

# INTERACTIVE INTELLIGENCE®

Deliberately Innovative

## The Interaction Center Platform®

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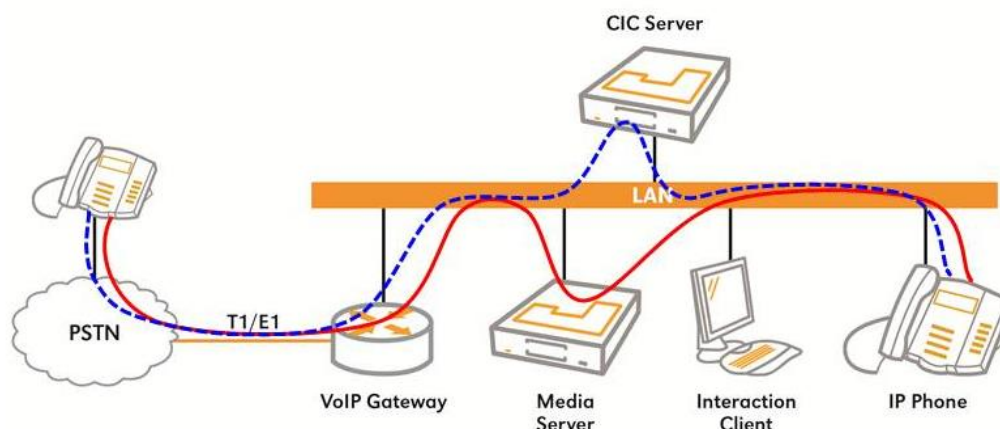
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## Overview

For more than two decades, Interactive Intelligence has offered businesses and contact centers a sophisticated software platform for advanced communications technologies including voice over IP (VoIP) and the cloud. This document provides a high-level, yet in-depth, technical description of the *Interaction Center Platform*, and illustrates how it can act as the foundation for Internet Protocol (IP) communications with an architecture fully developed on the Session Initiation Protocol (SIP) communications standard.

To understand how the Interaction Center Platform fits into the big picture of business communications in organizations of all types and sizes, we'll focus on the *Customer Interaction Center* product, or *CIC*. As an integrated suite of applications for the contact center and the enterprise alike, CIC exposes the broadest set of features of the Interaction Center Platform.

In the simplest case, shown here in Figure 1, CIC is installed on a single industry-standard server and connected to the corporate network. One or more VoIP gateways are used to hook up to T1, E1 or SIP trunks from the public switched telephone network (PSTN). IP phones are then plugged into the LAN and — voila! — you have IP telephony. The gateway is a simple network device akin to a router, and easily turns telephone calls into TCP/IP packets that can be routed over the organization's LAN or WAN.



**Figure 1. CIC's simplified connection to the corporate network**

In the Figure 1 diagram, notice that a phone call consists of two streams, one shown as a dashed blue line and the other as a solid red line. One stream (the dashed blue line) is used to control the call (disconnect, transfer, and so on) while the other (the solid red line) contains the actual audio of the conversation. We call the former the *SIP session* and the latter the *RTP (real-time protocol) stream*. The SIP session always passes through the CIC server, allowing CIC to keep track of the state of the call and perform actions such as transferring that particular call to another user, conferencing it with another call, and orchestrating other voice functions. The RTP stream does not go through the CIC server, instead passing through a device called a *media server*.

### *Media server for audio functions*

The media server, or more specifically the *Interaction Media Server*, is a dedicated appliance that can perform various operations on the audio stream, such as playing prompts to the caller, recording the call, playing music while the call is on hold, performing call analysis, performing real-time speech analytics, and supporting conferencing, among other voice related functions. By handling all of the audio requirements of CIC, the media server appliance makes the CIC server a pure application server and eliminates the need for third-party voice board hardware. Because the media server processes audio functions at higher volumes and with greater durability, it also increases CIC's reliability and scalability.

At the end-user level, the *Interaction Client* software gives users the ability to manage interactions in an intuitive client interface (as we'll see later). Various versions of the Interaction Client can be deployed to the desktop, a laptop, or smart devices. To be sure, users can still make and take calls by picking up the phone. But especially for high-traffic users such as agents and supervisors in the contact center and knowledge workers throughout an enterprise, the Interaction Client provides advanced functionality for call recording, quality monitoring, and conferencing, in addition to controls for standard functions such as call transfers and putting callers on-hold.

### *Location independence*

With respect to IP communications, an important concept to grasp is that once you move to VoIP, location doesn't matter. Although the CIC configuration diagram in Figure 1 shows all devices connected to a local area network, they don't always have to be. The CIC system provides location independence by moving all audio processing to the media server and turning the CIC server into an application server. So whether a single site, multiple locations, a remote workforce or some combination of these scenarios, an organization has several options for deploying the CIC solution:

- In a multi-site organization, a CIC server can be placed at a central location such as a main office or regional data center, and extend CIC's functionality to users and phones (including the Interaction Client) across branch offices, for at-home agents, and for other multi-site operations.
- A single CIC server can be configured with multiple media servers in a regionalized manner, which keeps audio processing "local" (the audio traffic doesn't have to travel over a wide area network) and reduces bandwidth usage.
- A dispersed organization can leverage a private cloud to drive communications across sites (and the globe), just place a media server appliance at each location.

When an organization runs the CIC server in a virtual environment, the benefits add up inherently. Server counts and equipment costs are reduced, and server management is simplified. Organizations also consolidate their data center operations and reduce power usage. And no matter the deployment option, moving the audio to the media server in a virtual CIC configuration increases CIC system continuity, since selected media servers can be taken out of service for maintenance without impacting system performance. Virtualization further allows the CIC system to be restored quickly should a natural disaster take place or catastrophic problem occur in the data center.

In all, CIC makes handling branch offices, remote sites and work-at-home employees a breeze. To CIC there's absolutely no difference between an employee in the home office and one sitting in an airport halfway around the world with a laptop — particularly with the Interaction Client software and its ability to act as a softphone that turns any computer into an IP phone from anywhere.

### ***Communications as a Service (CaaS) cloud contact center offering***

The Interaction Center Platform and CIC software provide the foundation for Interactive's Communications as a Service (CaaS) cloud contact center offering. Along with many of the same features contact centers get with an on-premises CIC implementation, including unified communications and business process automation capabilities, CaaS gives centers a distinct level of deployment flexibility. For instance, a contact center can choose:

- Who owns the carrier relationship
- Where voice interactions, recordings, and sensitive customer data reside
- Whether to keep an existing PBX in operation or replace it
- To stay in cloud or migrate to an on-premises solution over time; if and when a center does move its solution on-premises, there's no downtime or loss of applications during the migration process
- When to deploy new functionality and services (many CaaS system updates are deployed automatically via service update releases)

Scalability with CaaS is just as flexible. Though the CaaS architecture is able to support thousands of users in high volume contact center environments, it also is suitable for smaller, lower volume centers with as few as 10 agents. CaaS allows a contact center to start at any number of users, and scale up and back down as needed for seasonal peaks and valleys and to accommodate operational growth. Moreover with CaaS, organizations pay only for the users they license and the features they use.

### ***The Architecture of the Interaction Center Platform***

Unlike most other VoIP products on the market today, the Interaction Center Platform was developed over a span of time by a single team. Rather than a loosely integrated set of products assembled through acquisition or marketing alliances, the Interaction Center Platform is a tightly integrated suite of software components built atop a common framework (see Figure 2, next page). System administrators and IT teams appreciate this approach in that it minimizes the time and effort required to maintain the platform and the Customer Interaction Center (CIC) software that runs on it.

Instead of being forced to use different interfaces to manage various functions, administrators can employ a single application called *Interaction Administrator* to control virtually every aspect of the CIC system. Whether configuring your dial plan, turning on call encryption, setting up predictive dialing, or controlling contact center behavior, it can all be done in Interaction Administrator.

System administrators also appreciate the fact that taking advantage of functionality in the Interaction Center Platform and CIC is as easy as downloading a license key, which allows them to turn on predictive dialing, quality monitoring, and other advanced functionality. This approach is what makes the Interaction Center Platform and the solutions it supports easier to deploy and manage than any other solution, and what ultimately results in a lower total cost of ownership and quicker return on investment.



Figure 2. The Interaction Center Platform's integrated, easily-licensed functionality

### *Central event-processing engine*

At the core of the Interaction Center Platform is an event-processing engine called *Notifier* (see Figure 3, next page). Notifier is an enterprise service bus (ESB) that provides various services for all the other components that comprise both server and client portions of the Interaction Center Platform, including:

- **Request/Response.** Notifier exposes various services that can be provided by different components and makes them available to all components. Instead of one component talking directly to another, they all talk to Notifier and ask it for services. For example, when the Interaction Client graphical interface needs to make an outgoing call (say from a user typing a phone number and clicking the Client's Dial button), the Client transmits a *Make Call* request to Notifier. Notifier then passes this request on to the Telephony Services component. This architecture means that components don't have to know about each other and where they're located — they only need to know how to talk to Notifier.
- **Publish/Subscribe.** Notifier also allows components to subscribe to various notifications and then be alerted when they happen. Again using the example of Interaction Client, that application subscribes to incoming call notifications for the currently logged in user. Notifier then automatically sends out a notification whenever an incoming call targeted at that user is detected, allowing Interaction Client to display the appropriate information on its interface.

Notifier makes the Interaction Center Platform an extremely intelligent, scalable and responsive event-driven system. Changes happen nearly instantly and are reflected throughout. For example, a remote user might be running Interaction Client from home. A system administrator can change privileges (give or take away access to some functionality) and the remote user's interface will update on the spot. A new button or tab might appear because of a privilege that has been granted. There is no need for the end-user to reboot their machine or restart the application. (Service updates for system



components such as the Interaction Client do require the application itself to be restarted — a very quick, easy and inherent process at the end-user level). This dynamism is tremendously important in distributed organizations consisting of hundreds or thousands of users.

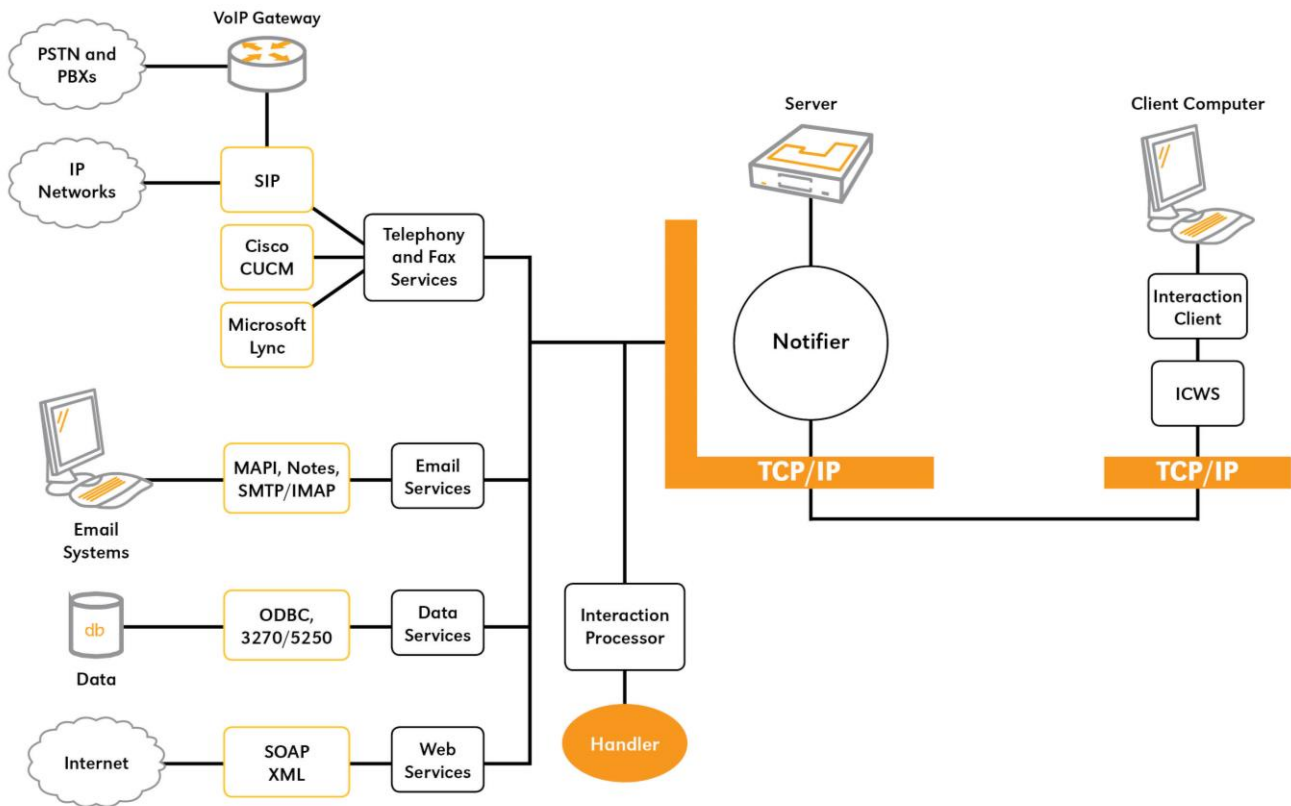


Figure 3. *Notifier* event-processing engine in the Interaction Center Platform

### Key services

As illustrated here, the Interaction Center Platform consists of dozens of services that have been developed over the years that allow it to cover everything from IP telephony to data access and process automation. Some of the most important services include:

- **Telephony Services.** The Interaction Center Platform includes a complete SIP stack, allowing it to function as a standalone IP PBX. However, CIC and other Platform-based products can serve to extend CIC's functionality for Cisco Unified Communications Manager (CUCM) and Microsoft Lync Server 2010 and 2013 (Lync to be renamed Skype for Business, mid 2015).
- **Email Services.** The Interaction Center Platform integrates seamlessly with major email platforms including Exchange, Lotus Notes, and Novell GroupWise. One direct benefit is that voice mail messages and faxes appear in end-user mailboxes, providing unified messaging functionality.
- **Data Services.** CIC and products based on the Interaction Center Platform can access a wide variety of data sources including Microsoft SQL Server databases, Oracle databases, mainframes, AS/400 applications, Microsoft Dynamics CRM, Oracle/PeopleSoft, Oracle Service Cloud, Salesforce, Siebel, and many others.

- **Web Services.** The Interaction Center Platform has built-in support for text chat and web collaboration as well as lower-level interfaces to SOAP-based web services.

### Customizing services

Although CIC is a suite of turnkey applications (IP PBX, automatic communications distributor, predictive dialer and other apps), it also has extensive opportunities for customization that will be discussed a bit later. For the moment, refer back to Figure 3 and notice that customer-specific business logic can be created in the form of *handlers* that run within a component called *Interaction Processor*. Handlers allow you to create your own rules for how calls and other interactions are managed when they come into your organization.

On the client side, notice that CIC provides the Interaction Center Web Services (ICWS) SDK. ICWS is a RESTful API for web, mobile, and desktop client applications, and all of CIC's next-generation web applications, such as the *Interaction Client Web Edition*, use this SDK. ICWS further provides API capabilities for workforce management and workforce optimization, and for business process automation via the *Interaction Process Automation* solution, or IPA. (More on IPA later.) Developers can use the ICWS environment to also make enhancements to the Configuration, Connection, Licenses, and Status APIs in CIC.

## The Interaction Center Platform as a Unified Communications Solution

As mentioned previously, CIC can function as the unified communications solution for organizations of just about any size. For small organizations, CIC can be installed on a single off-the-shelf server and provide a complete SIP-based IP PBX. Just plug the server into the network (or implement CIC via one of its many other deployment options), connect SIP-based IP phones from vendors such as Polycom, Aastra, or Cisco, and you have a complete VoIP phone system with features that include:

- **Auto attendant.** Create menus that callers can navigate by voice or by touch tone and route callers to the appropriate individuals or groups in your company.
- **Interactive voice response (IVR).** Create more advanced applications that can access data, read information back to callers, perform transactions, and so on.
- **Direct inward dialing (DID).** Assign unique telephone numbers to everyone in your organization that allow each employee to be dialed directly.
- **Desktop faxing.** Allow users to send faxes from within any application and to receive them directly in electronic form.
- **Voice mail and unified messaging.** Voice mail messages and faxes appear in the Outlook inbox or other email client.
- **Security.** Encrypt all calls and data connections (or selected ones) for maximum security and peace of mind.



- **Remote access.** Place phones anywhere in the world you like. Easily connect multiple remote offices, including at-home workers, and manage everything from a data center.
- **Conferencing.** Allow users to create conference calls from their phones or using the easy-to-learn Interaction Client graphical interface. Make use of “auto-conferencing” in conference rooms that allows external users to join meetings just by dialing an extension and entering a PIN.
- **IP phone management.** Manage all of your organization’s IP phones from a single administrative console. Easily update firmware. Add new phones in seconds by simply plugging them in.
- **Speech recognition.** Allow callers to just say the name of the person or department they want to reach, and give mobile employees the ability to reach other employees at home, via their cell phones, etc. just by saying what they want (“Call Cindy Smith at home”).
- **Presence management with company and departmental directories.** Users can automatically access contact information using the Interaction Client, which displays the real-time status of all other users in the organization. Instantly see who’s available, as well as who’s on the phone, in a meeting, at lunch, etc. Automatic notifications tell when a user’s status changes and they become available. In a unified communications environment, CIC integrations to Microsoft Lync and IBM Connections provide the ability to synchronize or “map” CIC’s presence management settings to those in Lync and Connections, creating shared contacts lists for CIC-Lync users and CIC-Connections users. Similar CIC integrations embed CIC’s presence management functionality in Salesforce.com, Oracle Service Cloud, and other CRM and customer service applications.
- **Open standards for SIP integrations.** In the world of unified communications, no one vendor can provide it all. If your organization has standardized on platforms like Microsoft Lync, IBM Connections, Cisco Unified Communications Manager (CUCM) or some other UC solution, out-of-the-box integrations using the SIP protocol let you straightforwardly bridge that solution together with CIC.

This list goes on and on, reflecting the multitude of advanced features that have been added to the Interaction Center Platform during the more than 20 years of its existence.

## The Interaction Center Platform in the Contact Center

In addition to unified communications, the Interaction Center Platform provides everything needed to run a sophisticated contact center operation — just add agents. As explained earlier, CIC can act as the communications system for the entire organization or serve just the contact center working in conjunction with the corporate PBX or IP PBX, including systems from Cisco and Microsoft. Regardless of the specific configuration, CIC provides a long list of contact center capabilities, including:

- **Interactive voice response (IVR).** Callers can perform a variety of self-service functions using either touch tones or spoken phrases. CIC integrates with popular speech recognition systems from companies such as Nuance.
- **Automatic call distribution (ACD).** Incoming calls can be queued up for delivery to the next available agent. However, the more appropriate term in the case of CIC is automatic *communications* distribution, since CIC can also queue up and route web chats, emails, faxes, voice mails, short message service (SMS) texts, and even social media alerts (see *Multichannel queuing* later in this list).
- **Intelligent routing.** ACD can be enhanced by assigning necessary agent skills, certifications or knowledge levels to calls and then matching calls “intelligently” to just the right agents. Agent skills and knowledge criteria can range from specific languages to expertise about a certain product, manufacturer certifications, and so on. The same skills and knowledge capability applies to web chat, social media, SMS texts, and other types of interactions. CIC supports an unlimited number and types of skills.
- **Interaction recording.** CIC makes it easy to set up rules to automatically record various types of interactions (calls to a particular queue, calls beyond a certain length, calls that went down a specific IVR path, and so forth). Additionally, supervisors or agents can simply click a button to initiate recording of any interaction type, including calls, emails, web chats, faxes, SMS, and social media. Call recordings are compressed and archived for flexible storage and playback.
- **Call scoring.** Supervisors can create graphical scorecards and use them to evaluate agent performance.
- **Screen recording.** Recording doesn’t stop with the calls themselves. Everything an agent does on his or her computer can be recorded.
- **Multichannel queuing.** The Interaction Center Platform and CIC can perform intelligent routing of any type of interaction, including emails, text chats, faxes, voice mails, SMS, and social media.
- **Predictive dialing.** Outbound campaigns for telemarketing and collections can make use of powerful predictive algorithms to move quickly through lists and keep agents busy.

## The Interaction Center Platform in the Contact Center (continued)

- **Workforce optimization (WFO).** Start with workforce management (WFM) to schedule agents efficiently based on forecast demand with allowances for skills, knowledge, media types, and similar criteria. In all for workforce optimization, the Interaction Center Platform and CIC combine WFM, multichannel recording, quality management, customer feedback, strategic planning (automated forecast, budget, staffing, and capacity plans), and speech analytics into a single WFO suite for comprehensive functionality that works to improve contact center performance.
- **Real-time supervision.** A .NET-based graphical interface called *Interaction Supervisor* allows supervisors to watch every facet of contact center operation. A supervisor can listen to an agent's call, "whisper" in their ear for coaching, take over the call, initiate a recording, and so on — even if the agent is located thousands of miles away. Interaction Supervisor also comes in an iPad Edition, giving supervisors the freedom to move around the contact center floor to better assist agents and improve the service experience for customers.
- **Real-time speech analytics.** Use the *Interaction Analyzer* application to define lists of words and phrases with alternate spellings and scores, and associate them with inbound and outbound queues. The result is immediate, accurate detection with channel separation (agent vs. customer).
- **Web portal for monitoring operations.** For executives and supervisors alike, monitor, record, report and track agent and queue activity in the *Interaction Web Portal*. Outsourced service providers can use the Interaction Web Portal to offer monitoring tools for customers in one extensive portal dashboard, including real-time ACD stats and historical data, customizable and ad-hoc reports, interaction monitoring, and recording functionality to playback recorded interactions and review agent scorecards.
- **Comprehensive reporting.** Every event associated with an interaction processed on the Interaction Center Platform is logged to a database and can be reported on for a cradle-to-grave view of what happened. A graphical report viewer allows managers to easily create ad hoc reports across every aspect of the operation — the contact center, the enterprise, branch offices, and even for mobile users and remote at-home users.
- **SMS texting.** Manage internal and external Short Message Service-based texts the same way as phone calls, emails, chats and other media types. Large scale, think of a retailer sending a text blast to thousands of mobile devices announcing an upcoming sale. An Interaction Client plug-in for SMS makes it easy for users to manage texts — contact center users, business users and mobile users alike.

## The Interaction Center Platform in the Contact Center (continued)

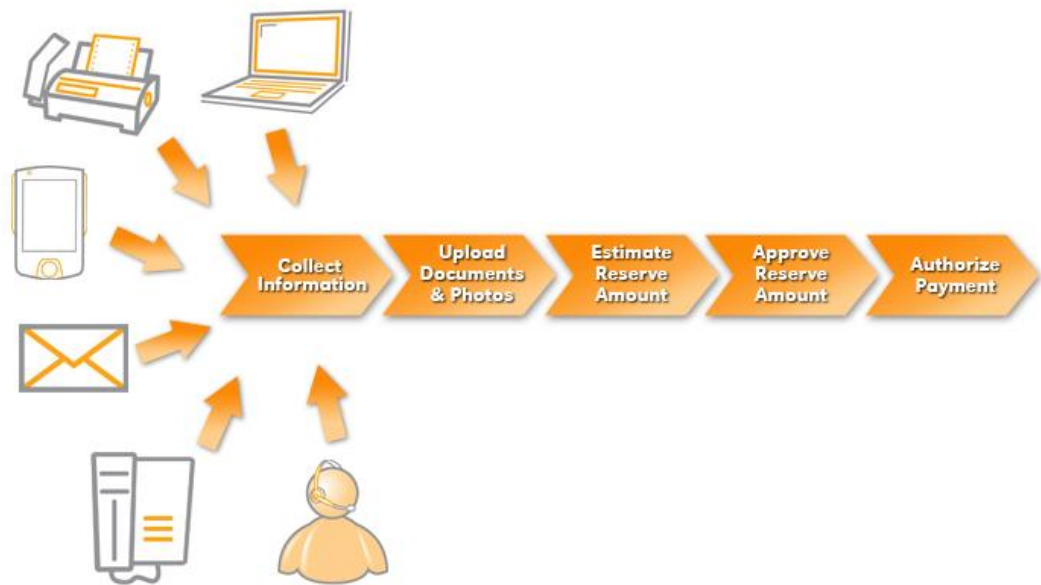
- **Social media integration.** Monitor the chatter on social networks with integrated analytics applications from leading social media monitoring vendors. When user comments impact your company, use the Interaction Center Platform and CIC to route social media alerts and comments to agents to respond accordingly. You can even manage, monitor, track and report on each agent's "social" responses, and create a 360-degree social media view of customers to aid problem resolution and build your brand. Social media capability in CIC lets you additionally establish a "listening station" to stay current with consumer opinions on your products and services, and to prevent a potential crisis when opinions are negative.
- **Callback disposition and retry.** For contact center agents using the Interaction Client .NET Edition, if one or more attempts to reach the callback requester are not successful, agents can click the Client's Retry Later button to put callback requests into a snoozed state. A snoozed callback interaction is then removed from the agent's queue and routed back to the appropriate workgroup queue, where the interaction remains until a configured interval passes and the interaction is routed back to the agent. The CIC administrator configures whether this feature is enabled, the number of retry attempts allowed, and how long a snoozed callback request remains on the workgroup queue before it is routed back to the agent. Agents' use of the Callback Complete, Retry Later, and Attempt Failed buttons in the Interaction Client indicates the disposition of a callback session for reporting purposes.

The Interaction Center Platform and its incarnation as CIC truly represent the state-of-the-art in contact center automation. Proof? Gartner has recognized the advantages of CIC by placing the product in its "leadership" quadrant for IP contact center products.

## The Interaction Center Platform for Business Process Automation

*Interaction Process Automation (IPA)* allows organizations to automate a wide range of internal and external processes completely. Processes can include applications (insurance, loans, admission, employment, and so on), lead management, order management, approvals, time-off requests, performance reviews, new employee onboarding, and other similar functions. Easily modified graphical flows can represent processes, instead of processes being locked into static documents or CRM systems. As business conditions change, processes can be modified as well.

Another important aspect of IPA is that it allows the same process logic to be used regardless of how a process is started (see Figure 4, next page). Organizations therefore can create automated processes that provide a consistent level of service through many different starting points. For example, processes can start with a customer hitting a website, the receipt of an incoming fax or email, an interactive voice response (IVR) session, or a database update. A process can also start with a call into a contact center agent or to an enterprise knowledge worker.



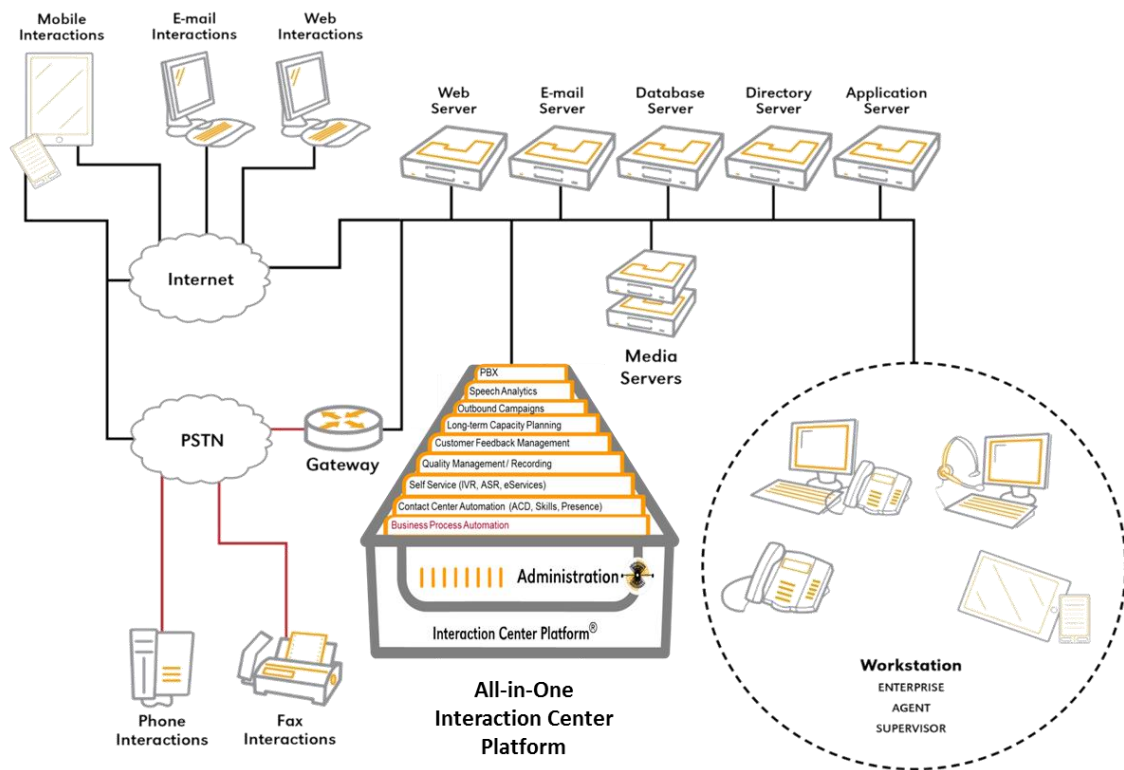
**Figure 4. IPA helps ensure process consistency no matter what media channel is used to start a process**

### *IPA architecture*

IPA is an addition to the Customer Interaction Center (CIC) product and the Interaction Center Platform. Together, CIC and IPA offer client-side and server-side components connected seamlessly via TCP/IP. A service-oriented architecture (SOA) interconnects all components, allowing processes to leverage all the power of the core Interaction Center Platform technology, including:

- A SIP-based IP PBX
- Integration to other PBXs, for example, Microsoft Lync and Cisco Unified Communications Manager
- Integration with email systems including Microsoft Exchange, Lotus Notes, and Novell GroupWise
- Configurable data actions capable of reading and writing to/from any relational database including SQL Server and Oracle
- The ability to invoke web services
- Mainframe access (for example, core processing hosts)
- Location-independence that allows employees working from home, remote locations, or even airport waiting areas to participate in important business processes
- Configurable tools to integrate easily with all your existing applications and workflow systems
- A scalable architecture capable of supporting thousands of users across multiple locations

IPA runs on off-the-shelf servers with built-in capabilities for redundancy, and scales to the point of handling the needs of thousands of users. This ability to scale makes IPA suitable for organizations of all sizes.



**Figure 5. The Interaction Center Platform supports both CIC and IPA**

### *An extension of the Interaction Center Platform and CIC*

As an extension of the Interaction Center Platform and the CIC product, IPA can involve other Platform-based applications in business processes. Here are a few examples:

- The Interaction Client .NET Edition
  - IPA users manage their availability and IPA work tasks from the same desktop environment they use to manage calls and interactions (see more on the Interaction Client in the next section)
- Speech analytics
  - Kick off a process based on key words captured in real-time during an interaction
  - Identify “high-risk” customers, also based on key words captured in real-time during an interaction
- Surveys
  - Initiate a customer follow-up process based on a feedback survey score
- Quality management and recording
  - Deliver a pre-set number of Quality evaluations to supervisors to score
- Outbound dialing
  - Use pre/post-call policies or scripts to initiate a process and pass through contact record details
  - An IPA process invokes web services to insert a contact into a campaign call list or update the status of a contact



## IPA stand-alone Web Client

In lieu of the Interaction Client .NET Edition, the IPA Web Client lets agents work from a desktop environment that includes the IPA Work Item Client and the IPA Work Item Viewer. Users can efficiently pick up IPA work items, act on them, and then transfer them. They can also change their own statuses for availability, activate or deactivate themselves in workgroups, and perform other tasks.

## The End-user's View of the Interaction Center Platform

The most-common end-user manifestation of the Interaction Center Platform is an application we've mentioned several times — *Interaction Client*. The Client .NET Edition is shown here.

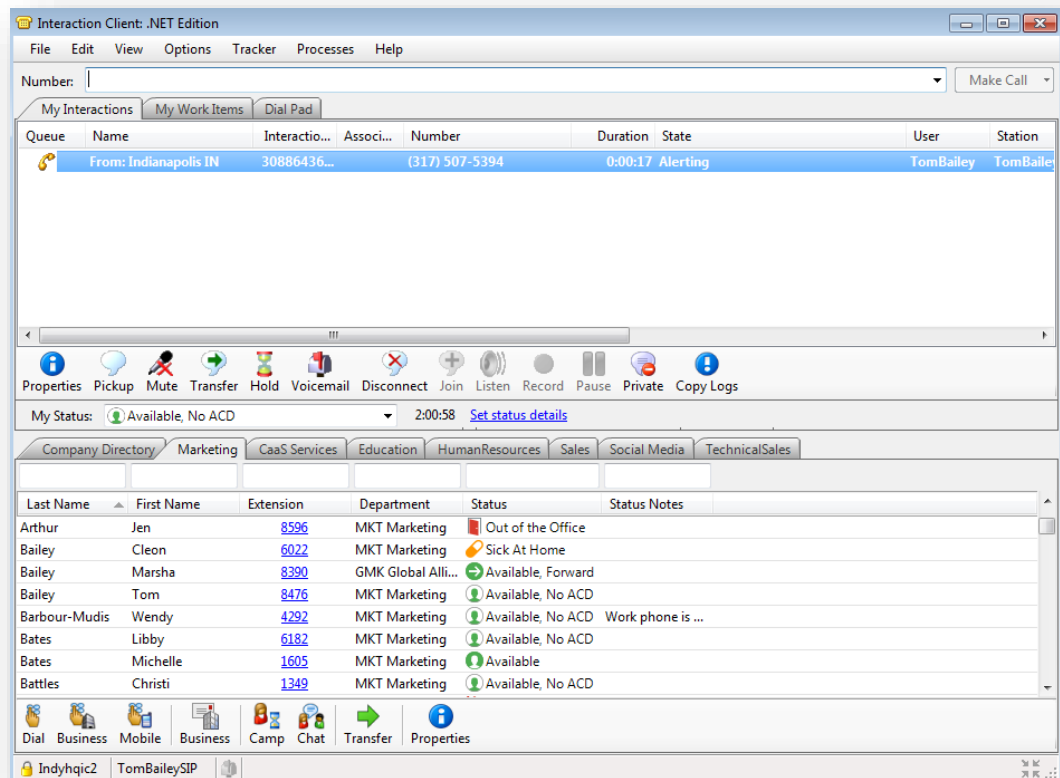


Figure 6. The *Interaction Client* .NET Edition

Interaction Client is a ready-to-use and extremely intuitive application from which users can perform a multitude of communications tasks. All the Interaction Client requires is a TCP/IP connection back to the server running the Interaction Center Platform.

- **Make outbound calls.** Users can type a number into the text box near the top of the form and click the MAKE CALL button. Previously-dialed numbers are archived in a pull-down menu for rapid future access. Alternatively, a user can simply click on an entry in any of the directory pages at the bottom of the Interaction Client form to speed dial the corresponding individual.
- **View incoming calls and other interactions.** New calls appear in the My INTERACTIONS tab along with any information available about the caller, as do queued web chats, emails, social media alerts, etc.

- **Perform operations on calls.** From the MY INTERACTIONS tab, the user can transfer calls, initiate recordings, send calls to voice mail, conference multiple calls together, and otherwise manage call functions with pinpoint precision.
- **Manage presence.** A user can change his or her status by selecting the appropriate value from the MY STATUS dropdown list just beneath the MY INTERACTIONS tab. Note that presence information such as On the Phone is set automatically by the CIC system. Presence values can be completely customized and different ones can be configured for different groups of users.
- **Access company and workgroup directories.** In Figure 6, the bottom third of the Interaction Client is devoted to various directory tabs. These tabs are completely configurable (as are their views) and allow the user to see the status of other employees company-wide as well as by specific workgroups. Users can quickly reach colleagues at the office, on their cell phones, at home or at remote locations. Users can also set up personal directories for external partners, suppliers, vendor contacts, etc.
- **Participate in ACD queues.** A user of Interaction Client can log into and out of various ACD queues. When logged in, new interactions — whether phone calls, emails, text chats, or others — show up in the MY INTERACTIONS tab and can be picked up in exactly the same way.
- **Participate in IPA business processes.** In addition to its role as a desktop communications interface, Interaction Client serves as the end-user interface for IPA, with routed IPA-based work items showing up the MY WORK ITEMS tab. Interaction Client can be configured to alert the user of new work items, and of work items that are about to reach their established deadlines. When an IPA user clicks a work item, the appropriate form is opened to allow the user to view and perform the work item actions they've been tasked to perform. New forms designed within the IPA process design interface are automatically downloaded to Interaction Client as needed, with no installation required.
- **Participate in other business processes.** Like IPA work item tasks, other process tasks show up in Interaction Client in a manner similar to that of telephone calls and other interactions. An Interaction Client user can click on an assigned task to pop either a specific application, such as Remedy for a help desk trouble ticket, or a form designed expressly for that process.
- **Advanced views for monitoring the Interaction Center Platform and CIC.** Users can tab seamlessly between CIC's *Interaction Supervisor*, *Interaction Optimizer*, *Interaction Feedback*, *Interaction Recorder*, *Interaction Process Automation (IPA)* and other monitoring applications within the .NET Interaction Supervisor environment and the Interaction Center Business Management (*IC Business Manager*) framework. Decision-makers can mouse over and "drill into" particular statistics in the Interaction Supervisor interface to get a more detailed real-time view and better understanding of developing service issues. Organizations can also scale to greater monitoring capacities, since the Interaction Supervisor application's .NET architecture reduces bandwidth usage.

## Multiple versions of the Interaction Client

There are several versions of Interaction Client, plus available integrations to products from industry leaders such as Microsoft, IBM, and Salesforce.com. All versions of the Interaction Client can operate in conjunction with a desktop phone or smart phone.

- **Interaction Client .NET Edition.** The full Windows application (shown in Figure 6), which can be used on any PC or laptop running Windows 8 or 8.1, Windows Vista, or Windows 7. Only the .NET Edition provides a full softphone, allowing a PC or laptop with a headset to function as an IP phone. Or instead of a headset, users can leverage the .NET Edition in conjunction with an IP phone, or with the more compact *Interaction SIP Station* device to save space on a user's desk.
- **Interaction Client Web Edition.** Run this version from most major web browsers, Internet Explorer, Firefox, and Safari among them. Nothing at all needs to be installed on the user's machine.
- **Interaction Client Mobile Edition.** Use this version on smartphones or tablets, with easy application installation on your mobile device.
- **Integrations.** Integrate Interaction Client call and presence controls to work with products such as Microsoft Lync Server and IBM Connections. Similar integrations bring the Client's capabilities together with CRM packages from Salesforce.com, Oracle Service Cloud, Remedy, Siebel, and others.
- **Interaction Desktop.** This application combines the Interaction Client .NET Edition and IC Business Manager, in turn allowing users to combine Interaction Client with Interaction Supervisor views in one place (Figure 7). Supervisors in particular can configure Interaction Desktop according to their needs, including adding a tab with statistics or graphs next to the MY INTERACTIONS view, and can still receive calls and manage contact center operations overall.

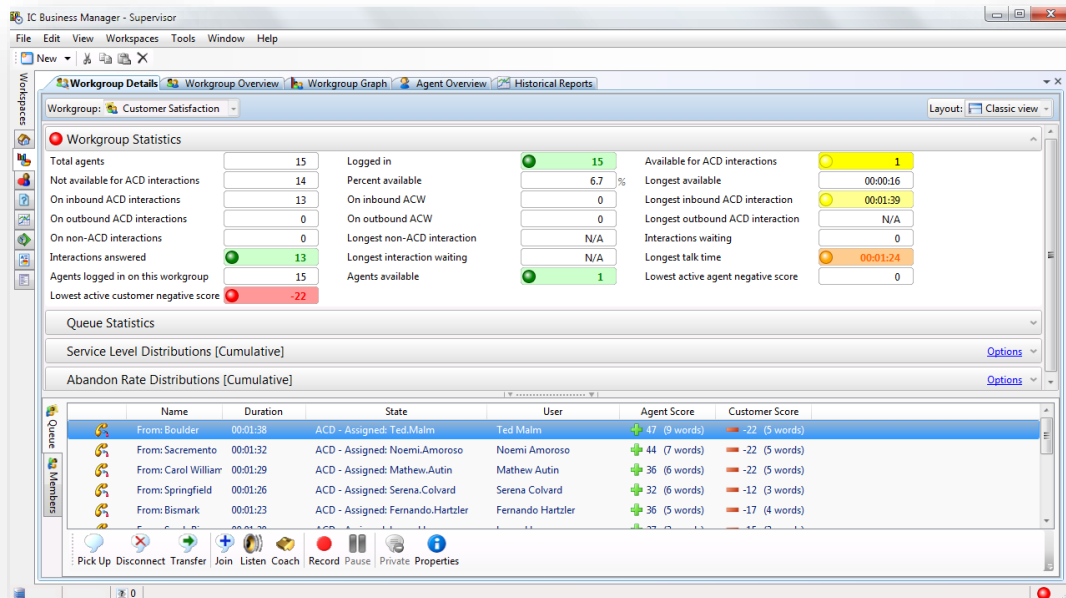


Figure 7. Interaction Desktop

## Session Manager

All versions of Interaction Client end up connecting to the Interaction Center Platform by way of a server-side software component called *Session Manager* (Figure 8). As its name implies, Session Manager keeps track of all client-side sessions and is responsible for authentication, encryption, and various other services. In particular, the use of Session Manager allows for extremely low bandwidth utilization between Interaction Client and the Interaction Center Platform (CIC) server.

To keep network utilization as low as possible, the Interaction Client and Session Manager actually work together in a variety of ways. For example, the first time a user runs Interaction Client, the Interaction Client application downloads all directory entries (people, phone numbers, etc.) configured for that user and creates an encrypted local cache. Thereafter, only updates to the Client are downloaded, and are done so in a rapid and rather painless fashion. Session Manager similarly transmits real-time presence information to the Interaction Client so it can display the current status of users in the directory pages. The Session Manager architecture allows users to run Interaction Client even over extremely slow dial-up connections.

Ordinarily, a single instance of Session Manager runs on the main Interaction Center Platform server (the one running CIC). Such a configuration is generally suitable for well over 1,000 or so concurrent connections of Interaction Client.

In larger environments, Session Manager can be placed on its own server — and even a cluster of servers for extreme scalability and reliability, as shown here.

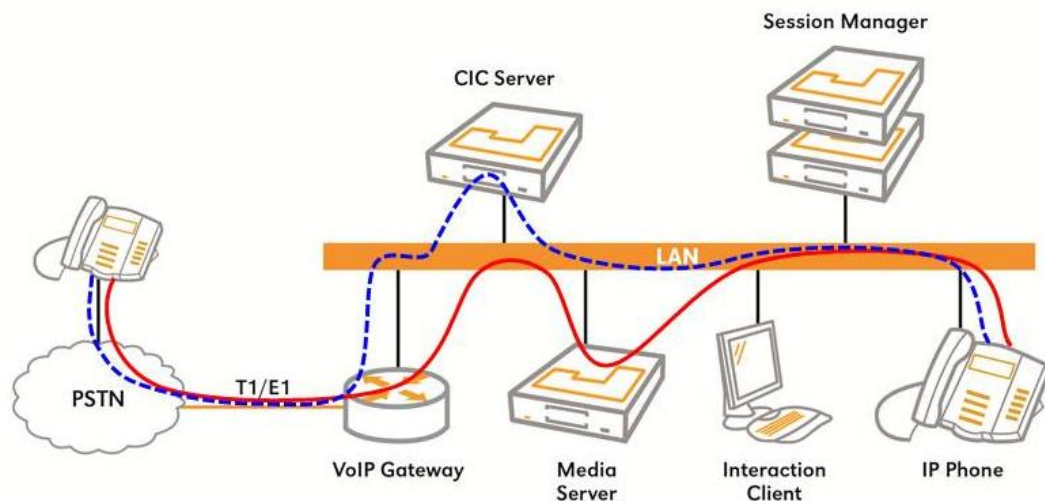


Figure 8. *Session Manager* configured for CIC

## The Supervisor's View of the Interaction Center Platform

As mentioned earlier in this paper, Interaction Supervisor is an application from which supervisors and managers can keep track of what's going on in a contact center or in workgroups and departments elsewhere in an organization.

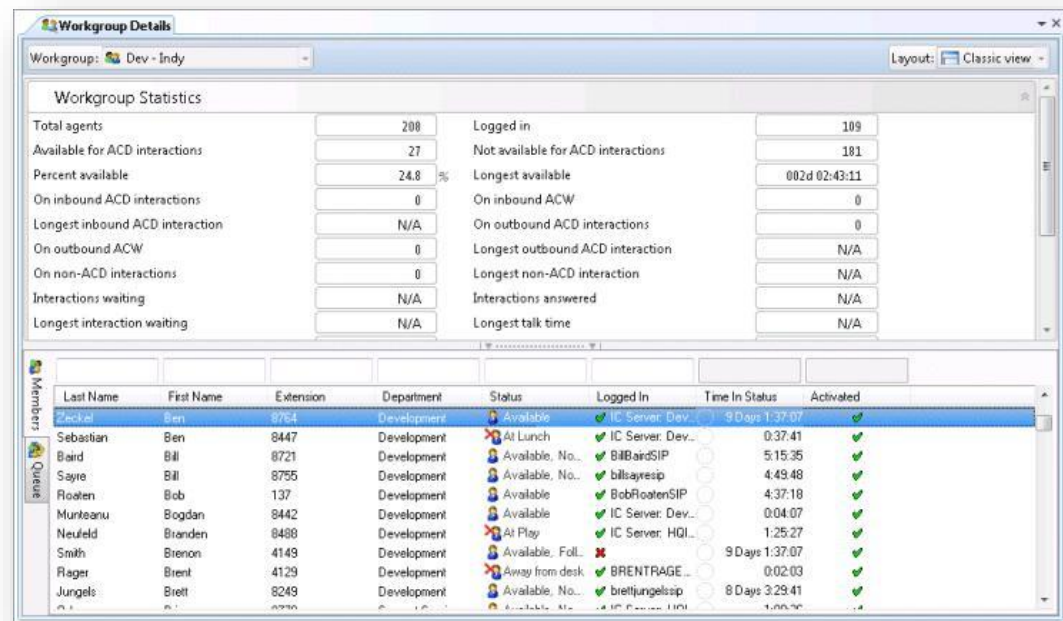


Figure 9. The .NET Interaction Supervisor environment

Interaction Supervisor provides a set of configurable views into many different aspects of communications and business processes. In addition to displaying various real-time information, Interaction Supervisor allows users to set alerts on different quantities (calls longer than a certain duration, average hold time greater than a given value, etc.) and be notified in selected ways (calls, emails, etc.). IT personnel can use Interaction Supervisor to monitor the system itself — SIP connections, PSTN trunks, etc.

A full description of Interaction Supervisor is beyond the scope of this document, but suffice to say that it allows supervisors to keep track of various objects, including:

- **People.** With sufficient access privileges, a supervisor can click on a given person and see their interactions, current status, etc.
- **Interactions.** A supervisor can highlight a given phone call and listen in, initiate a recording, whisper into the agent's ear, join the call, take the call away, etc. Similar operations are provided for queued emails and chats.
- **Queues.** Interaction Supervisor provides real-time information regarding the performance of various workgroups and their associated queues, including average wait times, talk times, calls currently in queue, and other stats.
- **Processes.** Interaction Supervisor also allow process managers to see work making its way through various process flows. It can display where a process object is along its execution path, how long it has been in transit, where it's currently held up, who's supposed to be working on it, and so on.

## Interaction Supervisor iPad Edition

The iPad Edition of Interaction Supervisor provides the same supervisory control as the desktop version — *plus* mobility that lets supervisors traverse a contact center floor to assist agents quickly and personally. Figure 10 shows just one of the statistical views easily configured in the Interaction Supervisor iPad Edition.

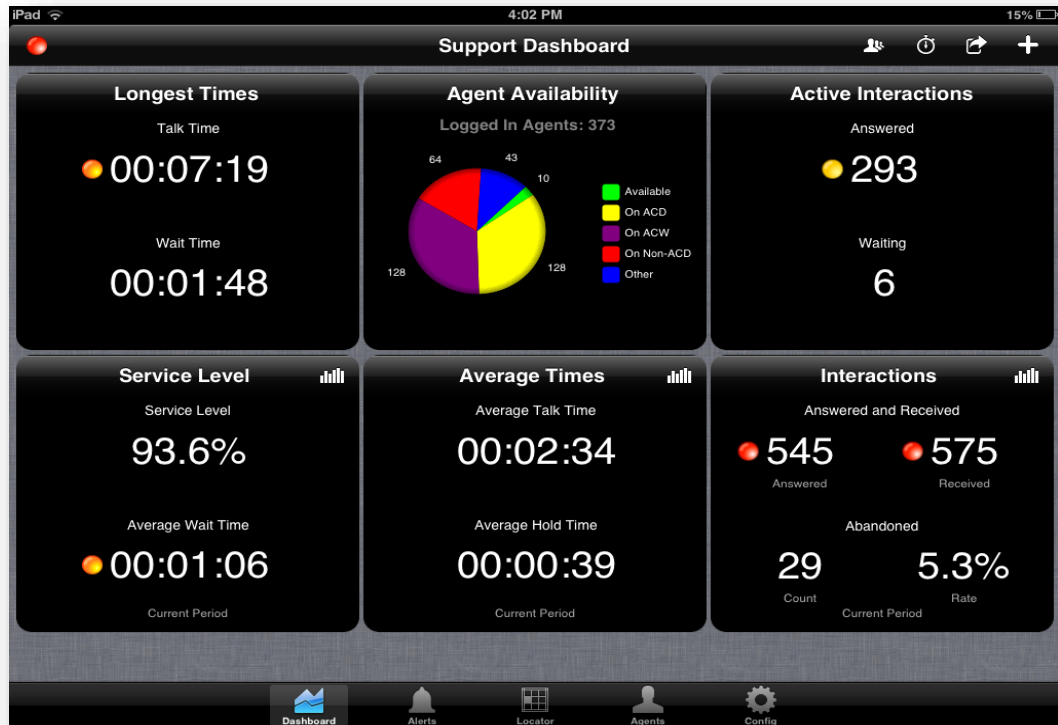


Figure 10. Interaction Supervisor iPad Edition

Among the capabilities in Interaction Supervisor iPad Edition, supervisors can:

- Extend statistics from the Interaction Supervisor desktop application and display “intelligent” metrics in real time
- Configure dashboard tiles to show real-time statistics as well as service levels, with the ability to drill down into key statistics for Workgroups, Queues, Agents, Speech Analytics scores, Intervals, and other stats
- Receive real-time alerts that provide the same data as Interaction Supervisor, with easy viewing and the ability to capture screen content
- Get a graphical floor plan of the contact center and an agent locator to keep track of agent activity, physically and efficiently
- Maintain comprehensive Agent Statistics Views (key statistics, agent photos, agent presence), including controlling an agent’s presence



## Interaction Web Portal

We mentioned the web portal earlier for monitoring operations in the contact center. More specifically, the *Interaction Web Portal* gives executives and supervisors a full operational view in one environment to monitor, record, report and track agent and queue activity throughout their organization (Figure 11). The Interaction Web Portal is also designed with outsourced service providers in mind — it allows outsourcers to offer a full range of monitoring tools for their own customers in one portal dashboard. Monitoring tools include real-time ACD statistics and historical data, customizable and ad-hoc reports, interaction monitoring, and recording functionality to play back recorded interactions and review agent scorecards.

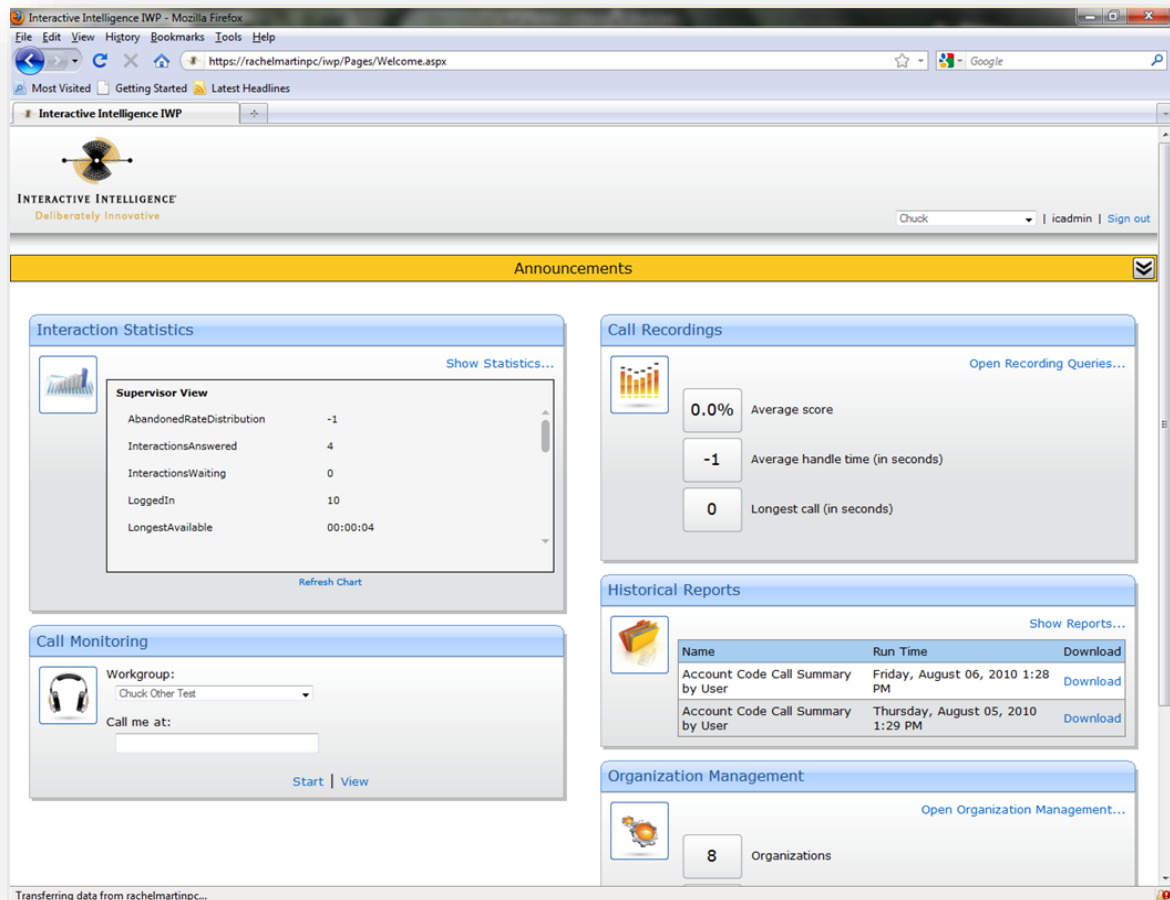


Figure11. Interaction Web Portal

## Interaction Analyzer

Interaction Analyzer brings real-time speech analytics to the Interaction Center Platform and CIC, and gives contact centers the ability to detect and measure customer sentiment intelligently, as it occurs during an actual voice interaction.

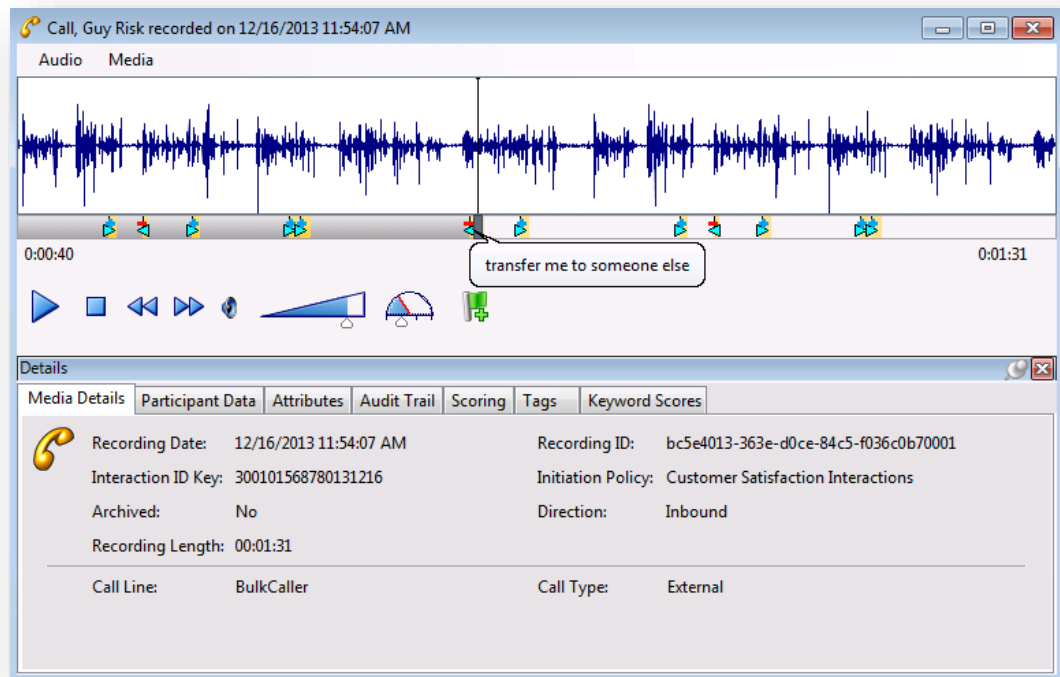


Figure 12. Interaction Analyzer

- **Real-time interaction keyword spotting.** Contact centers and businesses as a whole can define lists of the words and phrases they hear most from customers, with alternate spellings and scores, and associate with them inbound and outbound queues. Detection and event generation is both immediate and accurate, with channel separation (agent vs. customer), and with concurrent multi-language support for US English, Spanish and French (European).
- **Keyword detection accuracy.** Improve keyword detection accuracy and decrease false identifications with Interaction Analyzer's Linear Discriminant Analysis (LDA) model. Supported languages include German, UK English, US English, Dutch, Polish, Brazilian Portuguese, and Turkish.
- **Real-time Interaction Supervisor views.** In real-time, supervisors can view defined words spotted during an interaction (plus score statistics) to improve monitoring and take control of an interaction when they detect an unhappy customer. Alerts on calls with low/high agent/customer scores aid the process.
- **Interaction Recorder integration.** Associate spotted keywords with call recordings for additional recording search capabilities. Figure 12 illustrates how Interaction Analyzer automatically presents spotted keywords in a recording file, and then provides the ability to "jump" to spotted words quickly.

- **Reporting.** With the Interaction Analyzer Scoring Detail report in *Interaction Reporter*, positive and negative scores for keywords are documented from both the agent and customer conversation legs. The Scoring Detail report displays data from all workgroups by interval, and also breaks down scores by workgroup, with the name of the recorded agent and the scoring details of the recorded interaction.

### **Workforce optimization**

Interaction Analyzer is also component of the Interaction Center Platform and CIC's approach to workforce optimization (WFO). Analyzer works in unison with the Platform-based Interaction Recorder, Interaction Optimizer, Interaction Feedback, Interaction Decisions, Interaction Quality Manager, and IPA solutions to provide the following WFO capabilities.

- **Multichannel recording**
  - Maintain a full view of the customer experience across all contact channels, including what happens in the IVR
  - Maximize the business value of recordings by sharing customer interactions, safely and securely
- **Workforce management**
  - Meet service goals consistently with accurate forecasts for every contact channel and effective staff schedules
  - Fine tune operations when necessary by monitoring performance throughout the day
  - Automate the approval process for agent time-off requests
- **Strategic planning**
  - Set service goals intelligently to understand the effect on the business and the resources required to meet them
  - Minimize staffing costs with just-in-time hiring plans fully aligned with operational goals
  - Create detailed budgets and track variances in performance to adjust when necessary
- **Quality management**
  - Ensure consistent quality across all customer contact channels
  - Streamline the quality process with automated selection and delivery of interactions to evaluate
  - Use customer feedback and speech analytics information to target key strategic initiatives
- **Speech analytics**
  - Take action in real-time to improve the customer experience
  - Gain business intelligence on operational performance and trends
  - Mitigate risk from non-compliance

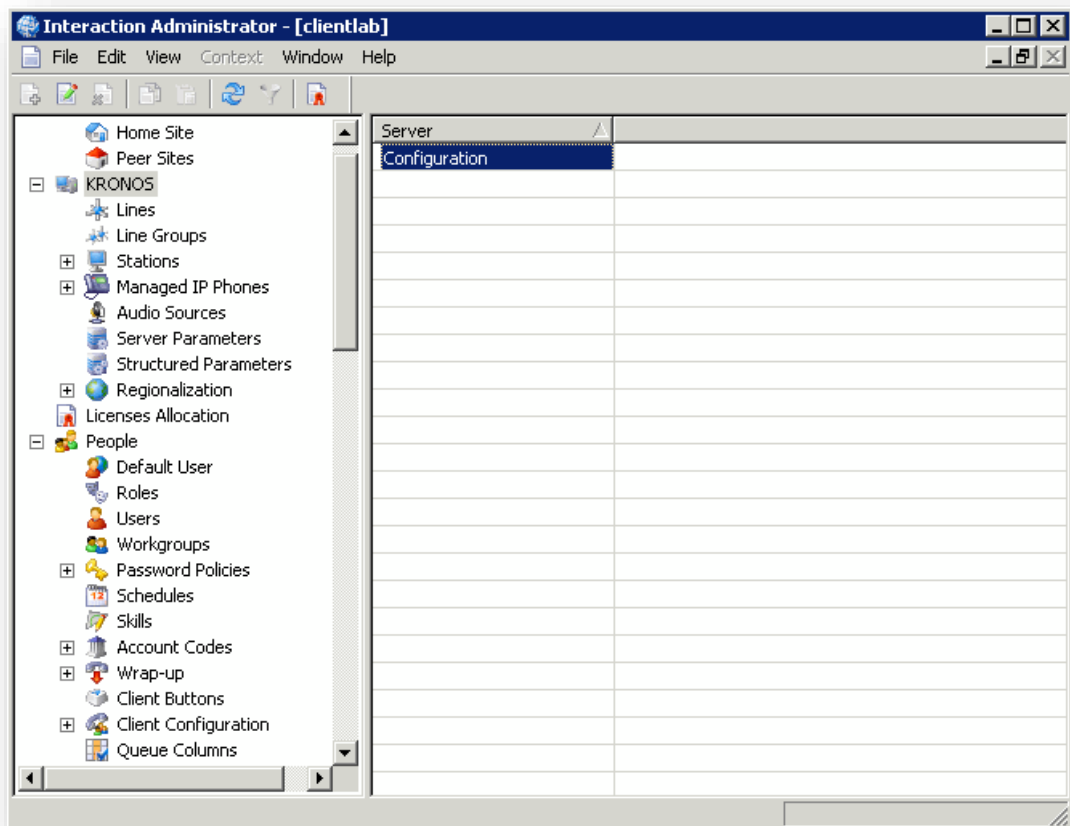
- **Customer surveys**
  - Capture the customer's opinion while still fresh in their mind, and better understand the full context of a customer's experience
  - Align internal processes and procedures with customer expectations
- **Business process automation**
  - Configure guided workflows for employees to handle escalations surfaced by WFO applications
  - Reduce complexity and IT involvement with process templates for survey follow-up, scoring and coaching, as well as escalation management
  - Accurately forecast and track back-office work, including backlog

### Unified administration and information access for WFO

For WFO, the Interaction Center Platform and CIC reduce configuration and maintenance efforts with its single point of administration. Administrators and contact center supervisors also eliminate data synchronization issues with the ability to share employee information across all WFO components. WFO information is easily and securely accessed via role-based portals.

### The Administrator's View of the Interaction Center Platform

The fact that the Interaction Center Platform and all of its functionality is implemented as a tightly integrated suite of software objects allows it to be completely administered from a single graphical interface called *Interaction Administrator* (Figure 13).



**Figure 13. Interaction Administrator**

Creating ACD queues, adding new users, turning on security, configuring remote locations and media servers, managing call recordings — it's all done from the single intuitive Interaction Administrator application.

The various objects that comprise an organization's Interaction Center Platform (CIC) system are structured hierarchically in the menu tree on the left side of Interaction Administrator. Simply expand the hierarchy, select the object you wish to configure, and the various properties that relate to that object are displayed on the right.

### **Greater control of user permissions and administrative rights**

Interaction Administrator also provides an extraordinary degree of control over user permissions — what various users can actually see and do. For example, you can use Interaction Administrator to allow the manager of a contact center group to listen in on the ACD calls for that group but not any others. Interaction Administrator can be configured to provide limited administrative rights to different individuals. Again for example, the help desk manager can be allowed to administer the users, queues, and other objects that fall under their responsibility, but not be given permission to see others outside their area. Using Interaction Administrator, you can even lock down the appearance and functionality of the Interaction Client for every end-user.

Interaction Administrator has been optimized to efficiently handle the needs of small organizations with a few dozen users as well as large enterprises with tens of thousands of users and phones spread across a large number of sites. Multi-site capabilities allow you to configure how calls are routed between sites, what VoIP codecs are used, and so forth.

## **Customization of the Interaction Center Platform**

It's important to understand that CIC and other products built on the Interaction Center Platform are turnkey applications, not toolkits. CIC can function out of the box as a powerful IP PBX, and also provide easy-to-configure contact center services. However, CIC additionally provides opportunities for extensive customization if required — largely via system configuration and not expensive, time-consuming programming.

Customization can be performed on both the server and the client levels, meaning you can customize how the CIC server processes interactions, and also create end-user applications that make use of CIC's many capabilities.

### ***Server-side customization***

On the server side, the easiest way to configure CIC is to use a simple application called *Interaction Attendant*, which allows you to quickly create auto attendant and simple IVR menus that callers can navigate via touch tones. CIC even allows you to set up basic email queuing in Interaction Attendant.

CIC further provides a more powerful customization tool called *Interaction Designer*. Interaction Designer provides an intuitive environment in which to visually lay out the business logic used to handle virtually every aspect of communications in the CIC system. All of the out-of-the-box functionality of CIC is included in source form that's available to you to modify or extend.

The basic idea of Interaction Designer is that you can choose various types of events and graphically determine how you'd like to handle them, thus the term “handler.” Events you can handle using routines structured in Interaction Designer include incoming interactions (calls, emails, faxes, text chats, SMS), outgoing interactions, queue changes (a call being placed on a queue), and others.

Once you've chosen the event you wish to handle, you can make use of pre-configured tools in Interaction Designer, or “building blocks,” that have been created over the years. Building block tools are organized into various categories for Database Access, Email Operations, Telephony, XML Manipulations, Calendar Access, ACD, and so on. Using literally hundreds of available tools like these, Interaction Designer allows you to create incredibly powerful applications that integrate IP communications into your information technology infrastructure easily.

### ***Client-side customization***

We mentioned earlier that the Interaction Center Platform includes the Interaction Center Web Services (ICWS) SDK. On the client side, ICWS is a RESTful API for web, mobile, and desktop client applications. All of CIC's next-generation web applications, such as the *Interaction Client Web Edition*, use this SDK. ICWS further provides API capabilities for workforce management and workforce optimization, and for business process automation via the Interaction Process Automation (IPA) solution, including the IPA Web Client.

## **Uses of the Interaction Center Platform**

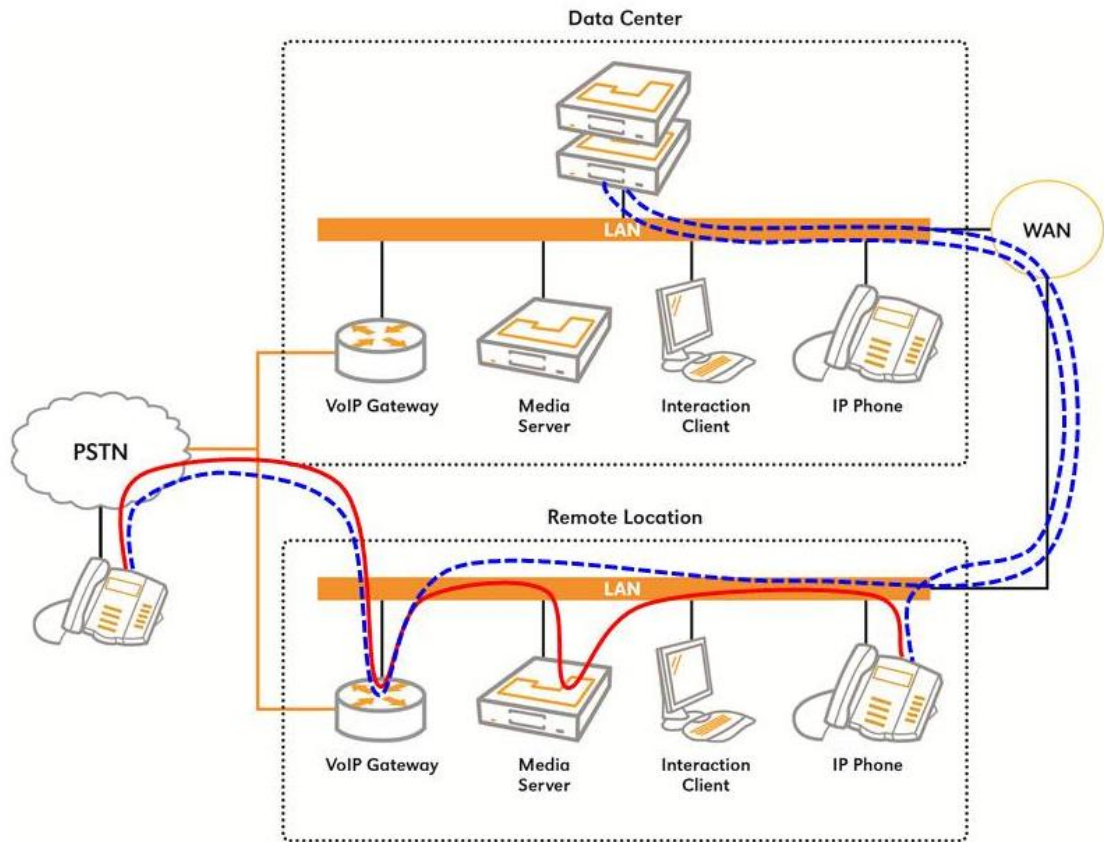
### ***Single-site IP PBX***

We've already seen in the opening Overview of this paper how CIC can be used as a turnkey IP PBX for a single site (refer back to Figure 1). In that initial example, we showed the deployment consisting of one CIC server; however, an organization can just as easily deploy two CIC servers as a cluster for redundancy. If one server fails, the other automatically takes over the full load, without dropping currently connected calls.

### ***Multi-site IP PBX***

CIC can also function as the IP PBX for multiple sites. One common multi-site configuration houses the CIC servers in a central data center and places media servers in each remote location (see Figure 14, next page). Notice how the SIP session (blue dashed line) for an external call connects over the WAN back to a CIC server, which allows the CIC server to track and control the call, while the actual audio traffic (solid red line) can stay within the remote site. This way, the SIP session requires very little bandwidth, since it's just a few TCP/IP command messages that occur mainly when the call changes state. The bandwidth-intensive audio traffic never needs to travel over the WAN. Having one or more media servers at the remote site allows calls to be recorded, monitored, or played audio (prompts, music on hold, and so on), again without taking up room on the WAN.



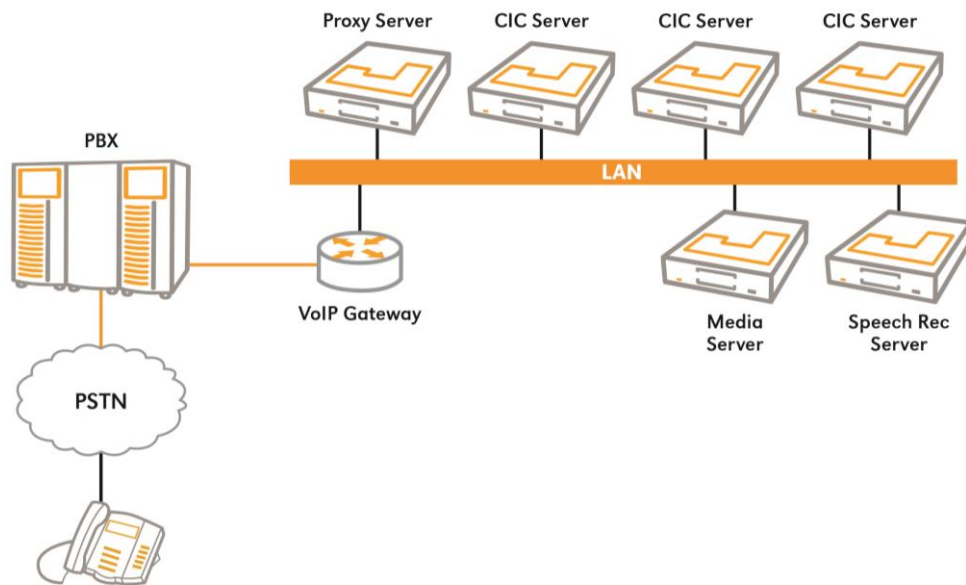


**Figure 14. Common CIC multi-site configuration using media servers at the remote site(s)**

This same approach can be applied to any number of remote locations. There can also be multiple data centers for redundancy or greater geographic coverage.

### ***Speech-enabled IVR***

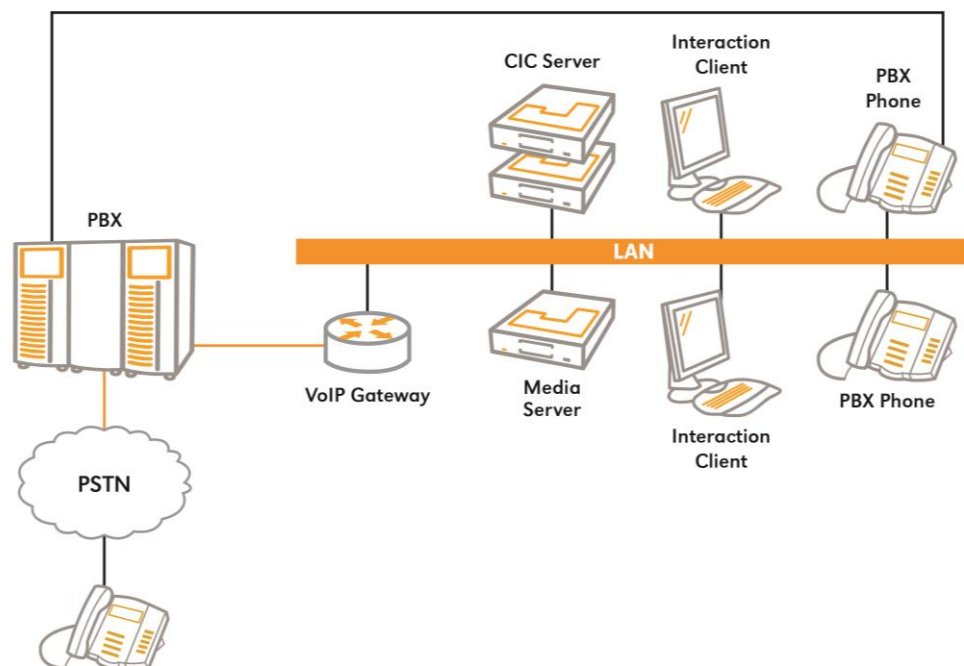
CIC can be used purely for speech-enabled interactive voice response (IVR) in conjunction with an existing PBX or IP PBX (see Figure 15, next page). Any number of CIC servers can be deployed in a cluster for load balancing, scalability, and redundancy. A software component called the Proxy Server takes the incoming SIP calls and distributes them evenly across the various CIC servers. This architecture can be used to handle many thousands of simultaneous IVR calls, with or without speech recognition.



**Figure 15. CIC configuration for speech-enabled IVR**

### *Contact center solution*

In conjunction with an existing PBX or IP PBX, CIC can be used as a departmental or enterprise contact center solution. All of the functionality discussed previously (ACD, IVR, call recording, etc.) is available. Contact center agents can use IP phones, headsets, or the Interaction SIP Station device, or continue to use their existing PBX phones. Figure 16 illustrates a common configuration with CIC integrated to an existing PBX. In addition to legacy PBXs, CIC can be used to add contact center and other application functionality to Cisco Unified Communications Manager (CUCM) and to Microsoft Lync Server 2010 and 2013.



**Figure 16. Common CIC configuration for contact centers, shown here integrated to an organization's existing legacy PBX**

## Summary

When Interactive Intelligence created the *Interaction Center Platform* more than 20 years ago, it introduced a sophisticated software platform for advanced communications technologies including voice over IP (VoIP). The Interaction Center Platform is fully architected on the SIP standard, providing a powerful foundation for Internet Protocol (IP) communications as well as cloud-based communications.

The *Customer Interaction Center* product, or *CIC*, is an integrated suite of applications that exposes the broadest set of features of the Interaction Center Platform. CIC can function as the unified communications solution for organizations of just about any size, and also delivers robust, advanced functionality for the contact center. The CIC software can be installed on a single off-the-shelf server and provide a complete SIP-based IP PBX (VoIP phone system) with a number of advanced features.

By handling all of the audio requirements of CIC, the *Interaction Media Server* (“media server”) appliance makes the CIC server a pure application server and eliminates the need for third-party voice board hardware. Because the media server processes audio functions at higher volumes and with greater durability, it increases CIC’s reliability and scalability. The media server further allows the CIC system to offer location independence and more easily support virtualization. Whether a single site, multiple locations, a remote workforce or some combination thereof, the options for how to deploy CIC are many, including via a private cloud, and via a hosted cloud-based contact center service from Interactive Intelligence.

## Appendix A: Certifications for Security, Compliance and Quality

Interactive Intelligence works with many organizations in the financial services, insurance, healthcare, outsourcer, collections, retail, utilities, and government sectors, where protecting customer and patient data is critical. To help safeguard the confidentiality and integrity of sensitive data, as well as the privacy of such data and its providers, we maintain the following security and compliance programs for all organizations implementing the Interaction Center Platform and Customer Interaction Center (CIC) software, whether via the cloud, on-premises or both.

### Cloud services attestation report

**Statement on Standards for Attestation Engagements No. 16 (SSAE16).** SSAE16, which replaced the former SAS70 in January 2010, is an auditor attestation report on the design and effectiveness of a Service Organizations' controls. The controls for our Cloud Services (Communications as a Service) organization are reviewed annually, with all findings documented in an SSAE16 SOC2 Type II auditors' attestation report. This SSAE16 Service Organization Controls 2 (SOC 2) report is performed in accordance with the attestation standard, AT 101, and is based upon the Trust Services Principles of Security, Availability, Processing Integrity, Confidentiality, and Privacy. A Type II report evaluates the design and effectiveness of controls over a period of time.

Our current SSAE16 SOC2 Type II report is available upon request, and requires the execution of a non-disclosure agreement.

### Product certifications and compliance

**Joint Interoperability Testing Command (JITC).** The latest versions of the CIC software (4.0 and 3.0) have been reviewed and certified by the JITC, which ensures compliance with information assurance and interoperability requirements for the U.S. Department of Defense (DoD) Private Branch Exchange 2 classification. With this level of security built in, you can be assured that our products can be configured and deployed so that you can achieve and maintain compliance with whatever industry regulations or standards that apply to your organization including:

- PCI DSS
- HIPAA
- FISMA
- GLBA
- Sarbanes-Oxley

### Enterprise ISO certifications for security and quality

**ISO/IEC 27001:2005 Information Security Management System (ISMS).** The ISO/IEC 27001 standard specifies the requirements for establishing, implementing, maintaining and continually improving an Information Security Management System (ISMS) designed to ensure the confidentiality, integrity, and availability of sensitive customer and corporate information. Interactive Intelligence is registered to operate an Information Security Management System that complies with the requirements of ISO/IEC 27001:2005 for the following scope:

The critical information systems for Interactive Intelligence Group Inc. and Latitude Software offices and logistics centers in North America as per the Statement of Applicability V1.0 11 June 2013.

Our company attained registration to this standard in August 2013.

**ISO/IEC 9001:2008 Quality Management System (QMS).** The ISO 9001 standard specifies the requirements for establishing, implementing, maintaining, and continually improving a Quality Management System (QMS) designed to ensure that our products and services are consistently delivered to meet customer, employee and other stakeholder requirements. Interactive Intelligence is certified to operate a Quality Management System that complies with the requirements of ISO 9001:2008 for the following scope of registration:

Delivering innovative design, development and manufacturing of interaction and accounts receivable management, software and support, implementation and educational services for business communications, contact center automation, IP/IP PBX for the enterprise, and VoIP.

Our company has maintained registration to this standard since December 2004.

Both the ISO 9001:2008 certification and the ISO/IEC 27001:2005 registration are issued and administered by SAI Global Certification Services Pty Ltd. View the respective ISO certificates at <http://www.inin.com/about/Pages/Trust.aspx>.

### **EU/Swiss Safe Harbor certification**

The U.S.-EU Safe Harbor Framework, developed by the Department of Commerce in coordination with the European Commission, provides guidance for U.S. organizations on how to provide adequate protection for personal data from the EU as required by the European Union's Directive on Data Protection. Interactive Intelligence is self-certified to this framework, ensuring the privacy of personal information that may be transferred to or from the European Union or Switzerland. Access the information regarding our certification at <http://www.inin.com/about/Pages/Trust.aspx>. (Or access on the U.S.-EU Safe Harbor site directly at <https://safeharbor.export.gov/list.aspx>.)

### **Sarbanes-Oxley (SOX)**

As a publicly traded organization, our technical and administrative controls for ensuring the accuracy and integrity of our public financial reports and fraud prevention controls are independently reviewed on an annual basis.

Interactive Intelligence includes the results of this audit each year in its annual report. View our annual report at [www.inin.com](http://www.inin.com) on the Investor Relations page.