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# GENESYS™

# Interaction Director Concepts

## Technical Reference

### Abstract

This document provides decision makers and technical implementers with essential background information about Interaction Director—the intelligent call routing solution for multi-site contact centers. Interaction Director monitors the current load, queue depth, utilization levels, and skill availabilities of call center sites connected by a wide area network. It works with Customer Interaction Center® (CIC) servers to route each call to the location or agent best able to handle the call.

For the latest version of this document, see the PureConnect Documentation Library at: http://help.genesys.com/pureconnect.

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# Introduction to Interaction Director Concepts

Interaction Director is a call routing solution for multi-site contact centers that provides scalable, reliable, and configurable pre- and post-call routing. Director's application-level tools monitor the current load, queue depth, and skill availabilities of call center sites connected by a wide area network. Interaction Director is a stand-alone server that works with Customer Interaction Center (CIC) servers to route each call to the location or agent that can best handle the call. The dedicated Interaction Director server communicates in real time with registered CIC servers in multiple locations, gathering data relevant to entities such as queues; users; workgroups; and skills, and storing the data for quick access when making routing decisions. Customer interactions process promptly and skillfully, no matter where a first available agent is working.

Director handles both pre-call and post-call routing, using the SIP standard to allow for third-party SIP-based integration. Director's call routing intelligence is important to multi-site call center environments, since Director allows you to use call center agents across locations. Your organization needs intelligent call routing such as Director performs when:

- You want more control over the routing process.
- Downtime is not an option.
- You want to scale operations to meet customer service requirements.
- You want service-level goals to drive queue and site overflow routing.
- You want to optimize WAN bandwidth by deploying local call handling as the primary call handling method.

It is common for organizations to have multiple CIC servers around the world. Each site is a separate, autonomous entity that processes interactions, regardless of what is happening at another contact center. But, what if distributed agents could participate in a single, *global* contact center?
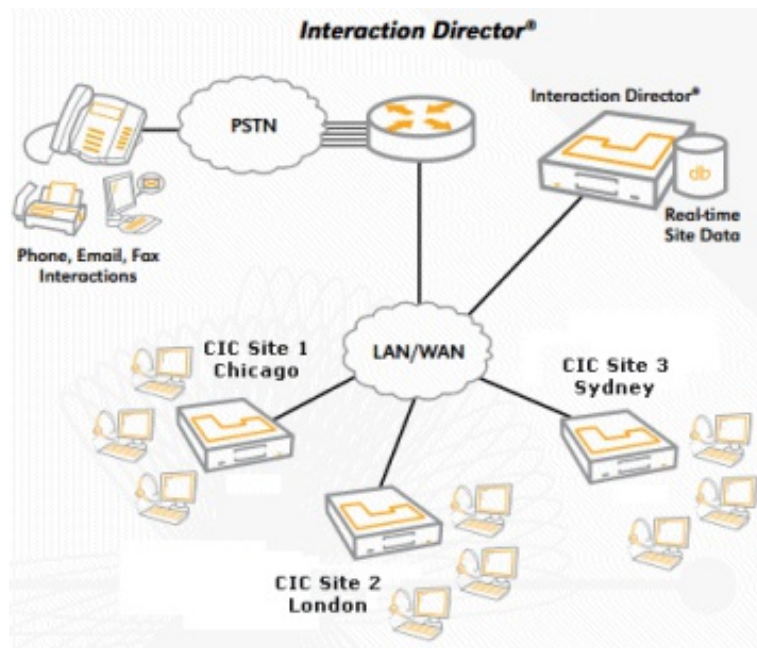


For example, suppose that a contact center in Chicago has an abundance of incoming customer calls while a sister site in London has idle agents. In this scenario, it is desirable to route surplus calls from Chicago to agents in London. Similarly, your organization can implement "follow the sun" call routing to provide 24-hour service. For example, you can route night calls in the U.S. to agents in Sydney.

## Installation

Once you understand the essential background concepts behind Interaction Director, its key features, benefits, and client/server components, you are ready to read the Interaction Director Installation and Configuration Guide. It explains how to install, configure, and administer an Interaction Director server and its monitored sites.

# Benefits of Using Interaction Director

Interaction Director provides pre- and post-call routing for CIC-based call centers. Its sophisticated pre-call routing algorithm uses carrier-defined protocols to examine incoming calls while they are still in the telephone network, *before* incurring any connection charges. Director tracks queue depths, agent availabilities, and skill profiles of all connected call centers and analyzes this information to decide how to route incoming calls.

Director enhances existing CIC servers to define site-specific call handling rules. These rules determine when Interaction Director can intervene to post-route a call from one CIC server to another. Director is customizable. You can manage most settings in *Interaction Administrator*—CIC's central configuration program. Director also capitalizes on the full power of *Interaction Designer*—CIC's graphical application generator that allows handler designers to create arbitrarily complex routing rules.

For more information about Interaction Administrator, see the [Interaction Administrator Help](). For more information about Interaction Designer, see the [Interaction Designer Help]().

Interaction Director helps organizations meet service level and reliability goals across multiple call center locations—Director packs a lot of intelligent routing punch! Its routing rules ensure the most appropriate call handling for a wide variety of situations. The major benefits that Director provides to an organization are:

| Benefit | Description |
| --- | --- |
| Director counters threats to service level adherence | Director enhances your response to system and site outages, while load-balancing calls across sites. It uses automatic switchover and dynamic audio processing to protect a system. Director never routes calls to a "down" system or site. It watches the status of sites; agents; and their skills, and uses this information to route calls intelligently. Director's dynamic pre-call routing load balances incoming traffic to comply with service level goals. |
| Consistent handling of interactions | When you define exactly how to route interactions in specific situations, Interaction Director helps you focus on your primary objectives, such as service levels. Director's multi-site routing improves agent availability and productivity, while minimizing the effect of weather, holidays, and situations that affect contact center operations adversely. |
| Reliability and disaster protection | Interaction Director helps you meet your up-time goals by allowing distribution of calls across your organization. Interaction Director knows which locations are operational and which aren't, and routes calls intelligently to avoid site and system outages. |
| Real-time monitoring and comprehensive reporting | Director monitors and logs interactions that it handles. Whether monitoring service levels in real-time or running reports, Interaction Director simplifies the process of managing distributed call center work. You can view Director statistics in real-time using Interaction Supervisor. |
| Balance customer interactions across multiple physical locations | This feature allows you to maintain customer service levels more effectively and allows distributed operations centers to take greater advantage of specific employee skills and available labor pools. |
| Scale your organization to greater size | Using multiple locations allows your organization to scale to a greater size without the usual physical or technological constraints. |
| Avoid problems with built-in fault tolerance and disaster recovery | Dispersed operations provide built-in fault tolerance and disaster recovery. For example, if one location goes offline because of electrical, telecommunications, or network outages, your other locations can receive the remaining interactions automatically without causing total catastrophic failure. |
| Route calls according to specific agent skills | Calls can route exclusively to locations where specific agent skills are present, allowing a group of smaller physical call center locations to respond in the same way as large contact centers. Skills-based routing sends calls to agents who have particular skills, such as the ability to speak an alternate language, or knowledge of a particular product line. Skill-based routing sends customers to the agent best qualified to process the call. |

# Enterprise Groups and Interaction Director

An Enterprise Group is a collection of CIC queues from one or more CIC locations. Enterprise Groups pool the resources of agents in multiple locations to manage calls and email messages efficiently. Director routes interactions to Enterprise Groups. Enterprise Groups raise the concept of a "queue" to a global contact center level. Director allows any ACD queue configured on an individual CIC server to be part of a Director Enterprise Group.

For example, sales queues on multiple CIC servers can form a single Enterprise Group. When you configure Director, you define at least one Enterprise Group. Interaction Director can support many enterprise groups—each working with a different set of CIC server queues—to support all of the multi-site call routing needed across an organization. Each enterprise group can contain as many CIC server queues as necessary to meet routing goals. Interaction Director collects real-time statistics from each CIC server queue and uses these statistics to determine how and when to route a call.

Enterprise groups allow Director to pool an entire collection of agents to manage calls and email messages efficiently. If the network or central Director server becomes unavailable, individual CIC sites continue to function autonomously.

With two or more CIC call centers connected by a wide area network running TCP/IP, Interaction Director can:

- Detect incoming pre-call notifications to obtain caller and called address information.
- Collect real-time information regarding load levels, queue depths, estimated hold times, specific skill availabilities, and other statistics from all connected call centers.
- Allow a CIC server to evaluate an incoming call's DNIS and ANI information, and post-route the call based on a programmable combination of business logic and real-time statistics.

# Client/Server Architecture

Interaction Director uses *client/server architecture*, meaning that software deploys across servers in a system. A Director solution requires two types of servers. The minimum hardware requirement is one dedicated Director server and two CIC servers.

## Director Servers

The Director Server is a stand-alone computer on which Interaction Director server software runs. Multi-site routing requires an extra layer of software intelligence that Director server provides. Director Server monitors the availability of agent resources on CIC servers. The Director server must have TCP/IP connectivity with CIC servers and it must know their IP addresses.

Since Interaction Director supports switchover, you can set up two Director servers so that a backup server can take over if the primary fails for any reason. For more information about how to install Interaction Director with or without switchover, see the Interaction Director Installation and Configuration Guide.

Following are the Director Server software components:
- **Interaction Director Administration Interface**: A plug-in for Interaction Administrator that adds containers for configuring Interaction Director.
- **Interaction Director Data Collector and ACD**: This component registers Director to receive updates from the Notifier subsystem of CIC servers and also tracks statistics for each site. Statistics include:
  - Load (for example, average wait time)
  - Number of available agents
  - Number of available skill positions
  - Queue depths, abandon rates
- **Interaction Designer Pre-Call Routing Tools**: When you install Director, it adds building blocks (called tools) to Interaction Designer, the graphical application generator used to customize CIC. Pre-Call Routing tools determine how to handle a pre-call notification. You can customize pre-call logic to meet your individual business requirements. Designer allows supervisors, systems integrators, or other "authors" to design pre-call routing flows visually for Interaction Director. Designer includes hundreds of basic tools, along with the specialized Interaction Director tools.

## Monitored Servers

A Monitored Server is a CIC server that Director Server recognizes and manages. Each monitored server provides information to the Director Server that allows the Director Server to route calls efficiently. For a CIC server to function as a monitored server, activate the *Director Monitored Server* feature of CIC using Setup Assistant. For more information, see the Director Monitored Server Installation and Configuration Guide and the Interaction Director Installation and Configuration Guide.
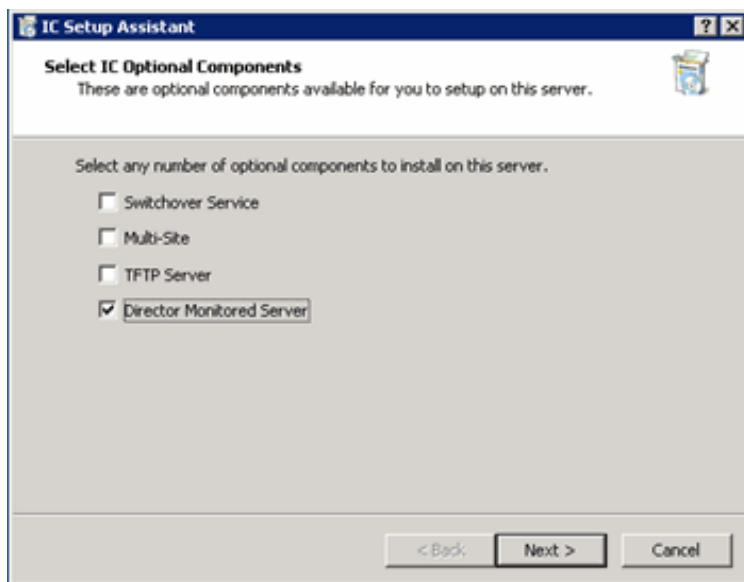


To implement a global contact center, you need a CIC server at each contact center and an Interaction Director server at one of the sites. The combination of CIC servers with a stand-alone Interaction Director server unites them into a global contact center. Director's footprint on CIC servers is modest. Director components release with CIC 4.0 or later servers and you activate the components through the Director Monitored Server feature.

# Agent Skills and Workgroup Membership

At initialization of Interaction Director's connection to each CIC server, all CIC servers report agents who are members of the workgroups configured on the Interaction Director server and their skills. Thereafter, changes to skills or workgroup membership report as necessary. Along with the agent status information above, this feature allows Interaction Director to know exactly who's available at each site and what skills an agent has.

## Agent status

Agent status updates within a second when certain items change. CIC sends the following information to Director:

- Available time
- Queued, active, and held interactions
- ACW state
- Idle state (whether local ACD indicates that it does not need the agent)

## Point statistics collected for each ACD queue

The following point statistics update every 10 seconds when they change:

- Active lines
- Free lines
- Calls waiting
- Calls connected

## Period statistics collected for each ACD queue

The following period statistics update every 10 seconds when they change:

- LongestAvailableTime
- LongestWaitTime
- AveragingPeriod
- AverageWaitTime
- AverageAbandonTime
- AverageCallLength
- AverageAcwTime
- AverageWaitSample
- AverageAbandonSample
- AverageLengthSample
- AverageAcwSample

# Director Server Administration

You configure Director-specific containers in Interaction Administrator to administer Interaction Director. Interaction Administrator manages every aspect of Interaction Director, such as hardware-level parameters for carrier interfaces, connection information for the CIC servers running at the various call center sites, timing and configuration options, routing rules, and membership in virtual spanned workgroups (called *Enterprise Groups*). For more information about containers, see the Interaction Director Installation and Configuration Guide.

When Interaction Administrator runs for a Director server, it displays Director-specific configuration containers and a subset of other containers relating to features that Director has in common with CIC servers. For more information about non-Director containers, see the Interaction Administrator Help.
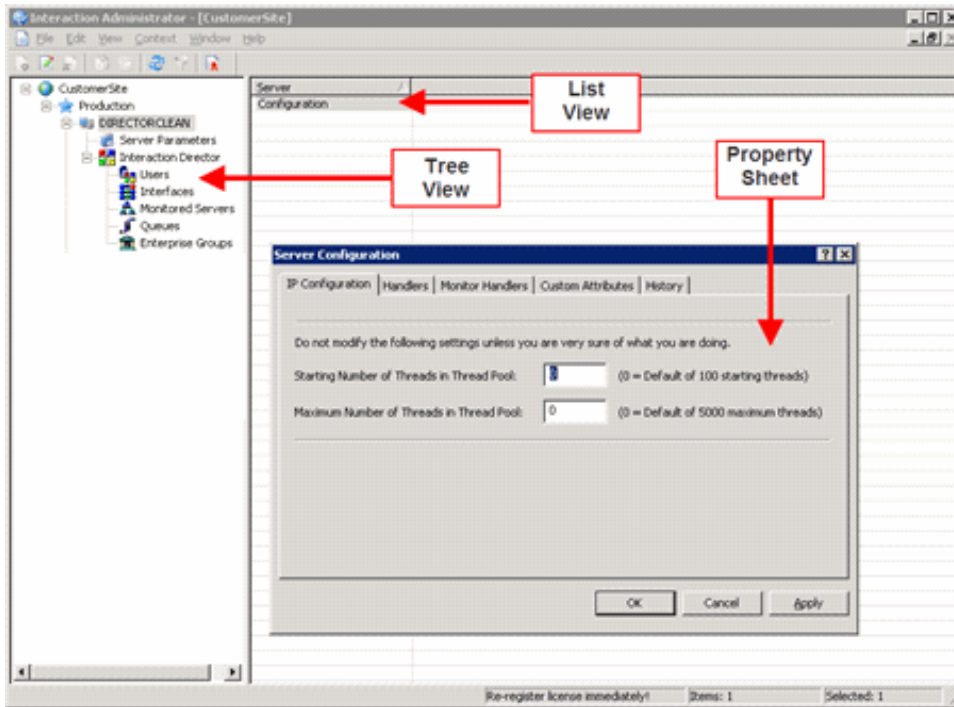


Interaction Administrator is easy to use, once you understand how to work with containers, entries, and property sheets.

- A *container* is an icon in Interaction Administrator's tree view that users can select to manage configuration settings of some kind, such as those settings that configure Interaction Director. When you select a container in Interaction Administrator's tree view, columns of configuration data appear in the *list view* on the right. Each row is a *configuration entry* that you can open for editing by double-clicking the row.

  If a container is empty (doesn't contain rows), you can press *Insert* to create a new entry. Likewise, pressing *Delete* removes a selected entry. When you add or edit an entry, configuration data displays in a *property sheet*.
- A *property sheet* is a form that allows you to maintain data. Some property sheets have multiple pages (tabs).
- A *configuration entry* is a saved property sheet for the selected container. Each entry stores one configuration record for that type of container. A container can have many configuration entries.

## Interaction Director containers

You administer Director using the containers in an Interaction Director node in the Interaction Administrator's tree view.
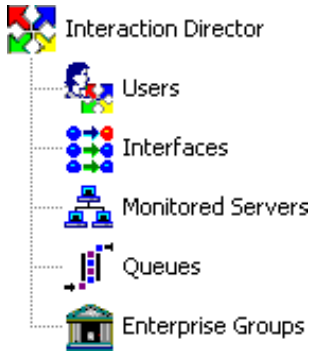
The Interaction Director container manages overall server configuration settings, and expands to display five child containers. Each container manages a group of logically related settings.

**Users** container: Collects user information needed for authentication purposes (CIC Name, Windows NT Domain User, and password).

**Interfaces** container: Defines boards and devices that interface with MCI or SIP.

**Monitored Servers** container: Manages a list of candidate CIC servers/sites available to Interaction Director. This container defines possible destination sites that Interaction Director can route interactions to.

**Queues** container: Represents a Site Group and a Queue and Line Group within that site. Director handlers determine routing decisions based on statistics collected for queues.

**Enterprise Groups** container: Manages collections of Queues that represent the target destination of a routed call.

## About containers

Each container creates an object to which other objects can refer. For example, you can define a Queue object and refer to it in an Enterprise Group object that pools agents from several call centers. In this context, object refers to a group of related settings that have an assigned name. Configuration settings (or objects) sometimes manage lower-level items. For example, an Enterprise Group object identifies queues that belong to the group.

Each container provides user interfaces that configure logically related settings. Containers manage objects (called entries) that can contain items. Items are subentries that an object manages. You define objects separately so other objects can use them.

You don't have to know the details of each container, entry, and dialog box. Administration exists in one administrative program so that it's easy for administrators to configure and maintain a Director system. For more information, see the Interaction Director Installation and Configuration Guide.

# Call Routing Configurations

You can configure Interaction Director to perform two types of call routing. Director's default configuration is post-call routing, wherein Director essentially functions as a multi-server ACD. Director also supports pre-call routing.

For more information, see the following:

- Post-Call Routing
- Pre-Call Routing
- Advanced Call Routing Customizations

## Post-Call Routing

*Post-Call routing* is the process of routing a call after it connects to a specific location. In post-call mode, Interaction Director acts as a multi-server ACD.
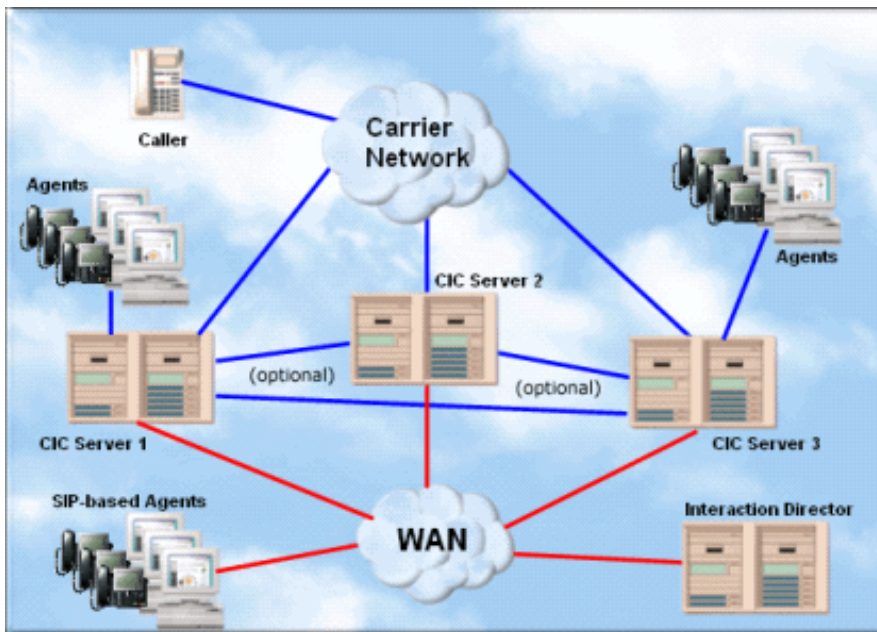


In this configuration, Director uses scoring to decide which CIC server and agent can best handle the call. Upon receiving this information, the starting CIC server works with Interaction Director to connect the call to that server and agent. Director verifies that the call reached the intended recipient and if not, reassigns it. In post-call routing scenarios, the CIC servers perform static routing when Interaction Director can't provide on-demand routing.

Post-call routing occurs when Director cannot redirect a call until after the call connects at a specific location. For example, a customer calls a local number in New York. The communications system at the New York contact center that answers the call uses interactive voice response (IVR) to ask questions and obtain information. Based on that information, or based on other factors such as the New York center's load level, Director transfers the call to another site.

Post-call routing occurs when a call connected to a CIC server routes to another CIC server over a tie line or other channel. Director uses post-call routing based on the scoring factors defined in the Enterprise Group configuration on the Director server.

Interaction Director supports post-call routing using SIP or circuit-based TDM tie lines. Specifically, Interaction Director supports T1/E1/PRI connections, PSTN connections, and SIP-based IP telephony as the tie lines between CIC servers. Post-call routing does not require a network interface connection with the carrier, only a Director server connected to the IP network, which is the same LAN/WAN that contains the CIC servers.

### Post-call routing process

Following is the post-call routing process:

1. The call ended on a system trunk line.
2. After the CIC server notifies Director of the waiting call, Director determines when to route the call to an agent and at which locations.
3. If the agent is not on the same server as the waiting call, Director instructs the originating server to make a trunk-to-trunk call,

which is a consult call to the remote agent. The trunks can dedicate to a virtual private network or through the customer's provider. SIP tie lines are best for most flexible call routing.

4. The originating CIC server passes call-identifying information through DTMF, ANI, or SIP.

5. After the agent answers the consult call, Director connects the original call and the consult call, known as "tromboning." If the carrier, hardware, and CIC version on both the source and destination servers support it, the call can reroute without tromboning using "take-back and transfer" (which lets the carrier reroute the call to another number).

Interaction Director defaults to post-call routing, which you can configure. Post-call routing can balance loads across several CIC servers. Director sends post-call routed calls to available agents regardless of their location and allows you to have full control over the IVR before assignment. Any call is a candidate for post-call routing, not just 8YY calls. (8YY is an acronym for the ability to dial toll-free numbers that start with prefixes such as 800, 888, and 877.) Director also supports screen pops and custom audio-on-hold.

## Post-call routing example

Post-call routing occurs as follows:

1. CIC receives a call from an external caller over lines connected to the carrier.
2. The caller hears the main IVR menu and selects an option. CIC transfers the call to a specific queue.
3. If you configured that queue in Interaction Administrator so that Director handles the call, CIC notifies Director of the waiting call.
4. While the caller is waiting, handlers control the state of the on-hold audio that plays. You can use a customized handler to determine whether to play patience prompts.
5. When Director locates an agent based on the scoring criteria, the following occurs:

   - If the agent is in the same workgroup queue where the call is waiting, Director alerts the agent the same way as for a call that the local ACD processes.
   - If the destination agent is at a remote site, Director sends a data packet to that site with the routing information about the call and then calls that site.
   - If the agent answers, the inter-site call and the original call connect.
   - If the agent does not answer, the inter-site call drops and the original call continues to wait for another agent.

## Post-call Director Server settings

Post-call CIC settings for Interaction Director include prioritizing calls and setting overflow rules. Each CIC server that receives an interaction may need to handle the interaction according to local requirements.

Settings used for post-call routing include:
- Interaction Priority
- Interaction Time in Queue
- Interaction Time in System
- Agent Skills Weight
- Agent Cost
- Agent Available Time
- Routing Cost
- Number of Free Lines
- Queue Member Order

**Example:**

For example, one site wants to hold calls for 30 seconds locally before offering the call to another location, and another site wants to hold calls for 15 seconds. For each monitored workgroup in an Enterprise Group, the following configuration options are available:
- In-queue timeout, which acts as an "alarm clock" to perform customized routing logic.
- Overflow "rules" that can specify when to queue or not queue an interaction under certain conditions. Those conditions include too many waiting interactions, lengthy wait time, whether the system can service an interaction immediately, and whether there is no viable destination within an enterprise group. You can define multiple Overflow rules to specify the interaction processing order.
- Full consideration of agent and interaction skill requirements. You can set skill weights individually for each CIC server.
- Support for prioritization – which you can use to set calls coming into one location as having a higher base priority than similar calls coming in from other locations.

# Pre-Call Routing

*Pre-call routing* is the process of routing a call before the call connects to a location. In pre-call mode, Interaction Director receives a call event from a SIP network interface, usually a telecommunications carrier. Interaction Director analyzes statistical data collected from managed CIC servers, then "directs" the carrier to send the call to a specific destination point.
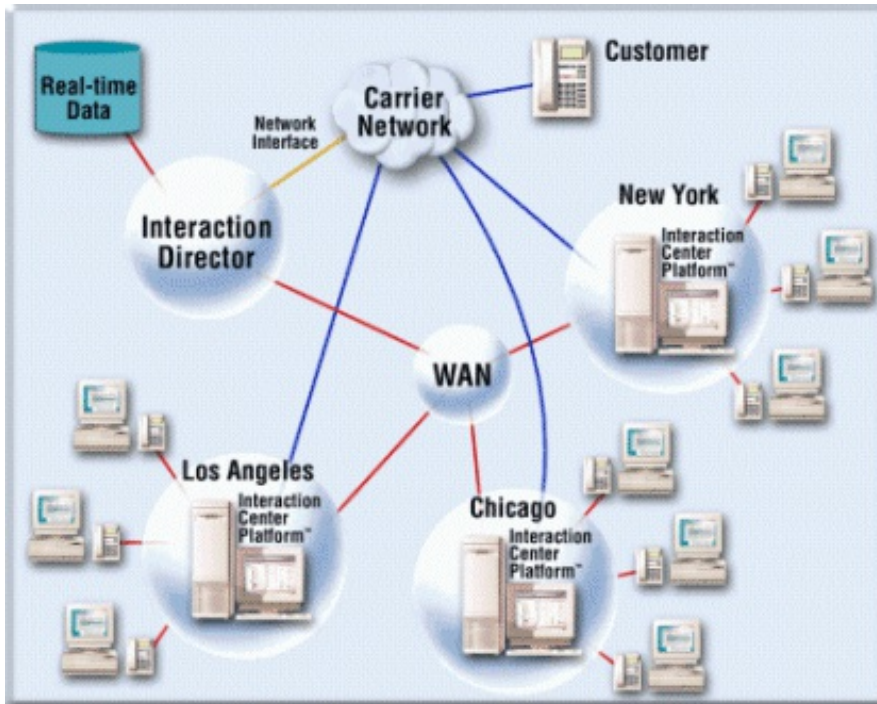


You can think of pre-call routing as "carrier-based routing" since routing decisions occur before the call connects and are based on signaling information from the carrier network.

A signaling link from a network carrier sends advance notifications of incoming calls to Director. It receives this information, views the current state of all call centers, and then sends a notification back to the PSTN indicating where to route the call. Thus, the call routes before answering it.

Pre-call routing can reduce toll charges, since Director makes intelligent routing decisions before the call connects, rather than using post-call routing to transfer the call after sending it to a call center site.

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## Pre-call routing process

Pre-call routing uses a carrier network protocol to examine calls in the PSTN before sending them to a specific site. In a pre-call routing configuration, the Director server connects to the carrier with an SIP interface and to the same LAN/WAN as the CIC servers to collect real-time CIC server queue statistics.

1. The carrier uses a carrier-provided protocol to send a message to Interaction Director. In Interaction Administrator, the Interfaces container manages the settings used to configure SIP protocols.
2. The message contains the ANI, DNIS, and another field that can contain information collected in an IVR session at the carrier level. Interaction Director can receive the dialed number, the caller's number, and CED (customer entered digits). These pieces of information are then available to the pre-call routing logic.
3. Director determines where to route the call based on scoring criteria and data collected in real time from the monitored servers on the network. Director can evaluate these factors:

   - ANI/DNIS
   - Network IVR info
   - Time of day, date
   - Current site loading
   - Current agent availability
   - Other logic and data available using Designer tools

4. Director sends a *destination message* to the carrier. This message tells the carrier where to route the call. The routing message contains:

- A *routing code* (a disposition for the call that the routing table provisioned with the carrier configures).
- Additional information in various forms (depending on the carrier) that can transmit with the call to the final destination.
- Error or diagnostic codes that can assist the carrier when there is a problem.

You can configure Interaction Director with defaults that Director sends back to the carrier when it cannot determine where to route the call in a specified amount of time. This feature ensures that Interaction Director minimizes alerts to the carrier's network maintenance facilities. For example, if Director does not respond within 500 milliseconds, the carrier uses a predefined routing table to route the call.

## Pre-call Director Server settings

You configure Monitored Servers, Enterprise Groups, and network interfaces on the stand-alone Director server, along with connections used to gather real-time statistics from monitored servers. When using post-call routing, they are also where an administrator specifies how to transfer calls, defines the cost of certain server-to-server connections, and specifies how to send call information.

After you establish Enterprise Groups for each phone number, Interaction Director uses the following statistics to determine how pre-call routing occurs. For each statistic, you can apply a weight and a positive or negative factor to specify how to route calls. Also, you can increase each time-based score using a time interval.

- Average Wait Time
- Average Wrap-Up Time
- Logged-in Agent Skills
- Longest Wait Time
- Number of Active Lines
- Number of Connected Calls
- Number of Free Lines
- Number of Logged-in Agents
- Number of Waiting Calls
- Number of Wrap-Up Agents
- Queue Member Order

# Advanced Call Routing Customizations

Although you can administer most multi-site routing using Interaction Administrator, Interaction Director also allows customizations to meet more complex and unique routing requirements. Customization options include Director-specific structured customization points and open handler customization. You apply customizations using Interaction Designer.

## Post-call customizations

You administer post-call routing using Director containers in Interaction Administrator. However, some options allow handler customizations (on the CIC servers):

- Action to take when reaching the in-queue timeout.
- Audio on hold.
- Attributes that follow the interaction to a remote destination for screen pops, for example.
- Provide specific destinations (agent, queue, server) for which the interaction waits for a certain time before considering any agent anywhere.

## Pre-call customizations

You specify most pre-call settings and routing options using Director settings in Interaction Administrator. However, you can apply other routing logic using handlers.

When you install Director, it adds tools to Interaction Designer. Designer includes hundreds of basic tools, along with the specialized Interaction Director tools.

Applications built using Interaction Designer start with the notion of an "initiator" – that is, a certain event that causes the application logic to run. Just as Visual Basic and other user interface-oriented programming tools allow developers to describe what happens when clicking a certain button or some other action occurs, Interaction Designer allows authors to tie logic to events such as notifications of incoming calls to a supported carrier. The pre-call initiator is a visual building block in Interaction Designer that, at runtime, contains all the information known about an incoming call, such as the called and calling address information for the call and other information collected in the carrier's network such as CED (Caller Entered Digits).

An initiator and the logic flow associated to it are collectively referred to as a "handler" – that is, instructions for handling a specific event. Handlers are as simple or as complex as you want; Interaction Designer imposes no limitations.

By using the tools available in Interaction Designer, Interaction Director can carry out complex routing logic. For instance, you can configure Interaction Director to ignore a particular call center outside certain hours or in the case of a catastrophic failure at that site.

Whatever the complexity of the routing logic created using Interaction Designer, Director uses the information to create a compiled program that executes in its own thread for each incoming pre-call notification. This feature allows for quick routing decisions – which is critical since the carrier generally requires that the "round trip" (incoming pre-call notification plus outgoing routing direction) take less than 500 milliseconds (1/2 second). The architecture of Interaction Director supports thousands of such routing decisions every minute.

# Director Switchover

You can set up two Director Servers in a switchover pair, for redundancy in the event of catastrophic failure. This setup includes both replication and data redundancy to ensure that you don't lose data or calls.

For more information, see the following:

- Switchover Server Requirements
- Role of Active Versus Backup Servers
- Switchover Initialization
- When Switchover Happens

## Switchover Server Requirements

To implement a Director Switchover system, use two Director Servers with similarly preconfigured hardware and software. The Director Switchover system requires that the servers are identical in every respect, including:

- An identical amount of RAM, disk space, number and names of drives, and hard drive partitions
- Operating system software and service packs, including identical services running (for example, SNMP)
- Director product software release and service update
- Director Administrator account name and password (for example, ICAdmin)
- Director components and site names (the site name is case-sensitive)
- Application software, including email clients that use identical mailboxes
- On the same network. Each Director Server needs at least one network card to communicate over the network. A dual port network card is best for providing fault tolerance
- Members of the same domain. A Domain Controller installed and configured to provide DNS and DHCP
- Immediate access to the same CIC resource files (for example, contact databases, report logs, voice mail recordings) on any separate database and recording servers

The two servers need different machine names and IP addresses, since the backup server is still accessible using TCP/IP while the active server is active, and conversely.

# Role of Active Versus Backup Servers

Switchover requires a complete pair of servers for switchover to function correctly. You define the server roles when installing Interaction Director. Each server in the pair has different responsibilities and takes different actions based on the role defined during installation.

| Active Server | Backup Server |
|---|---|
| The Active Server is the dominant server in the pair of redundant servers. This server has two states: Active or Dead. When Active, this server:<br><br>• Answers all messages and calls as though it was the only Director server present.<br>• Answers communication requests from the Backup Server. The Backup Server sends a ping message to the Active Server to confirm that it's still part of the network.<br>• Connects to the Backup Server when it is aware of a server of that type on the network. The Active Server then synchronizes its configuration with the Backup Server. This synchronization uses time stamp data stored in Directory Services.<br>• Implements synchronized changes to the Backup Server configuration when any change to the Active Server configuration occurs.<br>• Denies connection to any other Backup Server when a current connection to a Backup Server exists. This feature maintains integrity in the redundancy pair.<br>• Ensures that the local state of users is in sync. When a user's state changes on the Active Server, the Active Server sends a message to the Backup Server to maintain the same information on each server. This information is the only information not available during the initial synchronization or contained in the sync messages between the servers.<br><br>The Active Server can enter a dead state by: switching it manually in Interaction Administrator, using Switchover Control Panel, stopping the IP or Director service, or a network disconnect. | The Backup Server is the subordinate server in the pair of redundant servers. This server has two states: Active or Dead. This server:<br><br>• Does not answer messages or calls when in a backup state.<br>• Makes any monitored connections to an Active Server defined in its configuration settings.<br>• Monitors connection with the Active Server. This server sends a ping message to the Active Server to determine whether it is on the network.<br>• Receives updates from the CIC server and the Active Server concerning configuration. These messages, either at time of initial synchronization or when the Active Server sends a change message, contain configuration change information, which then synchronizes on the Backup Server.<br>• Determine the health of the Active Server. If the Active Server is in a dead state, the Backup Server takes over and becomes the Active Server. When a Backup Server becomes the Active Server, reset any affected connections and endpoints appropriately. Also, a switchover event triggers a "switch to backup" notification. This notification can trigger an imitator in a custom handler that could send email to a specific email address. |

# Switchover Initialization

When you connect a new Director server to a network and start it, the server does the following:

1. If the server configuration includes redundancy pair connection information, the starting server tries to connect to its paired server.
2. If the starting server cannot connect to the paired server, the starting server assumes that the other server does not exist and the starting server becomes the Active Server. If you didn't configure a redundancy pair, the starting server becomes the Active Server.
3. If you configured the starting server as the Active Server and it connects to its redundant partner, the starting server assumes the Active Server role.
4. If you configured the starting server as a Backup Server and it connects to its redundant partner, the starting server assumes the Backup Server role and does not accept any calls or messages.

## When Switchover Happens

When there is a problem with the Active Server, the following switchover process occurs:

1. The Backup Server determines the Active Server is dead.
2. The Backup Server changes roles to become the Active Server.
3. All calls, messages, and connections reset to the new Active Server.

# Real-Time Statistic Monitoring and Alerting

Real-time monitoring of multi-site routing can greatly improve visibility into various site conditions and help administrators adjust and realign staff and tasks to meet call center goals more effectively. You can monitor Interaction Director routing statistics using Interaction Supervisor—CIC's real-time statistic monitoring program. Interaction Supervisor provides state-of-the-art, real-time statistic monitoring.

For more information, see the Interaction Supervisor Help for IC Business Manager.

## Supervisor Views in CIC 4.0 or Later

Starting with CIC 4.0, Interaction Supervisor is a program module of IC Business Manager. Interaction Supervisor is no longer a stand-alone program.

### Enterprise Group Details View

Interaction Director makes intelligent routing decisions that helps balance loads across CIC sites, meet service goals, and increase customer satisfaction. This view displays service level, abandon, and queue statistics for an Enterprise Group. Enterprise Groups are logically related queues that conceptually represent the target destination of a routed call.

Each group is a collection of queues from one or more CIC sites where Interaction Director can route calls. For example, an Enterprise Group named "Corporate Sales EG" could include a Sales queue on server CIC_Chicago and a Sales queue on server CIC_Atlanta.



- **Enterprise Group Statistics** - Summarizes ACD interactions, such as the number of agents logged on, and other particulars that are common to the Enterprise Group as a whole.
- **Combined Queue Statistics** - Displays Director agent statistics for interval periods. These statistics summarize the activity of call center agents, by reporting the number of interactions received, answered, completed, and abandoned, along with average wait time and average talk time.
- **Service Level Parameters** - Displays time and histogram intervals for the service level statistic. The range of service level histogram intervals cumulate downwards by default. You can include or exclude histogram ranges.

- **Abandoned Rate Parameters** - Displays time and histogram intervals for the abandoned rate statistic. The range of abandon rate histogram intervals cumulate downwards by default. You can include or exclude histogram ranges.

## Interserver Routes View

This view shows routes on a monitored server used to place inter-server calls between CIC servers.

# Reporting and Logging

Interaction Director adds new reports to CIC's robust report set. These reports help you establish Agent staffing goals, manage service levels, and meet call center objectives. Genesys created the reports using Crystal Reports so that you can customize or create reports as needed. For more information about reports and logging, see the Interaction Director Reporting and Logging Help.

The Interaction Director reports are:

- Interaction Director – Enterprise Group Interaction Statistics
- Interaction Director – Local / Remote Statistics

Interaction Director logs detail data into an existing CIC server database, which you selected during the Director Install program. The Director install creates three Director-specific tables in that database.

The CIC administrator enables Director reports, which are configurable in Interaction Administrator. For every routed call, Interaction Director inserts a record into a table on the database that CIC servers use. This record contains all the information available (for example, date, time, ANI, DNIS) and the ultimate routing decision and the time required to make it. Any Status IDs and report groups that exist on the routed interaction replicate between CIC servers, in a manner similar to the transmission of call attributes.

# Glossary

## ACD

(Automatic Call Distributor) A phone system that answers calls, retrieves information from a database, determines call handling, and routes calls to agents. Calls route based on agent availability and skills, trunk line used, caller input, volume of calls, time of day, agent groups, and other variables.

## ANI

(Automatic Number Identification) Code that identifies a caller's phone number. All phone calls contain the numbers of the dialing phone. Also known as Caller ID.

## ANSI

(American National Standards Institute) A non-governmental organization that collaborates with private and public sectors to develop and publish voluntary standards for use in the United States.

## CO

Central Office.

## Contact Center

An integrated system of people, processes, and technology that organizations use for customer interactions.

## Contact Center Management

The process of managing contact center operations, including workforce, reporting, and forecasting.

## Container

An icon in Interaction Administrator that users can select to manage configuration settings (such as those settings that control the configuration of Interaction Director).

## CSV

(Comma Separated Values) Fields in a text file, separated by a comma.

## Customer Interaction Center (CIC)

(Customer Interaction Center) A Windows NT-based interaction processing engine from Genesys. CIC and its customization tools can automate the processing of virtually any type of communications event including telephone calls, faxes, email messages, digital and alphanumeric pages, and web hits.

## Datagram

Data packet that contains its own address information to allow the data to route to its destination independently.

## Default Response

Valid routing response that it is not based on real-time data. In Interaction Director, define a default response for each provisioned number.

## Destination Site

Server to which an Interaction Director routes calls.

## DNIS

(Dialed Network Identification Service) Allows a computer telephone system with attached 800 or 900 lines to see the number dialed for an incoming call.

## Enterprise Group (EG)

A collection of workgroup queues from one or more CIC locations to which Interaction Director routes calls. The target destination of a routed call is always an Enterprise Group. Enterprise Groups pool the resources of agents in multiple locations to manage calls, chats, and email messages efficiently.

## Handlers

A collection of steps organized and linked to form a logical flow of actions and decisions. Handlers are similar in structure to a detailed flowchart. Handlers can start other handler subroutines. A handler contains only one initiator step that identifies the type of event that starts the handler. Handlers respond to events in CIC. Handlers are in a proprietary format that Interaction Processor interprets. Every CIC server releases with hundreds of fast, professionally written handlers. These handlers play voice prompts, detect the entry of touchtone digits, send faxes, consult databases, and perform myriad other actions. Handlers define how the CIC server processes interactions. You create and modify handlers using Interaction Designer.

## IDir-IA

(Interaction Director - Interaction Administrator) This plug-in module adds Director-related configuration containers to Interaction Administrator. IDir-IA describes Interaction Administrator's user interface after configuring it to support Interaction Director.

## Integrated Services Digital Network User Part (ISUP)

A subprotocol of SS7. This protocol layer implements signaling functions that support voice, data, text, and video in an ISDN network to allow call switching on circuits that carry voice or data traffic.

## Interface

An interface (in IDir-IA) defines hardware and protocols that Director uses to communicate with a carrier.

## International Telecommunication Union (ITU)

A leading publisher of telecommunication technology, regulatory, and standards information.

## Interaction Administrator

A PureConnect program that manages server, system, and user configurations.

## Interaction Designer

PureConnect's graphical handler generator. Non-programmers use Interaction Designer to create handlers that control call-processing behaviors in CIC. Interaction Designer creates, edits, debugs, and manages handlers and subroutines.

## ISDN

(Integrated Service Digital Network) International standard for transmitting voice, data, and video over the same physical line simultaneously.

Transmission circuits that are digital from end to end, and allow voice and data to travel over the same physical line simultaneously.

## IVR

(Interactive Voice Response) An automated telephone system that retrieves and stores responses from a telephone keypad or verbal feedback. In CIC, the IVR logic is handler-based.

## Local Site

The server on which an external call first arrived.

## Message Transfer Part (MTP)

A subprotocol of SS7 that provides low level physical; data link; and network services, signaling transfer points; congestion priority; distribution; and routing.

## Monitored Site

A CIC server that Director Server manages.

## Natural Microsystems

Manufacturer of SS7 telephony boards used with Interaction Director.

## Period

The time during which ACD statistics accumulate. You configure period duration in Interaction Administrator. The default period setting is 30 minutes. Statistics accumulated during the period update once every minute.

## Post-call Routing

The process of routing a call after it connects to a location. Post-call routing occurs when a call connects to a CIC server and routes to another CIC server using a tie line or alternate telephone number. Director performs post-call routing based on current skill availability and call object attributes.

## Pre-Call Routing

The process of routing a call before the call connects to a location. In pre-call mode, Interaction Director receives a call event from a supported pre-call network interface; usually a telecommunications carrier. Interaction Director checks statistical data collected from managed CIC servers, and "directs" the carrier to send the call to a specific destination point. Thus, the call routes before answering it.

## Queue Object

An object that encapsulates the runtime properties of specific Line Groups and Queues within a Monitored Server. Queue objects allow Director to collect the statistics for determining call routing. You define Queue objects using the Queues container in IDir-IA, the plug-in module that adds Director-related configuration containers to Interaction Administrator.

## PSTN

(Public Switched Telephone Network) Public telephone network that telephones, ACDs, and PBXs connect to.

## Queue, Workgroup

Interchangeable terms for places where Interaction Director can send calls.

## Remote Site

A site apart from the local site.

## Requesting Site

The server where a route or reroute request originates.

## Screen Pop

Display of information about a caller when an agent receives a call.

## Server Parameter

An item of information maintained in Interaction Administrator's Server Parameters container. A parameter stores information that multiple processes can use, such as handlers or CIC subsystems. For example, you stored the path to wave files on a CIC server in a server parameter. If the wave files moves to a different folder, you update the server parameter instead of all the processes that use that information. Parameters can have a server-level scope or a system-wide scope, but their names and configuration are otherwise identical. Server parameters are available only on a specific CIC Server and system parameters are available on all CIC Servers on a network.

## Shift

The range of time in a 24-hour period during which a group of employees works. You configure a shift for each workgroup in Interaction Administrator. The default shift settings are 00:00 - 08:00, 08:00 - 16:00, and 16:00 to 24:00. Statistics that accumulate during the shift update once every minute.

## Signaling

The process by which a dialed number routes through telephone networks to connect two stations. The term describes transmission of electrical impulses (signals) between a telephone company's Central Office (CO) and a customer site. Examples of CO signals to the customer are dial tone and audible alerts, such as rings. Signals sent to the CO from a customer's telephone include off-hook, network control signaling (dialing), and on-hook (disconnected). Connection-oriented services (such as Asynchronous Transfer Mode) use more modern forms of signaling to request a connection. Connection-oriented services start when a user sends a setup request. The request passes across a network and, if the destination agrees to allow the connection, the call connects.

## Signaling Connection Control Part (SCCP)

A subprotocol of SS7 that supports higher protocol layers by providing data transfer services in connectionless and connection-oriented environments.

## Signaling System 7 Protocol (SS7)

Signaling System Number 7 protocol establishes connections within and between networks. SS7 is also known as Common Channel Signaling 7 (CCS7). SS7 includes subprotocols that integrate various services (such as ISDN or voice traffic) so that the services can route within the same switching system. Telephone networks use SS7 protocol to control call setup and routing, caller ID, toll-free rerouting of 800 numbers, and wireless roaming. SS7 signaling uses a separate network connection. Signals don't transmit on the circuit carrying the voice traffic, which increases the overall efficiency of the telephone network since the system handles call control data separately from the call itself. Director uses SS7 for pre-call routing. Director listens for SS7 signals from the public network to receive notification of incoming calls. When Director receives notification, Director views the current state of all call centers, and then sends a notification back to the PSTN indicating where to route the call. Thus, the call routes before an agent picks it up.

## SIT Tones

Special Information Tones precede machine-generated announcements to distinguish recorded voices from a live speaker.

## Site

Any CIC server or pair of servers connected through switchover, which is a redundancy facility that passes control to a similarly configured server in the event of a hardware fault.

## Skills-Based Routing

The process of routing an incoming call to the person whose expertise best fits the needs of the caller.

## Status

An agent availability indicator that affects the processing of calls directed to an agent. By default, any status condition other than "Available," "Available, Forward," or "Available No ACD" sends incoming calls to voice mail. You maintain status codes in Interaction Administrator's "Status Messages" container.

## Telephony User Part (TUP)

Provides signaling functions that control international and national calls. Integrated Services Digital Network User Part (ISUP) replaces TUP, typically.

## Transaction Capabilities Application Part (TCAP)

A subprotocol of SS7 that implements signaling to communicate with network databases. TCAP provides transaction-based information exchange, typically used to route 800-number calls, to support wireless roaming, automated credit card calling, and other advanced services.

## Tree View

An expandable list of icons in Interaction Administrator's in the left-side pane. Click items in the Tree View to display a list of configuration entries in the List View on the right side of the screen.

## TSV

(Tab separated values) Individual fields in a text file, separated by tabs. Each line ends using a return.

## User Datagram Protocol (UDP)

A communications protocol that sends datagram messages from one computer to an application running in another computer. Since UDP is connectionless, the protocol does not guarantee error-free delivery. Programs that use UDP process any errors and check for reliable delivery.

# Change Log

The following table lists the changes to the *Interaction Director Concepts Technical Reference* since its initial release.

| Date | Changes |
|---|---|
| 22-September-2017 | Rebranded to Genesys. |
| 10-April-2018 | Updated document format. |
| 04-June-2019 | Reorganized the content only, which included combining some topics and deleting others that just had an introductory sentence such as, "In this section...". |
| 15-January-2020 | Removed references to CIC 3.0 in Real-Time Statistic Monitoring and Alerting because it reached End of Support on July 1, 2018.<br><br>Also removed "Supervisor Views in CIC 3.0." |
| 29-April-2020 | Update or remove links to "my.inin.com" as appropriate. |