipulate and display information, or export data to industry-standard file formats for use in other applications. Reports can be viewed from an ICM admin workstation; any authorized browser-enabled desktop, or any other Open Database Connectivity (ODBC) compliant desktop application. IPCC delivers agent-level reporting functionality, including both real-time and historical agent data. Agent reporting allows IPCC users to view consistent information from the enterprise level down to a specific agent.

### **Third Party Integration**

IPCC can be seamlessly integrated with many third party software's for Customer Relationship Management (CRM), Work Force Management, Report generation, Recording, IVR software and ACD functionality.

## IPCC Call Flow

### IPCC single site call flow



1. A customer dials a toll-free number utilizing the PSTN.
2. The contact is received by the Cisco VoIP gateway, which converts the transmission from the TDM protocol to the IP protocol.
3. The VoIP gateway sends a route request containing the dialed number (DN), CLID, and CED to Cisco CallManager.
4. Via the ICM PG, Cisco CallManager forwards this route request to ICM software.
5. ICM software looks up account information and parses information to determine routing.
6. ICM software invokes a customer-defined routing script to select the most appropriate IPCC agent to receive the contact and forwards this route destination to Cisco CallManager via the PG.

7. The CTI server component of the PG sends customer-profile data to the targeted agent's desktop in the form of a screen pop.

8. Cisco CallManager instructs the Cisco VoIP gateway to connect the customer to the targeted agent.

9. The Cisco VoIP gateway establishes the voice connection.

**Note 1:** Depending on business requirements, the IP IVR can be used to gather customer-profile information, to complete transactions, or to queue calls.

**Note 2:** This sample voice/data flow depicts a single-site IPCC implementation. Alternatively, the IPCC can be integrated into a multisite contact center and receive the benefits of the enterprise-wide, network-level Pre-Routing capabilities of ICM software.

## Conclusion

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The Cisco IPCC solution provides organization with a powerful edge in quest to provide better customer service, cement customer loyalty and maintain competitive advantage. By allowing companies to seamlessly and painlessly migrate their existing TDM-based based call center operations into an IP network, IPCC delivers the flexible architecture businesses need to deploy a distributed contact center infrastructure that support their global e-sales and e-services initiatives at their own pace.

## Appendices

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For further information kindly contact [Intel SCS](#), Further reading is available at Cisco web site: <http://www.cisco.com/>.