

Interactive Intelligence, Inc.

# A New Approach to Cloud Communications

Communications as a Service (CaaS) with Local Control

Dr. Don Brown, *CEO*

# Table of Contents

- Overview ..... 3
  - CaaS* ..... 3
- CaaS with Local Control ..... 3
- Recording, Monitoring, and Advanced Capabilities ..... 7
- Survivability..... 8
- Work at Home Agents and Remote Sites ..... 9
- Local Control of Data ..... 11
- Agent Interface ..... 12
- Supervisory Interface ..... 14
- Administrative Interfaces..... 15
- Advantages ..... 17
- Summary ..... 17

**Copyright © 2008 - 2012 Interactive Intelligence, Inc.** All rights reserved.  
Brand and product names referred to in this document are the trademarks or registered trademarks of their respective companies.

Interactive Intelligence, Inc.  
7601 Interactive Way  
Indianapolis, Indiana 46278  
Telephone/Fax (317) 872-3000  
[www.ININ.com](http://www.ININ.com)

Update 3/12, version 3

## Overview

The cloud is exploding in popularity. Organizations of all types love the ability to treat software much as they do electricity — a service that they plug into and pay for monthly. The cloud model has been applied to all sorts of software — CRM, HR applications, sales force automation, and so on. The advantages of the cloud are obvious and include:

- Increased flexibility
- Faster deployment time
- Minimal upfront capital expense
- Reduced IT requirements

## CaaS

With the advent of voice over IP (VoIP), this same cloud delivery model can be applied to various communication services including contact center automation and unified communications. This utility-like model for communications is often referred to as Communications as a Service, or CaaS.

Unlike data services such as CRM, communications services have special considerations. Communications services are often considered more vital because they involve personal contact with customers. Temporary loss of access to CRM can be a major inconvenience, but an inability to take calls from customers can threaten the very existence of a business. The potential loss of voice capability is one reason why many organizations have been hesitant to trust CaaS providers with their critical communications. The disadvantages of CaaS for communications services include:

- Extreme business disruption in the event of a service outage
- Variable call quality that can make customers think they are dealing with a shoddy off-shore operation
- Loss of control over valuable data
- Lack of security for both voice and data

Even the public power grid has disadvantages with its variable quality, intermittent spikes, and occasional blackouts, some blackouts being severe enough to last for hours or days. Organizations have learned to mitigate these problems with surge protectors, uninterruptible power supplies, and emergency generators. Clearly what's needed is a similar hybrid model for communications services — one that combines the best of remote service delivery with local control.

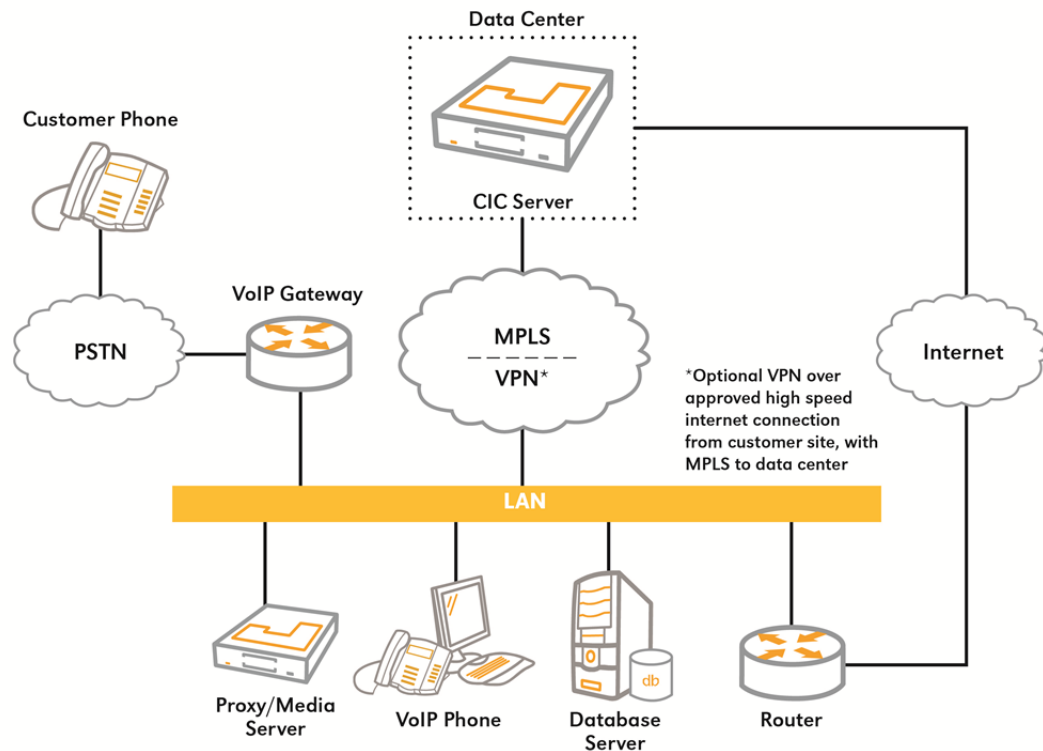
## CaaS with Local Control

Interactive Intelligence has found a way to offer organizations the advantages of Communications as a Service while providing the functionality, flexibility, security, reliability and control of an in-house communications system. The approach is simple.

- Keep your current telecommunications vendor
- Attach your phone lines to a VoIP gateway that sits on your network
- Connect a local call management device to your network

- Install an approved connection between your network and an Interactive Intelligence CaaS data center
- Deploy VoIP phones

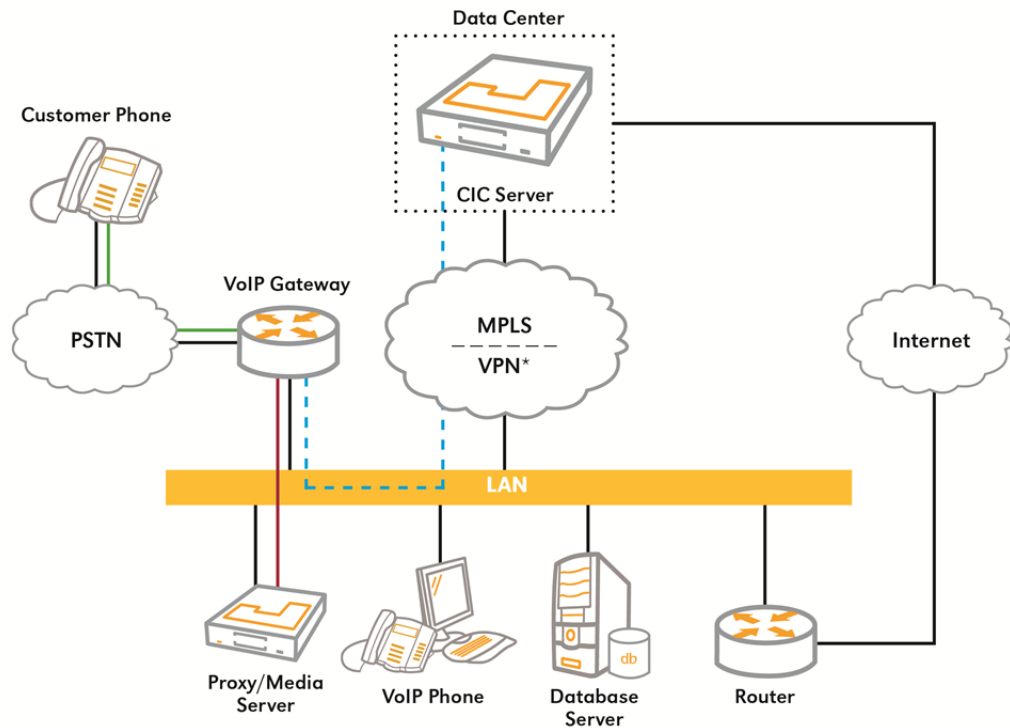
The configuration is illustrated in the diagram shown here.



Notice how simple this configuration is. The VoIP gateway is a type of router that connects traditional phone lines (T-1, E-1, ISDN PRI, analog) to your network. The gateway converts phone calls to voice over IP using the international SIP (Session Initiation Protocol) standard. Similarly, the Media Server — in this case the Interaction Media Server™, with the Interaction SIP Proxy™ installed — is a simple device that provides local call management, as we’ll describe in a moment. (We’ll also describe the “Proxy/Media Server” combination in more detail in a later section.)

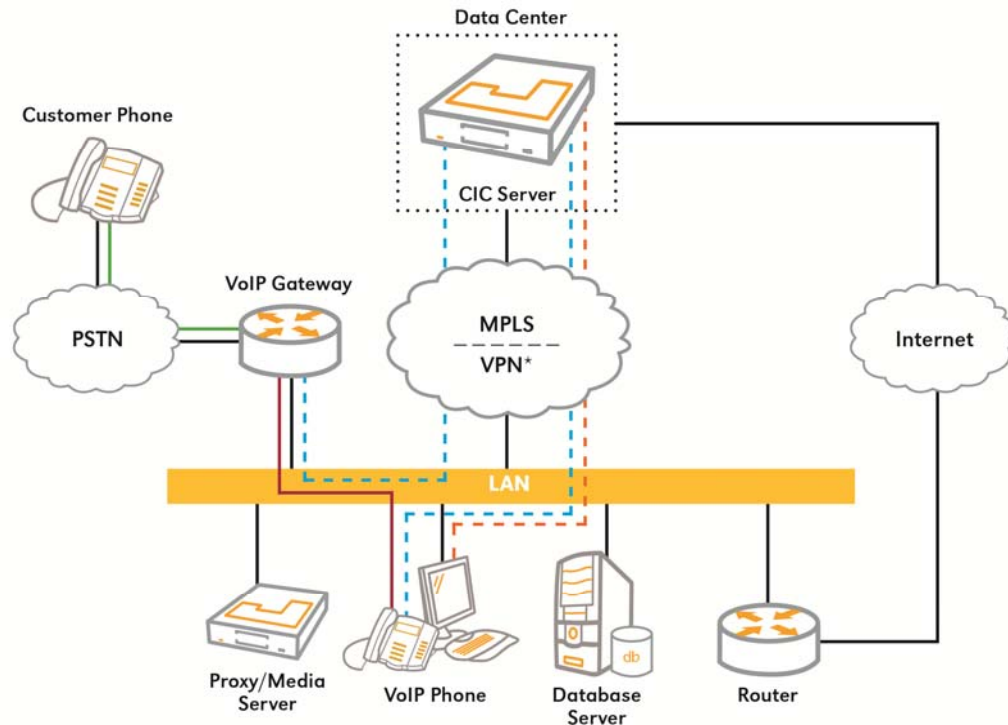
The Media Server is easily configured through a simple web interface. VoIP phones typically come from experienced vendors such as Polycom, who manufacture various models that adhere to the SIP standard. Phones can be everything from basic desk phones to advanced executive phones with touch screens and other features.

To see how this architecture works, the diagram on the next page shows how the CaaS with Local Control model handles an incoming customer call.



The customer call (solid green line) goes through the public telephone network and comes into a telecommunications trunk into your company. That trunk connects to the gateway, where the call is converted to voice over IP using the SIP standard. Notice at this point, the call splits into two streams. The first stream (dotted blue line) is the SIP signaling stream. This stream is a low-bandwidth stream used to control the call — to transfer it, disconnect it, and so forth. The second stream (solid red line) is the actual voice traffic often referred to as RTP, for Real-time Protocol. This stream contains the actual audio of the call, in this case the customer’s voice. Notice how the SIP signaling stream travels over the MPLS (Multiprotocol Label Switching) connection to an Interactive Intelligence CaaS data center. Optionally, the SIP signaling stream can travel over a VPN (Virtual Private Network) by means of an approved high-speed Internet connection, and then on to an Interactive Intelligence CaaS data center by means of an MPLS connection on the back-end. Either way, that’s where a powerful application server running the Customer Interaction Center™ (CIC) software from Interactive Intelligence carries out the complex call routing logic that has been defined for your organization. In a contact center application, the call from the customer can be queued until a suitable agent becomes available.

Unlike the SIP signaling stream, the audio stream stays on your network where it closes on the Media Server. This Media Server device contains software that performs various audio operations, such as playing greetings, prompts, music on hold, and other similar operations. In the current example, say that the customer goes through an interactive voice response (IVR) menu: “Press 1 for sales, 2 for customer service...” The Media Server handles these operations by playing audio and detecting the telephone keys the customer presses. Eventually, assume that the customer is placed in a queue. When a suitable agent becomes available, the customer call is connected to that agent and the situation appears as shown in the diagram on the next page.



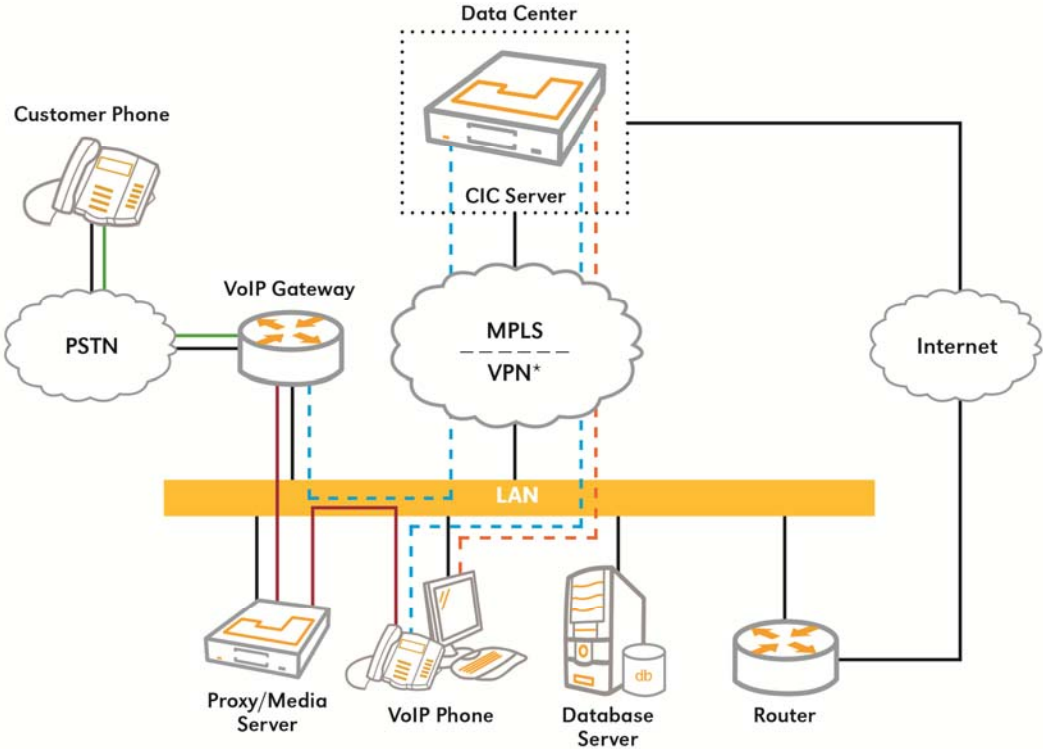
Notice how a second SIP signaling stream (dotted blue line) has been connected to the original one. The second “leg” flows from the CIC server in the data center to the phone of the agent selected to handle the call. By staying in the loop of the SIP signaling stream, the CIC server retains control of the call. The CIC server can take back the call if the agent doesn’t answer, or transfer the call to another user if the agent clicks the Transfer button on their screen.

Speaking of the agent’s screen, notice in the diagram a new IP stream that has been created. This stream (orange dashed line) flows from the CIC server to the agent’s computer and is used to perform screen pops and other operations. The Interactive Intelligence CaaS service includes a graphical application called Interaction Client® that runs on the agent’s computer. The Interaction Client allows the agent to transfer the call, conference in another user, record the call, and perform other call control functions intuitively. We will discuss Interaction Client more later.

Next, notice the audio stream (solid red line). Unlike the SIP signaling stream, the audio stream **never leaves your network!** It flows directly between the gateway and the user’s phone. As mentioned previously, the SIP signaling stream is low bandwidth and consists only of an occasional command, such as TRANSFER. For that reason, it really doesn’t matter if the signaling stream is delayed for a bit by network congestion. Nor does it matter if the delay just results from the time it takes the signal to travel from your location to the data center. However, the audio stream is rather high bandwidth and sensitive to delay. Relatively short delays of even a few hundred milliseconds can render a call almost unbearable. The call can seem like a satellite or old intercontinental connection where the two parties talk over one another. Such call quality can seriously harm a customer’s impression of your organization. By leaving the audio stream on your network and providing local processing with the Media Server, the Interactive Intelligence approach assures the highest possible call quality.

# Recording, Monitoring, and Advanced Capabilities

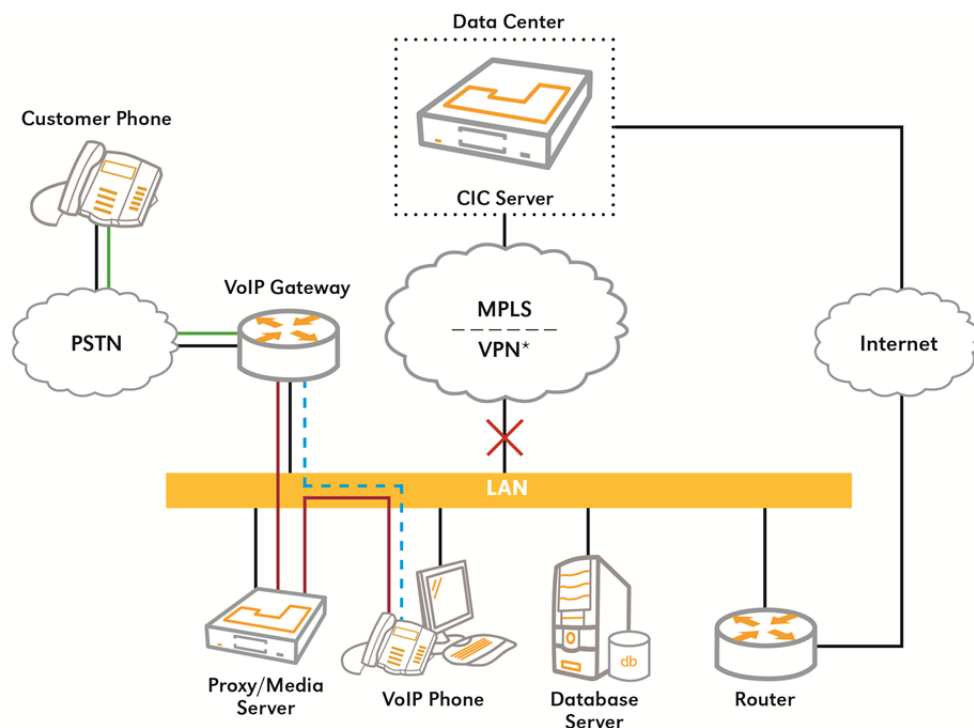
In the previous diagram, the audio traffic flows directly between the gateway and the agent’s phone. But what if you want to record the call or allow a supervisor to listen in on it? Audio can be made to flow through the Media Server, as the solid red line in the diagram shows here.



With this audio flow, the Media Server can record the call. The Media Server can also then save the recording to a disk file or stream a copy of the audio to a supervisor for monitoring. The CIC server is able to use its control of the SIP signaling session to route the audio stream dynamically through the Media Server as needed. Examples of such control are when a supervisor clicks the “Record” button on their screen, or when real-time speech analytics is being used. Future versions of the Media Server will offer additional functionality such as emotion detection to provide greater insight into what is happening with your customers and agents.

## Survivability

The Interactive Intelligence CaaS with Local Control model gives you the best of all worlds. It provides a professional, centrally managed set of communications services with high quality audio that stays on your network. With the Interaction SIP Proxy, the Proxy/Media Server additionally acts as an emergency generator during a power outage. If for any reason the CIC server in the data center becomes unavailable — an MPLS outage, for example — your organization can still make and take calls. In fact, you can even continue to queue incoming calls and route them to agents, albeit in a less sophisticated manner than you can with the CIC server. Thus just as an emergency generator keeps the electricity on, although perhaps in a degraded manner, the Proxy/Media Server allows you to keep communicating with the world. This emergency capability is illustrated here.



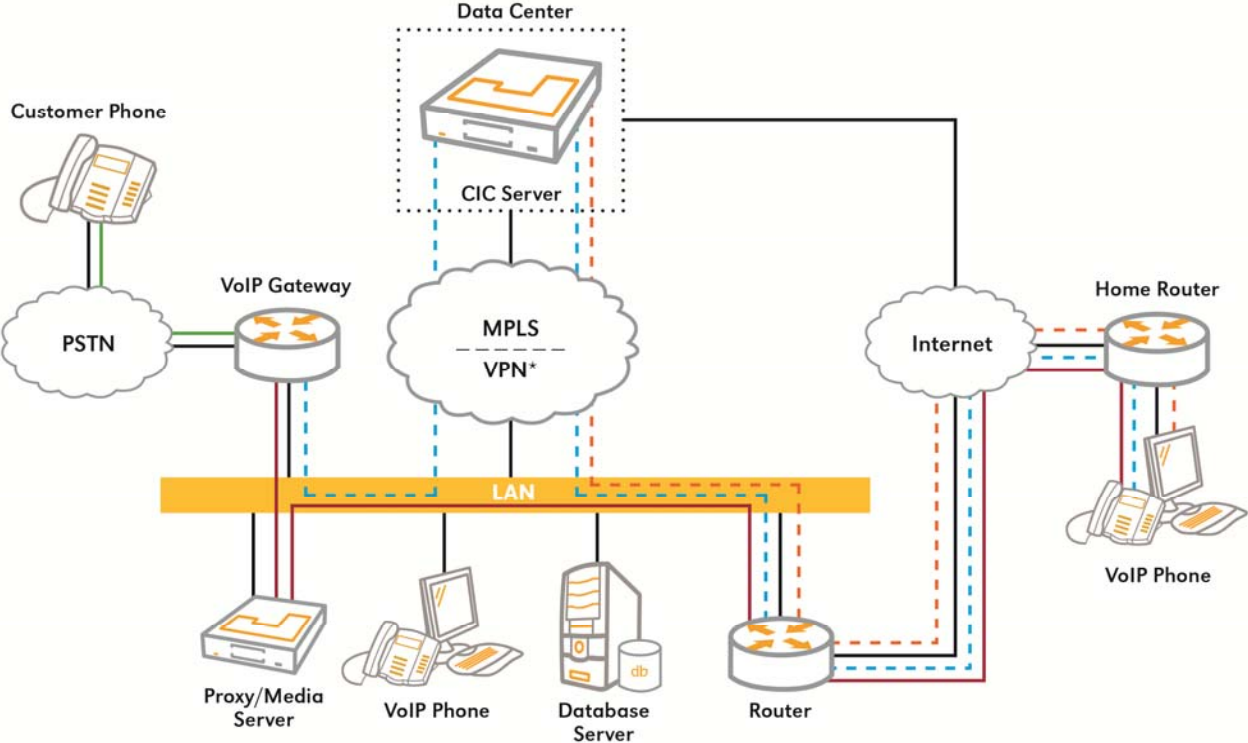
As you can see, the major difference is that SIP signaling (dotted blue line) now flows directly between the gateway and the user phone instead of going through the data center. When the CIC server becomes unavailable, the Proxy/Media Server automatically senses it and begins providing basic communications services, including:

- DID (direct inward dialing), allowing callers to continue to reach employees with direct-dial numbers
- Outbound dialing, including emergency services
- Queuing of incoming calls with round-robin routing
- In-queue audio (music, announcements, and so on)
- Recording of selected calls

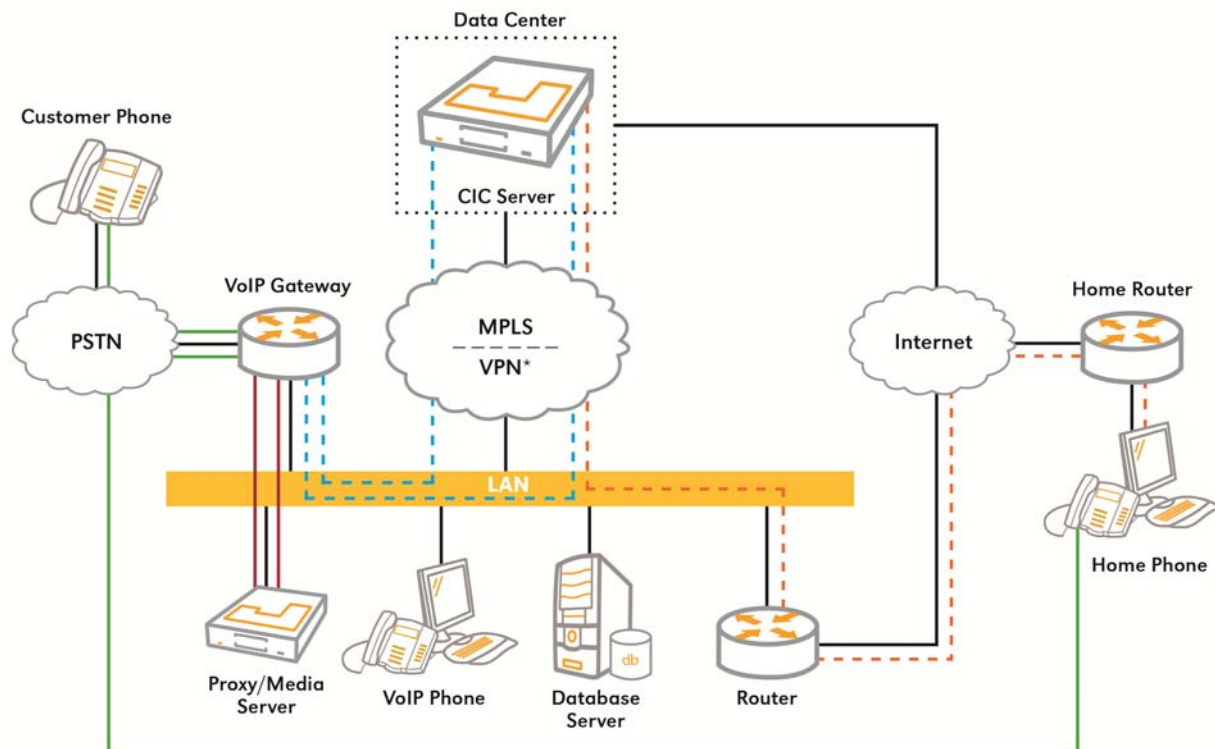
When the CIC server becomes available again, the Proxy/Media Server automatically resumes its usual operation. What's more, you can have multiple Proxy/Media Servers and use them in a cluster to avoid a single point of failure.

# Work at Home Agents and Remote Sites

The CaaS with Local Control architecture easily handles work at home agents, mobile workers, and remote sites. Consider the following illustration of a contact center agent working at home.



In this example, the agent has a computer and a VoIP phone at home connected to a router that connects to the Internet, probably via a cable modem or DSL. Both the SIP signaling stream (dotted blue line) and the audio (RTP) stream (solid red line) travel from your network to the agent by means of the Internet. The functionality is the same as for an agent sitting directly on the local network. Calls can still be recorded or monitored, since the audio flows through the Media Server just as it does for local agents. The work at home agent even has desktop call control and screen pop because of the data connection (orange dashed line) between the agent's computer and the CIC server in the data center. And the VoIP phone in the agent's home is not a requirement. An alternative is to use a regular home phone with voice that travels over the public telephone network (PSTN), as shown in the diagram on the next page.

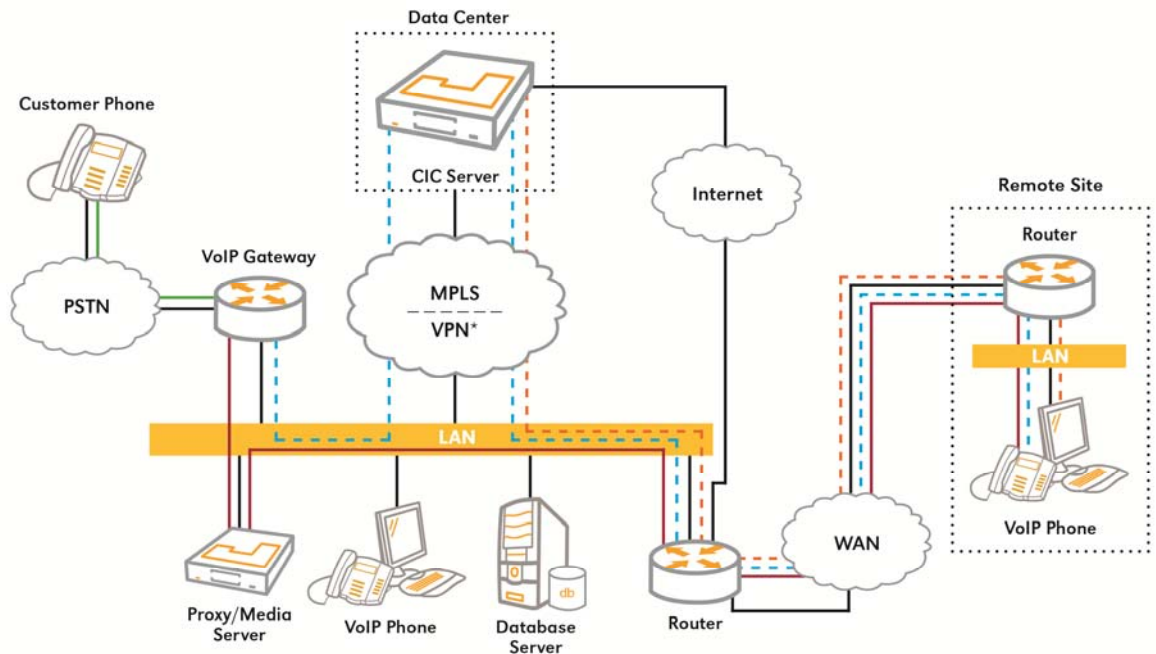


Here is how the call flows work:

1. The customer's call (solid green line) arrives at the gateway on your network, just like before.
2. The gateway converts the call to voice over IP using the SIP protocol. This process splits the call into the SIP signaling stream (dotted blue line) and the RTP audio stream (solid red line).
3. Once the CIC server finishes all IVR (with the Media Server handling the audio) and queue processing, it "decides" to send the call to the work at home agent. The CIC server makes the outbound call by means of the gateway, with the call traveling over the public telephone network (PSTN) to the agent's phone.
4. The SIP signaling streams of the original customer call and the outbound call to the work at home agent loop through the CIC server in the data center. Doing so allows the CIC server to maintain control of the call.
5. The RTP audio streams of the original customer call and the outbound call to the work at home agent loop through the Media Server on your network. This process allows the Media Server to record the call, monitor it, play audio to it, and perform other associated functions.

So once again, the work at home agent has the same capability as local agents, including desktop call control and screen pop. Supervisors can also record and monitor the work at home agent's calls, just as for local agents.

These same capabilities can be extended to mobile workers — sales people, executives, and others who are on the road, often with laptops and cell phones. Like the work at home agent, a mobile worker can remain connected to the communications system no matter where they are in the world. Remote sites are handled in much the same way, as illustrated on the next page.

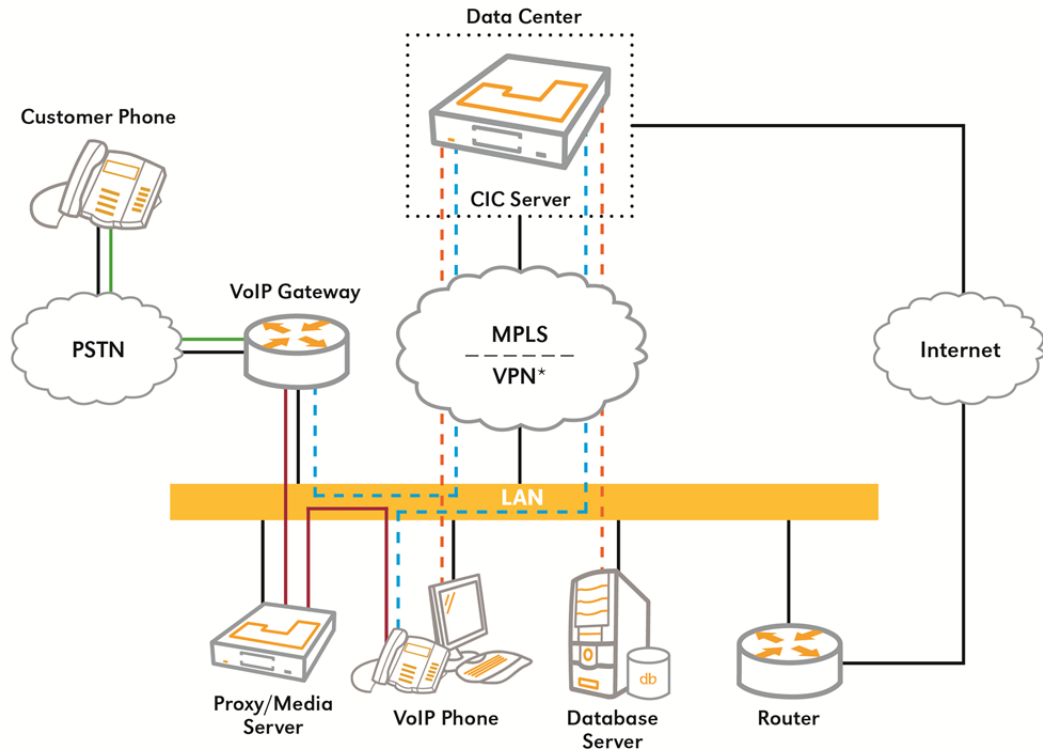


We assume here that the remote site is connected to the main office by means of a wide area network (WAN), ideally with quality of service (QoS) and adequate bandwidth. More ideal would be to connect the remote site to the same MPLS network used to connect the main office with the Interactive Intelligence data center. In any event, the call flows are straightforward. The SIP signaling and RTP audio streams still loop through the CIC server and the Media Server, respectively. Thereafter, both streams flow over the WAN to the VoIP phone of the user destined to receive the call. As in the situations examined previously, the CIC server in the data center retains control of the call, and audio still passes through the local Media Server. This approach allows the call to be recorded or monitored. The remote site can have dozens or even hundreds of employees and phones.

The Interactive Intelligence CaaS with Local Control architecture gives you tremendous flexibility for incorporating stay at home workers, mobile employees, and remote sites into your organizational communications infrastructure.

## Local Control of Data

A major disadvantage of other CaaS offerings is the loss of control over your valuable customer data. You are asked to trust that such data is handled properly and kept secure from tampering, and it is often difficult for you to access your own data. The Interactive Intelligence CaaS with Local Control model eliminates this problem. You have the option to store all sensitive customer data in your own database server sitting right on your network. This approach makes it easy to run reports, perform backups, and do whatever you would like to do with your data. You also conform with mandates such as PCI (payment card industry) compliance and HIPAA (Health Insurance Portability and Accountability Act). These and other similar mandates can make it illegal to store sensitive data outside your organization. The CaaS with Local Control architecture gives you the advantages of CaaS while maintaining strong control over your customer data. Data flows from the CIC server in the data center to your database server by means of a TCP/IP link, as illustrated on the next page.



## Agent Interface

The most common user manifestation of the Interactive Intelligence communications service is an application we have mentioned previously — Interaction Client. A screen capture is reproduced here.

The screenshot shows the 'Interaction Client web edition' interface. At the top, there are navigation links for 'Logout', 'View', 'Options', and 'Help'. The main area displays 'My Interactions' with a call log entry: 'To Indy HQ at (317) 872-3000' with a duration of '0:00:03 - Initializing' and a call ID of '1066725466'. Below this is a toolbar with icons for 'Pickup', 'Hold', 'Mute', 'Transfer', 'Voicemail', 'Disconnect', 'Record', 'Pause', 'Private', and 'Properties'. The 'My Status' section shows the agent is 'Available, No ACD' with a timer at '3:11:49' and a link to 'Set status details'. The 'Company Directory' section contains a table of contacts:

Log	Last Name	First Name	Extension	Department	Status
✓	Aanenson	Wayne	8286	Sales	Available, No ACD
✗	Adams	Joe	122	Channel Dept	On Vacation
✓	Adams	Jerkus	1366	Support Services	Available

At the bottom, there are more navigation icons for 'Dial', 'Email', 'Transfer', 'Voicemail', 'Park', 'Camp', 'Status', and 'Properties'. The status bar at the very bottom shows 'Indydevic2', 'Roe.Jones', and '4139936'.

Foremost, Interaction Client is a ready to use application from which users can perform a number of communications tasks intuitively from their desktop.

- *Make outbound calls.* Users can type a number into the text box near the top of the form and click the “Make Call” button. Alternatively, a user can click an entry in any of the directory pages at the bottom of the form to dial the corresponding individual.
- *View incoming calls.* New calls appear in the “My Interactions” tab, along with any information available about the caller.
- *Perform operations on calls.* From the “My Interactions” tab, the user can transfer calls, start recordings, send calls to voice mail, conference multiple calls together, and otherwise manage them.
- *Manage presence.* A user can change their status by selecting the appropriate value from the “My Status” drop-down list just below the “My Interactions” tab. Note the system sets presence information such as “on the phone” automatically. Presence values can be customized, and different ones can be configured for different groups of users.
- *Access company and workgroup directories.* The bottom third of the Interaction Client includes various Company Directory tabs. These tabs are configurable, and allow the user to see the status of other employees. The user can quickly reach co-workers at the office, on their cell phones, at home, and at other offices and remote sites.
- *Participate in ACD queues.* A user of Interaction Client can log on to and out of various ACD queues. When logged on, new interactions — whether phone calls, emails, text chats, or others — show up in the “My Interactions” tab and can be handled in the same way.

Interaction Client needs only a TCP/IP connection back to the server running CIC in the data center.

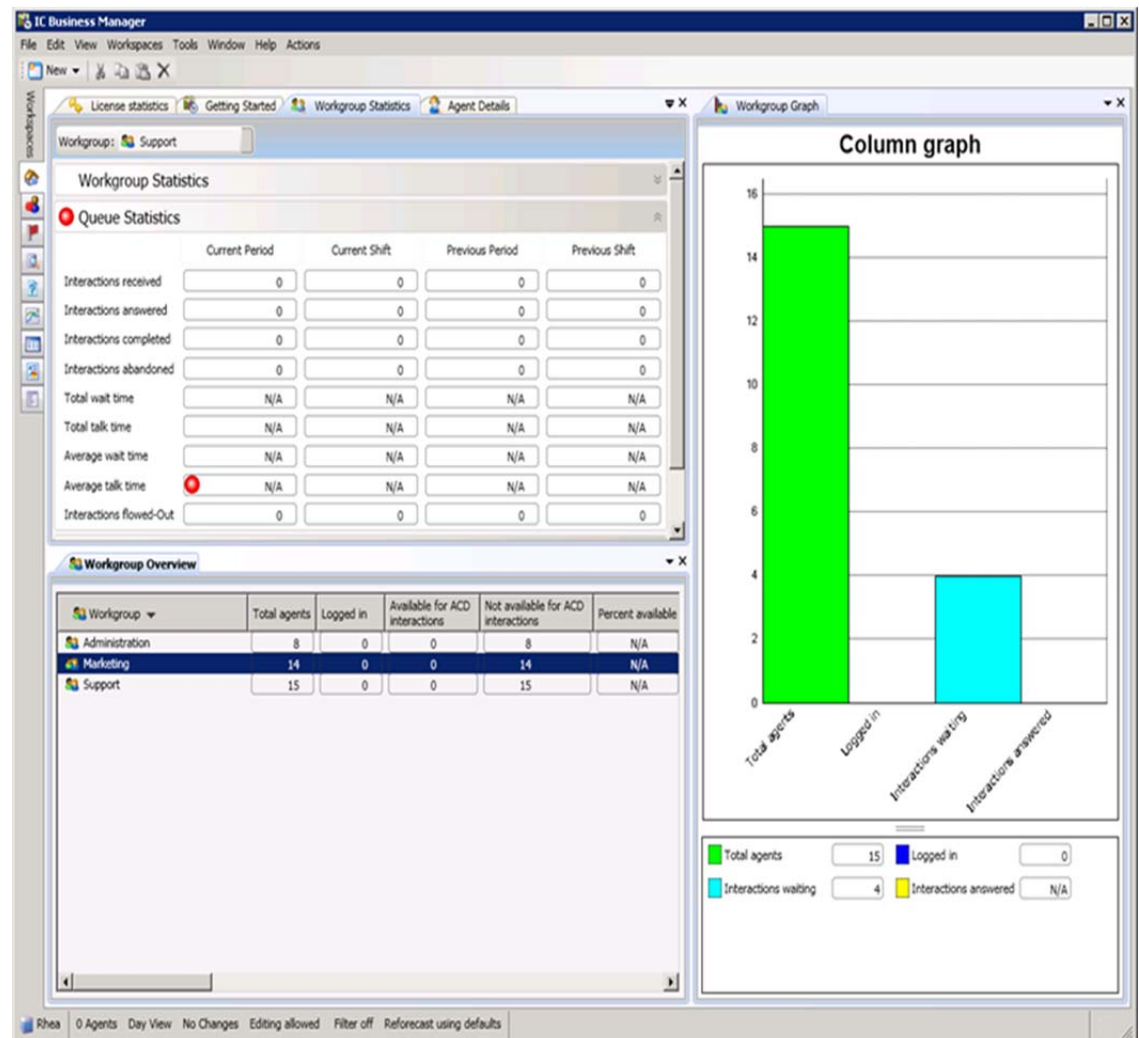
There are multiple versions of Interaction Client:

- **Interaction Client .NET Edition.** This version of the Interaction Client is the full Windows application, and can be used on any machine or laptop running Windows 7, Windows XP, or Windows Vista.
- **Interaction Client Web Edition.** This version, shown in the screen capture on the previous page, can be run from most major web browsers including Internet Explorer, Firefox, and Safari. Using the Web Edition, the user has to install nothing at all on their machine.

Both versions of the Interaction Client can operate with a desktop phone, mobile phone, or full soft phone that allows a PC or laptop with a headset to function as an actual IP phone.

## Supervisory Interface

Interaction Supervisor™ is an application from which supervisors and managers can track what exactly is going on in a contact center or other organization. A screen capture of Interaction Supervisor is reproduced here.



Interaction Supervisor provides a set of configurable views into many different aspects of communications and business processes. In addition to being able to display various real-time information, Interaction Supervisor allows users to set alerts on different quantities. For example, alerts can signal calls longer than a certain duration, average hold time greater than a specified value, and so on. To receive alerts, Interaction Supervisor users can be notified in selected ways including phone calls, emails, and other means. Although a full description of Interaction Supervisor is beyond the scope of this document, suffice to say that it allows supervisors to track various objects, including:

- *People.* With sufficient user rights, a supervisor can click a specified person and see their interactions, status, and associated activities.
- *Interactions.* A supervisor can select a specified phone call and listen in, start a recording, whisper into the agent's ear for coaching, join the call, or perform

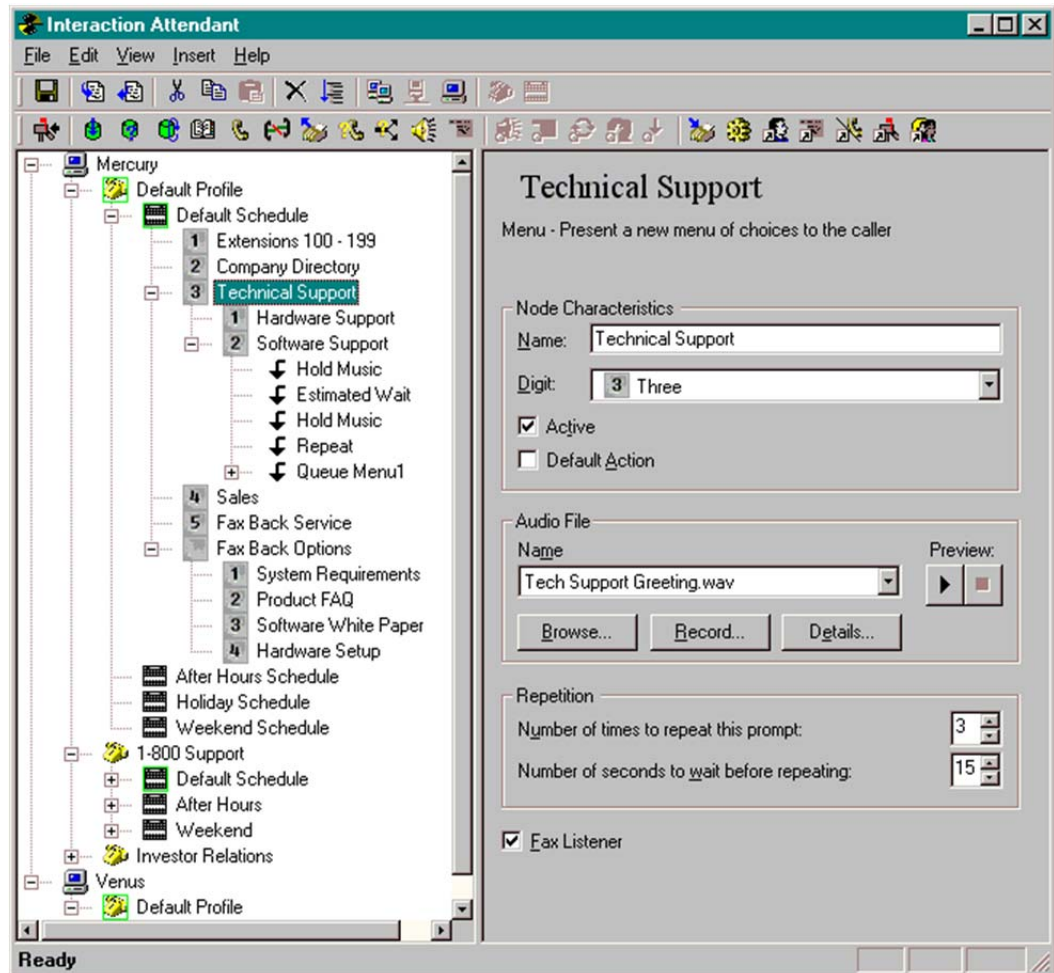
other associated monitoring functions. A supervisor can also take the call away if necessary. Similar operations are provided for non-telephonic interactions such as queued emails and text chats.

- *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 details.
- *Processes.* Interaction Supervisor has been extended to allow process managers to see work making its way through various process flows. The Interaction Supervisor application can display where a process object is along its execution path, how long it has been in transit, and where it is currently held up. Interaction Supervisor can even display who is assigned to work on the object.

Within the CaaS model, IT personnel can also use Interaction Supervisor to monitor the CIC system itself — SIP connections, PSTN trunks, and other functions.

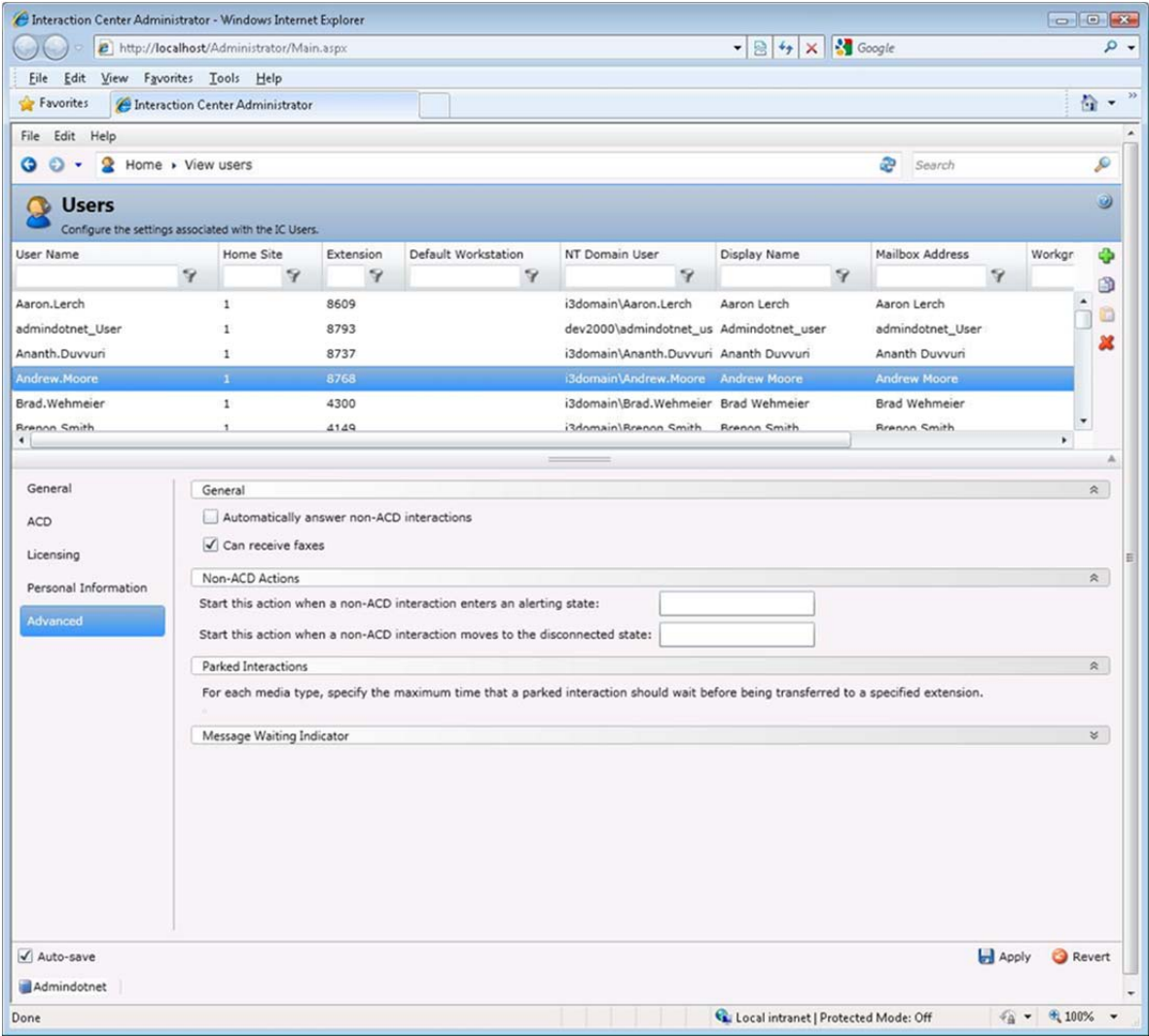
## Administrative Interfaces

As its name implies, Interactive Intelligence CaaS with Local Control allows you to exert complete control over your communications system. We provide a graphical application called Interaction Attendant® that allows you to determine how calls are handled in your organization. A screen capture is reproduced here.



Using Interaction Attendant, you can set up various call handling “trees” for different situations, such as during typical business hours, after hours, and for weekends and holidays. Additionally, you can determine that when the caller presses “3,” the caller is asked if they want “Hardware Support” or “Software support.” The Interaction Administrator® interface makes it easy to configure call handling routines including simple interactive voice response (IVR) applications and automatic call distribution (ACD) for call center operations. Similarly, organizations can use Interaction Administrator to configure the routing and queuing of incoming customer emails.

Interactive Intelligence also provides a web interface from which you can configure users, define workgroups, change passwords, and perform many other administrative tasks. A screen capture is shown here.



## Advantages

The Interactive Intelligence CaaS with Local Control offering provides you the best of all possible worlds:

- A powerful communications system based on the SIP standard for voice over IP
- A utility-like model that allows you to pay monthly and leave most of the complexity in the Interactive Intelligence data center
- Standards-based gateways, phones, and Media Servers that you own and that stay on your site, offering the power of an in-house phone system with much less hassle and IT overhead
- The ability to keep all call traffic, recordings, and sensitive customer data on your network, instead of sending it thousands of miles to a data center
- Local control and ownership of your customer data
- The ability to perform advanced functions including call recording and supervisory monitoring
- Survivability that allows you to continue operating even if the CaaS solution is temporarily unavailable
- The ability to incorporate mobile workers, work at home agents, and remote sites
- Powerful graphical interfaces for contact center agents, business users, and supervisors
- The ability to configure your system as you like by setting up your own IVR and call flows
- The ability to avoid lock-in by buying your own phones from supported vendors such as Polycom

## Summary

Only the Interactive Intelligence CaaS with Local Control offering is able to provide you the benefits listed here. Unlike less sophisticated services that must stream your audio over their network, the Interactive Intelligence approach guarantees unmatched call quality, reliability, security, data access, and flexibility. Best of all, if you ever want to move from a monthly CaaS service to a full in-house deployment, Interactive Intelligence allows you that option. You purchase the complete CIC system and move your existing server from our data center to your location. This option allows you to transition from Communications as a Service to full-blown on-premise communications in one easy step. Interactive Intelligence even credits a portion of your subscription payments toward the purchase of your in-house system. And with Interactive Intelligence, you are dealing with one of the top 500 software and service providers in the world. Our company has been around for close to 20 years, and now has more than 1,100 employees and 4,500 customers around the globe.