MiCONTACT CENTER BUSINESS—MIVOICE BUSINESS

RELEASE 9.2 SP1

DEPLOYMENT GUIDE

Mitel®

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CHAPTER 1 ABOUT THIS GUIDE

CHAPTER 2 MICONTACT CENTER BUSINESS

CHAPTER 3 ACD OVERVIEW AND ROUTING

Chapter 1
ABOUT THIS GUIDE

ABOUT THIS GUIDE

The purpose of this guide is to help channel partners and customers understand how to deploy MiContact Center Business, from simple to complex deployments. The guide describes the building blocks of the solution and then explains how to scale up from a simple single-site deployment to a complex multi-site, resilient, virtual ACD deployment.

This guide provides information for customers and channel partners who want to understand how to deploy complex solutions in a new deployment and also how to scale up from a simple solution for a deployment that can grow as the contact center grows.

This guide also provides the high-level requirements, specifications, networking considerations, best practices, and other useful references to plan the deployment of simple small contact centers, all the way to large scale, complex contact centers.

This guide is divided into the following sections:

MiContact Center Business

This section describes:

- MMiContact Center Business applications, features, and solution licensing notes
- Site-based security (multi-tenant) deployments
- Multimedia Contact Center routing
- IVR Routing
- MiVoice Border Gateway Connector considerations
- External hot desking agent configuration and deployment considerations

ACD overview and routing

This section describes:

- ACD path and queue concepts
- ACD routing
- ACD topologies
- ACD phone support and display settings

Capacity and scaling

This section describes:

- A brief description of MiContact Center Business reference topologies
- Adding trunk capacity
- Increasing agent capacity
- SIP support for contact centers

Resiliency and availability

This section describes:

- ACD resiliency configurations
- MMiContact Center Business support for MiVoice Business resiliency
- IVR Routing resiliency and redundancy

Virtual contact centers

This section describes:

- Virtual contact center configurations
- Virtual ACD resiliency
- Virtual solutions

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ADDITIONAL GUIDES

The MMiContact Center Business and MiVoice Analytics documentation suite consists of the guides listed below. All guides can be found at http://edocs.mitel.com.

Primary guides:

- *Contact Center Blueprint*: This guide includes detailed information about the Mitel-recommended Contact Center topologies, depending on the number of agents you are deploying and the applications your contact center needs.
- *MiContact Center Business and MiVoice Analytics System Engineering Guide:* Provides detailed information on the hardware and software requirements for server and client computers, data storage requirements, licensing, and other considerations for MiContact Center Business based on the size of the deployment.
- *MiContact Center Business Site-Based Security (Multi-tenant) Administration Guide:* Describes how to install and configure MiContact Center Business in a multi-tenant deployment.
- *MiContact Center Business General Information Guide:* Provides an overview of MiContact Center Business features.
- *MiVoice Analytics General Information Guide:* Provides an overview of call costing and general business telephony reporting.
- *MiContact Center Business User Guide:* Provides information about the basics of contact center management, and descriptions for use of all agent desktop applications in the MiContact Center Business suite. This guide focuses on voice media.
- *MiVoice Analytics User Guide*: Provides information on general business and call costing concepts and describes MiVoice Analytics features and configuration
- *MiContact Center Business – Contact Center Reports Guide*: Describes all of the report types available, and explains how to generate, view, and share reports for the Contact Center licensing package.
- *MiContact Center Business - Workgroup Reports Guide*: Describes all of the report types available, and explains how to generate, view, and share reports for the Workgroup licensing package.
- *MiVoice Analytics Reports Guide*: Describes all of the report types available and explains how to generate reports included with MiVoice Analytics.

- *MiContact Center Business Installation and Administration Guide:* Provides instructions for:
  - Downloading, installing, registering, and configuring MiContact Center Businesson the Enterprise Server and client computers
  - Upgrading from previous versions of MiContact Center Business
  - Installing and configuring MiContact Center Business at remote sites
  - Installing and configuring MiContact Center Business .ova files
  - All IVR Routing configuration
- *MiVoice Analytics Installation Guide*: Provides instructions for:
  - Downloading, installing, registering, and configuring MiVoice Analytics on the Enterprise Server and client computers
  - Upgrading from previous versions of MiVoice Analytics
  - Installing and configuring MiVoice Analytics at remote sites
  - Installing and deploying MiVoice Analytics .ova files
- *Multimedia Contact Center Installation and Deployment Guide:* This guide is the primary source of information for contact centers using email, chat, or SMS to communicate with customers. This guide describes how to:
  - Install, configure, and maintain a multimedia contact center
  - Use the tools required to manage a multimedia contact center
  - Handle customer interactions via voice, email, chat, and SMS using Ignite

Supplementary guides:

- *MiVoice Business General Information Guide:* Provides detailed information on how MiContact Center Business and ACD interact with MiVoice Business.
- *MiVoice Business Engineering Guidelines*: Provides detailed information about capacity and engineering design and trade-offs.
- *MiVoice Business Resiliency Guidelines:* Provides detailed information on how to plan and deploy a resilient network.
- *MiVoice Call Recording Installation and Configuration Guide* (formerly OAISYS)
- *MiVoice Call Recording Administration Guide* (formerly OAISYS)
- *Virtual Appliance Deployment Solutions Guide*: Describes how to deploy Mitel virtual appliances in VMware environments, and includes detailed information about resource requirements and virtual appliance capacities.
- Mitel OIG Installation and Maintenance Guide: Describes how to license and install the Mitel OIG.
- Mitel OIG Engineering Guidelines: Describes best practice for Mitel OIG installations with MiContact Center Business.
- MiVoice Integration for Salesforce Administration Guide: Describes how to set up and deploy MiVoice Integration for Salesforce for contact center users.
- *MiVoice Integration for Salesforce User Guide*: Describes the MiVoice Integration for Salesforce functionality and user interface.

Chapter 2
MICONTACT CENTER BUSINESS

MICONTACT CENTER BUSINESS

MiContact Center Business integrates with the 3300 MiVoice Business platform to provide contact centers with the tools they need to efficiently and effectively measure and manage contact center operations. Interactions are routed intelligently across all media types (voice, email, chat, and SMS), increasing customer satisfaction and streamlining agent interactions. Contact center efficiency and agent performance can be monitored both historically and in real time and can be measured using a wide variety of reports. Flexible licensing packages provide access to specific features and applications and enable you to build a contact center package that best suits your business needs.

MiContact Center Business consists of an ACD routing engine on a Mitel controller connected to one or more adjunct MiContact Center Business servers that run a suite of contact center applications. Supported controllers include:

- MiVoice Business on one of the following platforms:
  - Mitel 3300 IP Communications Platform
  - Industry Standard Server (ISS)
  - Installed on a VMware virtual machine
  - MiVoice Business Multi Instance Platform

MICONTACT CENTER BUSINESS CORE APPLICATIONS

MiContact Center Business relies on these core applications: YourSite Explorer, CCMWeb, Contact Center Client, Ignite, and MiCollab Client. You deploy these applications after you configure MiVoice Business with ACD.

YourSite Explorer enables you to configure your MiContact Center Business software. YourSite Explorer synchronizes queues, agents (including skill level), agent groups, trunks, and extensions between the YourSite database and the telephone system, and validates devices and assignment form settings to ensure quality data collection and accurate reporting. YourSite Explorer can also optionally synchronize with Microsoft® Active Directory®, aligning Active Directory security groups and users with MiContact Center Business and MiVoice Analytics agents, employees, and employee groups within selected organization units. YourSite Explorer includes a Read/Write option. When this option is enabled, changes made to the configuration settings can be written back to the telephone switch.

CCMWeb provides browser-based reporting and the ability to set user preferences such as language settings, password, and email contacts. Users log into CCMWeb from client PCs connected to the MiContact Center Business Server to generate and view reports.

Contact Center Client provides agents and supervisors with dynamic, real-time displays of agent and queue activity, charts, customizable display profiles, historical monitoring, data mining, and wall sign programming.

Ignite is an agent and supervisory tool that enables processing of all media types, including basic call handling, email, chat, and SMS. Ignite is available in desktop and Web versions.

MiCollab Client integrates with Ignite to enable efficient agent handling of all media types, including advanced call handling, email, chat, and SMS.

MICONTACT CENTER BUSINESS FEATURES

The following features are either included in, or available as options to, MiContact Center Business and MiVoice Analytics licensing starter packs. For feature licensing details, see the *MiContact Center Business and MiVoice Analytics System Engineering Guide*.

- **MiVoice Analytics** enables businesses to track the cost of incoming and outgoing calls and bill accordingly and bill subscribers for the use of services provided and mark up or discount prices based on fixed rates or percentage rates. CMiVoice Analytics is supported in North America, Latin America, United Kingdom, and the Benelux regions only.
- **Contact Center Chat** enables employees to chat with each other using Contact Center Client or Microsoft Skype for Business.
- **Contact Center PhoneSet Manager and Contact Center Softphone** automate Mitel IP phones and enable agents to use their desktop computers as IP-based phones. An agent using Contact Center PhoneSet Manager uses a headset connected to a desk phone while an agent using Contact Center Softphone uses a wired or wireless USB headset connected to their desktop computer.
- **Contact Center Screen Pop** works in conjunction with Contact Center PhoneSet Manager or Contact Center Softphone to launch applications and Web pages on ACD agent desktops when they receive calls.
- **CTI Developer Toolkit Client** is a programmable .NET C# Dynamic-link library (DLL) that can be used in any .NET (Release 4.5) application or website. The client-side DLL may be used to display information in a Customer Relationship Management (CRM) system, Microsoft Outlook, or custom applications. This feature requires a skilled developer for implementation.
- **CTI Developer Toolkit Server** provides the ability to relay custom third-party IVR data (for example, collected digits and custom query results) into MiContact Center Business, which then passes this data to the Contact Center PhoneSet Manager toaster, Contact Center Screen Pop, Interactive Visual Queue monitor, and agent monitor card design, in addition to any custom client-side application. This feature requires a skilled developer for implementation.
- **Flexible Reporting** enables you to design your own reports.
- **Interactive Contact Center** enables agents to control their availability and supervisors to control the availability of agents and ACD queues, a well as set business hours for auto opening and closing of queues.
- **Interactive Visual Queue** is a real-time monitor that works with MiContact Center Business and Interactive Contact Center. Using Interactive Visual Queue, calls can be viewed and moved between queues to optimize efficiency and reduce call waiting times. In addition, abandoned call information can be accessed and callbacks initiated using the Abandoned calls grid.
- **IVR Routing** is a scalable, integrated, customizable voice processing solution. Speech Recognition and Text to Speech are available options. IVR can be deployed alongside MiContact Center Business or as a standalone product.
- **Messaging and Routing** provides a subset of IVR Routing activities and is included in the Contact Center licensing package and available as an option for the Workgroup licensing level
- **MiContact Center Business Outbound**, when integrated with MiContact Center Business, enables customers to run outbound calling to existing or potential customers. Refer to the MiContact Center BusinessOutbound documentation available on Mitel OnLine.

- **MiVoice Border Gateway Connector** enables remote agents to connect to the Enterprise Server using a VPN-like connection and use all MiContact Center Business and MiVoice Analytics applications as if they were in the office.
- **MiVoice Integration for Salesforce** uses Mitel Open Integration Gateway (OIG) as an interface to Salesforce.com. Contact center agents use the MiVoice Integration for Salesforce to perform their job functions through a single user interface.
- **MiVoice Call Recording Connector** provides start/stop recording control in Contact Center Client. Links to call recordings are available in Lifecycle reports, when enabled.
- **Multimedia Contact Center** enables routing of emails, chats, and SMS messages to agents based on queue priority, agent skills, and longest idle agent.
- **Salesforce.com Connector** enhances the functionality of Salesforce CRM by embedding your Mitel phone directly into the Salesforce user interface, enabling contact center agents to perform their job functions through a single user interface.
- **Workforce Scheduling** enables you to build schedules based on forecast information, business rules, and required skills. **Schedule Adherence**, included in Workforce Scheduling, enables you to monitor the real-time states of contact center agents and run adherence reports on both employees and groups. **Employee Portal**, included in Workforce Scheduling, enables employees to make scheduling requests, such as trading or taking other employee shifts and requesting schedule changes and time off.

MICONTACT CENTER BUSINESS FEATURE LICENSING

MMiContact Center Business comprises two MiContact Center Business licensing levels (Contact Center and Workgroup), MiVoice Analytics packages, and standalone offerings for Multimedia Contact Center and IVR Routing.

The following starter packs are available:

- Contact Center Starter Pack
- Workgroup Starter Pack
- MiVoice Analytics Starter Pack
- MiVoice Analytics Starter Pack
- Contact Center Multimedia Starter Pack
- Contact Center IVR Starter Pack

For detailed information regarding MiContact Center Business feature licensing, see the *MiContact Center Business and MiVoice Analytics System Engineering Guide*.

MICONTACT CENTER BUSINESS SOLUTION LICENSING

MiContact Center Business integrates with MiCollab Client, MiVoice Border Gateway, MiVoice Call Recording, and Open Integration Gateway to offer a feature-rich, complete contact center solution. Bundled licensing packages include most of the required components to implement a variety of contact center scenarios, however, fully-featured implementations require the purchase of additional items, as detailed below.

NOTE: MiContact Center Business license bundles include the MiVoice Business Active agent license, which can be applied to either a standalone or Enterprise MiVoice Business implementation, but does not include the license that is required for active users in the system.

To implement MiCollab Client with MiContact Center Business, in addition to the Contact Center or Workgroup bundled licensing package, you require:

- MiCollab Base

To implement MiVoice Border Gateway Client, in addition to the Contact Center or Workgroup bundled licensing package, you require:

- MiVoice Border Gateway Base

To implement MiVoice Call Recording with MiContact Center Business, in addition to the Contact Center or Workgroup bundled licensing package, you require:

- A separate server – MiVoice Call Recording software cannot be collocated on the MiContact Center Business Server

To implement Open Integration Gateway with MiContact Center Business, in addition to the Contact Center or Workgroup bundled licensing package, you require:

- A separate server – Open Integration Gateway software cannot be collocated on the MiContact Center Business Server

NOTE: Open Integration Gateway licensing is comprised of the MiVoice Integration for Salesforce only and does not allow for 3rd party development or other integrations. If alternative application integration is required, please contact Sales Engineering to determine the proper licensing required.

See the relevant licensing documentation for MiCollab, MiVoice Border Gateway, and MiVoice Business for descriptions of their product licensing.

MICONTACT CENTER BUSINESS TYPICAL DEPLOYMENT

Figure 1 illustrates a typical deployment of MiContact Center Business (Contact Center licensing package). In this multi-site resilient deployment, agents are geographically dispersed, allowing calls to overflow from the main office to the branch and home offices, providing improved customer response time, and flexibility for workers. The two MiVoice Business instances in this deployment provide resilient functionality, ensuring the continuation of service in the event that one of the controllers becomes unreachable.

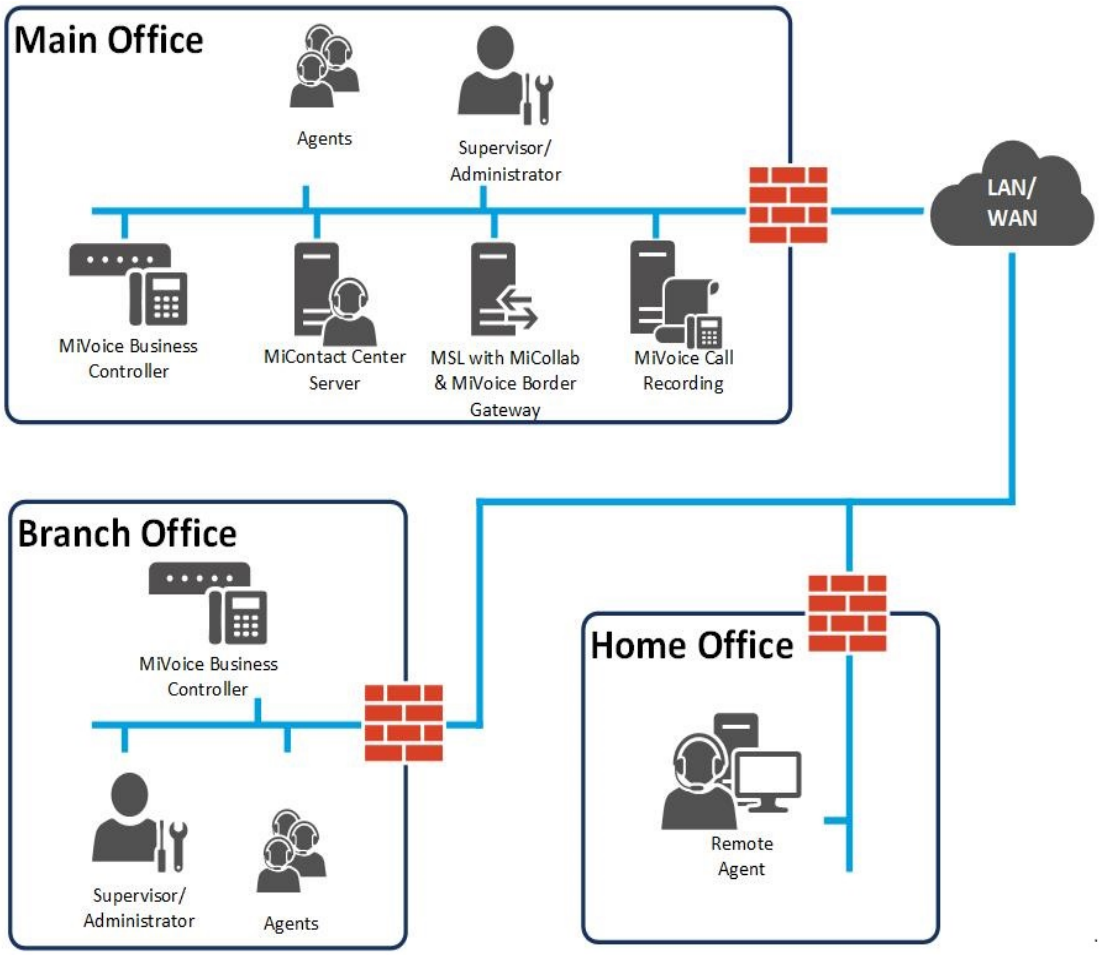

Figure 1: Typical Installation of MiContact Center Business - Contact Center license

DATA COLLECTION

Data for MiContact Center Business is collected locally, on the MiContact Center Business Server. The MiVoice Business controller collects data through two network cards: a dedicated NIC for ACD/SMDR connectivity and a dedicated NIC for network data transmission. MiTAI™, SMDR, Traffic (separate PBX data stream), and ACD data collection are provided using a network connection. It is recommended that you use the NIC interface between MiVoice Business and MiContact Center Business over a TCP/IP connection. This guarantees network delivery of SMDR, Traffic, ACD real-time, and MiTAI data without having to traverse the customer corporate network.

MULTI-SITE AND REMOTE SERVER IMPLEMENTATION

A Network License is included in the Contact Center Starter Pack, MiVoice Analytics Starter Pack, and MiVoice Analytics Starter Pack. The Network License enables multi-site capability by providing connections to additional telephone systems. You need the Network License if your business has more than one telephone system that collects SMDR, Traffic, and ACD data, and you want to view real-time data and run reports on data generated from the additional telephone systems.

Implementing a remote server allows collection of data from co-located or geographically distant telephone systems, enabling you to store data from the remote media server to the local hard drive of the MiContact Center Business Server. Data streams to the Enterprise Server over TCP/IP. The Mitel Collector service gathers the data and the Mitel Enterprise Server service makes it available for enterprise-wide real-time monitoring and reporting.

Installing and configuring a remote server enables redundant data collection, which provides added security in the case of network outages. The MiContact Center Business Server installed at the local site supports all local and remote agents throughout the enterprise. System administrators can manage operations over the Internet from any location on the company's LAN/WAN and intranet via TCP/IP, and Advanced Supervisors can view up-to-the-minute reports and real-time agent and queue displays on an enterprise-wide basis.

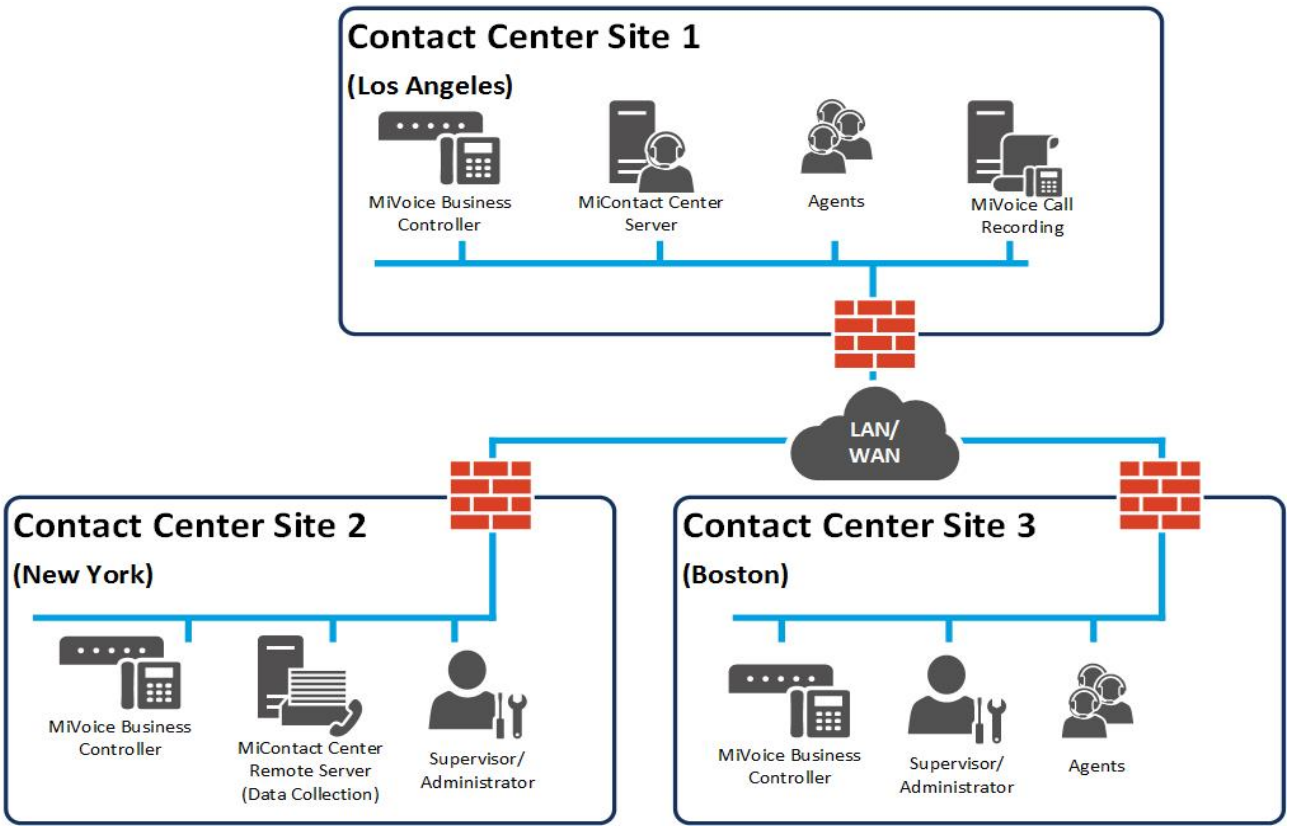

Figure 2: Example of multi-site MiContact Center Business implementation

ACD AND STATION MESSAGE DETAIL RECORDING (SMDR) DATA COLLECTION

In multi-site enterprises, ACD and Station Message Detail Recording (SMDR) data is stored on the MiContact Center Business Server. It is recommended that you install a backup MiContact Center Business media server, at the remote sites to ensure data integrity. If there is no MiContact Center Business Server at the remote site and the WAN goes down, data may be lost because of limited data buffering on the remote MiVoice Business instances, and data cannot be sent to the MiContact

Center Business Server for storage. If there is a MiContact Center Business Server at the remote site and the WAN goes down, no data is lost. The remote server buffers data until the WAN is restored and then sends the data to the MiContact Center Business Server. Redundant data collection provides increased reliability.

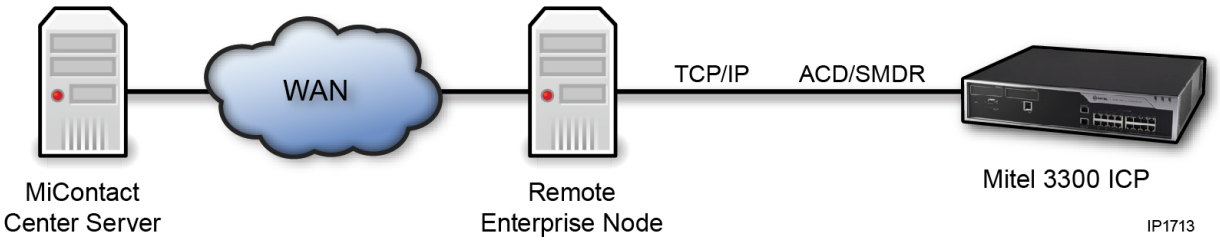

Figure 3: Data Collection at Remote Site - 3300 ICP

For additional data collection recommendations, refer to the *MiContact Center Business and MiVoice Analytics System Engineering Guide.*

SITE-BASED SECURITY (MULTI-TENANT) DEPLOYMENTS

The MiContact Center Business site-based security (multi-tenant) solution enables service providers to offer hosted contact center services to their customers. Using a site-based security model, service providers can host multiple tenants on a single platform, while maintaining an isolated environment for each tenant. Tenant-specific real-time and historical data collection and customized configuration are established using security settings on a per-tenant basis. Optionally, site-based security can be implemented to deploy multiple sites with multiple MiVoice Business instances that will not communicate with each other.

You enable site-based security during the MiContact Center Business installation process. You cannot enable multi-tenanting on the system if you have installed the MiContact Center Business software without selecting the site-based security feature. To do so, you must reinstall and ensure you select the 'Site Based Security' feature on the 'Enable Features' page when prompted.

In a multi-tenant deployment, each tenant (site) has dedicated media servers for their contact center. Dedicated media servers (one voice, one chat, one email, and one SMS server) ensure that data between sites is never shared.

There are two administrator roles involved in a multi-tenant contact center deployment: Enterprise Administrator and Local Administrator. Each administrator type has specific abilities that enable configuration and maintenance of the deployment, at the enterprise and tenant levels.

NOTE: If you are currently running a version of MiContact Center Business that predates Version 8.x, and are using security roles to provide separation between sites or tenants, you will not be able to upgrade to the multi-tenant system used in MiContact Center Business 8.x. You will have to perform a new install instead.

For detailed information see the *MiContact Center BusinessSite-Based Security (Multi-tenant) Administration Guide*.

FEATURE EXCLUSIONS

The following MiContact Center Business applications and features are not supported:

- Workforce Scheduling
- MiVoice Analytics
- Wallboarder
- Workforce Management Connectors
- Flexible Reporting
- Active Directory synchronization
- Oria integration (for agent and supervisor provisioning)

The following reports are not supported:

- Traffic Analysis
- Conversation Reports
- Administrative Reports
- Custom Reports

NOTE:

- Because the SQL database is shared, SQL views are not supported when using Site-based security.
- After an installation has completed, you cannot change from site-based installation to non-site-based, and vice versa.
- MiVoice Business vLANs for the purpose of splitting the configuration and data tiers are not supported.

AUTOMATED REPORTING AND BILLING

Usage data for Hosted Service Providers present billing information on subscriber account usage. Data is collected from the Enterprise Server during a nightly, automated process that encrypts, collects, and transmits archived usage data from the Enterprise Server to Mitel. Mitel then summarizes this data for consumption. If data fails to send, the automated process reattempts transmission on its next run. Usage and billing data provides per-site statistics for customers, which can be used in tracking individual sites in one enterprise, or for gathering the data needed to invoice external companies or tenants.

ONLINE VS. OFFLINE SERVERS

The following table shows the differences between the data upload steps, based on whether the server is online or offline, that are used when Mitel is collecting the MiContact Center Business data for reporting and billing:

Table 1: Online and off-line data upload comparison

ONLINE	OFFLINE
1. MiContact Center Business uploads the archived and encrypted data to Mitel after it has been collected. 2. A Mitel function is used to attempt to upload the package to the Mitel servers. 3. Successful uploads are moved from the usage data directory into an archival sub-folder. 4. Unsuccessful uploads remain in the usage data directory and are reattempted the next time the routine is run.	1. MiContact Center Business provides methods for users with off-line servers to gather the saved data and to transmit the package to Mitel. 2. The UsageStatisticsUploader application is used to retrieve the data from the disk and package the data for transmission to Mitel. 3. The UsageStatisticsUploader application collects all unsent usage data for sending when convenient, or when scheduled. 4. The UsageStatisticsUploader application is used again to send the package from a separate server that has an Internet connection.

MULTIMEDIA CONTACT CENTER

Multimedia Contact Center is a feature within MiContact Center Business that enables contact centers to handle email, chat, and SMS interactions, using the desktop or Web version of Ignite. Email, chat, and SMS are routed using visual, configurable, workflows. Voice interactions can also be handled using Ignite or in collaboration with MiCollab Client.Agent handling is tracked across all media types and available in real-time monitors and reports.

Figure 4 shows a typical Multimedia Contact Center setup using Microsoft Exchange with a local SQL server. The MiContact Center Business Server houses MiContact Center Business and Multimedia Contact Center and an SQL Server.

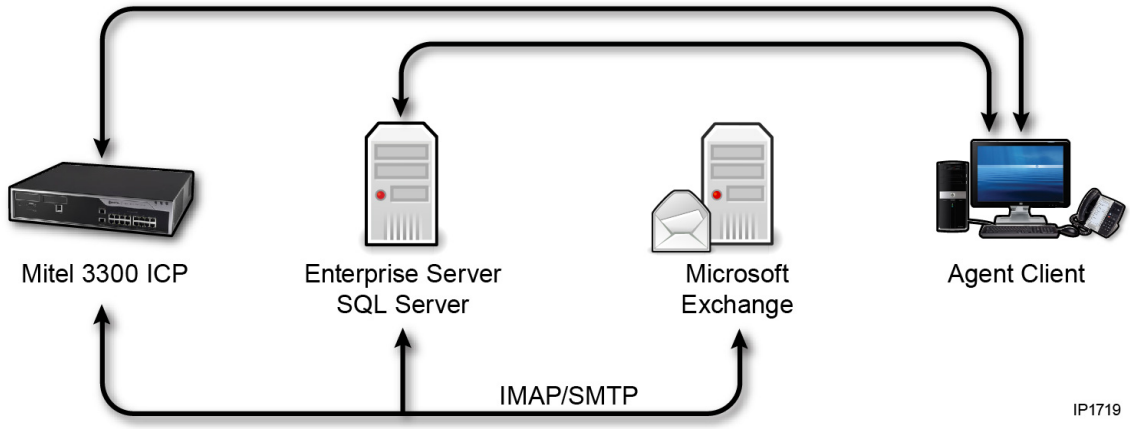

Figure 4: Basic Multimedia Contact Center deployment using Microsoft Exchange

NOTE:

- The agent desktop requires either Contact Center Client or MiCollab Client to manage advanced call handling and Ignite to manage multimedia interactions. These applications maintain synchronization with each other with respect to agent state. For more information, see the *MiContact Center Business User Guide* and the *Multimedia Contact Center Installation and Deployment Guide*
- Multimedia Contact Center uses ElasticSearch to enable network drives as the multimedia repository. For information about ElasticSearch, consult ElasticSearch documentation available from http://www.elasticsearch.org/.

The following figure shows a typical Multimedia Contact Center setup using cloud-based mail servers and remote SQL. The MiContact Center Business Server hosts Multimedia Contact Center.

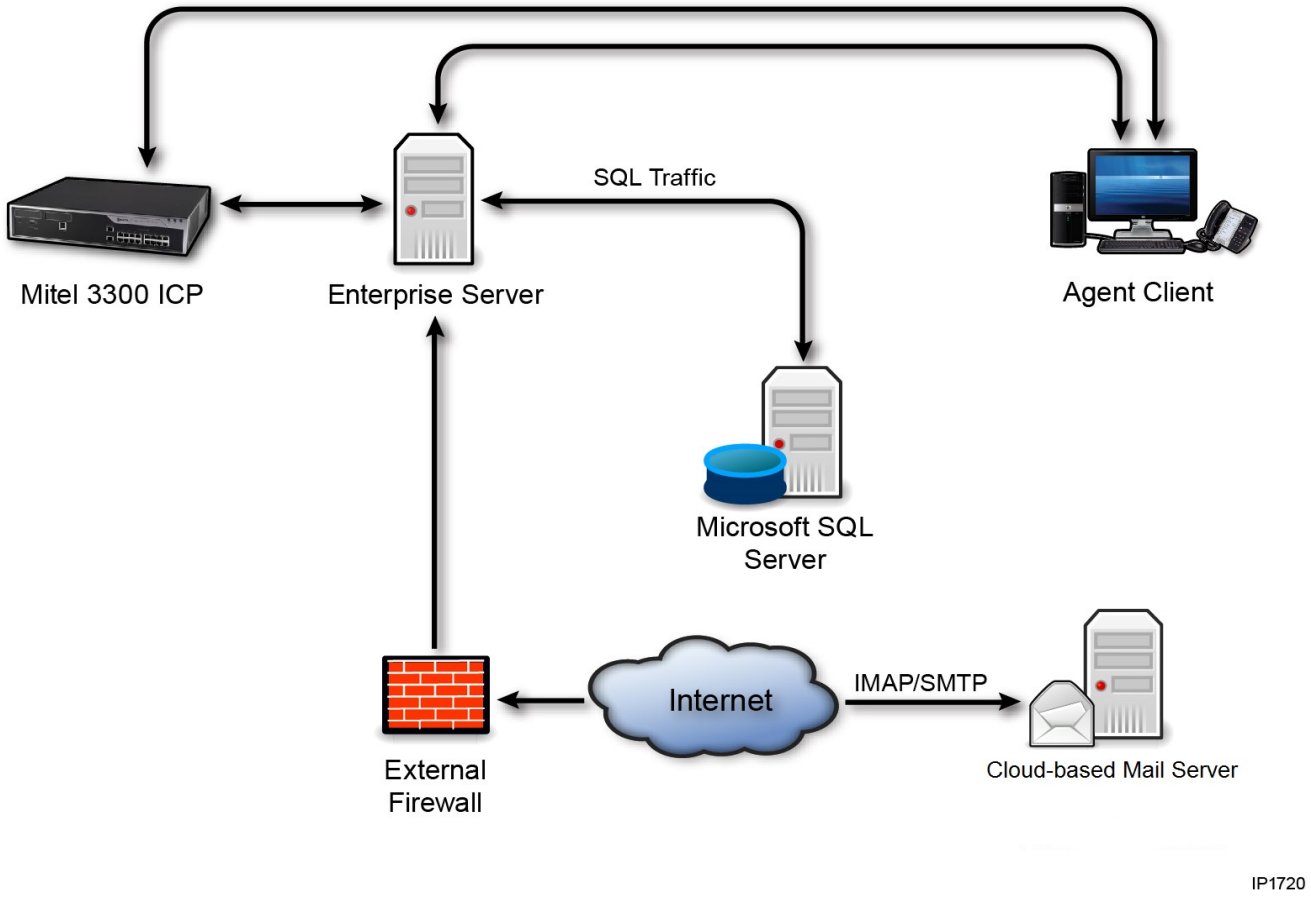

Figure 5: Basic setup using cloud-based mail servers and a remote SQL server

MULTIMEDIA CONTACT CENTER EMAIL ROUTING

Incoming emails are processed as follows:

1. A customer sends an email request.
2. An email media server configured for Multimedia Contact Center receives the email from the mail server.
3. An inbound workflow configured for the email media server executes the workflow to route the email to a queue.
4. After the email is in the queue, a configurable inqueue workflow is executed. Typically this involves sending an auto-acknowledgment message and routing the email to an agent.
5. The agent responds to the customer's request.

MULTIMEDIA CONTACT CENTER CHAT ROUTING

Figure 6 illustrates a basic configuration for Multimedia Contact Center chat routing.

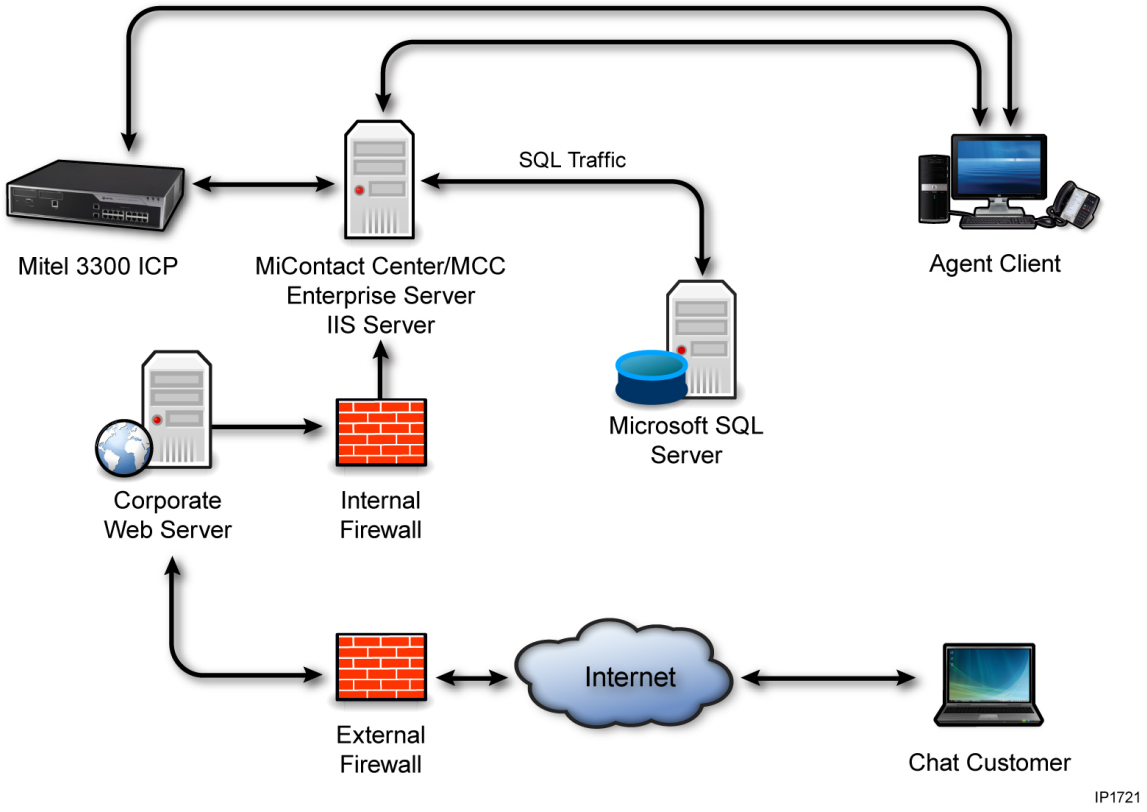

Figure 6: Multimedia Contact Center chat routing

Chat sessions are processed as follows:

1. A customer visits your Web site and requests a chat session:
   - The customer browses your Web site and clicks a “Chat Now” graphic on your support Web page. A reverse proxy is configured to redirect the request to the IIS Server residing on the MiContact Center Business Server. A JavaScript chat request page asks the customer to enter their name, email address, and the subject of the chat session. The customer submits the chat request and a chat session window opens. URL redirect or reverse proxy is configured to redirect the request to the IIS Server residing on the MMiContact Center Business Server.
2. The chat media server configured in the MiContact Center Business Server receives the chat request and establishes a chat session. It then executes a user-configurable inbound workflow that routes the chat request to a queue.
3. Upon receiving the chat request, the queue routes the chat through a user-configurable inqueue workflow that offers the chat request to an agent.
4. When the agent clicks **Reply** to handle the chat, a chat window is created within the Ignite agent application connected to the chat session.
5. The chat session ends:

- If the chat session is ended by the customer - The chat agent becomes available to answer another inbound chat request.
- If the chat session is ended by the agent - The chat agent becomes available to answer another inbound chat request.
- If the chat session remains idle for a configured length of time.

6. If the queue that handled the chat is configured to email the transcript of the chat, the chat media server executes a response workflow that sends the customer an email that contains a transcript of the completed chat session.

MULTIMEDIA CONTACT CENTER SMS ROUTING

SMS support is provided through integration with Twilio™ SMS (http://www.twilio.com/sms). SMS support is implemented as an ongoing interaction similar to the way Google phones support chat.

The SMS feature integrates with the multimedia router to route SMS messages to queues, which in turn, are offered to an agent group, and ultimately an agent.

MULTIMEDIA CONTACT CENTER OPEN MEDIA

Open Media allows you to create custom media types that integrate this agent activity into the contact center workflow. It allows management of all media from a single interface.

Open Media channel supports using non-traditional third-party media, such as video or IoT alarms, to leverage the visual workflow routing interface of MiContact Center Business to route a third-party media using an API (target URI) and deliver these interactions to agents, along with a 'property bag' of information about the request.

SOCIAL MEDIA INTEGRATION

Multimedia Contact Center offers integration with a third-party social media monitoring application (delivered by Trakur™, Imooty, and BizVu) that enables MiContact Center Business customers to provide proactive and responsive messaging to social media sites, industry blogs, wikis, knowledge bases, and forums, as illustrated in Figure 7. The application (Trakur, Imooty, and BizVu) monitors social media sites and filters information for relevant posts and activity which can then be distributed to Multimedia Contact Center agents and/or queues that review and respond to the posts as necessary.

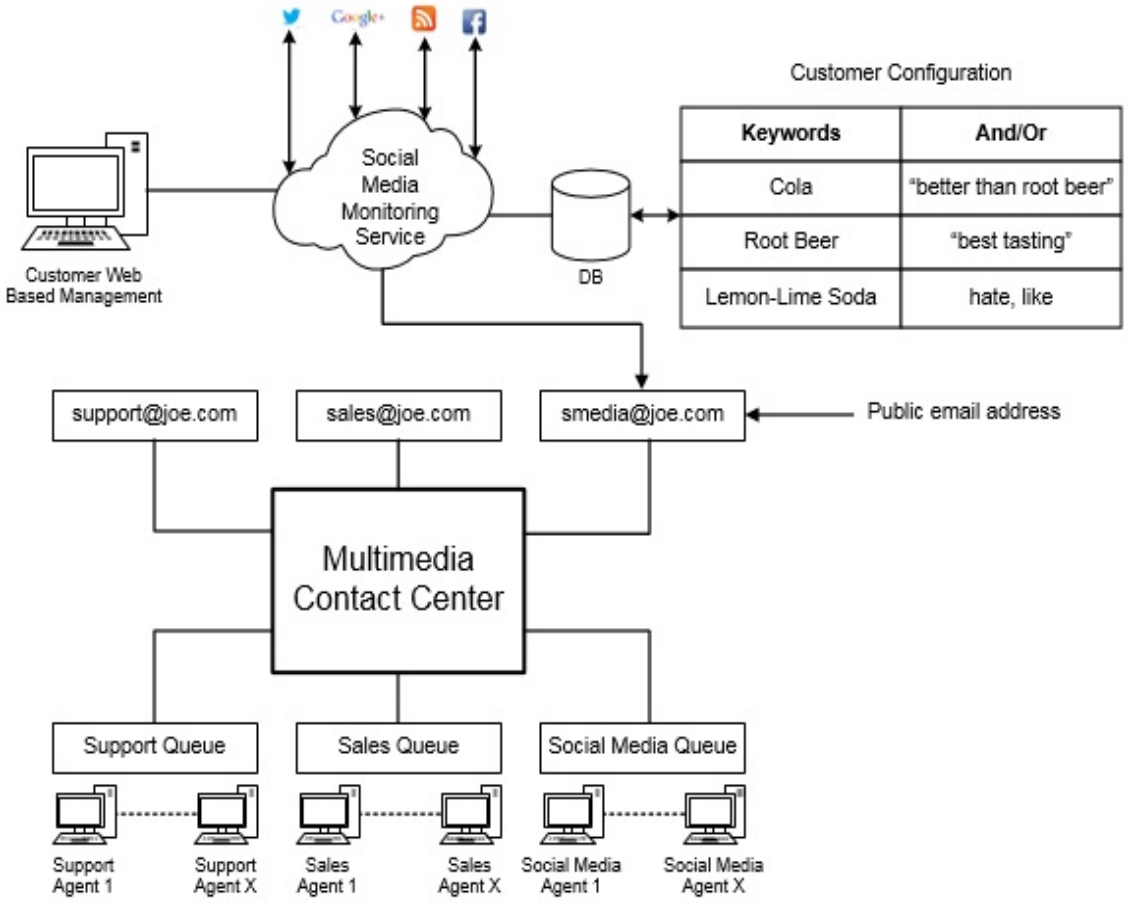

Figure 7: Social Media monitoring architecture

Using Multimedia Contact Center with Imooty, Trackur, or BizVu enables businesses to:

- Monitor corporate public Facebook Fan pages and LinkedIn sites.
- Report tweets on Twitter that match filter conditions.
- Specify public email addresses where Facebook, LinkedIn, and Twitter posts are sent.
- Distribute social media posts to agents who can respond to posts.
- Generate reports on social media posts handled by agents.

If agent traceability is important, then the BizVu solution is better suited as it allows agents to respond through the social media site using an email. The email response is retained in the contact center repository, providing a contact history.

With these solutions, businesses can use advanced text analytics to detect relevant key words and phrases on social media sites and send notifications to a skilled Multimedia Contact Center agent who can respond accordingly. This enables contact center agents to respond to customer's concerns within the blog they are posting or reach out to them directly. Using the advanced real-time and reporting capabilities of Multimedia Contact Center, businesses are able to measure and manage agent activity while they are responding to social media posts.

The Multimedia Contact Center Social Media integration leverages existing MiContact Center Business and Multimedia Contact Center infrastructure to minimize startup costs. Customers need

an account with one or more social media applications to integrate with Multimedia Contact Center. Customers must purchase the Mitel Multimedia Contact Center software, but no additional Mitel part numbers are required.

IVR ROUTING

Mitel IVR Routing is an all-in-one, scalable, integrated voice response (IVR) processing solution for contact centers. One IVR Routing server supports up to 100 ports, with a maximum of 120 ports per MiVoice Business instance. IVR Routing enables to you to rapidly and intuitively:

- Build workflows using a drag-and-drop graphical interface.
- Create and present static and dynamic recorded announcements to callers in the queue.
- Provide callers with expected wait time or position in the queue.
- Provide callers with time of day, day of week, day of year, or queue-conditional messaging.
- Guide callers to the information, extension, or ACD path that best meets their needs.
- Allow customers to request a queued callback through the Web or voice mail.
- Route calls based on the number they are calling from (ANI/CLI), the number they dialed (DNIS), time of day, or current queue conditions.
- Configure Automatic Speech Recognition (ASR) and Text to Speech (TTS) functionality
- Perform IVR surveys.
- Report on IVR Routing activity.

IVR Routing provides standard recorded announcements and intelligent messaging capabilities. Intelligent messaging enables you to create and automatically serve recorded announcements that provide callers with the following information:

- Estimated time that they will wait in the queue
- Number of callers in queue
- Time-of-day messaging
- Day-of-week messaging
- Exception-based messaging (messages based on what is happening in the queue)

MiContact Center Businessintegrates with IVR Routing to provide time-in-queue real-time statistics and IVR Routing call detail historical reporting options.

Workflow activities are available within the following routing packages: Messaging and Routing, IVR, and Contact Center IVR (standalone). The IVR routing package includes all of the activities available in the Messaging and Routing package, plus activities that enable voice/web callback, remote database access, outbound callflows, digit collection, additional call control features, PCI tools, and more advanced customization functionality. See the *MiContact Center Business and MiVoice Analytics System Engineering Guide* for specific details.

BASIC IVR ROUTING CONFIGURATION

In the basic IVR Routing configuration, all ports, paths, and agents are on a single controller.

Figure 8 shows a basic IVR Routing configuration with MiVoice Business.

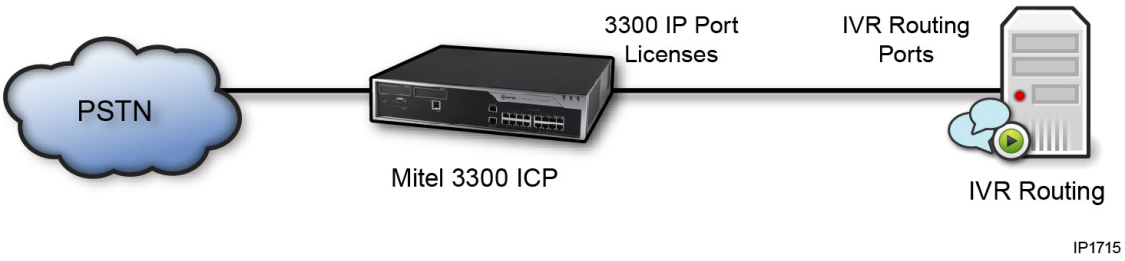

Figure 8: IVR Routing for MiVoice Business

Note: MiContact Center Business IVR Routing application only supports G.711 and does not support compression from G.729 to G.711. If you only have SIP trunks coming in at G.729, you must front end IVR Routing with a MiVoice Business configured with a loop-back (T1), which takes the G.729 call through the E2T card and back in again so that it is converted to G.711.

OPTIMIZED RECORDED ANNOUNCEMENT DEVICE (RAD) PORTS

RAD optimization reduces the number of RADs required by IVR Routing.

Historically, RAD ports were statically mapped against a specific path or queue and its position. This meant each port needed to be dedicated to a specific path even if that path received very few calls. Now ports can be shared among multiple queues and play multiple messages depending on RAD port availability and the current call demand on the system.

For example, on Queue 1, a “Your estimated wait time is x minutes” message could be played using Port 1, while on Queue 2, an “Our wait times are currently higher than expected; we are sorry for the inconvenience” message could be also played using Port 1, if it is available. This common use of ports across paths can greatly reduce the port requirements, making IVR Routing a much more cost-effective solution.

EXAMPLE OF RAD PORT OPTIMIZATION

In Figure 9, Port 1000 is being used to play a RAD message that is unique to the Sales queue. Port 1000 can also be used to play a different greeting to callers in the Parts queue if the port is available when the RAD plays.

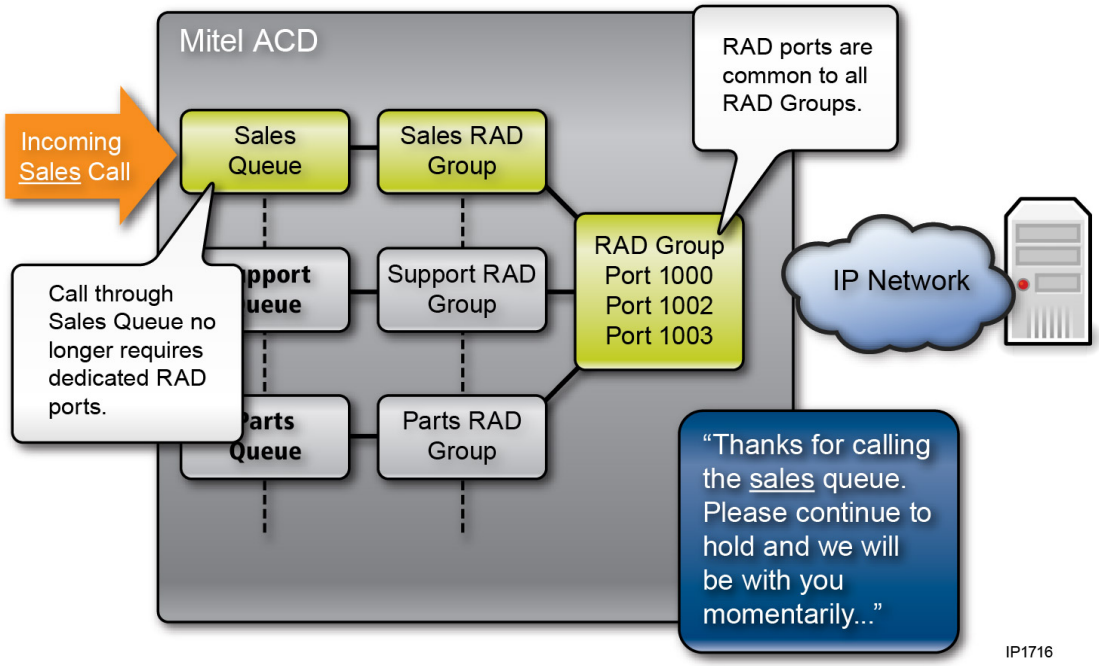

Figure 9: RAD Port Optimization

This capability can significantly reduce RAD port requirements in a contact center that has a large number of queues that require unique messages.

IVR ROUTING AVAILABILITY

Depending on your particular operation, it may be essential that your call center remain available during maintenance, system upgrades, and system failure. IVR Routing redundancy and resiliency offers varying levels of accessibility depending on how you configure your system.

IVR Routing provides availability by supporting:

- Redundant ports that allow continued operation when one IVR system fails
- Self-sufficient remote instances that continue to function if they lose access to the primary database or site
- Resilient ports across controllers in the event of an MiVoice Business failure

The MiContact Center Business Server enables IVR system configuration and provides real-time statistics to ensure effective call routing. If the MMiContact Center Business Server goes off-line, the following will occur:

- Real-time connectivity will be lost.
- Changes cannot be made to the IVR Routing system.
- Cached data ("last known good") will be used as the reference for call statistics.

In rare situations, when the MiContact Center Business Server goes off-line, real-time connectivity is lost and all call flow components that depend on data that is derived from real-time queue

statistics are affected, for example, queue condition activities, and Updated Position in Queue (UPiQ) messages.

IVR SURVEYS

If IVR is used to do the up-front routing to the queues, IVR can provide survey results on the back end when receiving a call through a post-call destination. Survey implementation is done by Mitel Professional Services. Call Mitel for details and quotes.

The following tables describe the survey packages and options available.

Table 2: Standard IVR Survey

Description	The Standard IVR Survey offers the ability to survey callers and obtain rudimentary survey data
Quote Details	The Standard IVR Survey provides a mechanism for offering a survey on incoming calls and results reporting at the IVR branch level. The Professional Services offering includes: • Design and implementation of an IVR-based survey for one business line, with up to ten questions (plus a recording) • Agents can transfer the caller to the IVR survey workflow or have calls transferred using Post-Call Destination functionality • Reporting is provided using CCWeb • The survey results are grouped by reporting period and based on IVR branching Limitations: • Individual survey results are not available • Links to customer recordings are not included in reports
Requires	IVR Routing ports
Notes	If using Post Call Destination to send calls with the Standard IVR Survey, it is not possible to identify the survey per business line (all redirected agent calls go to a single location). The original DNIS is not retained on this transfer, so the system is unable to determine the call type.

Table 3: Advanced IVR Survey

Description	The Advanced IVR Survey provides more sophisticated functionality and is used when individual survey results and the ability to switch surveys for callers, based on the business line or DNIS, are required. Custom reporting is available using SQL Server Reporting Services (SSRS).
Quote Details	The Advanced IVR Survey includes: • Design and implementation of an IVR-based survey for one business line, with up to ten questions (plus a recording) • Custom database for provided up-front IVR information gathering and back-end reporting • The choice for callers to opt-in to the survey • Call redirection to IVR using the Post Call Destination feature of MiVoice Business (or transferred via the agent) • Reporting provided: • Individual Survey Report per call (with recording linkage) through SSRS • Grouped Survey Report per Business Line through IVR branch reporting in CCMWeb reports • Full database access provided to customer for further reporting where required
Requires	• IVR Routing ports • IVR Routing must designed to handle up-front routing to paths • MiVoice Business with Call Coverage - Post Call Destination • SQL Express or higher With Tools
Notes	If using Post Call Destination to send calls with the Standard IVR Survey, it is not possible to identify the survey per business line (all agent calls will go to a single location). The original DNIS is not retained on this transfer, so the system is unable to determine the call type. However, if the front-end IVR is in place, it is possible to configure the survey system to retain DNIS information for reporting.

Table 4: Optional IVR Survey

OPTION 1	Additional one (1) Survey with 5 Questions
OPTION 2	Additional report
OPTION 3	Custom development: Terminate button to send callers to IVR survey from Contact Center PhoneSet Manager
OPTION 4	Custom information added to the individual report
OPTION 5	SQL database to add customer responses (can see only Agent ID or ANI—not both—when not using Post Call Destination).

IVR ROUTING USING MiVOICE INTEGRATION FOR SALESFORCE

MiVoice Integration for Salesforce supports communication between MiContact Center Business, IVR Routing, and Mitel Open Integration Gateway (OIG). Using IVR Routing workflows, MiVoice Integration for Salesforce can display relevant Salesforce customer records based on ANI, matching campaigns based on DNIS, or Salesforce records based on Account, Campaign, Case, Contact, Lead, or Opportunity using call details or IVR Routing Collected Digits. Calls passing through an IVR Routing workflow will display ANI, DNIS, queue name, and Collected Digits when ringing MiVoice Integration for Salesforce. Phone data coming through the IVR will have a higher priority than that coming directly from the MiVoice Business controller.

NOTE: The OpenCTI integration with Salesforce supports the E.164 directory for calling international numbers when used with Mitel OIG 3.0+.

MiContact Center Business ACD hot desking Agents and hot desk users are supported with MiVoice Integration for Salesforce. MiVoice Integration for Salesforce does not directly integrate with MiContact Center Business applications for agent call handling. Agents should use phone hot keys to perform contact center tasks, such as applying Make Busy and Account codes while handling calls. Administrators must ensure that the appropriate feature access codes are programmed on their MiVoice Business controllers.

For information about implementing this integration, contact Mitel Professional Services.

The migration from the desktop connector to the MiVoice Integration for Salesforce follows these general steps:

1. Upgrade to MiContact Center Business 8.x.
2. Deploy the Mitel OIG Server (3.0+).
3. Set up the IVR.
4. Test with a sample user.
5. Migrate to the MiVoice Integration for Salesforce integration.

Agents will continue to operate normally, and with no changes, while these first four steps are being performed.

NOTE: Support for the Salesforce.com Connector is being discontinued by Salesforce.com and is being replaced by the MiVoice Integration for Salesforce. After MiContact Center Business Version 8.x, the Salesforce.com Connector will no longer be available and all new customers will be expected to use the MiVoice Integration for Salesforce instead.

SPEECH RECOGNITION AND TEXT TO SPEECH

The Automatic Speech Recognition (ASR) and Text to Speech (TTS) features are provided using Nuance software. The Nuance applications must have their own server, but the Nuance ASR and Nuance TTS can both be run on the same server.

Table 5: Nuance applications

FEATURE	NUANCE APPLICATION NAME
Automatic Speech Recognition	Nuance Recognizer
Text to Speech	Nuance Vocalizer

To install the Nuance applications and the Nuance License Manager, refer to the Nuance installation instructions.

For ASR and TTS configuration details, see the *MiContact Center Business Installation and Administration Guide*.

To configure the TTS for use in MiContact Center Business, you must also import a Speech Synthesis Markup Language (SSML) file. SSML files can be purchased from companies that specialize in creating them. The SSML import can also be done in the IVR Routing application.

We recommend that a Nuance server be deployed with each IVR server to improve resiliency. The Nuance License Manager can be shared with multiple Nuance servers, but it becomes a single point of failure. It is therefore recommended that a separate License Manager be deployed with each Nuance server. Each Nuance ASR or TTS port license is associated to the MAC address of the License Manager. Therefore, during site registration, it is essential that the dealer provide the MAC address(es) where the License Manager(s) is deployed and the number of ASR/TTS ports to be deployed on each Nuance server. A license file will then be created for the License Manager deployed with each Nuance server.

Nuance licenses are purchased through Mitel, but Nuance software assurance is purchased directly from Nuance.

MiVOICE BORDER GATEWAY CONNECTOR

The MiVoice Border Gateway Connector replaces the previous Teleworker functionality enabled when MiContact Center Business is used with MiVoice Border Gateway.

Using MiVoice Border Gateway, MiContact Center Business, and the MiVoice Border Gateway Connector, home-based agents, employees, and supervisors, and remote agents, employees, and supervisors can perform telephony functions without the use of a Virtual Private Network (VPN), including the ability to:

- Use IP desk phones, automate desk phones using Contact Center PhoneSet Manager, and use Contact Center Softphone, which provides complete desk phone functionality.
- Use CCMWeb to run reports.
- View real-time monitors, and enable real-time alarms within Contact Center Client.
- Configure devices and manage their business using YourSite Explorer.
- Benefit from full support for Workforce Scheduling, Schedule Adherence, Employee Portal, and Flexible Reporting.

The MiVoice Border Gateway Connector is installed using Client Component Pack and runs as a light-weight system tray application. Users run the MiVoice Border Gateway Connector from the **Start > Programs > Mitel** menu. At installation, enter the details of the MiVoice Border Gateway to connect to (Name and IP address), along with the phone MAC address and, optionally, the IP phone extension. After the MiVoice Border Gateway Connector has connected, users can access all MiContact Center Business and MiVoice Analytics applications as if they were in the office. For installation details, see the *MiContact Center Business Installation and Administration Guide*.

NOTE: For MiNET soft phones and non-soft phone MiVoice Border Gateway Connectors: in the MiVoice Border Gateway **Service configuration > Minet Devices**, program the device and add the MAC address.

While active, the MiVoice Border Gateway Connector is visible in the Windows system tray. The current number of active number connections is displayed.

Figure 10 shows the MiVoice Border Gateway Connector in the system tray.

Figure 10: System Tray Access

The MiVoice Border Gateway Connector offers the same characteristics as that of standard MBG deployment: local streaming, secure RTP, jitter buffering, and packet handling QoS, and G.729 and G.711 encoding. For information about configuring the MiContact Center Business and MiVoice Analytics software to support MiVoice Border Gateway, see the *MiContact Center Business Installation and Administration Guide* or the *MiVoice Analytics Installation Guide*.

NOTE: The following ports must be open in order to take advantage of the full features and functionality provided by MBG Connector: 80, 443, 1433, 5024, 5025, 5026, 5030, 7001, 7003, 8083, 8084, and 42440.

MBG Connector for MiContact Center Business versions 7.x and 8.x support connections to a single MiVoice Border Gateway only.

EXTERNAL HOT DESKING FOR ACD AGENTS

External hot desking allows a Mitel ACD Hot Desk Agent Directory Number (DN) to be associated with any external dialable number. This allows the system to call an agent who is working remotely and using any phone type, including a standard Public Switched Telecommunications Network (PSTN) analog phone at home, a third-party PBX end-point, or a mobile phone. External Hot Desk Agents can log in either externally or internally. When an agent logs in internally (locally), the system recognizes the agent as a standard hot desking agent. When an agent logs in from an external location or phone, the system recognizes the agent as an External Hot Desking Agent. The External Hot Desk Agent feature is not supported for Agent DNs that are members of Personal Ring Groups.

When logged in as an External Hot Desk Agent, most of the call control resides in the Contact Center Client GUI (or the MiVoice Integration for Salesforce GUI, if applicable). Setting the Make Busy state, for example, can be done only from the client GUI. Some basic mid-call features are available through the end-point. If an agent's PC goes down and the agent temporarily loses the client, mid-call feature support allows the agent to place the call on hold, retrieve the call, or transfer the call directly from the end-point. Some restrictions apply to mid-call feature support depending on the type of end-point being used and the trunk type (PSTN versus IP) to which the end-point is connected.

Example: Two agents (Agent A and Agent B) are in the same agent group and ACD path. Agent A places herself in the busy state by clicking Make Busy. The next incoming ACD call is sent to Agent B on a third-party end-point. Agent ID 100 has been associated with Agent B's third-party end-point through external hot desk programming. The voice channel traverses the third-party PBX to ring Agent B's physical end-point. The MiTAI signaling channel from the MiVoice Business instance traverses through the MiContact Center Business server to the client GUI on Agent B’s desktop.

If an EHDA call is routed to an agent that is on a personal call, the agent will be put in a temporary Make Busy state for a set period of time, and the call will be re-queued and routed to the next available agent. This timer is user programmable. When they disconnect from their personal call, they have the ability to cancel the Reseize Timer from the Contact Center Client GUI rather than wait for the timer to expire. This ensures they can take an ACD call right away rather than wait several more seconds or minutes for the timer to expire and put them back into the agent available queue. If the agent remains on the personal call when the timer expires the system will attempt to send the agent another ACD call. When a busy signal is detected again, the system will restart the Reseize Timer, and the process begins again.

DEPLOYING EXTERNAL HOT DESK AGENTS (EHDA)

lists the key points to consider when deploying EHDA with different end-points and in different configurations.

Table 6: EHDA configurations and deployment considerations

CONFIGURATION	DEPLOYMENT CONSIDERATIONS
EHDA with agents using analog phones at home while connected through MiVoice Border Gateway	

Table 6: EHDA configurations and deployment considerations (continued)

CONFIGURATION	DEPLOYMENT CONSIDERATIONS
	• Users can log in and out, set Make Busy, Conference, or Transfer, using either the Contact Center PhoneSet Manager client application or the analog end-point. • Supervisors can log in individual agents to EHDAs using the Contact Center PhoneSet Manager client without specifying the agent PINs (if they are programmed). • Agents can log themselves in using the Contact Center PhoneSet Manager client application and enter passwords, if they exist. • Agents can log themselves in using the MiVoice Integration for Salesforce UI and enter passwords, if they exist. See the *MiVoice Integration for Salesforce User Guide* and the *MiVoice Integration for Salesforce Administration Guide* for details. (MiContact Center Business Starter Pack only, see the *MiContact Center Business and MiVoice AnalyticsSystem Engineering Guide*.)
EHDA with agents using third-party PBX phones	• PRI trunking between Mitel and third-party PBXs is required to ensure that DTMF receivers are allocated for mid-call features.
EHDA silent monitoring	• Supervisors who require silent monitoring must be on Mitel IP sets. If Silent Monitoring is not required, supervisors can be on any type of end-point. • Agents can invoke Silent Monitoring help from any end-point using the Contact Center PhoneSet Manager client.
EHDA with agents using SIP or analog phones behind a MiVoice Business controller	

Table 6: EHDA configurations and deployment considerations (continued)

CONFIGURATION	DEPLOYMENT CONSIDERATIONS
	• ONS/SIP phone EHDAs must use the Contact Center PhoneSet Manager client to log in or out of the EHDA. Users cannot dial the External Hot Desking Number from the phone to log in and out, because this number does not accept calls from IP trunks. The calls must be from PSTN trunks, or use TDM loopback. • ONS/SIP EHDAs can make outgoing agent calls only using their Contact Center PhoneSet Manager client. They can still make outgoing personal calls from their phones without the client application, but the calling number is shown as the EHDA registration DN. • When in talk state, ONS end-points have access to mid-call features through the set. Even if the Contact Center PhoneSet Manager application is not present, the detector is available on the TDM devices. • When in talk state, SIP end-points do not have access to mid-call features through the phone sets; however, mid-call features may be possible with the addition of MiVoice Border Gateway or TDM loopback where the EHDAs are programmed. • After the SIP/ONS EHDA is logged in, the agent receives Path calls regardless of whether or not the Contact Center PhoneSet Manager client is present. • If the Contact Center PhoneSet Manager client is not present, the user can log out by letting the phone ring (no answer), which automatically logs out the agent. • If the Contact Center PhoneSet Manager client is not present, the agent can set the system Make Busy by going off hook until an incoming call attempt is made.
EHDA with agents using a mobile end-point	• An agent can use a mobile end-point to receive ACD calls, but the agent will not have a mobile client (Contact Center PhoneSet Manager) to control the ACD calls. This limits the agent's ability to invoke ACD functions, such as setting or removing Make Busy, canceling the Work Timer, and accessing group presence. The agent can log in and invoke basic mid-call features through the end-point, for example transfer, hold, and hold retrieve.

Chapter 3
ACD OVERVIEW AND ROUTING

ACD OVERVIEW

MiContact Center Business consists of an ACD call processing engine and a MiContact Center Business application server. ACD helps businesses optimize their resources. It enables businesses to handle large numbers of incoming customer calls and answer these calls with as few trained agents as possible. An ACD system routes incoming calls to the longest idle agent within a specific agent skills group. If no agents are available, calls are queued and forwarded to an agent when one becomes available.

Typically, ACD systems have more incoming calls than there are agents available to answer them. This results in callers having to wait for agents to become available. ACD systems play recorded announcements to waiting callers interspersed with Music on Hold (MOH). Recorded announcements set the expectations of waiting callers and reassure them their calls are important to the business. When an agent becomes available, the first caller in the queue is routed to the agent.

Networked ACD extends ACD functions over multiple MiVoice Business instances with an MiVoice Business cluster or network. Agent groups on various controllers can answer calls on the network regardless of where the call first entered the network.

ACD Resiliency maintains real-time monitoring and Interactive Contact Center agent and queue control on resilient telephone systems, with real-time monitors that notify you immediately if agents re-register with the failover controller, and reports that provide seamless coverage without breaking up the shift.

A virtual contact center can distribute calls evenly among agents in a specific agent group, irrespective of the agent's geographic proximity to other agents in their group, or the agent controller to which they are registered.

Virtual resilient ACD involves separating the ACD functions into two entities: queuing gateways and agent controller(s), either or both of which can be deployed on resilient controllers. For more information about virtual resilient contact centers, see "Virtual contact centers" on page 92.

For information about ACD features and programming ACD, refer to the MiVoice Business System Administration Tool Online Help, and the *MiContact Center Business General Information Guide.*

ACD AND MIVOICE BUSINESS

When MiVoice Business is used for ACD (call center) applications, there are two main factors that must be considered in determining the capacity limitations.

- The performance of the controller will be the limiting factor because of the high number of calls made, when compared to a system with normal office traffic. When agents are connected to TDM trunks, the number of Ethernet-to-TDM (E2T) channels will be critical to the number of agents and trunks that can be supported.
- MiVoice Business installations use IP phones for the agents. In a standalone system, the number of agents with IP phones is limited by the number of E2T channels. Conversely, an agent controller connected to multiple queuing gateways can handle more IP phones and therefore, more agents.

Refer to the *MiVoice Business Engineering Guidelines* for information about the maximum number of ACD agents and TDM trunks you can have on a mixed system that includes other ACD applications, such as the real-time monitoring application.

ACD PATH/QUEUE CONCEPTS

Paths/queues are designed to guide incoming calls through the system. They determine how the system handles calls that are placed in the queue. There are 64 priority levels that can be assigned to each path/queue. These levels are programmed in the **ACD Path** form (formerly called the **Path Assignment** form) in the System Administration Tool. The priority levels allow calls arriving on higher paths to move to the front of the queue to be answered first. The lower the priority number, the higher the priority given to the call. Priority 1 is the highest priority; 64 is the lowest priority.

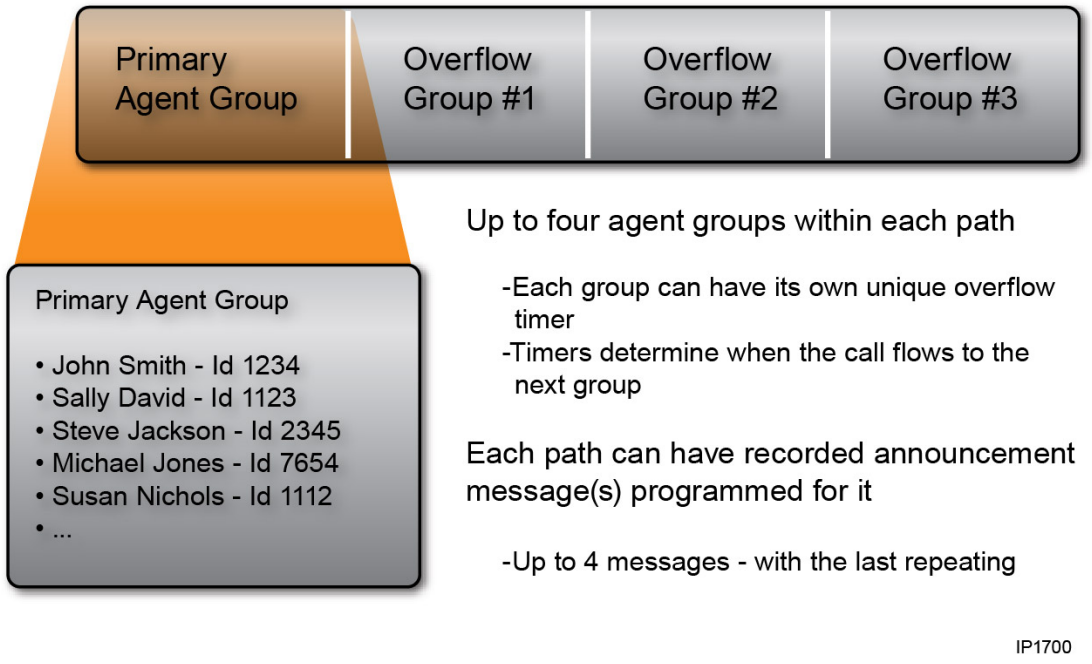

Figure 11: ACD Path with Overflow Skill Group

ACD PATH

ACD is built around the ACD Path, a flexible call routing method that provides the information required for handling incoming calls. The ACD path controls the resources used, the order in which resources are encountered, and the timing of the steps. Calls are queued for an agent skill group based on the path priority, and the order of arrival at that path. Queuing is the same as for new calls and overflow calls. If an agent skill group is not available, new calls are not queued for that group. The priority of a call may change if an interflow occurs. See "Interflow " on page 36.

THE ACD ROUTING ENGINE (MIVOICE BUSINESS)

The ACD routing engine involves several basic components:

- Incoming lines/trunks that point to ACD paths on a MiVoice Business
- Individual queues (paths) that point to agent skill groups. Queues consist of a primary agent skill group and up to three overflow agent skill groups.
- Agent skill groups that consist of agents that can be local or remote to the controller on which the group is programmed
- Recorded announcements to greet waiting callers
- Music between recordings

Central to ACD functionality is the ACD path. A number of possible paths can be defined in the ACD system. The ACD path is a flexible call-routing point that provides the information required for handling incoming calls. Each path has a set of parameters that determine how the system handles queued callers, what system resources to use, when the call is to be answered and which group will answer the call. Based on customer requirements, each call received is directed to a path. Calls are queued for an agent group based on the path priority and the order of arrival at that path. Each ACD path is assigned a priority number. A call to a path adopts the priority of the path, which allows incoming calls to be directed based on their importance and expense.

Calls are routed to the longest idle agent within a skill group, or optionally, if skill levels are being used, to the agent with the highest skill level for that group. If the available agents have no skill level or are of equal skill level, the call is routed to the longest idle agent.

Each MiVoice Business controller can have multiple Agent Skill Groups or “agent skills”, and 500 Skill Levels within each skill group. You can assign Skill Levels to some or all agents.

Agents who appear in more than one Skill Group may be assigned a different Skill Level for each group. Calls to a Skill Group are routed to the most skilled available agent based on their Skill Level.

You can have up to 60 agent skill groups on MiVoice Business running on Industry Standard Server (ISS) or MiVoice Business Virtual; on the 3300 ICP platforms, up to 16 agent skill groups are supported.

Each ACD agent is assigned a unique agent identification (ID) number that is associated with an answering group or groups. The agent ID is similar to a telephone directory number and can be assigned a name in the telephone directory. Agents can be classified as traditional or hot desk agents. See "Traditional agents versus hot desk agents" on page 44.

CALL FLOW

ACD calls to a group are routed to the longest idle agent, assuming all agents have the same skill level. Idle time is calculated from completion of an agent's last ACD call. Non-ACD calls are not considered.

A caller never receives a busy tone from an available path. An incoming ACD call is handled as follows:

1. The caller receives a ringback tone.
2. The RAD timer starts.

3. The overflow timer for the primary group in the path starts.
4. The interflow timer programmed in the path starts.
5. The call goes to the longest idle agent.

The caller connects to the agent when the agent answers the call. When no agent is available, the caller is automatically queued to the primary agent skill group in the path. The caller receives ringback tone until the first RAD answers, an agent answers, interflow occurs, or the caller hangs up. ACD Call Progress - All Agents Busy shows the ACD path progress when all agents are busy.

OVERFLOW

A path contains one primary agent skill group and can have up to three overflow groups. This provides backup resources to the primary agent group to ensure that service level goals are met. Calls that overflow maintain their position in queue and are queued simultaneously against all the agent skill groups that have been overflowed to. Group overflow timers determine how long a call waits before overflowing. Overflow groups can be local or remote. See Figure 12 for a comparison of Overflow and Interflow.

In Figure 12, the term “Look back” describes the situation in which all of the Overflow Groups are full, and the call is sent back to the Prime Agent Group. Note that the call remains in queue for all of the overflow groups until it is answered.

PREDICTIVE OVERFLOW

Predictive overflow determines whether a newly-queued call to an agent skill group should be immediately overflowed or sent to the next agent skill group. The average call duration is based on the average agent talk time, including the work timer. If the system predicts that a call will not be answered before the overflow timer expires, the system places the call in overflow before the timer expires.

INTERFLOW

While Overflow offers calls from a queue to different agent groups handling calls for that queue, Interflow moves calls between queues when the wait times reach a preset threshold. Interflow can be time-based or load-based.

Interflow redirects calls automatically after a set duration, which is configured on the queue. Interflow occurs without any user interaction. When you configure Interflow for a queue, you set how long a call can sit in the queue and tell the system where to move the call when that time expires. This is useful in reducing caller wait times on a very busy queue.

A call that interflows to another path adopts the priority of the new path if:

- The new path has **Interflow To This Path Uses This Path Priority** set to **Yes** in its **ACD Path** form, or
- The call interflows from a path that has a priority of 64

If neither of these conditions is true, the priority of the call re-routed using Interflow does not change. See Figure 12 for a comparison of Overflow and Interflow.

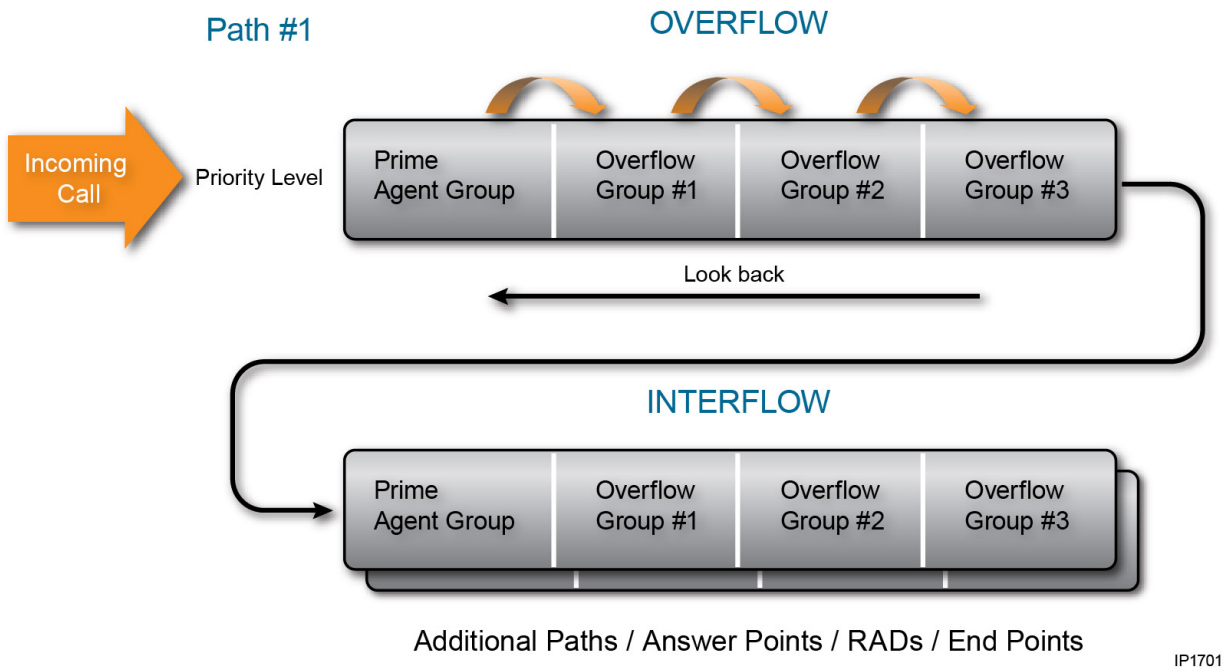

Figure 12: Overflow between skill groups in 1st path followed by interflow to 2nd path

UNAVAILABLE AGENT SKILL GROUP

Calls that are directed to an unavailable agent skill group are prevented from being queued. An immediate overflow is attempted. If all agent skill groups are unavailable, then the path is unavailable and “path unavailable” handling is used.

RECORDINGS

The following section describes recording options and configuration notes for in-queue recording, music played between recordings, alternative recording devices, and agent greetings and whisper announcements/pre-announce,

WHILE IN QUEUE

An ACD path can define up to four recorded messages—specific Recorded Announcement Devices (RADs) or groups of RADs—and their relative start times for callers waiting for an agent to answer. The path also specifies whether the programmed recording is repeated and its repeat interval.

RADs can be played from the following:

- MiVoice Business Embedded Voice Mail
- MiVoice Business IVR
- NuPoint Unified Communications

MUSIC BETWEEN RECORDINGS

Between each recording (delivered by a RAD) on an ACD path, the incoming caller, by default, listens to the embedded music source (if programmed). An alternate music source may be specified between recordings and after the last recording.

NOTE: If a call from a remote switch is answered by a RAD before being queued to an ACD path, the caller will not hear music unless there is a Music on Hold source at the local switch.

ALTERNATIVE RECORDING DEVICE (ARD)

Up to four different recordings are available on each path. The Alternative Recording Device (ARD) is an off-hook ONS port that connects to callers in a listen-only conference. The user decides what is supplied on the ONS port: silence, music, or endless loop recordings. This applies only to 3300 ICP controllers, since MiVoice Business on ISS and MiVoice Business Virtual instances do not have physical ports.

NOTE: An ARD should not be used as a first-level announcement, for example, Music on Hold.

Between RAD messages, callers hear ARDs when they are available. If ARDs are not available or an ARD becomes unavailable when callers are connected to it, callers hear the System Music On Hold. If the System Music On Hold is not available, callers hear silence between RAD messages.

Attempts to directly dial, forward to, transfer to, or reroute to an ARD result in the message “INVALID DIALING” on display sets and/or a reorder tone. Attempts to program call forwarding to an ARD result in the message “NOT ALLOWED” on display sets and/or a reorder tone.

By modifying programming in the MiVoice Business System Administration Tool, you can provision the same alternative recording, or up to four different recordings, to play between recorded announcements.

The ARD can be a telephone, a recording device, or a transfer device (8/600 ohms) that simulates an off-hook device and allows connection of an audio source such as a radio. The system connects callers only if the device is off-hook. There are no restrictions on how paths share ARDs.

NOTE: Depending upon country of installation, the ARD must be either an FCC Part 68 or DOC approved voice coupler or voice connecting arrangement to an ONS circuit.

AFTER ANSWER BY AGENT

The system can be programmed to play a pre-recorded agent greeting to customers when the agent accepts an inbound call. This is sometimes called a pre-announcement. It frees the agent from having to repeat the same introduction for every phone call, allowing them up to perform other work. Agent greeting is considered a two-way playback because both the agent and customer hear the recording.

NOTE: Agent greeting ports must belong to the same MiVoice Business controller as the agents. The limit is 100 ports for IVR and agent greetings.

Whisper announcement is similar to agent greeting except that the playback is only heard by the agent. Typical use of a whisper announcement is to tell the agent what queue the call is originating from so the agent can customize their introduction. This playback is usually very brief so that the agent can engage the customer immediately. This is often used in contact centers in which queues represent different companies or product lines.

Agent greeting and Whisper announcement are supported in a per-queue agent workflow that can be supported on Mitel communication platforms. A per-queue agent workflow is provided to answer calls on behalf of the agent, and play the whisper announcement and or agent greeting.

NOTE:

- Agent greeting and Whisper announce can be used only on MiVoice Business Virtual due to conferencing resource requirements.
- Besides the pre-announce feature available within Contact Center PhoneSet Manager and Contact Center Softphone, agents can record their own custom agent greeting through the Ignite (DESKTOP) interface. Whisper announcement recordings are performed through an IVR menu that accepts recordings. We recommend you do not configure pre-announcement and whisper announcements on the same system.

PATH UNAVAILABLE

When a path is unavailable, calls can be routed to a “path unavailable answer point,” such as an attendant, voice mail, recorded announcement, another ACD path, or a system speed call number. This enables the supervisor to choose where to send calls received after hours or during holidays.

An ACD path becomes unavailable in the following situations:

- The path directory number is remotely placed in Do Not Disturb (DND) mode.
- The primary and all programmed overflow agent skill group directory numbers are remotely put in DND mode.
- All members of all agent groups in the path are logged out.
- All agent groups are either in DND mode or have no agents logged in.

When a path is unavailable, calls can be routed to a “path unavailable answer point”. The path unavailable answer point can be:

- An attendant or valid extension (display set, non-display set, auto attendant, or night bell)
- A voice mailbox
- A RAD
- Another ACD path
- A system speed call number

INTERCONNECT RESTRICTION

If an interconnect restriction exists between the caller’s station or trunk and members of an Agent Skills Group, the call waits in queue like any other call. When an agent is ready to service the call, the call is removed from the path and forwarded to the destination designated in the Intercept Handling Assignment form. If no alternate directory number is provided, the caller hears a reorder tone.

AGENT NO ANSWER CALL HANDLING

An agent who fails to answer a call within a programmed length of time is automatically logged out of ACD. The call is requeued as the oldest call in the queue and offered to all of the agent skill groups in the path prior to the call offer to the agent.

When the Class of Service (CoS) setting **ACD Agent No Answer Timer** expires, the following events occur:

- The caller is automatically requeued into all agent skill groups the caller was previously in, as the oldest call within its priority.
- The agent is logged out.

NOTE: If the **ACD Make Last Agent Unavailable on No Answer** system option is set to **No** (this is the default), the caller will not be requeued when the **ACD Agent No Answer Timer** expires. Instead, the caller continues to hear ringback tone, recordings, music, or silence until the agent answers, the caller hangs up, an overflow or an interflow occurs.

MCD Release 6.x and MiVoice Business offer an additional option, **ACD Agent Behavior on No Answer**, which lets you select agent behavior on no answer. Select either:

- **Logout** to automatically log out agents, or a
- **Absent** to automatically make agents absent from all groups

DIAL OUT OF QUEUE

With this feature, callers in an ACD path can dial out during or between RAD messages if they cannot wait for an agent to answer, or if they want to change their current action. This gives the caller the opportunity to exit the wait queue and have the system call them back at a number the caller specifies. Businesses benefit by being able to free up valuable trunk resources until an agent becomes available to initiate a voice callback.

NOTE: A sufficient number of DTMF Receivers must be available to handle the extra demand generated by this feature. The number of DTMF Receivers required is dependent on several factors, including: the number of available trunks, the volume of calls, the length of each RAD message. The extra demand generated by this feature can be minimized by providing dial out capability during the first RAD message only in the **Path Interflow Dialing List Assignment** form.

AGENT GROUP PRESENCE

Agent Group Presence permits an agent to join or leave an agent group (or a collection of agent groups) instantly without logging in or out.

When agents are in multiple groups, they can invoke ACD absence or presence on each group using Feature Access Codes (FAC) or Feature Access Keys (FAK) on their phones. In addition, supervisors can quickly change the mix of groups the agents are present in or absent from using this feature.

NOTE: Feature access keys for group presence are not supported with traditional agents.

SILENT MONITORING

For quality monitoring purposes the supervisor can silently listen to calls in real time. They can also monitor the Agent Skills Group pilot DN, which allows them to automatically scan active calls in a group and silent monitor calls of their choice. An agent can request silent monitor help from a supervisor, which alerts the supervisor to start silent monitoring the agent.

NOTE: Silent monitoring is not supported over IP Trunking.

WHISPER COACH

When an agent needs assistance, the supervisor can immediately switch from simple monitoring to Whisper Coach and converse with the agent without the caller hearing.

A whisper announcement is a recording that is played to the agent when an agent answers an inbound call. The whisper announcement can provide useful information to the agent (for example, it can identify the incoming queue) to help the agent to handle the call more efficiently.

The whisper announcement plays only to the agent. You can choose a .wav file from the IVR Prompts page, or a Text-to-Speech prompt (if licensed).

NOTE: When the whisper announcement is playing, the caller is able to hear the agent speaking. To prevent the caller from hearing the agent or other contact center background noise during the whisper announcement, mute the agent's headset for the duration of the announcement.

NETWORKED ACD

Incoming calls are simultaneously queued against local and remote agent skill groups within a path. This allows multi-site customers to design call routing schemes that take advantage of, and optimize, their call handling resources. See "Networked ACD" on page 45.

AGENT SKILLS-BASED ROUTING AND SKILL LEVEL ROUTING

ACD routing, based on agent skill designation, works on two levels:

- Skill groups
- Skill levels within each skill group

SKILLS-BASED ROUTING

Agents are programmed in agent groups/skill groups. Skills-based routing enables the system to route calls to the next available, highest-skilled agent within a skill group.

ACD calls to a group are routed to the longest idle agent. Idle time is calculated from completion of an agent's last ACD call. Non-ACD calls are not considered.

Figure 13 shows routing based on an available agent's skill. When a new call comes to a skills group, the call goes to the agent who has been idle the longest, in this case Agent C, as shown.

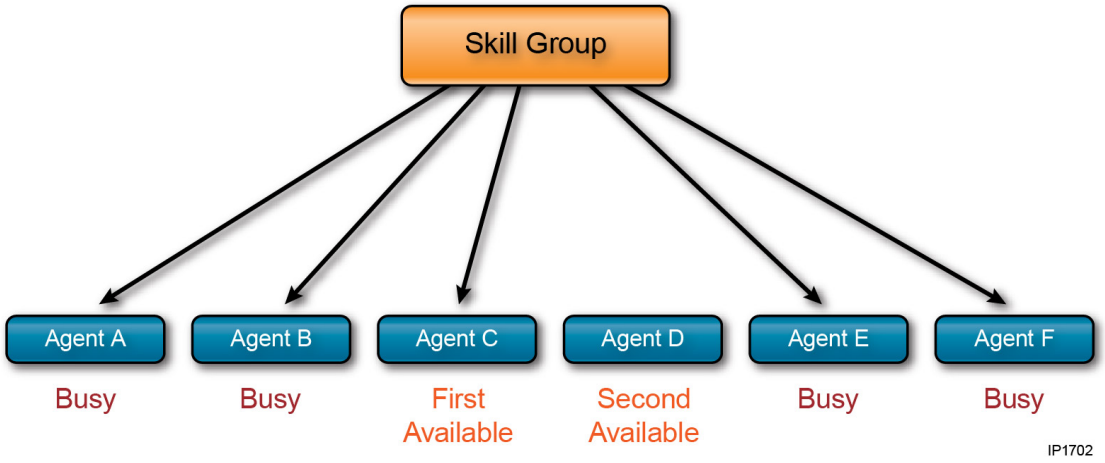

Figure 13: ACD Skills-based Routing

SKILL LEVEL ROUTING

Skill level routing enables the system to route calls to the next available, highest-skilled agent within a skill group, and gives priority to agents who have higher skill level assignments in any given group.

Figure 14 show routing based on an available agent's skill level within an skill (or routing on Agent skill proficiency). If longest idle time is shared by two or more agents in the skill group, the call goes to the agent with the highest skill level.

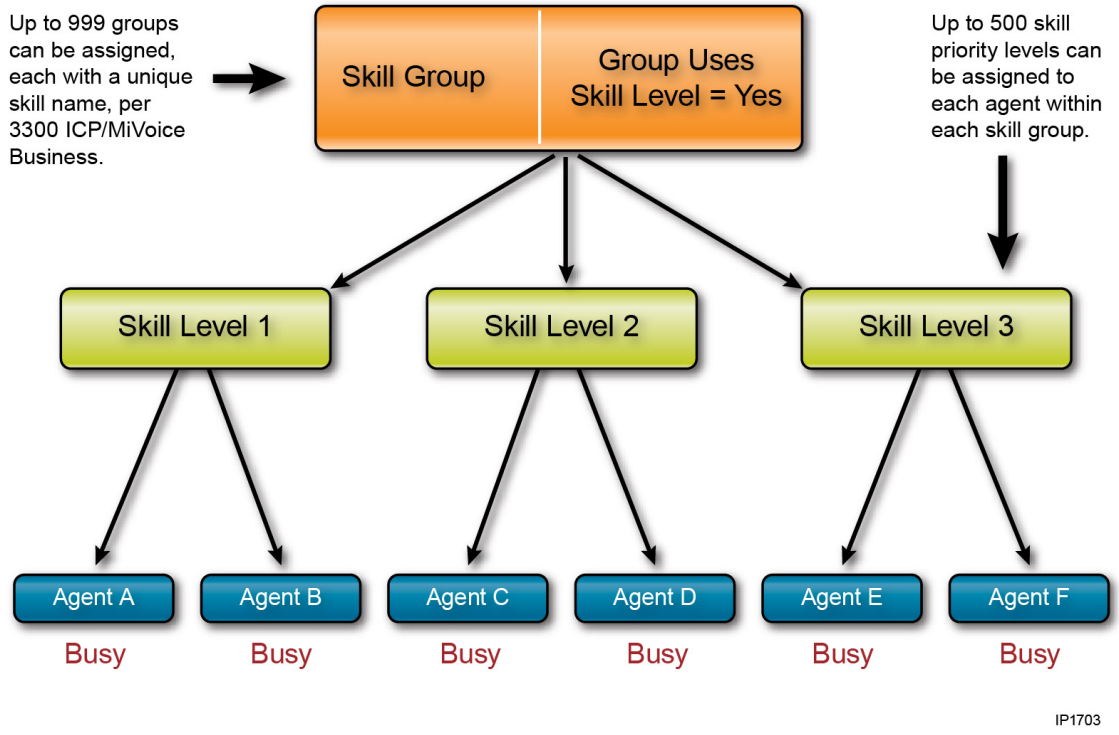

Figure 14: Skill Levels in Skill Groups

When a new call comes to this group, the call goes to the agent who has been idle the longest. If there is more than one agent who has been idle the greatest length of time, the call goes to the agent with the highest skill level in the skills group. In this example shown in Figure 15, the call would go to Agent A (who has a higher skill level assignment), then Agent C, then Agent F.

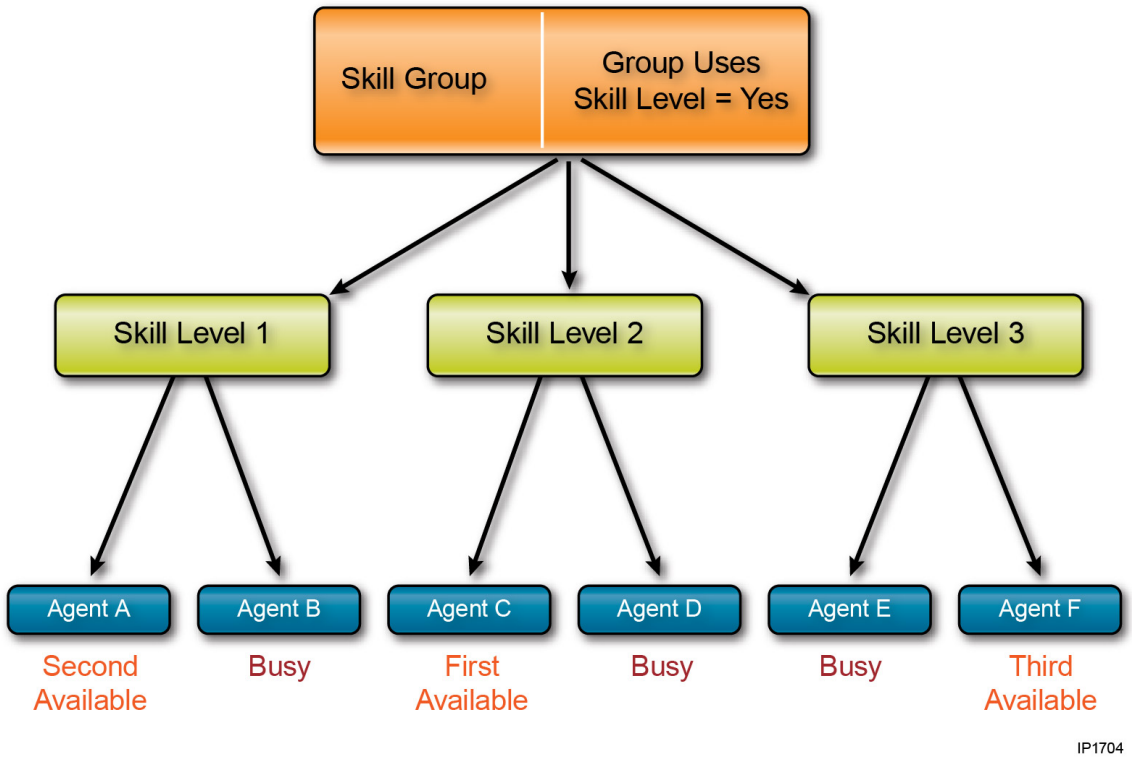

Figure 15: ACD Skill Level Routing

NOTE: An agent can appear only once in a single agent skill group, but can be programmed in many skill groups and be active in up to 60 skill groups at the same time when running on MiVoice Business for ISS or MiVoice Business Virtual, and 16 when running on a 3300 ICP MXe.

SKILLS-BASED ROUTING WITH AGENTS IN MORE THAN ONE GROUP

Each agent can be in multiple skill groups; see Figure 16. When agents are in multiple groups where skill levels have been assigned to them, they receive calls based on the following order:

1. Calls with the Highest Path Priority
2. Calls for which their Skill Level is highest (among available agents)
3. Calls that have been queued the longest

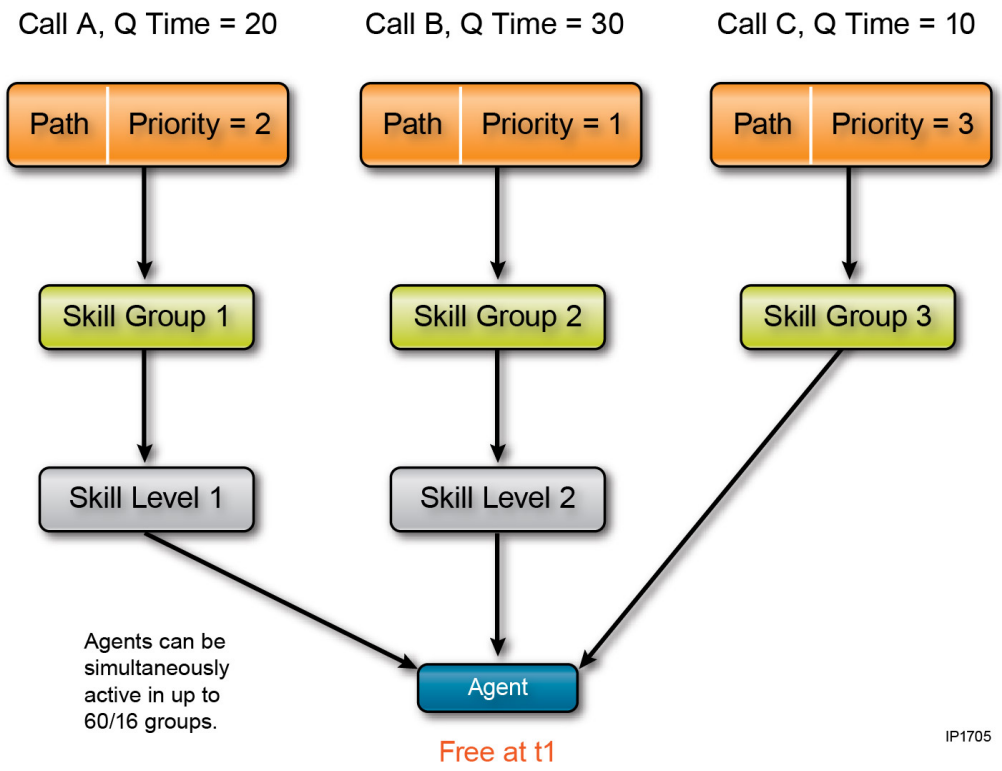

Figure 16: Skills-based routing with agents in more than one group

In Figure 16, t1 is the time at which the agent becomes free to take a call.

In this example, the call offer order would be Call B, Call A, and then Call C.

TRADITIONAL AGENTS VERSUS HOT DESK AGENTS

Traditional agents do not typically move around in an organization; generally, they log into the same ACD-enabled phone to receive calls. Hot desk ACD agents can log into any ACD-enabled device and receive calls. During the agent login, the set assumes the personal profile of the agent, which includes (but is not restricted to) the assigned name, Class of Service (CoS), Class of Restriction (CoR), group memberships and path memberships, Direct Inward Dialing (DID), call forwarding, speed calls, and personal keys.

NOTE: The use of hot desk ACD agents and traditional ACD agents in the same ACD system is not supported.

ACD TOPOLOGIES

STANDALONE ACD

Figure 17 shows a single standalone ACD site that has a single MiVoice Business, which is used for agents, paths, and trunks. It supports up to 90 IP ACD agents. Paths and agents are programmed on the MiVoice Business controller.

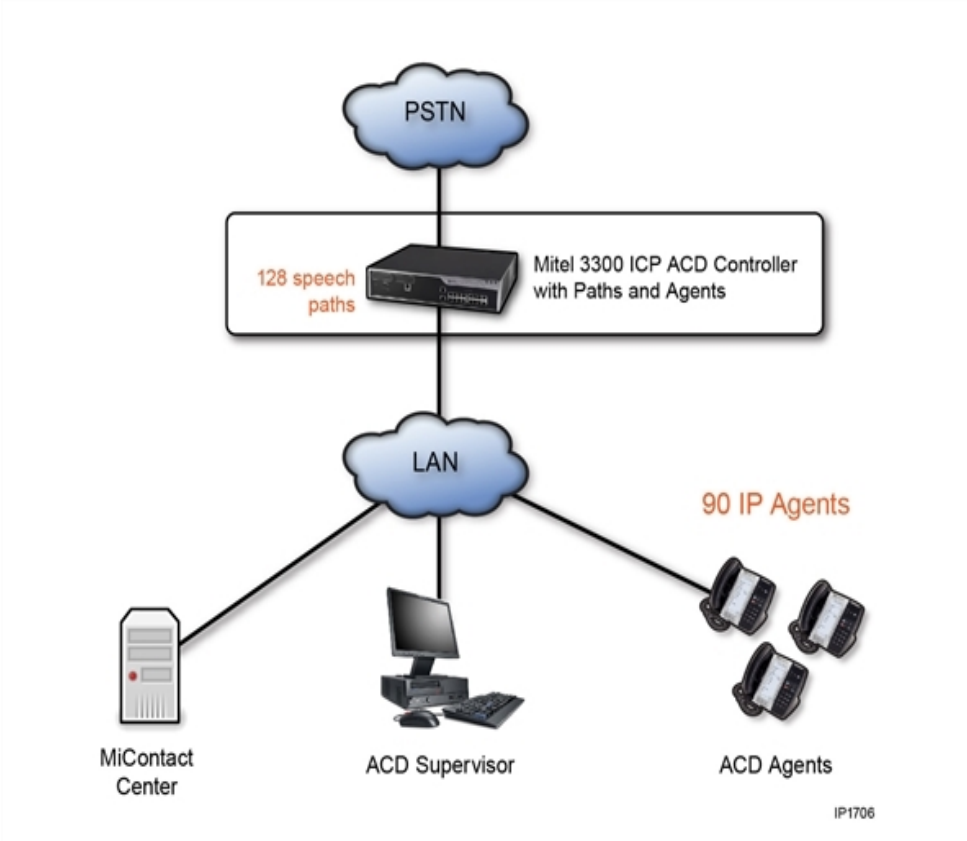

Figure 17: Standalone ACD Site

The 3300 ICP in this graphic must be an MXe. The CX model is not suitable for this application.

NETWORKED ACD

Networked ACD allows ACD calls to overflow between multiple call center sites that may or may not be geographically dispersed. This configuration enables customers to optimize agent and equipment resources, support peak hours with back-up agents, and provide enhanced caller service with time zone support.

Networked ACD is based on ACD overflow functionality. Overflow permits a call originating in a particular geographic location to overflow to an agent group on a remote system, possibly in a different geographic location, in the event of high call volumes. Overflow groups receive calls only when all of the agents in the primary group are busy, which reduces the work load of the primary agent group. Overflow is effective for optimizing bandwidth usage, but is not intended for evenly distributing calls (regardless of origination point) among local and remote agents.

Networked ACD is based upon the ability to overflow between agent groups in the same path. When calls are overflowed to remote groups on different systems, delivering the call to the longest idle agent across the whole path is not possible.

Limitations:

- The longest-waiting idle agent is guaranteed only if all agents reside on the same controller.

- The Silent Monitor feature is available only to supervisors based on the same controller as the agents they want to monitor.

Figure 18 to Figure 21 illustrate how Networked ACD works.

The Networked ACD call flow process works as follows:

1. An incoming call queues to Group 1 on the main site, and after a period of time it overflows to Group 2 on the main site. (See Figure 18.)
2. After a period of time, if agents are not available in Groups 1 or 2, the call overflows to Group 3 at Networked Site 1 to wait for an agent there, while also still in queue and waiting at the main site. (See Figure 19.)
3. The call overflows to Networked Site 2 and is now simultaneously queued to four groups across three sites. (See Figure 20.)
4. The call is answered by an agent in Group 4 at Networked Site 2. (See Figure 21.)

For configuration details, refer to the MiVoice Business System Administration Tool Online Help.

Figure 18: Networked ACD 1

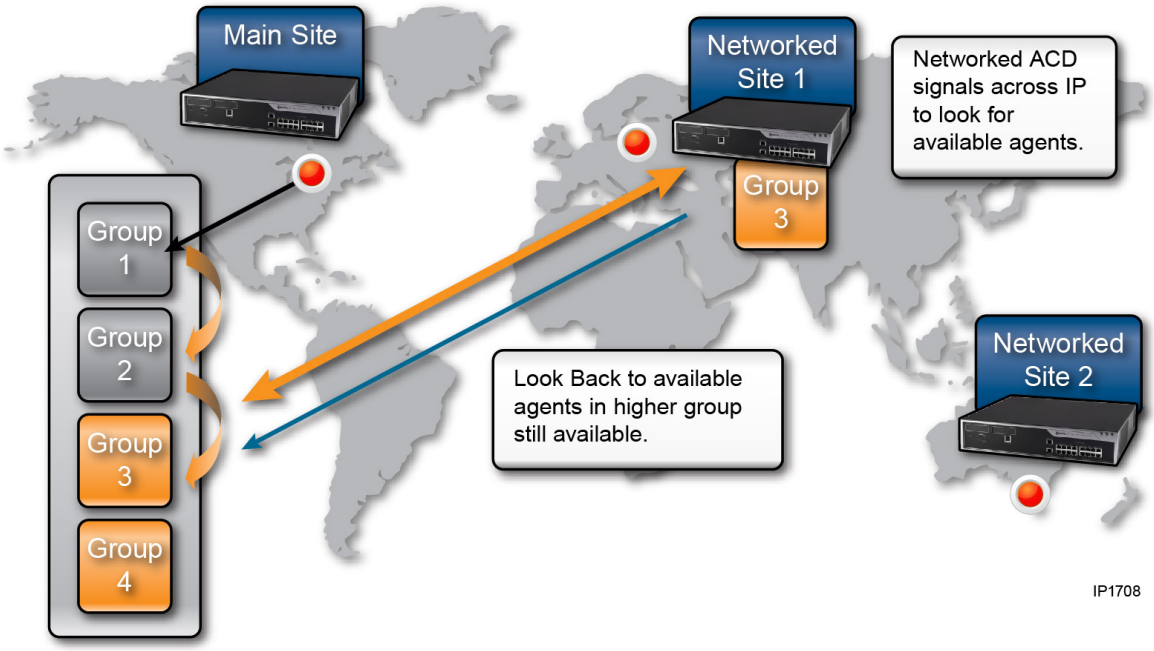

Figure 19: Networked ACD 2

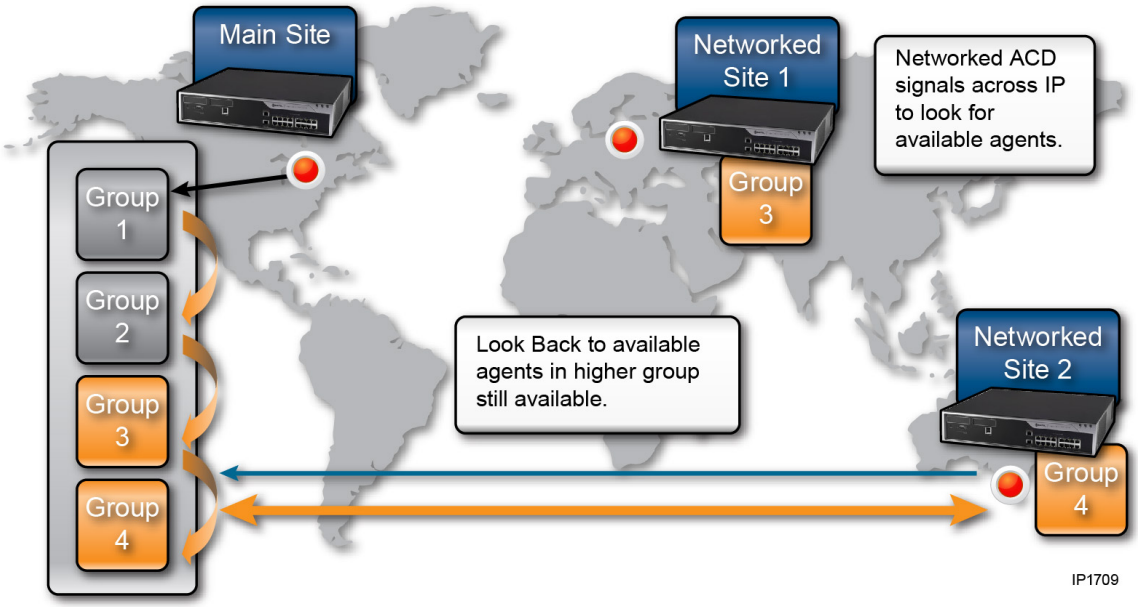

Figure 20: Networked ACD 3

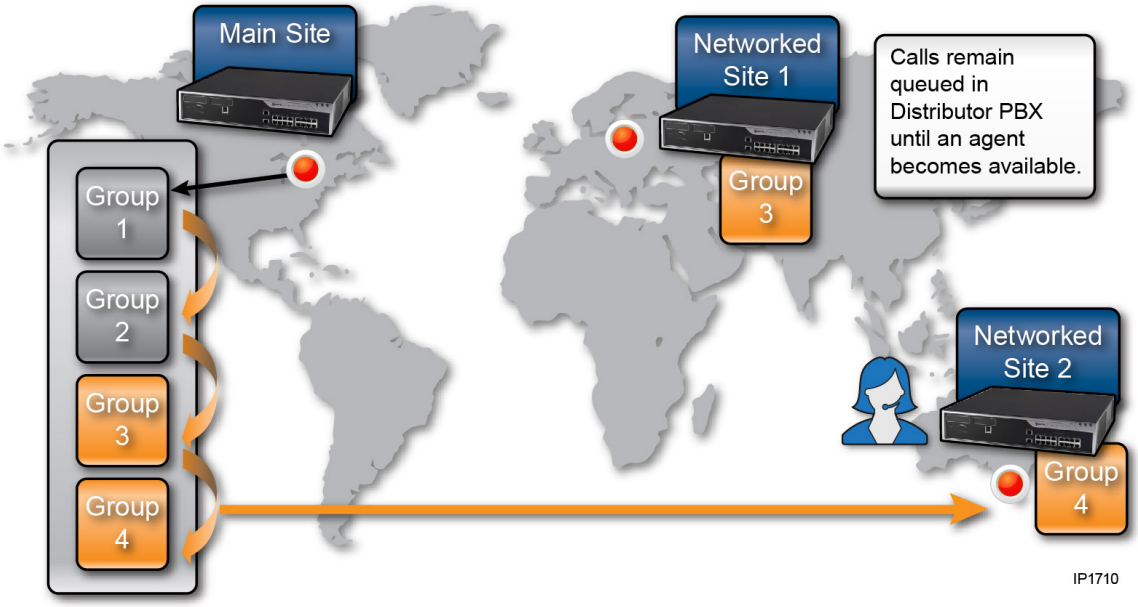

Figure 21: Networked ACD 4

ACD REAL-TIME EVENT RECORDS

Real-time event records are used to monitor and record the activity of the entire ACD operation. Events are divided into two groups: call events and group statistic events. Call events report on the activities of individual ACD agents, and group statistics provide a cumulative report for agent group activity.

INCREASING THE ACD REAL-TIME EVENT REFRESH RATE

The MiVoice Business ACD Event Statistics Refresh mechanism issues real-time event updates of queue information to MiContact Center Business to be displayed on the user interface.

By default, the ACD updates the records for 4 queues every time it runs. Every 0.5 seconds, the refresh mechanism refreshes four queues, cycling through all the Groups, followed by all of the Paths, every 0.5 seconds.

NOTE: Even though the refresh mechanism cycles through the queues every 0.5 seconds, there can potentially be another 0.5 second delay while the refresh mechanism processes the events and sends them to the real-time events output stream.

This may not be frequent enough for deployments containing a large number of groups or paths, or both. Depending on factors such as contact center attributes, traffic, and the number of paths and groups, you may choose to increase the refresh rate to avoid long delays on the delivery of these events.

In large ACD environments, for example, specifically those with 50 ACD Paths or greater, latency may be experienced in the following ways:

- Displaying calls waiting in a queue when they have actually been delivered to an agent
- Displaying agents as available when they are not

The ACD Event Statistics Refresh Rate can be modified via MiVoice Business programming. See MiVoice Business documentation for details.

The examples in illustrate the effect of changing the ACD Event Statistics Refresh Rate for different numbers of Groups and Paths.

Table 7: Update times by ACD Event Statistics Refresh Rate and numbers of groups and paths

	INTERVALS	ACD EVENT STATISTICS REFRESH RATE = 4 (DEFAULT SETTING) STATISTICS REFRESHED FOR:	ACD EVENT STATISTICS REFRESH RATE = 20 STATISTICS REFRESHED FOR:
10 GROUPS 20 PATHS	0.5 seconds	• Groups 1-4	• Groups 1-10, Paths 1-10
	1.0 second	• Groups 5-8	• Paths 11-20, Groups 1-10
	1.5 seconds	• Groups 9-10, Path 1-2	• Paths 1-20
	2.0 seconds	• Paths 3-6	• Groups 1-10, Paths 1-10
	2.5 seconds	• Paths 7-10	• Paths 11-20, Groups 1-10
	3.0 seconds	• Paths 11-14	• Paths 1-20
	3.5 seconds	• Paths 15-18	• Groups 1-10, Paths 1-10
	4.0 seconds	• Paths 19-20, Groups 1-2	• Paths 11-20, Groups 1-10
		Refresh of all queues and groups complete after 4 secs.	Refresh of all queues and groups complete after 1 second.
100 GROUPS 150 PATHS (MAXIMUM ALLOWED IS 999 EACH)	0.5 seconds	• Groups 1-4	• Groups 1-20
	1.0 second	• Groups 5-8	• Groups 21-40
	1.5 seconds	• Groups 9-12	• Groups 41-60
	2.0 seconds	• Groups 13-16	• Groups 61-80
	2.5 seconds	• Groups 17-20	• Groups 81-100
	3.0 seconds	• Groups 21-24	• Paths 1-20
	3.5 seconds	• Groups 25-28	• Paths 21-40
	4.0 seconds	• Groups 29-32	• Paths 41-60
		• Continue until all 100 Groups are processed, then continue through 150 Paths	• Continue until all 100 Groups and 150 Paths are processed
		Refresh of all queues and groups takes 31.5 seconds.	Refresh of all queues and groups takes 6.5 seconds.

NOTE: Path and Group statistics are generated and counted only if their status has changed since the previous output.

PHONE SUPPORT AND DISPLAY SETTINGS

lists the phone sets supported in ACD deployments.

Table 8: Phone set support for ACD

PHONE SETS
5212 IP Phone
5220 IP Phone
5224 IP Phone
5320e IP Phone
5324 IP Phone
I 5330, 5330e IP Phone
5340, 5340e IP Phone
5360 IP Phone
6920 IP Phone
6930 IP Phone
6940 IP Phone

NOTE:

- MiVoice 5320 IP Phones or higher are recommended.
- Silent Monitoring Agent Help is not supported on the SUPERSET 4015 phone, or the 5010, 5212, 5215, and 5312 IP Phones. However, Silent Monitoring Agent Help can be supported on these phones if Contact Center Phone Set Manager is used.

TELEPHONE FEATURES NOT AVAILABLE TO AGENTS

With the exception of the following features, ACD hot desk agents and general hot desk users have access to the same features, as do traditional ACD agents and general extension users.

An ACD agent cannot:

- Be a member of a regular hunt group or a Uniform Call Distribution hunt group
- Be a member of a ring group or a personal ring group
- Belong to a key system group
- Belong to a multi-call group
- Belong to a pick-up group
- Move or swap ACD agents

RING GROUP SUPPORT

The following types of numbers or devices can be programmed as ring group members:

- Any type of broadcast group: A directory number programmed to appear on multiple devices constitutes a broadcast group.
  - Multiline set prime number
  - Non-prime line numbers
  - Key system numbers
  - Multi-call numbers
- Single line sets
- Night bell
- SIP end-points
- Internal and external hot desk users
- Remote Directory Numbers (RDN)

NOTE: Ring group support requires a minimum of MiVoice Business 7.0.

ACD ANI/DNIS DISPLAY SETTINGS

IP phones in an Automatic Call Distribution (ACD) environment do not display ANI or DNIS digits while ringing. Instead, depending on how they have been programmed, IP phones display the ACD path name or number. After a call is answered, ANI or DNIS numbers can display, depending on which CoS options have been enabled and which numbers (ANI, DNIS, both, or none) have been sent on the trunk.

If agents are using Contact Center PhoneSet Manager or Contact Center Softphone, the screen pop/toaster or the Call Notes page can be used to display ANI/DNIS without answering the call.

illustrates how these variables function.

Table 9: Displaying ANI and DNIS numbers in an ACD environment

CoS OPTION SETTING	DIGITS SENT WITH CALL	RINGING STATE	ANSWERED STATE
Display ANI/DNIS/ISDN Calling/Called Number = No			
ANI/ISDN Calling Number Only = No			
	ANI and DNIS sent	Path number, name, trunk label, and/or number	Trunk label or number
	ANI sent	Path number, name, trunk label, and/or number	Trunk label or number
	DNIS sent	Path number, name, trunk label, and/or number	Trunk label or number
	Neither sent	Path number, name, trunk label, and/or number	Trunk label or number
Display ANI/DNIS/ISDN Calling/Called Number = Yes			
ANI/ISDN Calling Number Only = Yes			

Table 9: Displaying ANI and DNIS numbers in an ACD environment (continued)

CoS OPTION SETTING	DIGITS SENT WITH CALL	RINGING STATE	ANSWERED STATE
	ANI and DNIS sent	Path number, name, and/or DNIS	ANI
	ANI sent	Path number, name, and/or ANI	ANI
	DNIS sent	Path number, name, and/or DNIS	DNIS
	Neither sent	Path number, name, trunk label, and/or number	Trunk label or number
Display ANI/DNIS/ISDN Calling/Called Number = Yes			
ANI/ISDN Calling Number Only = No			
	ANI and DNIS sent	Path number, name, and/or ANI	ANI
	ANI sent	Path number, name, and/or ANI	ANI
	DNIS sent	Path number and/or name	Trunk label or number
	Neither sent	Path number, name, trunk label, and/or number	Trunk label or number
Display ANI/DNIS/ISDN Calling/Called Number = Yes			
Call sent to ACD Hunt group or ACD path			
	ANI and DNIS sent	Path number, name, and/or DNIS	ANI

NOTE:

- is provides guidance as to what information may be displayed under various CoS setting combinations. However, due to the variety of feature interactions and PBX and network configuration options, actual displayed information may differ from that described here.
- The behavior of DNIS numbers received on DID trunks is unaffected by the ACD environment.
- 5320 IP Phones or higher are recommended.

Chapter 4
CAPACITY AND SCALING

CAPACITY AND SCALING

This section includes examples of topology deployments, and describes how to add agent and trunk capacity, in a MiContact Center Business with IVR deployment.

A call center can be implemented in many different ways. In its most basic form, the ACD is hosted on the same switch as the office telephone system, and the mini contact center shares with all of the other office functions. This is called the Work Group Topology. IVR Routing cannot be used in the Work Group Topology. Please see the *Contact Center Blueprint* for details on the Workgroup Topology.

NOTE: The term 'workgroup' is used to refer to two separate entities, a licensing package and a topology. The Workgroup licensing package is described in the *MiContact Center Business and MiVoice Analytics System Engineering Guide* and the Workgroup Topology is described in the *Contact Center Blueprint*.

The smallest and simplest dedicated contact center deployment topology is called the Standalone Topology.

This section also describes three reference topologies for larger contact centers, as follows:

- "1 + 1 MiVoice Business Topology" on page 56
- "Scaling Resilient Topology" on page 57
- "Distributed Resilient Topology" on page 58

Refer to the *Contact Center Blueprint* for detailed information about all of the topologies discussed in this chapter.

STANDALONE TOPOLOGY DEPLOYMENT

In the Standalone Topology, the MiVoice Business controller is dedicated to the contact center function, and one controller is used in all of the required functions (single-tier architecture):

- Trunking gateway
- Path/Queue controller
- Agent controller

Figure 22 shows all of the possibilities offered by the Standalone Topology. The following functional blocks are optional:

- IVR Routing/RAD (MiVoice Business built-in Auto-attendant can be used)
- Call recording (MiVoice Call Recording)
- Outbound Dialer (MiContact Center Business Outbound)
- Business applications

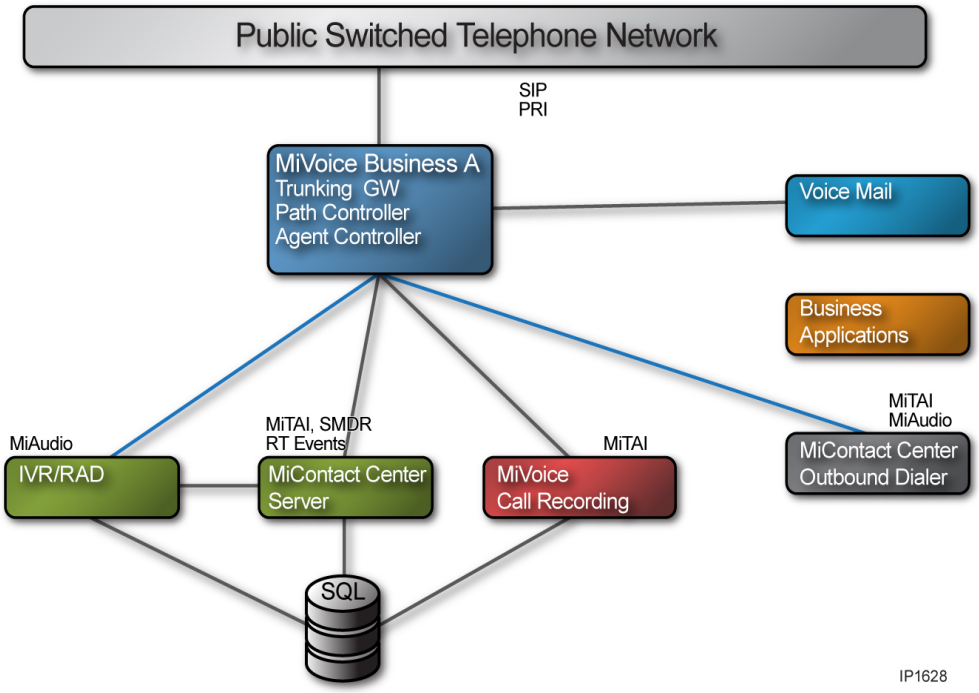

Figure 22: Standalone Topology, including all optional elements

NOTE: Mitel does not support the installation of MiContact Center Business and MiVoice Call Recording on a single server.

The following parameters describe a single-site basic Standalone Topology deployment:

- All ACD routing is done by MiVoice Business.
- Single-tier architecture - One controller carries all of the functions: gateway, queuing, and agent hosting.
- ACD real-time events are sent over the LAN to the MiContact Center Business Server.
- The agent screen is updated over the LAN.
- MiVoice Business has the following ACD queues (paths):
- Embedded RADs
- Basic ACD routing with answer point and DNIS/DID
- There are a maximum of 90 IP agents on a 3300 ICP controller, up to 350 agents if on MiVoice Business on Industry Standard Server.
- Has desk-set agents or PC-based ACD soft phone agents.
- Remote agents can be located anywhere if configured as External Hot Desking Agents (EHDA) and using the MBG Connector.

STANDALONE TOPOLOGY WITH IVR ROUTING

When a single-site contact center is configured with IVR Routing, incoming calls are handled by IVR Routing ports that reside on the MiVoice Business platform, which processes and routes each call to

the appropriate queue, based on IVR Routing call flows. (See Figure 23.)

In the event of an IVR failure, MiVoice Business embedded voice mail provides a backup solution for intercept handling, and a hot button to place hunt groups into Do Not Disturb (DND) state. Customers who require a high availability solution require multiple instances of IVR Routing and multiple telephone systems.

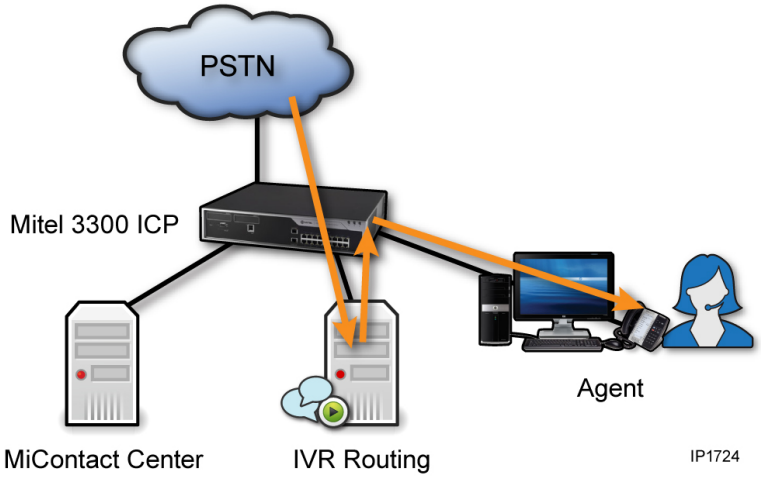

Figure 23: ACD single-site basic layout with IVR Routing

IVR Routing adds advanced features in the Standalone Topology deployment, and performs intelligent routing on:

- ANI/DNIS based routing
- Interactive menus
- Voice and Web callbacks
- Updated Position in Queue and Estimated Wait Time
- Digit collection
- Queries to external data sources
- Complex date and time based routing
- Execution of external applications, scripts, and web services
- Any combination of the above

IVR Routing ports can also be used for:

- Recorded Announcement Devices (RAD)
- Administrative functions

1 + 1 MIVOICE BUSINESS TOPOLOGY

All agents home to the same controller, and all calls queue to the same ACD controller, with all paths and agents on a single controller. This is very similar to the Standalone Topology, with the addition of a second MiVoice Business controller for failover in case the primary MiVoice Business goes out of service.

- Up to 350 agents and 999 paths/queues are supported.

- MiVoice Business on ISS or Virtual machine or 3300 ICP controller
- SIP or PRI trunking

For details, refer to the *Contact Center Blueprint* on Mitel OnLine.

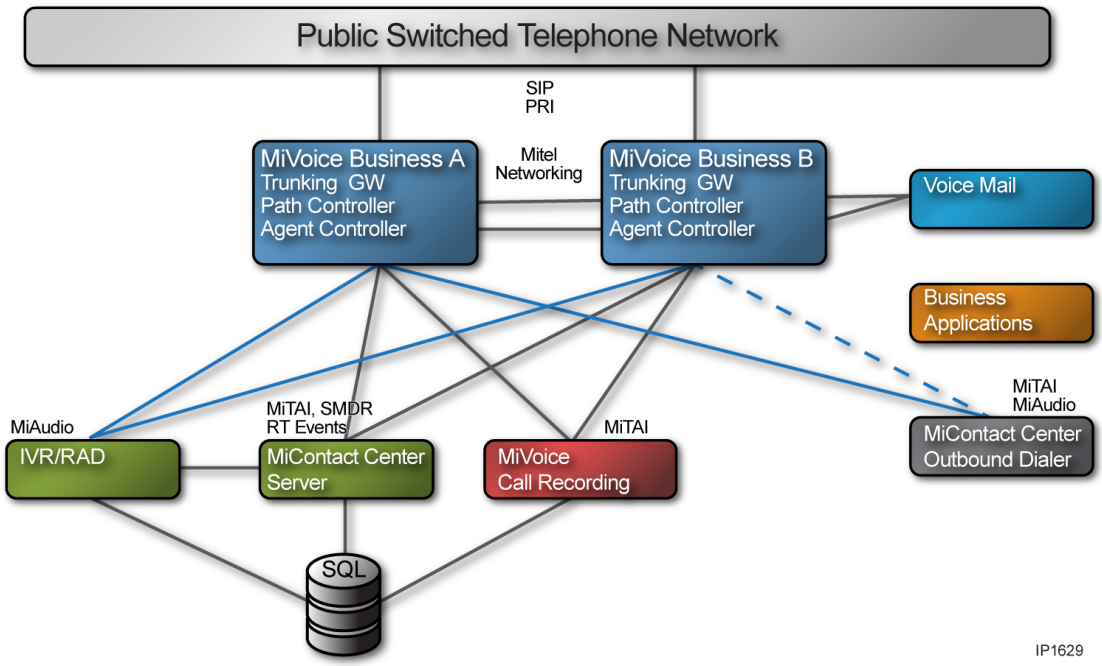

Figure 24: 1 + 1 MiVoice Business Topology

Some of the blocks shown in Figure 24 are optional, including:

- External voice mail - embedded voice mail can be used.
- MiVoice Call Recording - depending on the industry and compliance requirements
- MiContact Center Businessr Outbound (outbound dialer)
- Business applications

SCALING RESILIENT TOPOLOGY

The Scaling Resilient topology increases the number of agents and provides reduced impact to agents and callers in the event of an outage in the MiVoice Business controller. This is achieved by splitting MiContact Center Business operations into two levels and splitting the gateway functions and queues from the agents. This is also referred to as the 2-tier or 2-layer model.

This allows the agent controllers to be dedicated to hosting the agent phones and allows an increase in the number of connected agents. Splitting the gateway and queues also allows for increased number of trunk connections and the potential for multiple gateway access points; for example, a mix of both SIP and PSTN-connected trunks.

- This architecture is supported when using MiVoice Business on ISS or MiVoice Business Virtual. The 3300 ICP can be used only for the TDM gateway functionality.
- Up to 700 agents and 999 paths are supported.

- The trunking gateway shares a controller with the queuing function.
- All agents home to the centralized Agent controller.
- Incoming TDM PSTN or SIP trunks are used.

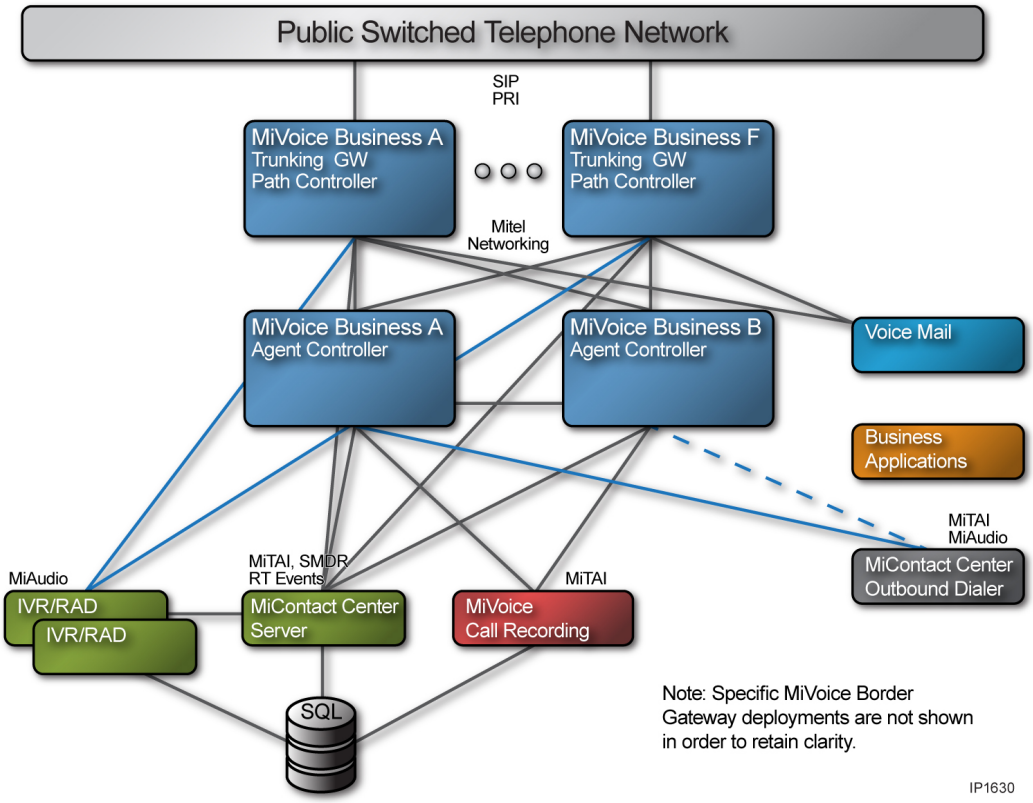

Figure 25: Scaling Resilient Topology

Some of the blocks shown in Figure 24 are optional, including:

- MiVoice Call Recording - depending on the industry and compliance requirements
- MiContact Center Business Outbound (outbound dialer)
- Business applications

DISTRIBUTED RESILIENT TOPOLOGY

The Distributed Resilient topology is typically used for large corporations that may have agents and network connections in many geographically-dispersed locations. The addition of centralized and separate path controllers and independent trunking gateways allows for increased trunk capacity and a point of presence at multiple locations.

In this topology, agents home to a dedicated ACD controller, and calls queue to a queuing gateway (or they queue virtually on an agent controller).

- Up to 700 agents and 999 paths/queues are supported.
- The trunking gateway controllers are dedicated, and do not host any paths or agents.

- All paths reside on queuing gateway controllers.
- All agents reside on a single controller.
- Incoming SIP or TDM trunks are used.

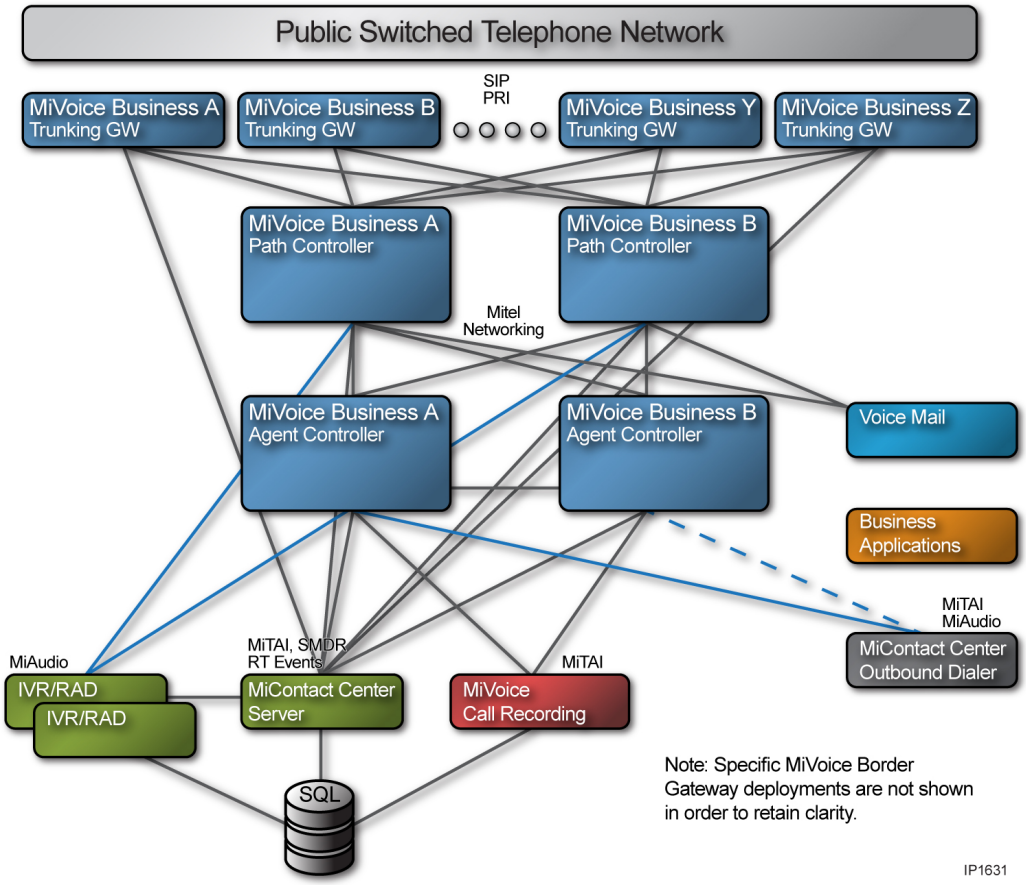

Figure 26: Distributed Resilient Topology

Some of the blocks shown in Figure 24 are optional, including:

- MiVoice Call Recording - depending on the industry and compliance requirements
- MMiContact Center Business Outbound (outbound dialer)
- Business applications

TRUNK CAPACITY

Mitel 3300 ICP controllers can support up to 128 gateway channels, depending on the controller variant. This section describes several ways to add trunk capacity to your call center. Use the following general rules in planning trunk capacity:

- For single-tier or two-tier deployments, calculate using 128 gateway channels.
- For three-tier deployments, calculate using 192 gateway channels.

For a description of single-tier, two-tier, and three-tier deployments, see the *Contact Center Blueprint*.

ADDING TRUNK CAPACITY WITH MiVOICE BUSINESS QUEUING GATEWAY

The E2T on the expanded 3300 ICP MXe supports 128 TDM-to-IP channels. To add trunks, you can add another MiVoice Business as a Queuing Gateway, as illustrated in Figure 27.

In this deployment:

- The new controller is used for TDM-to-IP conversion.
- The new controller is used as a second Queuing Gateway that terminates trunks and has local ACD Path programming through network ACD.
- RADs are programmed on both Queuing Gateways
    - RAD is embedded on the controller
    - If IVR Routing is handling RADs, RAD ports must be configured to both MiVoice Business instances
- Agents can be on either controller
    - A maximum of 90 IP agents on each
    - To provide resilient operation, a maximum of 90 IP agents total

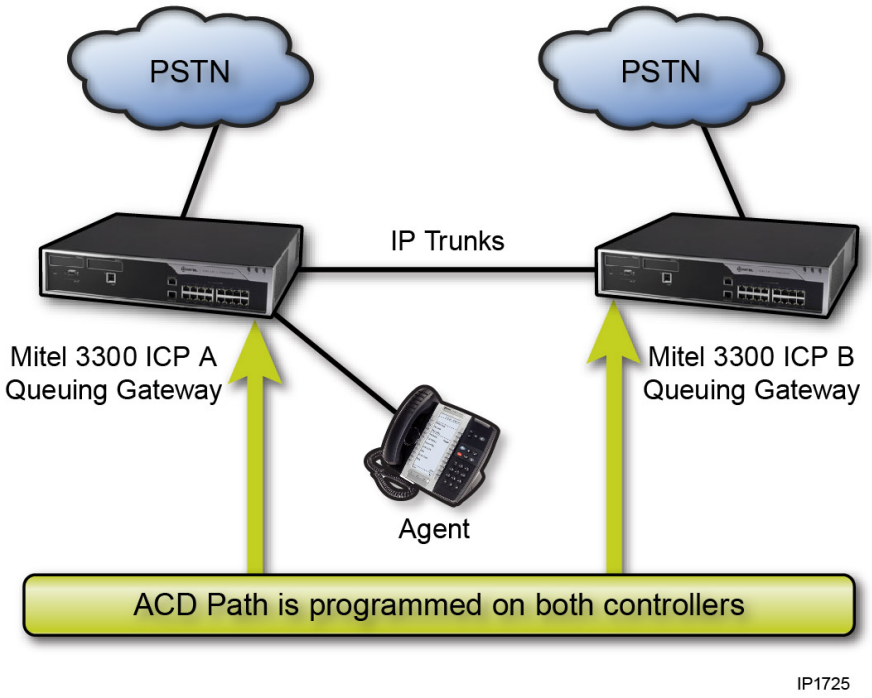

Figure 27: Adding Trunk capacity with MiVoice Business queuing gateway

ADDING TRUNK CAPACITY WITH MICONTACT CENTER BUSINESS AND IVR ROUTING

The following figure shows how to add trunk capacity with MiContact Center Business and IVR Routing. This configuration also provides a single point of administration for MiContact Center Business and IVR Routing across multiple sites. See "IVR Routing Port Sizing Wizard" on page 64 for help planning this deployment.

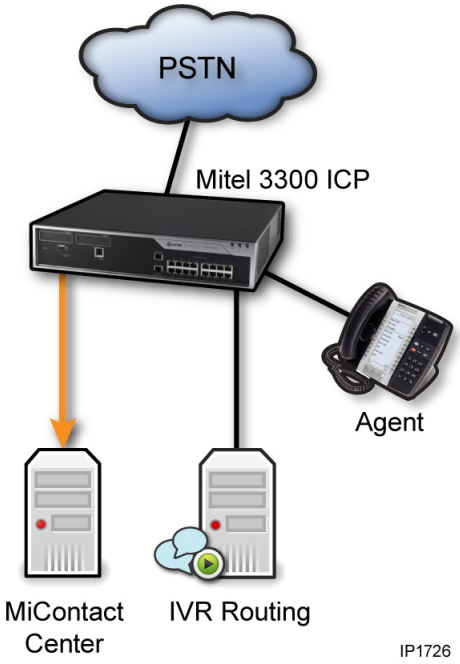

Figure 28: Increased trunk capacity and single-point administration

MULTI-NODE (MULTI-SITE) IVR ROUTING

Multi-node IVR Routing provides:

- Up to 100 ports per IVR server; and 120 ports per MiVoice Business
- Failover support; resilient port support
- Configuration and management of multiple PBXs on the same server, from one location
- The ability to scale up, while lowering the cost of ownership
- Backup solution on MiVoice Business embedded voice mail

See "IVR Routing Port Sizing Wizard" on page 64 for help planning this deployment.

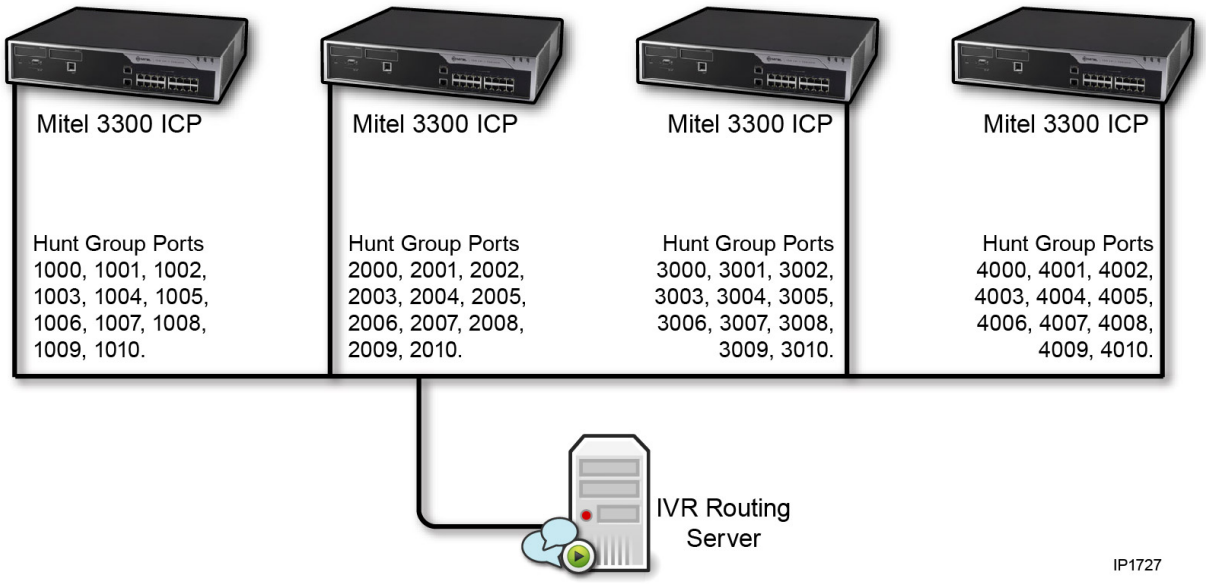

Figure 29: Multi-node (Multi-site) IVR Routing

Figure 29 illustrates multiple trunking/queuing gateways being served by a single IVR server. Each gateway has its own hunt group with dedicated IVR ports.

DUAL GATEWAY/IVR ROUTING DISASTER RECOVERY

Dual IVR Routing provides:

- Up to 100 ports per IVR server
- Configuration and management of multiple IVR Routing instances from one interface
- Programmable load balancing between two IVR Routing servers
- A redundant server for failover support in the case of hardware or software failure of one of the IVR Routing servers

Dual IVR Routing servers offer two key benefits:

- Increasing the capacity by sharing the load between two servers by using IVR ports interleaving. The following figure shows interleaving with odd ports to Server A and even ports to Server B. This allows the enterprise to continue scaling up while maintaining required service levels.
- Adding a redundant server in a hot/hot configuration to take over if the primary server fails. See "Virtual contact centers" on page 92.

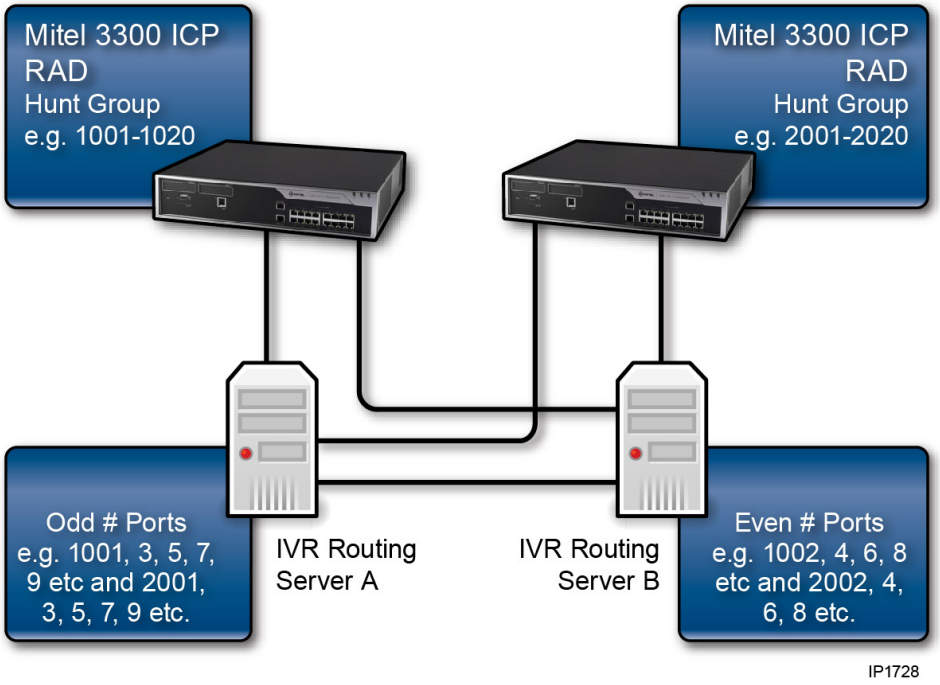

Figure 30: Dual Gateway/IVR Routing backup for disaster recovery

IVR ROUTING PORT SIZING WIZARD

The IVR Port Sizing Wizard is a tool that helps you determine the number of IVR port and servers you require based on your contact center configuration and the IVR functionality you want to access. The IVR Port Sizing Wizard is described in and can be accessed from this Knowledge Base article: http://micc.mitel.com/kb/KnowledgebaseArticle51487.aspx. We recommend using Internet Explorer as your browser when accessing the wizard.

Based on engineering guidelines developed by Mitel and using the answers you provide to a series of questions, the wizard creates a summary report of a suggested configuration that is tailored to your contact center requirements. The report includes the choices you made during the process and suggested totals for messaging ports, callback ports, UPiQ ports, RAD ports, All ports, and servers.

MiVOICE BUSINESS ACTIVE AGENT CAPACITIES

This section describes MiVoice Business agent capacities, including how these numbers change with call volume.

Figure 31 shows an ACD configuration that uses 3300 ICP digital queuing gateways. For configuration details, see the MiVoice Business System Administration Tool Online Help.

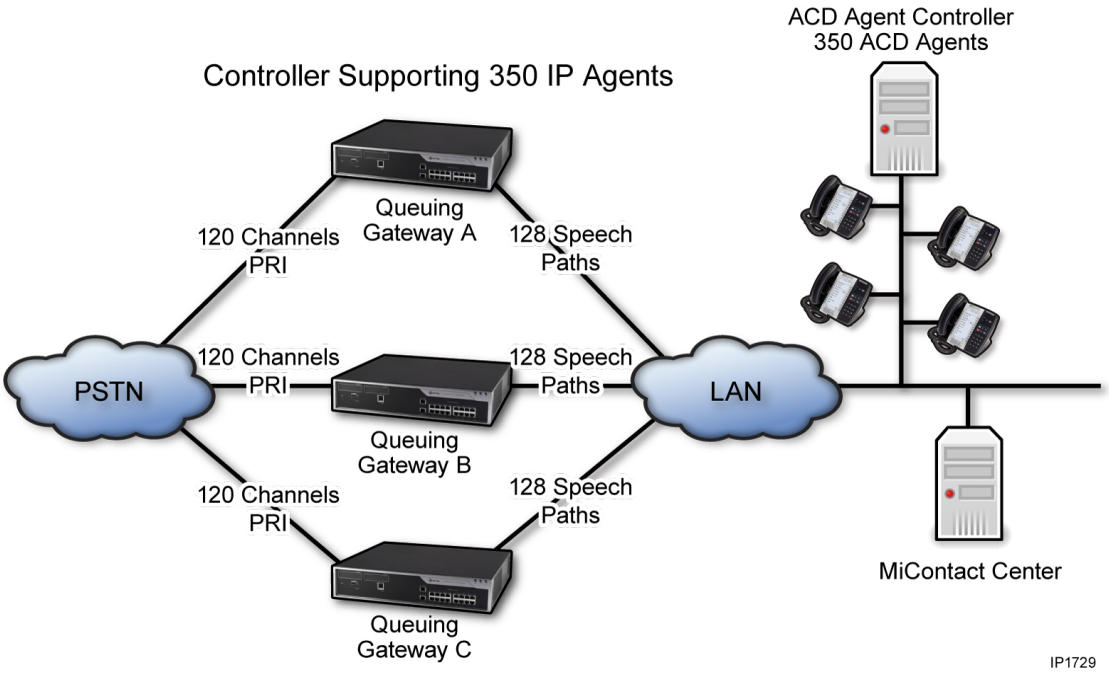

Figure 31: Controller supporting 350 IP agents

ADDING AGENT CAPACITY

The MiVoice Business on 3300 ICP MXe controller, with trunks, queuing, and agents on the same controller, is currently limited to 90 simultaneous IP agents. If more agents are needed, you can split the functions over multiple controllers to have dedicated queuing gateways and agent controllers. This type of deployment uses Mitel Network ACD. See Figure 32.

- Queuing Gateway
  - This is where ACD Paths and RADs are programmed
- Agent controllers
  - Up to 700 simultaneous agents (MCD Release 5.0+ and MiVoice Business) when deploying MCD/MiVoice Business on Industry Standard Servers (ISS)
  - Agents only (No trunks or RADs)

When agents are split across multiple controllers, the deployment uses Network ACD. If you do not need to implement an overflow mechanism, you can configure all agents in the same group on the same controller.

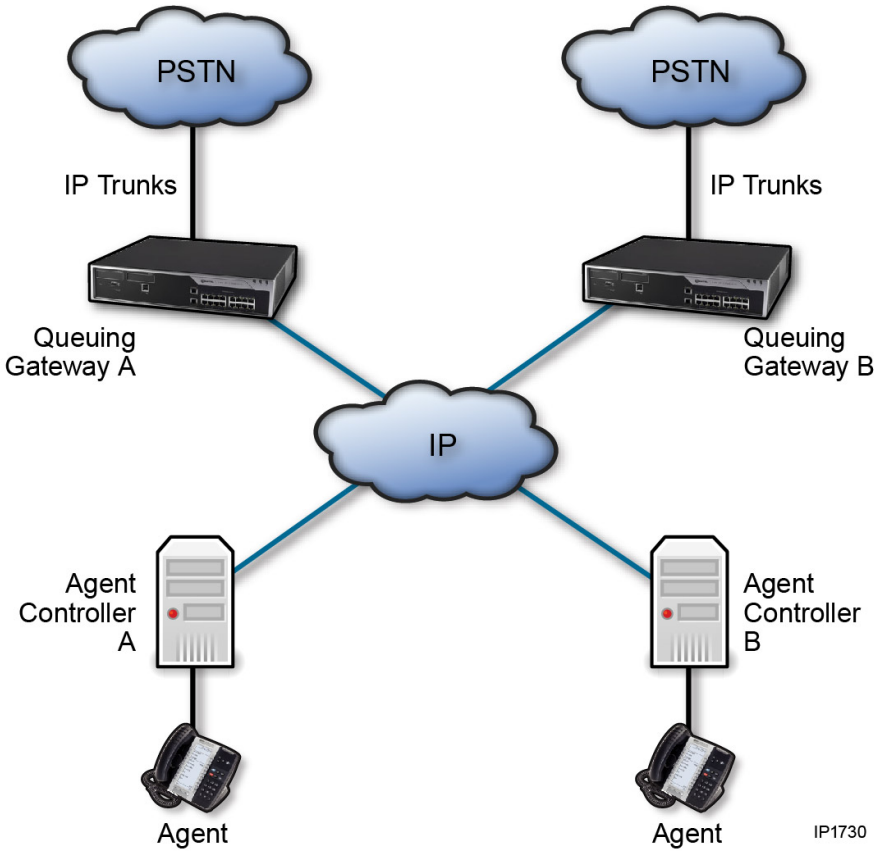

Figure 32: Adding agent capacity

ADDING AGENT CAPACITY WITH MICONTACT CENTER BUSINESS OVERLAY

If you add MiContact Center Business to a deployment that includes dedicated Queuing Gateways and Agent Controllers using Network ACD, as shown in Figure 33:

- ACD Real-Time Events and SMDR records are sent over the IP network to the MiContact Center Business Server:
  - ACD Port # TCP 15373
  - SMDR Port # TCP 1752
  - Traffic (optional) port # 1754
- One MiContact Center Business Server and a Contact Center Starter Pack are required.
- You can place a local buffer PC at remote sites to continue data collection in the case of IP network failure.

NOTE: When deploying separate queuing gateways and agent controllers, the Mitel IVR ports must be programmed on the queuing gateways and not on the agent controllers.

ADDING AGENT CAPACITY WITH IVR ROUTING OVERLAY

To add agent capacity with IVR Routing, connect one or more IVR Routing servers to the queuing gateways; they do not have to be plugged directly into the controller. (See Figure 33.)

For detailed information about implementing ACD Resiliency, refer to the *MiVoice Business Resiliency Guidelines*, available on Mitel OnLine.

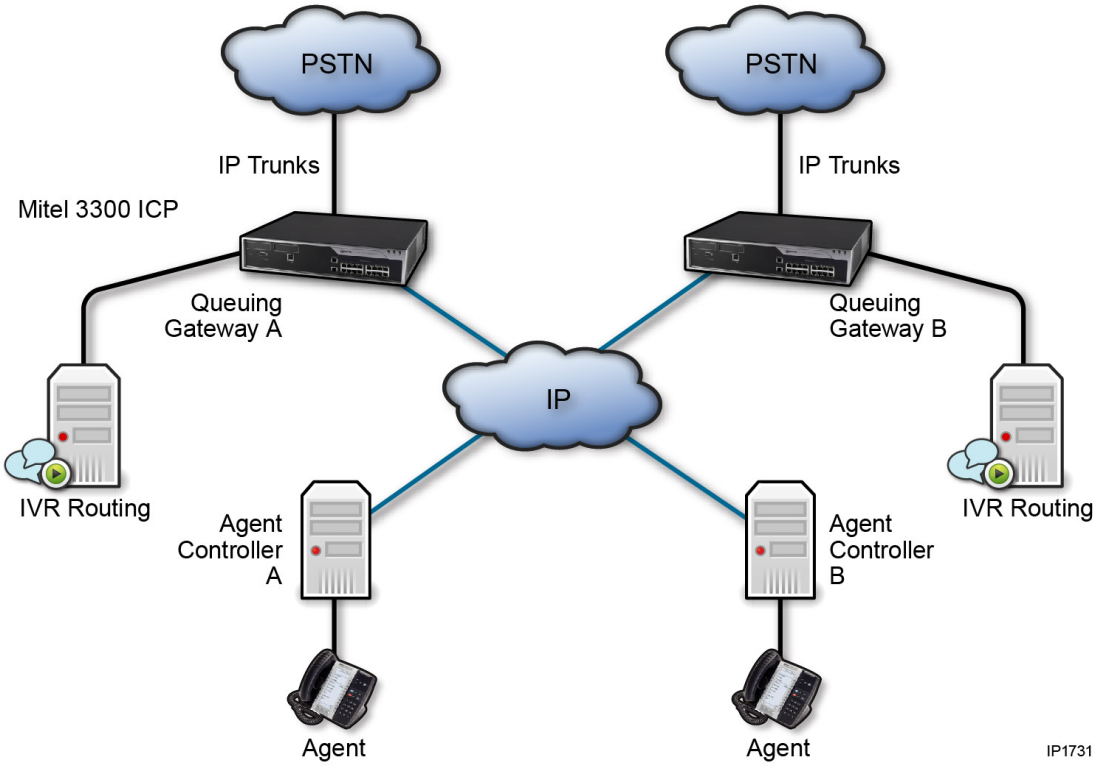

Figure 33: Adding agent capacity with MiContact Center Business and IVR Routing overlay

MAXIMUM ACD DIMENSIONING

Using MCD 5.0+ significantly increased active agent ACD capacities for MiVoice Business running on Industry Standard Servers (ISS). Although some ACD dimensioning increases have been applied to the MiVoice Business controller variants, no performance improvements have been made on those platforms in terms of supporting an increased number of active agents.

shows the ACD limits by platform.

Table 10: ACD dimensions by platform

	MiVOICE BUSINESS MICONTACT CENTER BUSINESS			
	3300 ICP CXI II	3300 ICP MXE III	MCD ON ISS MiVOICE BUSINESS VIRTUAL	MiVOICE BUSINESS MULTI-INSTANCE[1]
Max Agents - Single Node	50	90	350	350
Max Agents - Single Node; cluster with paths on Gateway Controllers[2]	50	90	700	700
Total Programmed Agent DNs	50	1180	2100	2100
Max Programmed Queues (Paths)	999	999	999	999
Max Skill Groups	256	256	999	999
Max Skill Levels within a Group	500	500	500	500
Max Agents Programmed per Skill Group	500	500	700	700
Max Agent Skills Groups per Agent	16	16	60	60
Max Dial Out of Queue Points	500	500	500	500
Max Work Timer Length	4 hours	4 hours	4 hours	4 hours
Max IVR Routing Ports	100 total, 120 per controller	100 total, 120 per controller	100 total, 120 per controller	100 total, 120 per controller

NOTE:

- ISS is Industry Standard Server.
- With agents on a dedicated agent controller.

ACTIVE AGENT BASELINE CALCULATIONS

Calculations of active agent numbers use the following assumptions:

- 30 Centum Call Seconds (CCS) (approximately 27 Calls per Hour (CPH))
- Two minutes handling time per call
- Each agent is in five skill groups
- One overflow group is configured and available
- Full MiTAI monitoring of Paths, agents, and IVR ports
- All calls are routed through IVR

The supported number of active agents can change if the baselines change. Refer to the *MiVoice Business Engineering Guidelines* and the Mitel Engineering tool when modeling ACD for specific call center opportunities.

AGENT CAPACITY BASED ON CALL VOLUME

The following tables show how the supported active agent capacities for a given controller and network topology vary based on the Calls per Hour (CPH) that must be handled.

Refer to the *MiVoice Business Engineering Guidelines* for further detail.

Table 11: Agent capacity per controller, based on call volume

NUMBER OF AGENTS	CALL HANDLING TIME (CHT)	CALLS PER HOUR (CPH)	CPH/AGENT	NOTES
MiVoice Business/ISS All-in-one Controller				
IP Agents, SIP trunks, active in 5 groups, 1 overflow per path, IVR, MiTAI				
100	30	12000	120	
200	60	12000	60	
300	90	12000	40	Removing IVR or MiTAI improves Agent count.
400	120	12000	30	
600	180	12000	20	
700	240	12000	15	
MiVoice Business/ISS Dedicated Agent Controller				
IP Agents, IP trunks to gateway(s) (path controllers), active in 5 groups, 1 overflow per path				
150	30	18000	120	
300	60	18000	60	Removing IVR or MiTAI does not significantly improve performance.
450	90	18000	40	
600	120	18000	30	
700	180	18000	20	
MXe-III All-in-one Controller				
IP Agents, PRI trunks, active in 5 groups, 1 overflow per path, IVR, MiTAI				

Table 11: Agent capacity per controller, based on call volume (continued)

NUMBER OF AGENTS	CALL HANDLING TIME (CHT)	CALLS PER HOUR (CPH)	CPH/AGENT	NOTES
10	30	1200	120	Removing IVR or MiTAI improves Agent count.
20	60	1200	60	
30	90	1200	40	Traffic limited by E2T resources, performance of embedded trunks and IVR.
40	120	1200	30	
60	180	1200	20	
80	240	1200	15	
100	300	1200	12	
MXe-III All-in-one Controller				
IP Agents, SIP trunks, active in 5 groups, 1 overflow per path, IVR, MiTAI				
15	30	1800	120	
30	60	1800	60	
45	90	1800	40	With SIP trunks, limit is entirely performance.
60	120	1800	30	
90	180	1800	20	
120	240	1800	15	
150	300	1800	12	
MXe-III Dedicated Agent Controller				
IP Agents, IP trunks to gateway(s) (path controllers), active in 5 groups, 1 overflow per path, IVR, MiTAI				
25	30	3000	120	
50	60	3000	60	
75	90	3000	40	Removing IVR or MiTAI does not significantly improve performance.
100	120	3000	30	
150	180	3000	20	
200	240	3000	15	
250	300	3000	12	

SIP SUPPORT FOR CONTACT CENTERS

Topics covered in this section include:

ETHERNET-TO-TDM (E2T) CHANNEL CONSUMPTION

A SIP trunk environment does not eliminate E2T channel consumption when a 3300 ICP controller (MXeIII, for example) is used for Paths. Although no E2T channels are consumed for callers talking to agents, E2T is consumed when RADs or MOH are played to queued callers. One E2T channel is consumed for every queued caller listening to a RAD or MOH. This is true whether the RAD/MOH source is embedded on the MiVoice Business controller or provided using an IP connection through IVR Routing. You must consider these E2T boundary limitations when introducing SIP to a contact center environment. However, if SIP trunks are used on a MiVoice Business/ISS box where paths are queued, no E2T channels are used. Host Media Processing services are used to play the RADs.

SIP TRUNKING

NOTE: If you use external outbound SIP trunks, they must be programmed with a unique reporting number—not the default 9999.

CONSIDERATIONS AND LIMITATIONS

MiContact Center Business, MiVoice Analytics, and Traffic Analysis trunk performance reports are limited in the following ways when using SIP trunking:

- All SIP trunk performance is consolidated into a single carrier view, so you cannot report on the performance of individual SIP trunks in MiContact Center Businessand MiVoice Analytics.
- Trunk group busy reports, and all trunk performance reports that detail individual trunk data, are unavailable.
- Traffic Analysis trunk reports are not supported.

Mitel agents are not supported on SIP end-points. Agents can be supported only on SIP end-points that use an External Hot Desking implementation. See "External hot desking for ACD agents" on page 29.

Chapter 5
RESILIENCY AND AVAILABILITY

ACD RESILIENCY

For a full discussion of contact center resiliency and availability, refer to the *Contact Center Blueprint*, available on Mitel OnLine.

NOTE: Only MiVoice Business platforms support ACD resiliency.

ACD resiliency provides failover of agents and service continuity on the telephone network. contact center resiliency provides failover reporting and real-time monitoring while the users are in failover mode. With ACD Resiliency:

- Calls in queue are not lost.
- Calls in progress are maintained.
- The system can handle new incoming and outgoing calls.
- Single points of failure are minimized.
- Monitors notify system administrators when agents are in failover mode.
- System reports agent performance without breaking up the shift.

NOTE: Refer to the ACD documentation in the MiVoice Business System Administration Tool Online Help and the *MiVoice Business Resiliency Guide* for programming instructions.

A resilient ACD configuration is typically made up of a queuing gateway or gateways, a primary agent controller, and a secondary agent controller programmed within a MiVoice Business cluster. The ACD paths are configured on the queuing gateways to direct calls to the resilient ACD agent groups that are configured on both the primary agent and secondary agent controllers. During normal operation, the queuing gateways direct the ACD calls to the primary agent controller. If the primary agent controller fails, calls are redirected to the secondary agent controller. The resilient agents and resilient agent groups fail over to the secondary agent controller and can continue to process the incoming ACD calls.

ACD paths are not resilient, but you can achieve a level of ACD path resiliency by programming two paths with the same configuration information on multiple queuing gateways. You configure each path with a unique directory number within the cluster. Traffic to these paths can be evenly split across gateways ensuring that any one gateway outage will not result in the loss of all calls queued to a specific path, and also ensure that the path remains available for future calls from the gateways that did not suffer the outage.

NOTE: To make this a virtual path for reporting purposes, use different path directory numbers on each gateway but the same or common path reporting number. This will ensure that the CCMWeb reporting application reports on it as a single path. The same applies to the group reporting numbers programmed within each path.

ACD RESILIENCY CONFIGURATIONS

ACD resiliency configurations are classified based on the level of resiliency achieved. Three resiliency models are described in this section.

- Basic ACD resiliency
- Intermediate ACD resiliency
- Advanced ACD resiliency

For detailed information about ACD Resiliency and converting an ACD network to a resilient ACD network, refer to the *MiVoice Business Resiliency Guide* and the resiliency and availability recommendations in the *Contact Center Blueprint*.

BASIC ACD RESILIENCY

This section provides two basic ACD Resiliency configurations. Also see "IVR Routing availability " on page 22.

BASIC 1: TWO CONTROLLERS - 90 AGENTS DIVIDED BETWEEN THE CONTROLLERS (RECOMMENDED)

Features of Basic 1:

- This configuration supports agent device resiliency.
- This configuration does not support Agent Skills Group resiliency.
- The E2T boundary limits the agent total to 128, depending on the controller variant, and whether a two-tier or three-tier topology is deployed.

As shown in Figure 34, the ACD agents and paths are programmed on both MiVoice Business agent controllers, so that the PSTN calls are split evenly between the controllers. Each controller is both a primary and secondary agent controller in the event of a failure on either controller. This configuration enables automatic failover to the secondary agent controller, upon outage, and automatic return of the agents to the primary agent controller, upon its return to service.

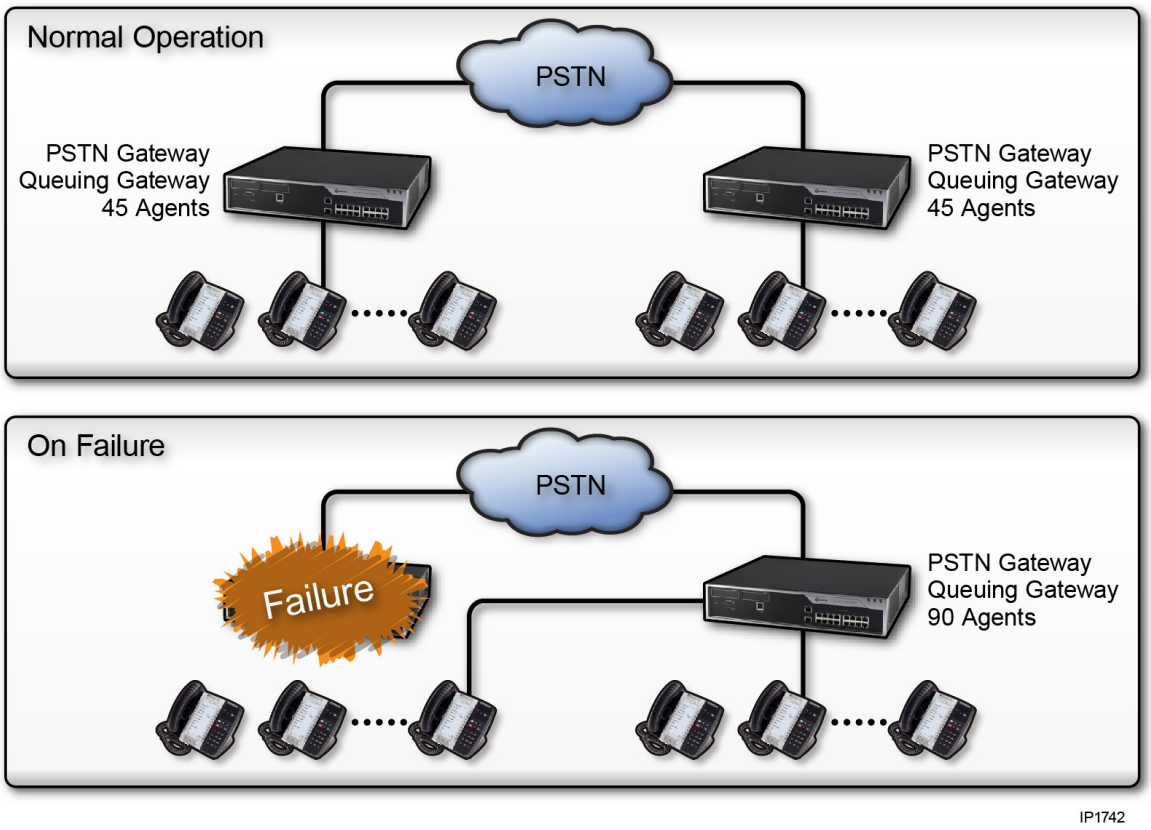

Figure 34: Basic ACD Resiliency - 1 (Recommended)

BASIC 2: TWO CONTROLLERS - ALL 90 AGENTS ON ONE CONTROLLER

Features of Basic 2:

- This configuration supports agent device resiliency.
- This configuration supports Agent Skills Group resiliency.
- The E2T boundary limits the agent total to 128, depending on the controller variant.

In Figure 35, all PSTN calls land on the queuing gateway and queue to ACD paths. The gateway also acts as a secondary agent controller in the event of a failure. This configuration provides automatic failover to the secondary agent controller, upon outage, and return of the agents to the primary agent controller, upon its return to service.

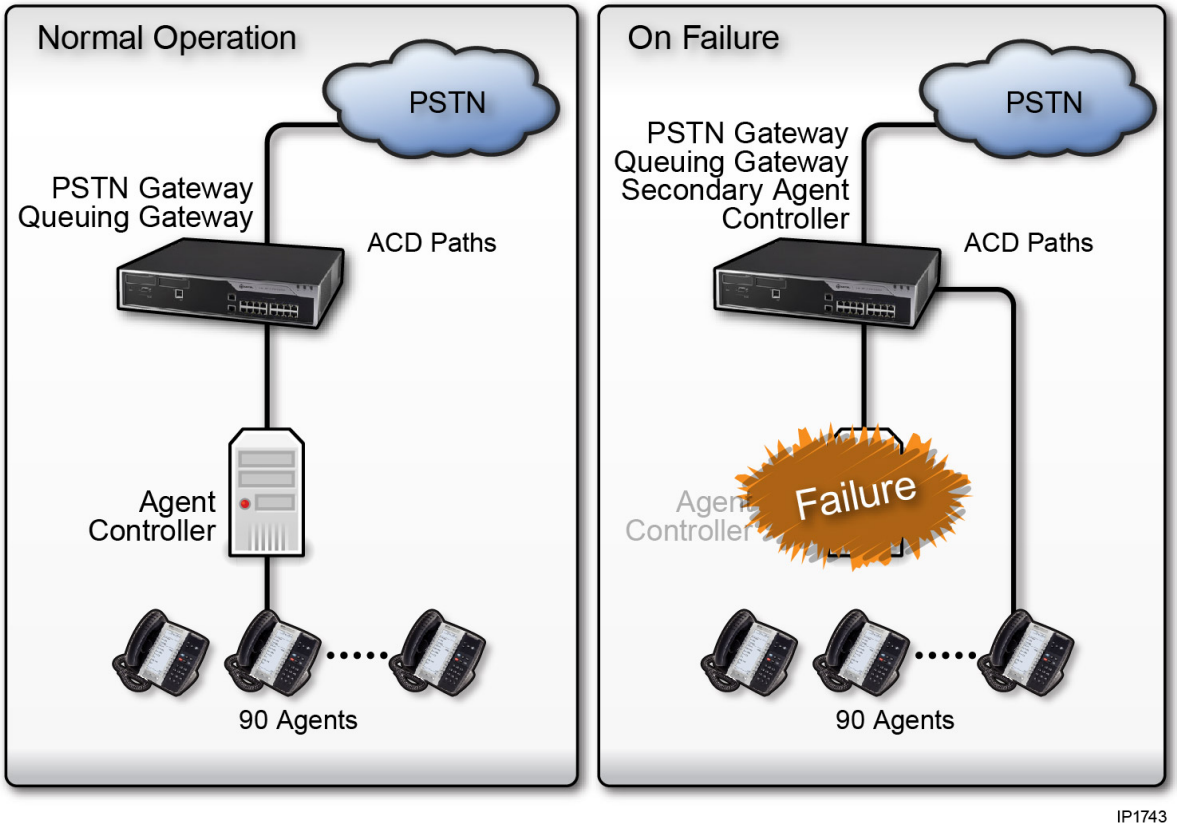

Figure 35: Basic ACD Resiliency - 2

INTERMEDIATE ACD RESILIENCY

This section provides two intermediate ACD Resiliency configurations.

INTERMEDIATE 1: THREE CONTROLLERS WITH UP TO 120 AGENTS

Features of Intermediate 1:

- This configuration supports agent device resiliency.
- This configuration supports Agent Skills Group resiliency.
- The E2T boundary on the 3300 ICP used as the PSTN gateway limits the agent total to 128, depending on the controller variant. Additional gateways can be used to support a maximum of 350 agents.
- This configuration supports path resiliency.

In the intermediate configuration shown in Figure 36, calls are split evenly by the central office between the two 3300 ICP Queuing Gateways where the paths are programmed. In this configuration, if one gateway fails, all incoming traffic can be diverted to the other gateway. If the Agent Controller fails, calls and agents are diverted to the secondary controller, which also serves as a queuing gateway. The ACD path calls queue on the gateways and are routed to the agent controller

when agents become available. In Intermediate Configuration 1, the second gateway is used for trunking and path resiliency rather than for incremental E2T.

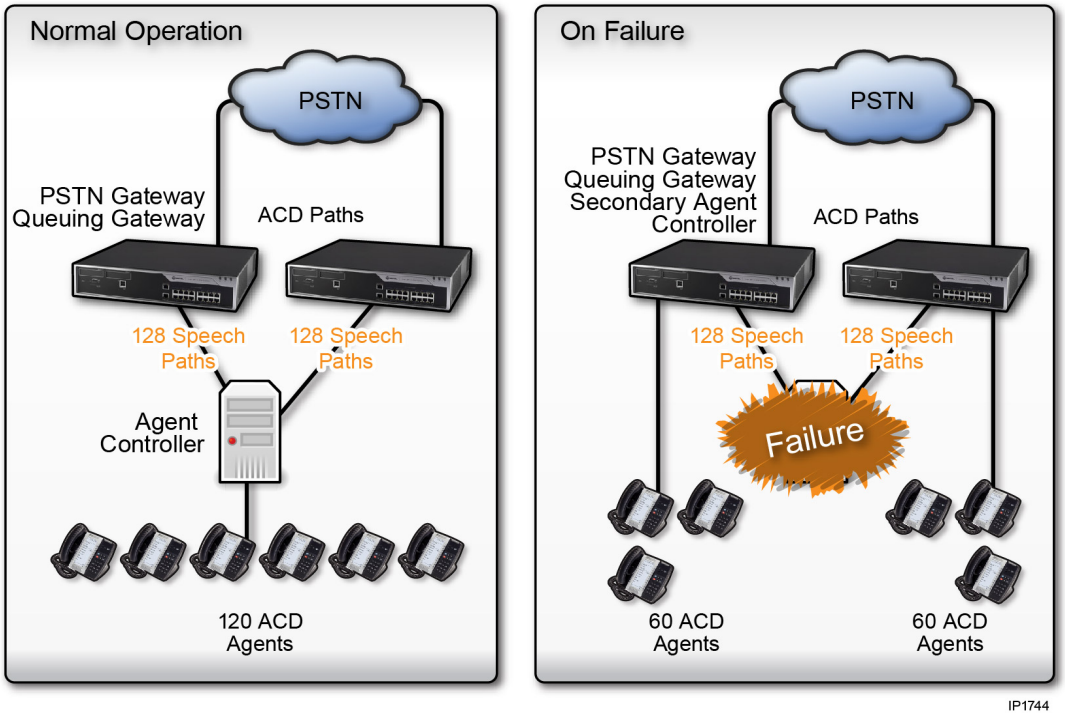

Figure 36: Intermediate ACD Resiliency - 1

INTERMEDIATE 2: THREE CONTROLLERS SCALING TO UP TO 180 AGENTS

Features of Intermediate 2:

- The configuration supports path resiliency
- The configuration supports group resiliency, depending on how the resiliency groups are configured
- The configuration supports agent device resiliency
- The configuration supports 180 agents, but additional gateways can be added to scale to a maximum of 350 agents

In the Intermediate Configuration 2, shown in Figure 37, the ACD paths and PSTN calls are split evenly between two queuing gateways, and all 180 agents are hosted on the agent controller.

In this configuration, if one gateway fails, all incoming traffic can be diverted to the other gateway. ACD path calls queue on the gateways and are routed to the agent controller when agents become available.

This configuration provides automatic agent failover to the secondary agent controllers (the queuing gateways), upon outage, and recovery back to the primary agent controller upon its return to service.

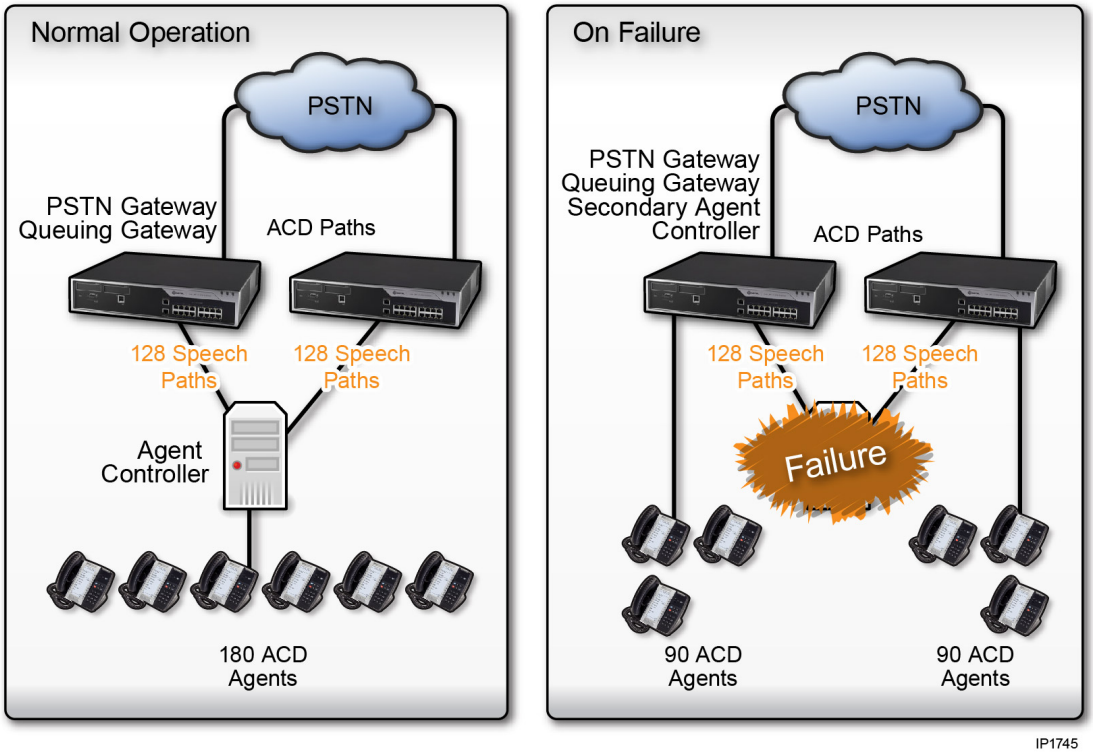

Figure 37: Intermediate ACD Resiliency - 2

ADVANCED ACD RESILIENCY (RECOMMENDED)

ADVANCED RESILIENCY: TWO CONTROLLERS - 1 PRIMARY AND 1 SECONDARY

- This configuration supports path resiliency, group resiliency, and agent device resiliency.
- This configuration supports up to 700 agents, at 30 Calls per Hour when using an ISS as an agent controller.

In the configuration shown in Figure 38, the ACD paths are programmed on multiple queuing gateways, and the PSTN calls are split evenly between the gateways. If one gateway fails, all incoming traffic can be diverted to another gateway. The ACD path calls queue on the gateways and are routed to the agent controller when agents become available. This configuration provides automatic agent failover to the secondary agent controller, upon outage, and failback to the primary agent controller upon return to service.

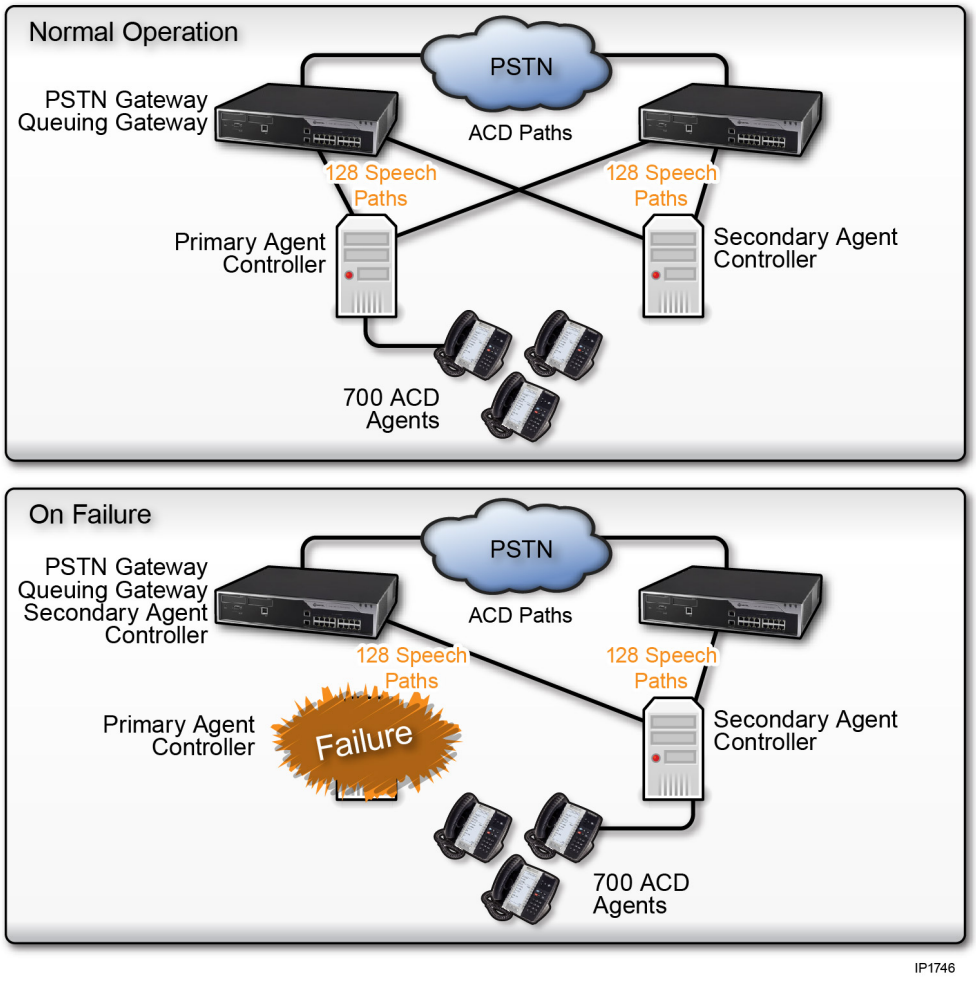

Figure 38: Advanced ACD Resiliency (Recommended)

NOTE: Mitel does not support configurations using transit nodes. The IP trunking must be direct between the queuing gateway and the agent controller.

MICONTACT CENTER BUSINESS SUPPORT FOR MiVOICE BUSINESS RESILIENCY

MiContact Center Business real-time monitoring, reporting, and Interactive Contact Center support MiVoice Business resiliency in the event of an outage or failure on the primary controller.

The following MiContact Center Business applications support MiVoice Business resiliency, as described here:

- Interactive Visual Queue: CTI control of callers in queue while in failover mode
- The following devices can fail over from one telephone system to another:
  - Contact Center Softphone extensions
  - Hot desk extensions
  - Hot desk agents
- IVR Routing ports on the telephone system: IVR Routing ports can fail over to another telephone system. See "IVR Routing resiliency and redundancy" on page 81.
- Support for contact center reporting on hot desk agents while in failover mode, including:
  - Real-time monitoring of hot desk agents
  - Reporting on hot desk extensions
  - Real-time monitoring and reporting for hot desk general business extensions

IVR ROUTING RESILIENCY AND REDUNDANCY

IVR Routing provides availability by supporting:

- Redundant ports that compensate when one IVR system fails
- Self-sufficient remote instances that continue to function if they lose access to the primary database or site
- Resilient ports across MiVoice Business controllers

The MiContact Center Business Server enables IVR system configuration and provides real-time statistics to ensure effective call routing. If the MiContact Center Business Server goes off-line:

- Real-time connectivity will be lost.
- Changes to the IVR Routing system cannot be provisioned.
- Cached data ("last known good") is used as the reference for call statistics.

In rare situations, when the MiContact Center Business Server goes off-line, real-time connectivity is lost and all call flow components that depend on data derived from real-time queue statistics are affected; for example, queue condition activities, and Updated Position in Queue (UPiQ) messages.

IVR ROUTING RESILIENCY

Resiliency capabilities are dependent on the Mitel PBX configuration. If one controller fails, ports registered on that controller fail over to the defined secondary element and continue to function after they are registered (usually after a period of about two minutes). After the port is registered on the secondary controller, the IVR Routing call flow must be loaded onto that port. The complexity of the call flow and the number of ports in the hunt group affect the length of time it takes for all ports to become active.

NOTE: For ports to be resilient, they must be programmed directly on the PBX. To define a port as resilient, enter the secondary element on the **User and Device Configuration** form on the PBX. The secondary element must be a valid controller on your cluster.

After the secondary element has been defined, you can do one of the following:

- Perform a YourSite Explorer synchronization to update the port information from the PBX.
- Enter the secondary element information manually if the port is already present in YourSite Explorer.

Some configuration details:

- There is an interaction between the **Resilient IVR ports** and **Virtual Queue Groups**.
    - If the **primary IVR** and **Virtual Queue Group** queues are on the same PBX, all calls to the secondary IVR are lost if the first queue is unavailable. This is because the algorithm always routes the calls to the first queue.
    - If the **primary** and **secondary IVRs** are on a different PBX than the **Virtual Queue Group** queues, then the **Virtual Queue Group** acts as a load balancing mechanism. If the PBX fails, all calls through the primary IVR are lost; however, you can still handle calls through the secondary IVR. For more information, see the *MiContact Center Business Installation and Administration Guide*.
- When IVR Routing functionality is not contingent on being co-located on the MiContact Center Business Server, you can turn IVR Services off on the Enterprise Server to save on

memory usage (configuration scenarios 2, 4, 5, 6, and 7, below). When you do this, the IVR Services on the Enterprise Server do not control any ports or perform any IVR Routing functions; however, IVR Services are included in the configuration figures for these scenarios to indicate they are a valid failover option if one of the remote IVR instances goes off-line.

For more information concerning resiliency, see the *MiVoice Business Resiliency Guidelines,* available on Mitel OnLine.

IVR ROUTING REDUNDANCY

For redundancy, you must have two or more installed instances of IVR Routing. Purchasing a redundant IVR Routing Server and redundant ports equal to the number of primary ports (as defined by the IVR Port Sizing Wizard) allows for minimal call disruption in the event of an IVR Routing server failure. To enable IVR Routing redundancy, each IVR Routing port is assigned to a dedicated IVR Routing instance. If an IVR Routing server fails, ports assigned to that IVR Routing instance will cease to function. The secondary IVR Routing instance must be provisioned with enough ports to handle anticipated load in the event that one IVR Routing instance fails.

For example, if your call flow and traffic require 40 ports to handle all incoming calls, you would typically program 20 IVR Routing ports to be controlled by IVR Routing server A and 20 ports to be handled by IVR Routing server B. If IVR Routing server A fails, you are running at 50% capacity. Purchasing an additional 40 redundant ports and provisioning an extra 20 ports on each controller ensures you continue to handle calls at 100% capacity during an IVR Routing server failure.

Some configuration details:

- The maximum number of live calls is dependent on the number of regular (non-redundant) ports. For example, if you have 20 regular ports and 10 redundant ports, the maximum number of live calls is 20. All other calls ring, but are not answered, by the IVR Routing server until a live call completes.

ALTERNATE ANSWER POINTS

If you only have one IVR Routing server and the link between it and the PBX is lost, no calls will be processed. It is recommended that you configure an alternate answering point for calls, as a backup call handling strategy. Alternate answer points can be configured to route calls based on certain conditions, or be activated manually (for example, using the feature access code on a supervisor phone).

The following describes three methods that can be used to set up alternate answer points:

- **Intercept handling:** Intercept handling is primarily used to define an answer point when the chosen called party (IVR Routing hunt group or port) is out of service. For more information about programming the Directory Number out of service location, refer to the *MiContact Center Business Installation and Administration Guide*.
- **Call rerouting:** In situations where the called device is in service, but not answering, alternate answer points are defined on the **Call Reroute Assignment** form and the **Call Reroute First Alternate Assignment** form. Call reroute should be defined on hunt groups and ports.
- **Override button:** An override button can be programmed on a supervisor's desktop phone to manually route calls to alternate points, as needed. For example, calls could be sent to alternate answer points during scheduled maintenance or emergencies. After the key

sequence is pressed on the supervisor set, calls bypass IVR Routing and go to a new defined answer point. To program an override button, you modify the **Feature Access Assignment** form and the **Multi Line Set Key Assignment** form.

NOTE: If communication between the IVR Routing server and the MiContact Center Business Server is lost, you will not see port status in real time, and answer point report data will be lost.

SUPPORTED CONFIGURATIONS FOR IVR ROUTING REDUNDANCY AND RESILIENCY

This section describes multiple IVR Routing configuration scenarios that offer varying levels of redundancy and availability. Your configuration choice depends on your business needs.

When there is more than one controller, queues should be programmed as redundant pairs. The same queue should be programmed on each controller with the same reporting number, but a different dialable number.

NOTE: Queuing gateways are also known as controllers or PBXs.

1: SINGLE CO-LOCATED IVR ROUTING SERVER WITH A SINGLE QUEUING GATEWAY

The most rudimentary configuration scenario for IVR Routing is a single co-located IVR Routing server and a single queuing gateway (controller). This configuration does not enable redundancy or resiliency. If the controller or the server fails, callers will not be able to contact your business. When using this configuration, be sure to set up alternate answer points, as detailed above.

Some considerations for planning and deploying this configuration:

- The server can have any combination of port types (Messaging, Outbound, RAD, or UPiQ).

This configuration offers the following:

- No resiliency (the controller is not resilient)
- No port redundancy (there are only primary ports, no redundant ports)
- No IVR Routing server redundancy (only one IVR Routing server)

Figure 39 shows this configuration.

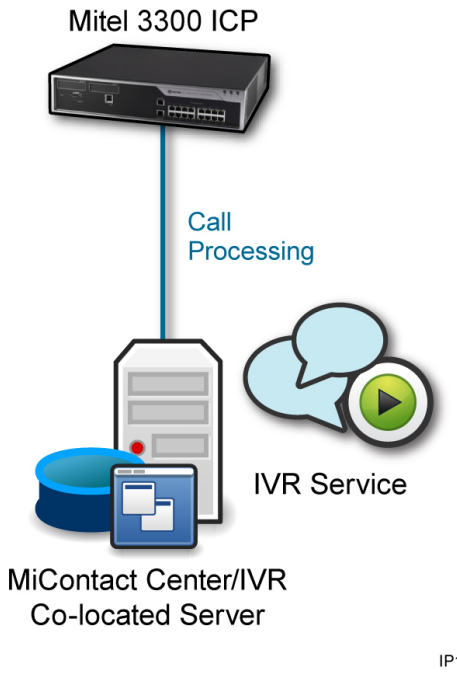

Figure 39: Single co-located IVR Routing server with a queuing gateway

2: SINGLE REMOTE IVR ROUTING SERVER WITH A SINGLE QUEUING GATEWAY

This configuration is similar to that in Configuration 1, except that the IVR Routing server is not co-located in the MiContact Center Business server. Even though the IVR Routing server is not co-located with the MiContact Center BusinessServer, the Enterprise Server can be used as an alternate call processor. Upon installation, if an IVR Routing instance license is detected, all IVR Routing services will be installed on the Enterprise Server, but they will be dormant during normal operation. However, if necessary, a port migration process can be performed, activating IVR Routing services on the Enterprise Server and allowing it to process calls.

This configuration does not enable port redundancy or resiliency. If the controller or the server fails, callers will not be able to contact your business. If you use this configuration, you must set up alternate answer points.

Some considerations for planning and deploying this configuration:

- The server can have any combination of port types (Messaging, Outbound, RAD, or UPiQ).

This configuration offers the following:

- No resiliency: The controller is not resilient.
- No port redundancy: There are only primary ports, no redundant ports.
- IVR Routing server redundancy: When you choose to have the MiContact Center Business Server control the ports, because the IVR services are always installed to the MMiContact Center Business Server and you are only licensed for one IVR server at a time, if the IVR server goes down, you can use the Enterprise Server as the backup.

- In the rare event of an Enterprise Server outage, loss of real-time connectivity affects all call flow components that depend on data that is derived from real-time queue statistics, for example, queue condition activities and Updated Position in Queue (UPiQ) messages.

Figure 40 shows this configuration.

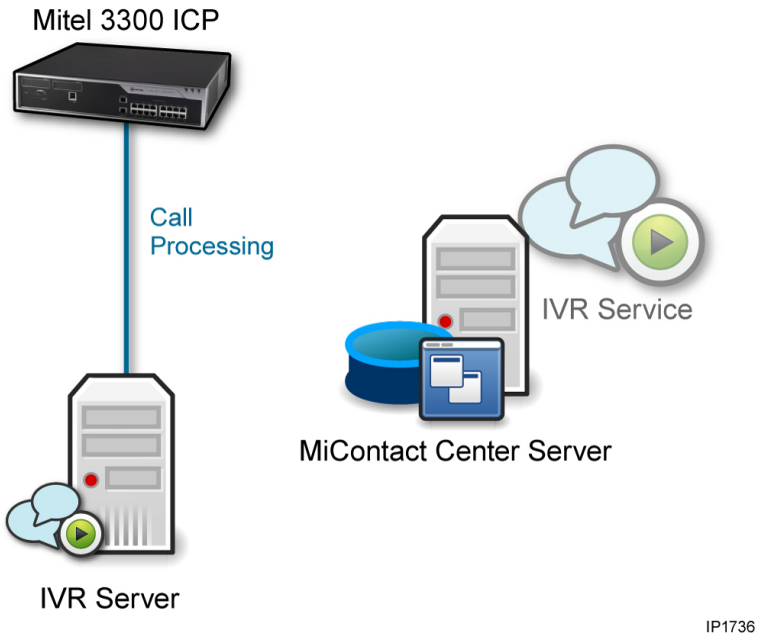

Figure 40: Single remote IVR Routing server with a single queuing gateway

3: CO-LOCATED AND REMOTE IVR ROUTING SERVERS WITH A SINGLE QUEUING GATEWAY AND LOAD BALANCING

Configuration 3 includes a single, co-located IVR Routing server, a single Remote Server, and a single queuing gateway. The call load is split evenly between two servers, resulting in more efficient resource utilization. Calls are split evenly between the IVR Routing instances using interleaved hunt groups (each hunt group has ports from each IVR Routing instance). Assigning an equal number of each type of port to each IVR Routing instance enables load balancing.

Some planning and deployment considerations for this configuration:

- You must have sufficient redundant port licensing, in relation to primary port licensing.
- Both servers can have any combination of port types (Messaging, Outbound, RAD, or UPiQ).
- Typically, an equal number of each type of port resides on each IVR Routing server.
- In the event of an Enterprise Server outage, loss of real-time connectivity affects all call flow components that depend on data that is derived from real-time queue statistics; for example, queue condition activities and Updated Position in Queue (UPiQ) messages.

This configuration offers the following:

- No resiliency (the controller is not resilient)

- Port redundancy (primary and redundant ports on each server)
- Load balancing
- Ability to handle full traffic on one server in case of failure (if you have equal primary and redundant ports)

Figure 41 shows this configuration.

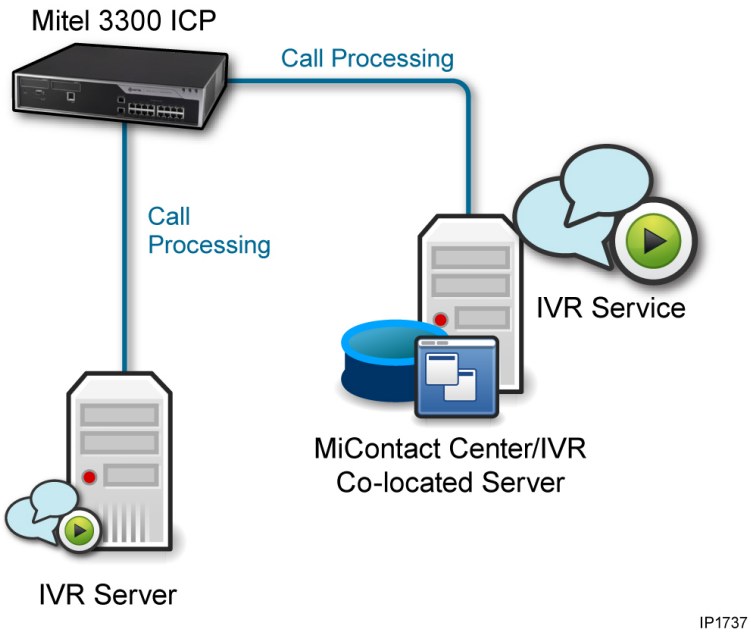

Figure 41: Co-located and remote IVR Routing servers with a single queuing gateway and load balancing

NOTE: Only Contact Center Starter Pack licensing is supported in this configuration.

4: DUAL REMOTE IVR ROUTING SERVERS WITH A SINGLE QUEUING GATEWAY AND LOAD BALANCING

Configuration 4 includes dual remote IVR Routing servers and a single queuing gateway. Calls are split evenly between the IVR Routing instances using interleaved hunt groups. The call load is split evenly between two servers, resulting in more efficient resource utilization. Calls are split evenly between the IVR Routing instances using interleaved hunt groups (each hunt group has ports from each IVR Routing instance). Assigning an equal number of each type of port to each IVR Routing instance enables load balancing.

Even though the remote IVR Routing servers are not co-located with the MiContact Center Business Server, the Enterprise Server can be used as an alternate call processor. Upon installation, if an IVR Routing instance license is detected, all IVR Routing services will be installed on the Enterprise Server, but be dormant during normal operation. However, if necessary, a port migration process can be performed, activating IVR Routing services on the Enterprise Server and allowing it to process calls.

Some considerations for deploying this configuration:

- You must have sufficient redundant port licensing, compared to primary port licensing.
- Both servers can have any combination of port types (Messaging, Outbound, RAD, or UPiQ).
- Typically, an equal number of each type of port resides on each IVR Routing server.
- In the event of an Enterprise Server outage, loss of real-time connectivity affects all call flow components that depend on data that is derived from real-time queue statistics; for example, queue condition activities and Updated Position in Queue (UPiQ) messages.

This configuration offers the following:

- No resiliency (the controller is not resilient)
- Port redundancy (primary and redundant ports on each server)
- IVR Routing server redundancy: When you choose to have the Enterprise Server control the ports, because the IVR services are always installed to the Enterprise Server and you are only licensed for one IVR server at a time, if the IVR server goes down, you can use the Enterprise Server as the backup.
- Load balancing
- Ability to handle full traffic on one server in case of failure (if you have equal primary and redundant ports)

Figure 42 shows this configuration.

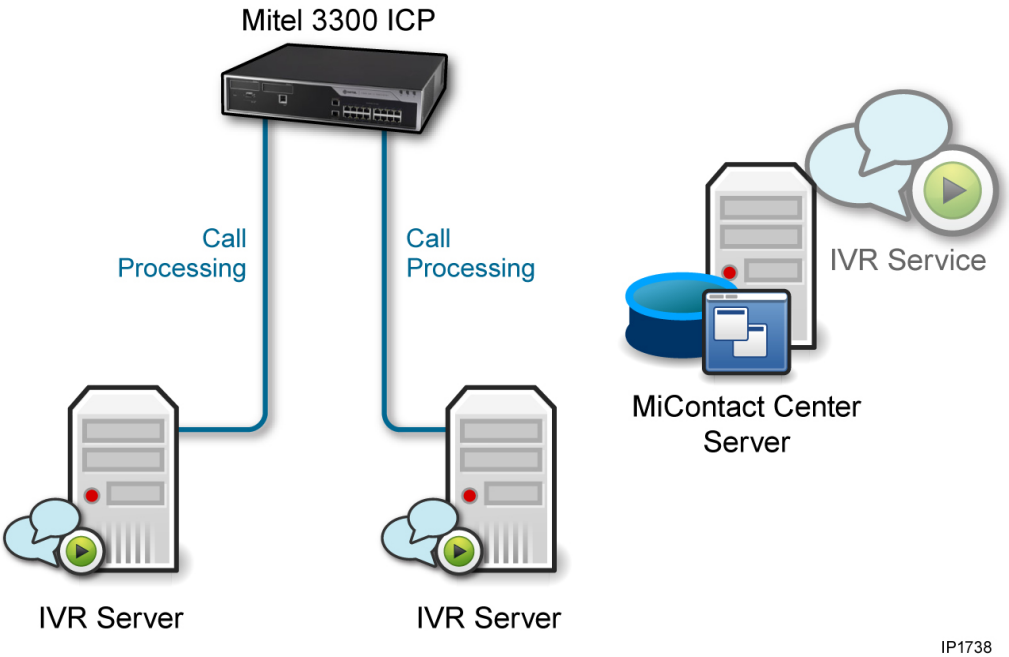

Figure 42: Dual remote IVR Routing servers with a single queuing gateway and load balancing

NOTE: Only Contact Center Starter Pack licensing is supported in this configuration.

5: SINGLE REMOTE IVR ROUTING SERVER WITH PAIRED RESILIENT QUEUING GATEWAYS

Configuration 5 includes a single remote IVR Routing server and paired resilient queuing gateways. Paired controllers with resilient ports provide enhanced availability. Some considerations for the planning and deployment of this configuration are:

- Typically, trunks transport calls to each queuing gateway in a round-robin fashion.
- Both servers can have any combination of port types (Messaging, Outbound, RAD, or UPiQ).
- In the event of a MiContact Center Business Server outage, loss of real-time connectivity affects all call flow components that depend on data that is derived from real-time queue statistics; for example, queue condition activities and Updated Position in Queue (UPiQ) messages.

This configuration offers the following:

- Resiliency (both controllers are resilient)
- No port redundancy (there are only primary ports, no redundant ports)
- Ability for both queuing gateways to handle live calls. One queuing gateway will handle all incoming calls. If the IVR Routing server fails, calls can be handled by setting up alternate answer points or by using a backup of the MiContact Center BusinessServer.

See Figure 43 for a graphical demonstration of this scenario.

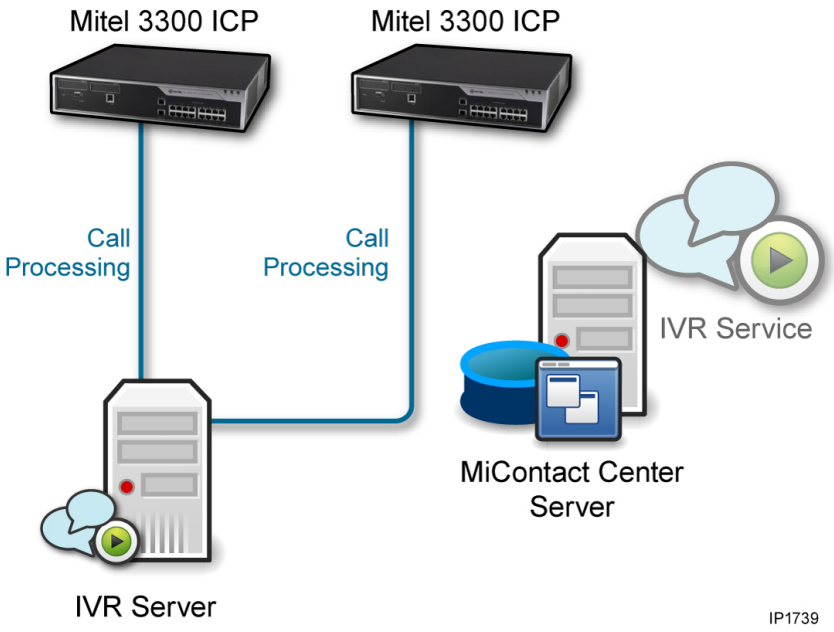

Figure 43: Single remote IVR Routing server with paired resilient queuing gateways

NOTE: Only Contact Center Starter Pack licensing is supported in this configuration.

6: DUAL REMOTE IVR ROUTING SERVERS WITH PAIRED RESILIENT QUEUING GATEWAYS

Configuration 6 includes dual remote IVR Routing servers with paired resilient queuing gateways. Paired controllers with resilient ports provide enhanced availability. The call load is split evenly between two servers, resulting in more efficient resource utilization. Calls are split evenly between the IVR Routing instances using interleaved hunt groups (each hunt group has ports from each IVR Routing instance). Assigning an equal number of each type of port to each IVR Routing instance enables load balancing.

Some considerations for planning and deploying this configuration:

- You must have sufficient redundant port licensing, in relation to primary port licensing.
- Both servers can have any combination of port types (Messaging, Outbound, RAD, or UPiQ).
- Typically, an equal number of each type of port resides on each IVR Routing server.
- Typically, trunks transport calls to each queuing gateway in a round-robin fashion.
- In the event of a MiContact Center Business Server outage, loss of real-time connectivity affects all call flow components that depend on data that is derived from real-time queue statistics; for example, queue condition activities and Updated Position in Queue (UPiQ) messages.

This configuration offers the following:

- Resiliency (both controllers are resilient)
- Redundancy (equal number of primary and redundant ports on each server)
- Ability to handle full traffic on one server in case of failure (when licensed for the full number of redundant ports)
- Ability for all queuing gateways to handle live calls

Figure 44 shows this configuration.

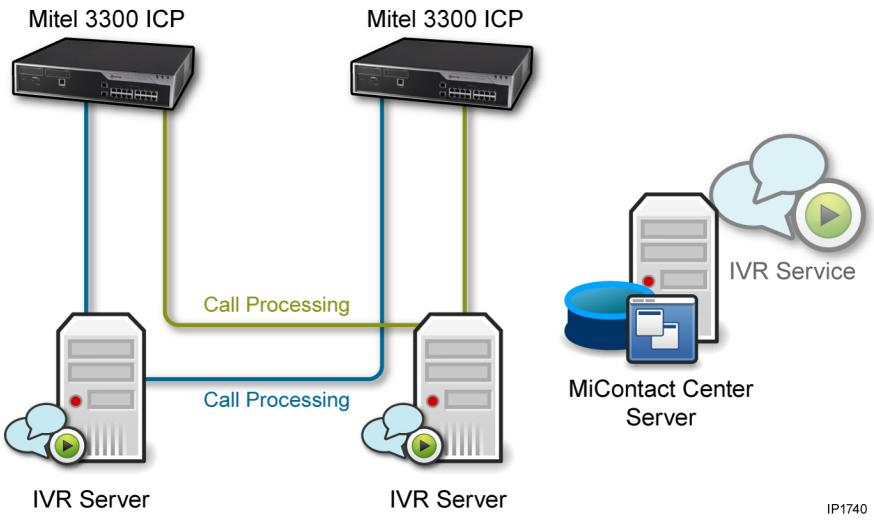

Figure 44: Dual remote IVR Routing servers with paired resilient queuing gateways

NOTE: Only Contact Center Starter Pack licensing is supported in this configuration.

7: SINGLE REMOTE IVR ROUTING SERVER WITH PAIRED RESILIENT QUEUING GATEWAYS - (MESSAGING PORTS)

Configuration 7 includes a single remote IVR Routing server with paired resilient queuing gateways (Messaging ports). Paired controllers with resilient ports provide enhanced availability. This configuration is used for instances with no ACD programming.

Some considerations for planning and deploying this configuration:

- Typically, trunks transport calls to each queuing gateway in a round-robin fashion.
- The server has only Messaging ports.
- In the event of a MiContact Center Business Server outage, loss of real-time connectivity affects all call flow components that depend on data that is derived from real-time queue statistics; for example, queue condition activities and Updated Position in Queue (UPiQ) messages.

This configuration offers the following:

- Resiliency (both controllers are resilient)
- No port redundancy (there are only primary ports, no redundant ports)
- Ability to handle full traffic on one server in case of failure
- Ability for both queuing gateways to handle live calls. One queuing gateway handles all incoming calls. If the IVR Routing server fails, calls can be handled by setting up alternate answer points or by using a backup of the MiContact Center Business Server.

Figure 45 shows this configuration.

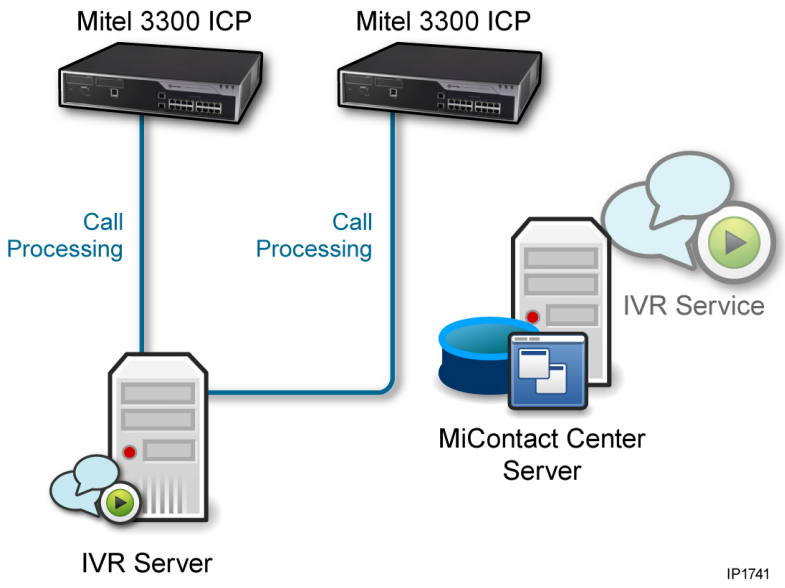

Figure 45: Single remote IVR Routing server with paired resilient queuing gateways

Chapter 6
VIRTUAL CONTACT CENTERS

VIRTUAL CONTACT CENTERS

NOTE: Only MiVoice Business platforms support virtual contact centers, as described in this chapter.

A virtual contact center can distribute calls evenly among agents in a specific agent group, irrespective of the agent's geographic proximity to:

- Other agents in their group
- The agent controller to which they are registered.

Networked ACD is based on ACD overflow functionality. Overflow permits a call originating in a particular geographic location to overflow to an agent on a different system in a different geographic location or overflow to an agent in a different skill group when all of the agents in the primary group are occupied.

Traditionally, one of the limitations of networked contact centers has been that the overflow groups receive calls only when all of the agents in the primary group are busy. Also, networked contact centers are suitable for optimizing bandwidth usage, but not for evenly distributing calls, regardless of origination point, among geographically dispersed agents.

Virtual contact centers address these limitations. Geographically dispersed agent devices can be registered on the same MiVoice Business Agent Controller across an IP network, while agents separated by geographical boundaries can be placed in the common agent groups on the same controller. Calls are evenly distributed between agents based on which agents have been idle the longest, regardless of their physical proximity to the MiVoice Business Agent Controller on which they are registered or to other agents in their group.

NOTE: Virtual ACD, as the term is used in this section, does not refer to use of MiVoice Business Virtual or an environment using virtual machines on standard servers, with a VMware or Hyper-V infrastructure.

ADDING RESILIENCY WITH VIRTUAL ACD

Figure 46 shows a sample resilient virtual ACD deployment in normal operation. Figure 47 shows the same deployment in resilient operation.

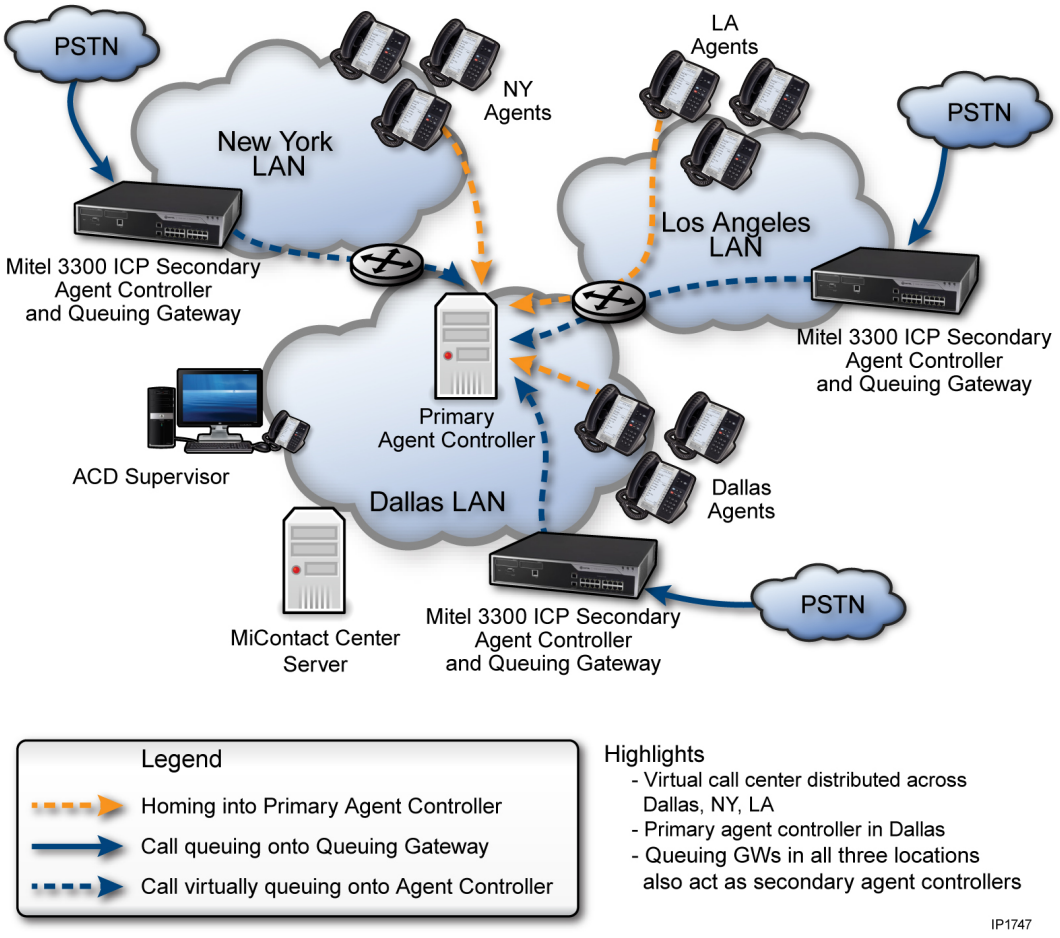

Figure 46: Resilient virtual ACD - Normal operation

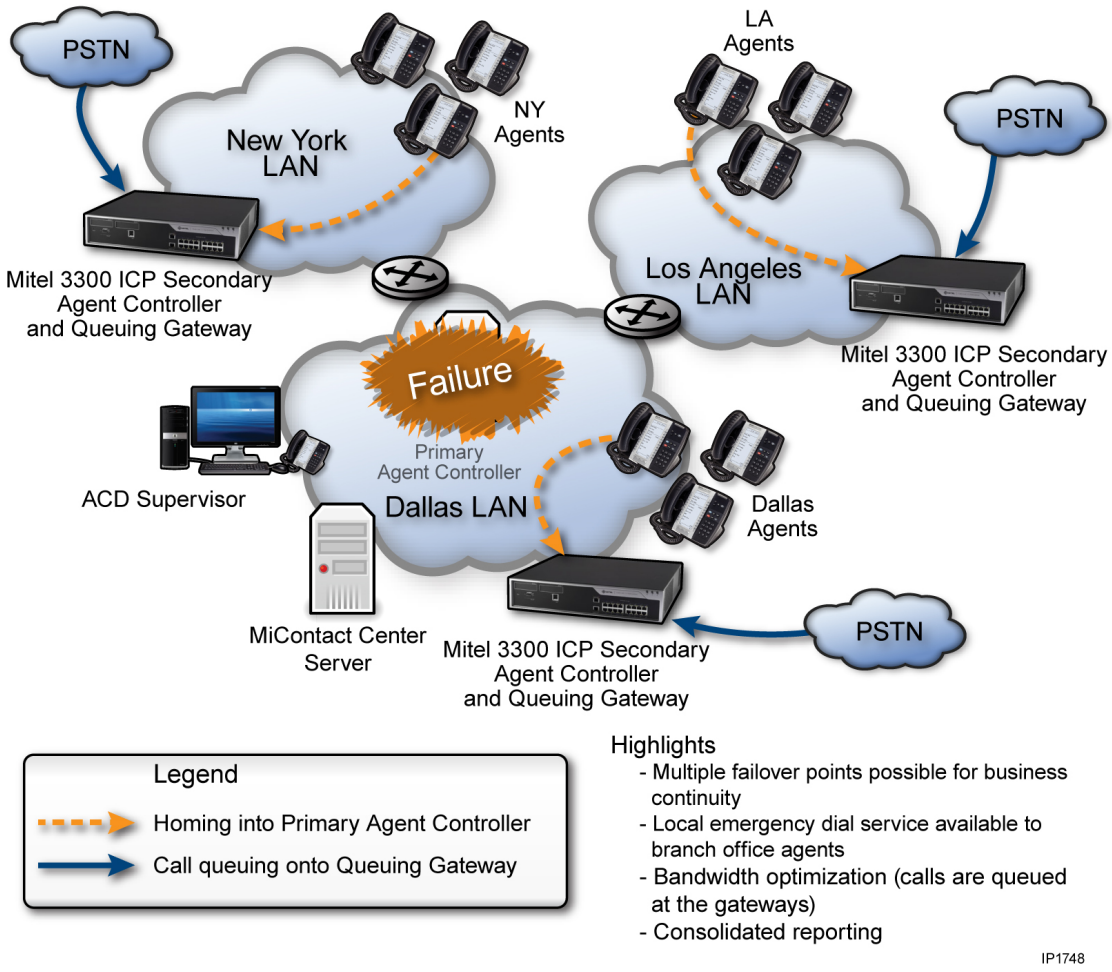

Figure 47: Resilient virtual ACD - Resilient operation

Figure 48 shows a resilient virtual ACD deployment operating in resilient mode, supporting 350 virtual MiContact Center Business agents.

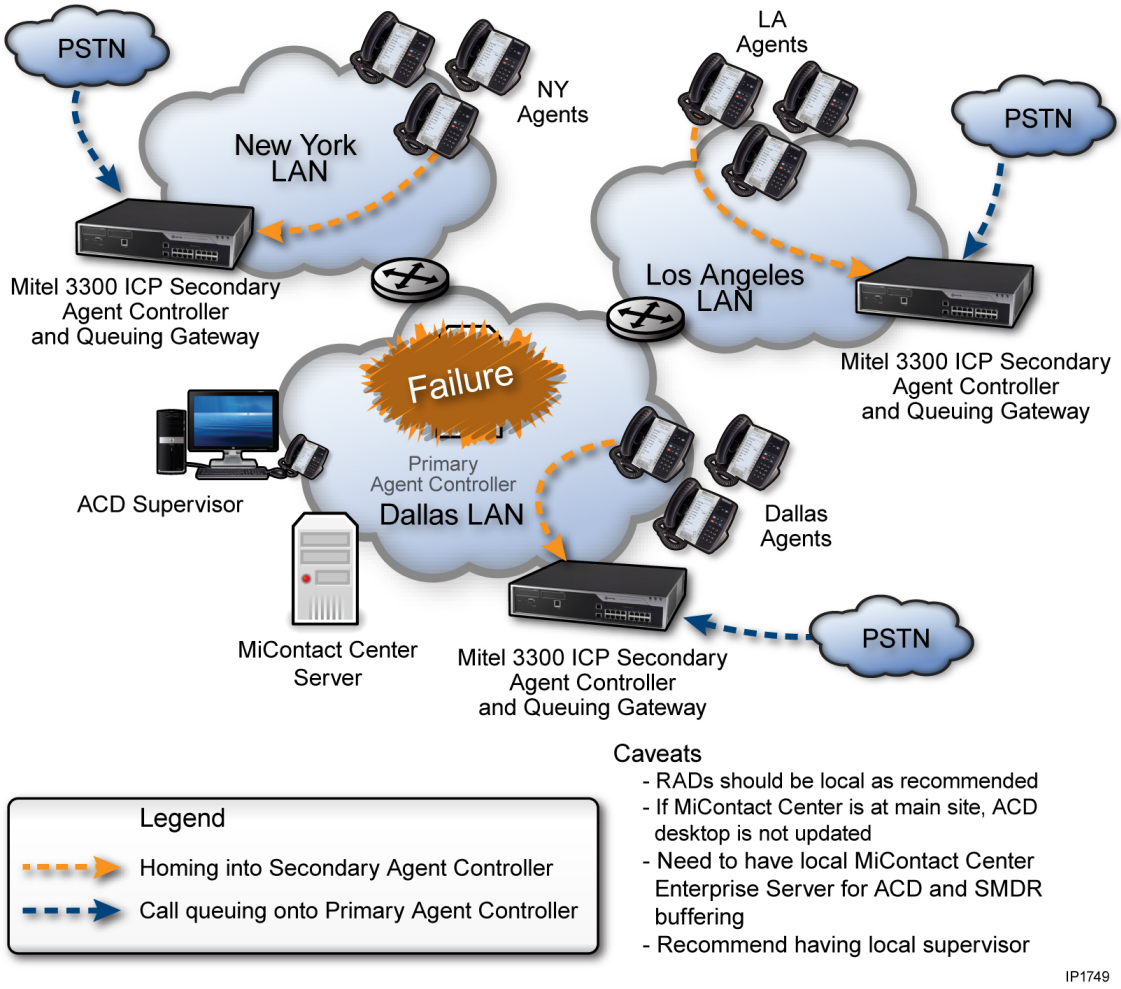

Figure 48: MiContact Center Business resiliency

RESILIENT VIRTUAL ACD

In a virtual ACD deployment, all agents are logged into and homed to the MiVoice Business at main site #1 (see Figure 49). In an example call flow in this deployment, a call comes in at Main Site #1 and enters the ACD path on the MiVoice Business at the main site. The longest idle agent at the agent group at the main site, to which all agents belong regardless of geography, receives the call. The call could, if desired, overflow to another agent group.

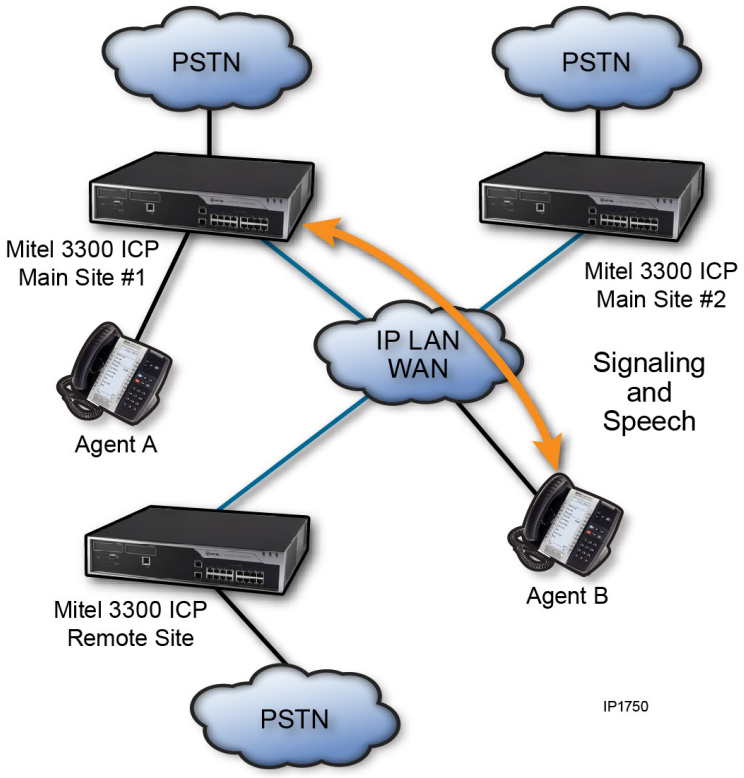

Figure 49: Virtual ACD

CONSIDERATIONS FOR RAD AND BUFFER PLACEMENT

Figure 50 shows multiple IVR Routing servers but you can use fewer servers in a multi-site configuration, depending on the redundancy requirements. RAD placement (and therefore ACD Paths) should be on the system where the TDM trunks enter the network.

It is generally recommended that IVR Routing not be used across a WAN link because the need for bandwidth for RAD messages prevents optimizing the use of the WAN link.

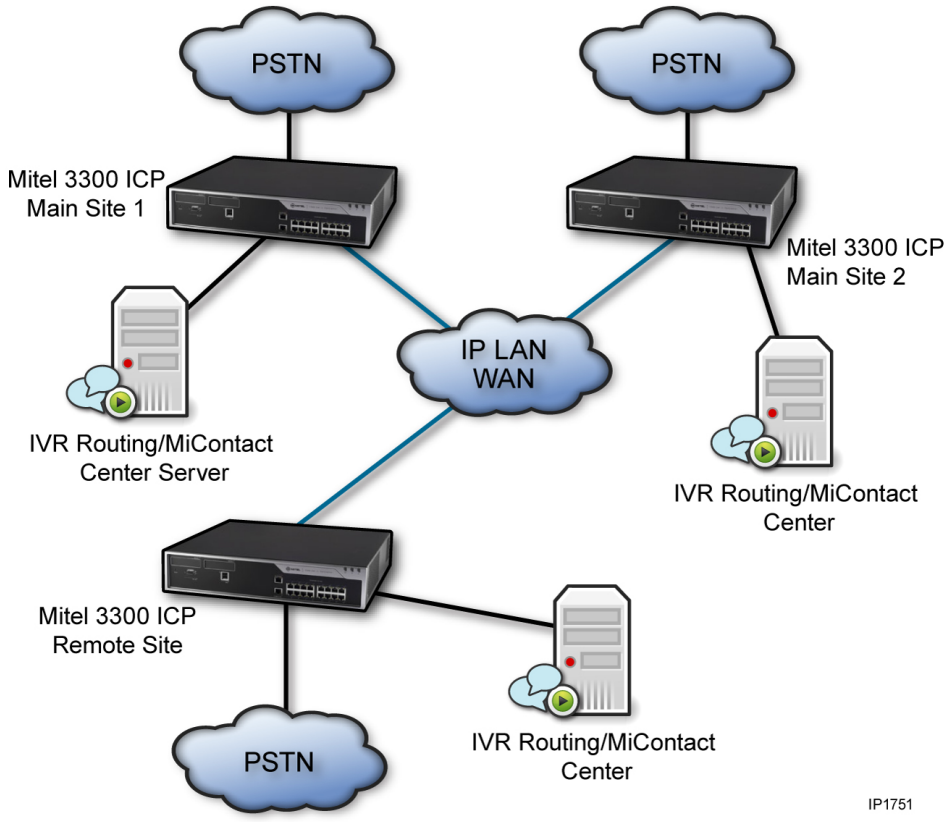

Figure 50: Virtual ACD - RAD/buffer placement

RESILIENT VIRTUAL CONTACT CENTER - CONFIGURATION 1

Figure 51 shows a resilient virtual contact center in which all the ACD paths are programmed on MiVoice Business controllers. Configuration 1 is the recommended configuration because this configuration protects against a WAN failure or primary agent controller failure.

NOTE: In this configuration, Agent Skills Group resiliency support depends on how the Agent Skills Groups are configured. There are scenarios where group resiliency is not supported when groups fail over to local secondary nodes. Refer to the *MiVoice Business Resiliency Guidelines* for more information.

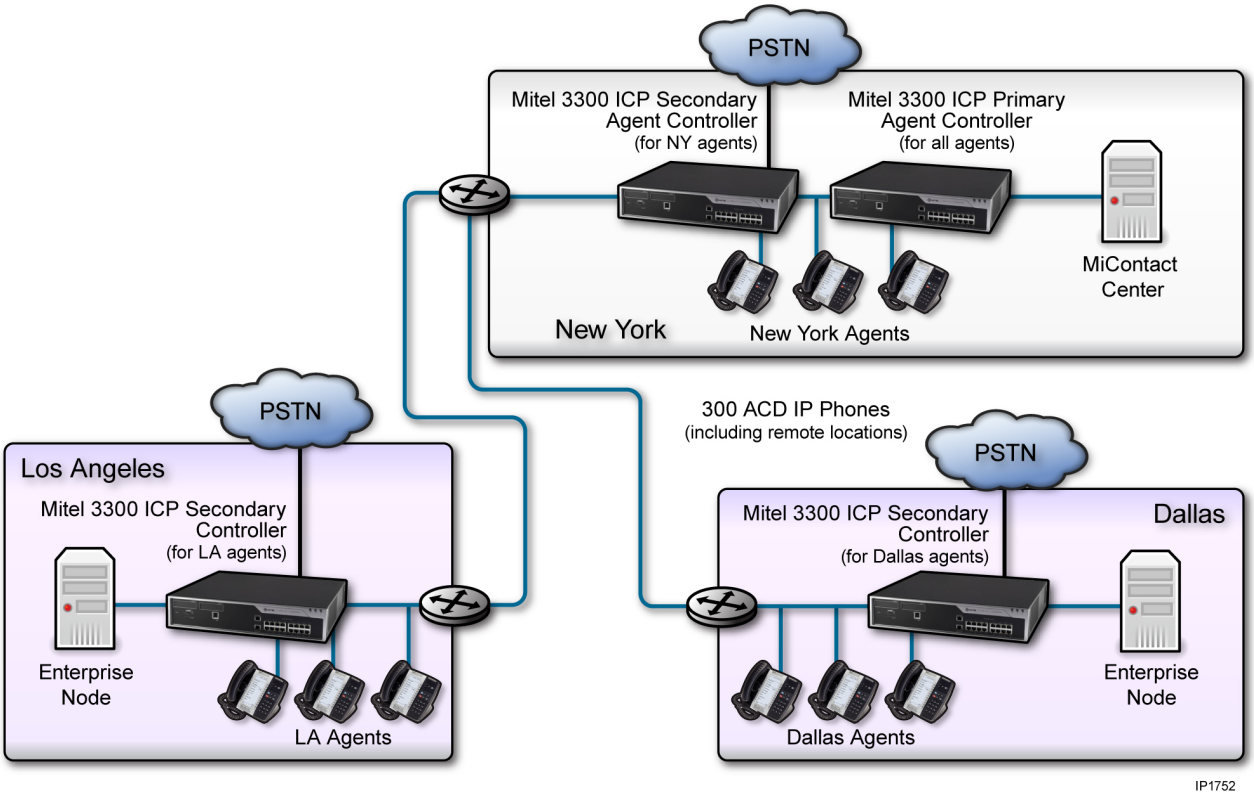

Figure 51: Resilient virtual Contact Center - Configuration example 1

DETAILS

All controllers in this configuration are MiVoice Business instances. All of the MiVoice Business instances are clustered, and connected by IP networking. System Data Synchronization (SDS) is enabled for sharing data among the MiVoice Business instances. Refer to *Mitel Voice Cluster Design and Implementation* and the *Using System Data Synchronization Solutions Guide* for detailed information and instructions.

If MiContact Center Business is being used with MiVoice Integration for Salesforce, then the Mitel OIG Server must also be added as a network element to SDS sharing.

Agents on the primary controller are programmed as resilient ACD hot desk agents and fail over to their respective ACD agent skill group on the secondary controller in the event that the primary controller fails. Refer to the *MiVoice Business Resiliency Guidelines*, available on Mitel OnLine.

In this example, the controllers that are programmed as the agents' secondary controllers also serve as the digital trunking controllers. All ACD paths are programmed on these controllers; that is, all local Los Angeles (LA) calls come though the LA paths, Dallas calls come through the Dallas paths, and so on.

New York agents physically reside in New York, Los Angeles agents physically reside in LA, and Dallas agents physically reside in Dallas, while all agent phones are registered to the primary agent controller in New York. All agents can be in the New York agent skill groups, ensuring that calls are distributed to them based on who has been idle the longest, even though the agents are not located in the same geographic area.

In the event that the primary agent controller goes out of service, the New York agents fail over to their secondary controller in New York; Los Angeles agents fail over to their secondary controller in LA; and Dallas agents fail over to their secondary controller in Dallas. In a virtual configuration, the agents are not in resilient agent skill groups. The agents fail over to a local agent skill group on their secondary controller. On each gateway, the primary Agent Skills Group and overflow groups associated with a path point to agent skill groups that reside on the primary agent controller.

During the outage, agents work in a local ACD environment, answering calls that originate from their own geographical region, rather than from a virtual environment.

The paths are programmed on the queuing gateways. All the path groups, however, are remote, and all reside on the primary agent controller in New York. Each group is programmed as resilient, and the resilient backup controller for each group is the queuing gateway that its paths are programmed on.

Resiliency is enabled for the agent skill groups. The agent skill groups are primary on the ACD primary controller and secondary on the ACD secondary controller. The agent skill-group members are resilient hot desk agents configured with the same primary and secondary controllers as for the skill group.

Under normal operation, calls are answered only from the primary controller in a virtual environment. Queued callers listen to RADs at the secondary MiVoice Business instances, so IP bandwidth is not used for the recorded messages. RADs can be configured on the queuing gateways using the embedded RAD functionality available through the MiVoice Business embedded voice mail system, or through Mitel IVR Routing. Calls are distributed to agents registered to the primary controller in New York as agents become available.

For call center reporting, MiContact Center Business collection points are required for all nodes.

The system capacity is as follows:

- Up to 2100 agent IDs are supported on the primary and/or secondary agent controllers.
- Up to 999 paths are supported on the secondary MiVoice Business instances.
- Up to 700 active agents are supported on the primary and/or secondary agent controllers.

ADVANTAGES

- Agents and supervisors in different geographical locations can be represented in the same agent skill groups to create a virtual contact center environment.
- This solution is supported by MiVoice Business; no off-board external application is required to support longest idle agent routing.
- When the primary ACD agent controller fails:
  - 100% of agents remain in service
  - 100% of trunks remain in service
  - Agents can complete 100% of active calls before failover (in talk state only, held calls are lost).
- There are up to 700 active agents on the primary controller.
- Local dial 9 and 911 service is available to Los Angeles, New York, and Dallas agents through ARS programming.
- There is no single point of failure.
- The configuration protects against both WAN failure and primary agent controller failure.

CONDITIONS AND LIMITATIONS

- Current route list programming permits only five remote sites to be part of a Virtual MMiContact Center Business, that is, the sixth site and subsequent sites will not have Local dial 9 and 911 service, rather they must route out of New York. This can be overcome using loopback IP trunks and the Default Account Code feature.
- Calls queued only to the secondary while the primary was unavailable must be redirected back into the path after all agents fail back to the primary controller. The Interflow timer can be used to redirect the calls.
- Currently, the time displayed on the telephone sets will show New York time zone for all agents. Starting in MCD 6.0, you can provision a Default Billing Number and a Default CPN for each network zone; these numbers can be sent instead of a caller's or diverting party's public number for caller identification and billing purposes.
- The contact center reports generated by the MiContact Center Business application are presented in the time zone of the city in which the main MiContact Center Business server resides; in this case, New York.

RESILIENT VIRTUAL CONTACT CENTER - CONFIGURATION 2

Figure 52 shows a resilient virtual contact center in which the ACD paths are programmed on the 3300 ICP Digital Trunking Gateways.

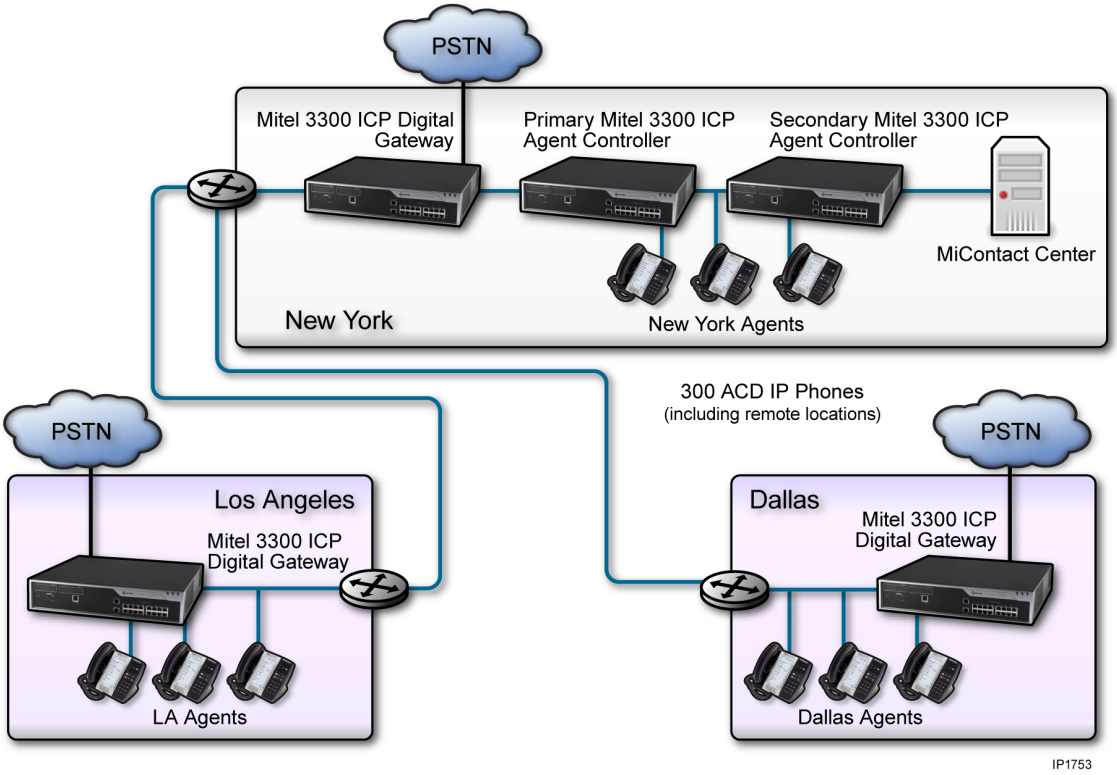

Figure 52: Resilient virtual MiContact Center Business - Configuration example 2

DETAILS

All controllers in this configuration are MiVoice Business instances. All of the MiVoice Business instances are clustered, and connected by IP networking. Ethernet-to-TDM (E2T) gateway functionality is performed by the Digital Trunking Gateways. System Data Synchronization (SDS) is enabled for sharing data among the MiVoice Business instances. Refer to *Mitel Voice Cluster Design and Implementation* and the *Using System Data Synchronization Solutions Guide* for detailed information and instructions.

If MiContact Center Business is being used with MiVoice Integration for Salesforce, then the Mitel OIG Server must also be added as a network element to SDS sharing.

ACD paths are programmed on the 3300 ICP Digital Trunking Gateways (in Los Angeles, New York, and Dallas).

New York agents physically reside in New York, Los Angeles agents physically reside in LA, and Dallas agents physically reside in Dallas. All agent phones are normally registered to the primary agent controller in New York. Under normal operation calls are answered only from the primary controller.

All agents can be in the same agent skill groups, programmed on the New York controller, ensuring that calls are distributed based on who has been idle the longest, even though the agents are not located in the same geographical area. On each gateway, the primary Agent Skills Group and Overflow groups associated with a path point to agent skill groups that reside on the primary agent controller.

Agents on the ACD primary controller are programmed as resilient ACD hot desk agents and fail over to the ACD secondary controller in the event that the primary controller fails.

Resiliency is enabled for the agent skill groups. The agent skill groups are “primary” on the ACD primary controller and “secondary” on the ACD secondary controller. The agent skill group members are resilient hot desk agents configured with the same primary and secondary as the group.

Queued callers listen to RADs at the secondary MiVoice Business instances, so IP bandwidth is not used for the recorded messages. RADs can be configured on the queuing gateway using the embedded RAD functionality that is available through the MiVoice Business embedded voice mail system, or by using Mitel IVR Routing. Calls are distributed to agents on either the primary or secondary MiVoice Business instances in New York using Networked ACD, as agents become available.

For reporting, MiContact Center Business collection points are required for all nodes.

The system capacity is as follows:

- Up to 900 Paths are supported on the Digital Trunking Gateway.
- Up to 2100 Agent IDs are supported on the agent controllers.
- Up to 700 active agents are supported on the primary and/or secondary agent controllers.

ADVANTAGES

- Agents and supervisors in different geographical areas can be represented in the same agent skill groups to create a virtual contact center environment.
- Support for this configuration is provided by MiVoice Business. An external application is not required to support longest idle agent routing.

- When either ACD agent controller fails:
  - 100% of agents remain in service
  - 100% of trunks remain in Service
  - Agents can complete 100% of active calls before failover. Held calls are lost.
- Up to 700 active agents are supported on the primary controller.
- Local dial 9 and 911 service is available to Los Angeles, New York, and Dallas agents through ARS programming.
- There is no single point of failure.
- A Digital Trunking Gateway failure drops calls that are queued through that gateway but does not take any agents out of service. Local PSTN access (local dial '9' and '911' service) through that gateway is unavailable for the outage period; however, alternate routing (via Automatic Route Selection) is available to agents.

CONDITIONS AND LIMITATIONS

- Current route list programming permits only five remote sites to be part of a Virtual MiContact Center Business, that is, the sixth site and subsequent sites will not have Local dial 9 and 911 service, rather they must route out of New York. This can be overcome using loopback IP trunks and the Default Account Code feature. Starting in MCD 6.0, Location-based Call Routing directs designated numbers to appropriate services located in the same zone as the device from which the users are dialing, eliminating the need to configure loopback IP trucks.
- Currently, the time displayed on the telephone sets will show New York time zone for all agents. Starting in MCD 6.0, you can provision a Default Billing Number and a Default CPN for each network zone; these numbers can be sent instead of a caller's or diverting party's public number for caller identification and billing purposes.
- A WAN failure in which LA and Dallas devices lose their link to New York, takes LA and Dallas agents out of service for the outage period, because they will not be able to home to their secondary. controller. Redundant IP routing paths (NLPS Network Multilayer) may be used to overcome this issue.
- Agents have full ACD functionality on their secondary controller. The status of most ACD features is maintained after failover. For more information, refer to the *MiVoice Business Resiliency Guidelines*.
- The contact center reports generated by the CCMWeb application are presented in the time zone of the city in which the main MiContact Center Business server resides; in this case, New York.

GENERAL PROGRAMMING FOR VIRTUAL CALL CENTER CONFIGURATIONS

In a virtual contact center configuration, IP phones are registered to a primary MiVoice Business in New York. Automatic Route Selection (ARS) is programmed in New York to ensure that outgoing external calls (especially E911 calls) for hosted phones are routed through IP trunking to the appropriate gateway (Configuration 1, Figure 51) or to the appropriate gateway controller (Configuration 2, Figure 52). ARS route lists are used for this purpose. Since ARS is limited to six ARS routes in a single route list, and one route is assigned for local dialing, this solution is limited to five MiVoice Business secondary controllers per MiVoice Business head office (either Configuration 1 or Configuration 2).

This restriction can be overcome using the techniques (loopback IP trunks and the default account code feature) described in Mitel Knowledge Base article 05-5191-00042 “How to route 911 to more than 6 Analog Gateways”.

The following is a general programming guide. Specific implementation will vary from site to site.

In the explanation that follows, you can substitute the term “Gateway” for “Dual-purpose MiVoice Business”, which is applicable to Configuration 1 above, in which the controller serves as both the secondary agent controller and a trunking controller.

1. Set up an IP trunk between the primary PBX and all remote gateways.
2. On the primary PBX, create a route for each gateway, ensuring that each route uses a unique Class of Restriction (CoR). You can create a maximum of six routes: five routes for remotely situated gateways plus one local route.
3. Set up a route list that contains all routes created in 2, to a maximum of five gateway routes plus one local route.
4. Program ARS leading digits for both local access and local 911 and assign the route list created in 3.

NOTE: It is essential that the correct Class of Restriction (CoR) is assigned to each route and the corresponding IP phones. The routing mechanism to the proper gateway location is based on the CoR of the set and the CoR group defined in each route defined in the Head Office controller.

On each gateway, ensure that the ARS leading digits for both local and 911 are created and that the local trunk is selected to process local and 911 calls. Starting in MCD 6.0, Location-based Call Routing directs designated numbers to appropriate services located in the same zone as the device from which the users are dialing.

VMWARE® AND HYPER-V® SUPPORT

MiContact Center Business and MiVoice Analytics server applications are supported in virtualized environments. Product testing has been limited to VMware ESXi and Microsoft Hyper-V. MiContact Center Business is compatible with VMware vSphere and Horizon View. This compatibility statement extends to VMware's basic virtualization feature set.

For complete and up-to-date support information, refer to the *Virtual Appliance Deployment Solutions Guide*, and the VMware documentation. For a list of supported versions of VMware and Hyper-V, see the *MiContact Center Business and MiVoice Analytics System Engineering Guide*.

VIRTUAL SOLUTIONS

MiContact Center Business and MiVoice Analytics can be purchased as an OVA for deployment in a VMware infrastructure.

The MiContact Center Business and MiVoice Analytics software supports the following VMware® vSphere® and vCenter® features: vSphere Distributed Resource Scheduler, Distributed Power Management, High Availability, Fault Tolerance, and Site Recovery Manager features.

There are two general ways to discuss virtualization: server-side virtualization and client-side virtualization.

Server-side virtualization involves virtualizing the Windows® operating system on physical hardware through virtualization software. The system emulates physical hardware in software to allow for improved resource utilization and centralized management, along with many other features. Server virtualization is supported using VMware ESXi or Microsoft Hyper-V products.

In client-side virtualization, there are two categories: Virtual Desktop Infrastructure (VDI) and Application Presentation.

In VDI environments, a virtualized desktop is available to users as if they were using a traditional PC, however the operating system runs on a remote server infrastructure.

In Application Presentation, individual applications are virtualized and provided to users as opposed to providing all applications together, as with a Windows desktop presentation. In Application Delivery, the virtualization technology offers both online and offline application access by copying the application files, configuration, and settings directly to the client and executing within an isolation environment. When executed, the application can interact with the user desktop through an application virtualization layer. Alternatively, through Session Virtualization the application runs directly within the server environment and the application interface is streamed to the user over the network.

For full details on implementing MiContact Center Business and MiVoice Analytics software in a VMware virtual machine environment, refer to the following Mitel documents. All are available on Mitel OnLine

- *Virtual Appliance Deployment Solutions Guide*
- VMware Virtual Appliance Quick Start Guide
- *VMware Horizon View Support Solutions Guide*

CUSTOMER SCENARIO 1: MIGRATION TO VIRTUALIZATION

Figure 53 illustrates a site configuration that supports:

- Seamless migration to virtualization with full MiContact Center Business license portability
- Resiliency maintained throughout
- vCenter management functions

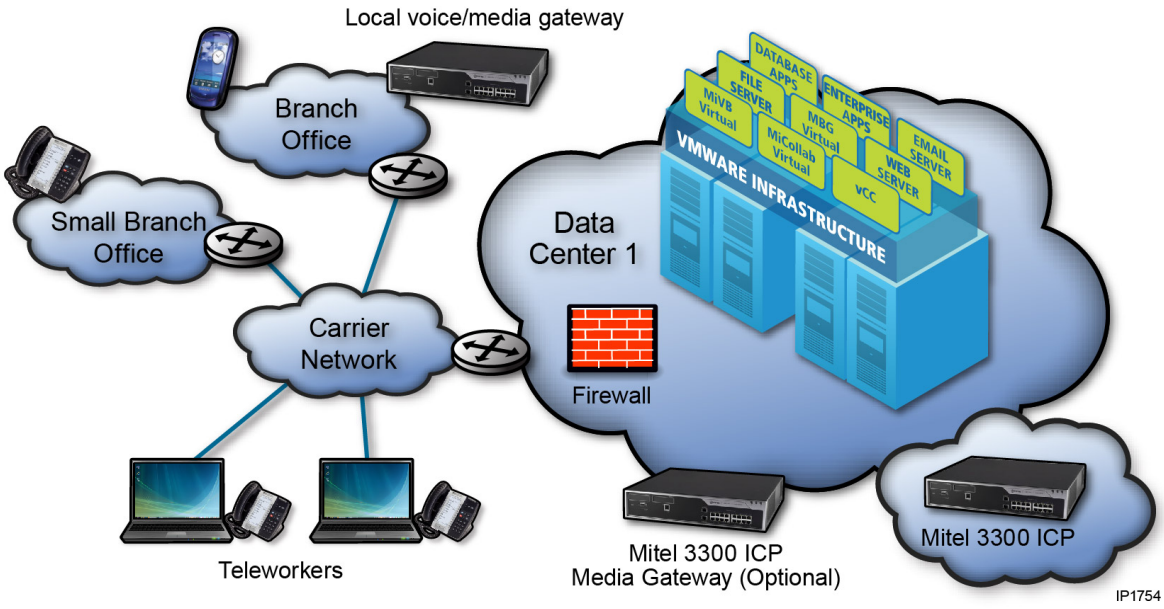

Figure 53: Data Center Setup

CUSTOMER SCENARIO 2: TWO DATA CENTERS

Figure 54 illustrates two data centers that support:

- Geographically-diverse business continuity solutions across data centers
- VMware vSphere data center disaster recovery and avoidance using Site Recovery Manager
  - An entire virtual cluster can be recreated on a backup data center; storage replication ensures data continuity.
  - Enables preplanned disaster recovery management policies to be enacted should a primary data center or server cluster be put out of service.

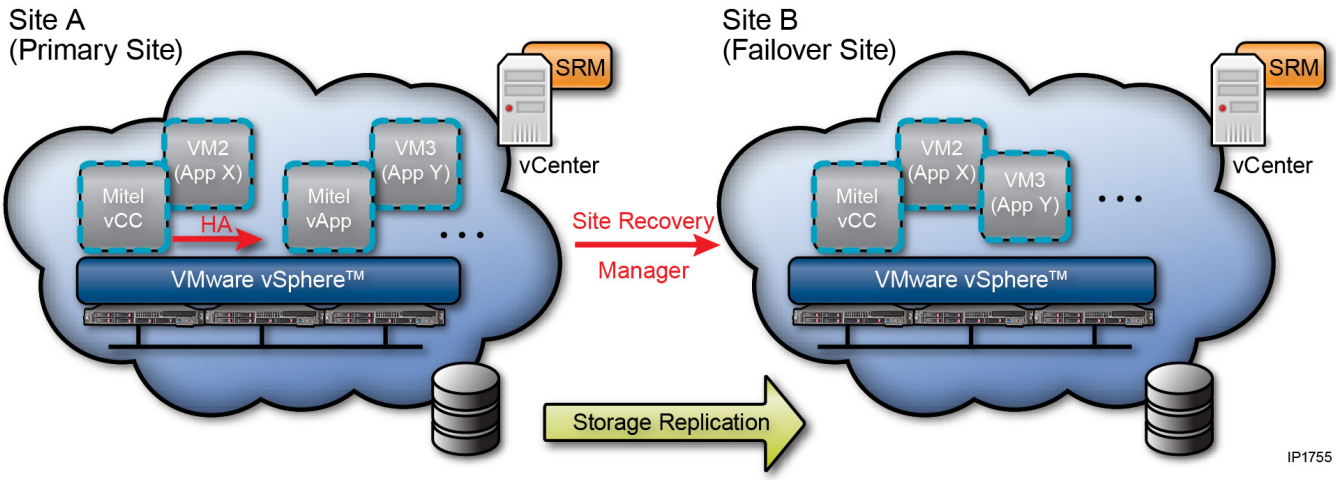

Figure 54: Dual Data Center setup

GLOSSARY

ACRONYM	DESCRIPTION
ACD	Automatic Call Distribution - Enables calls to be evenly distributed among contact center agents, for a cost-effective use of pooled resources and improved customer service. It ensures the equal distribution of incoming calls to the most appropriate group of agents based on the type of information or service required by the caller.
ARD	Alternative Recording Device
ARS	Automatic Route Selection
CCS	Centum Call Seconds - Often used to describe 100 call-seconds. A call second is equivalent to 1 call with a duration of 1 second. 3600 call-seconds = 36 CCS = 1 call-hour. 3600 call-seconds per hour = 36 CCS per hour = 1 call-hour per hour = 1 erlang = 1 traffic unit.
controller	A MiVoice Business platform, whether it is hosted on a 3300 ICP, an industry standard server, MiVoice Business Multi Instance, or on a VMware virtual machine. Sometimes called a node or network element.
CoR	Class of Restriction
CoS	Class of Service
CPH	Calls per Hour - Call volume statistic
CTI	Computer Telephony Integration
E2T	Ethernet-to-TDM - a card in the 3300 ICP controller. The E2T card has a capacity of 128 channels.
EHDA	External Hot Desk Agent - Mitel feature that allows agents to use phone sets or other end-points that are external to the company LAN.
erlang	1 erlang = 3600 call-seconds per hour = 36 CCS per hour = 1 call-hour per hour = 1 traffic unit.
ICP	IP Communications Platform
ISS	Industry Standard Server - In addition to running on the MX, CX, and LX controllers, MiVoice Business is also supported on industry standard servers, and on VMware virtual machines (MiVoice Business Virtual).
IVR IVR Routing	Interactive Voice Response - a technology that enables callers to interact with a contact center's phone system by pressing keys or using speech recognition while following IVR dialog instructions.
LAN	Local Area Network
MCD	Mitel Communications Director (now called MiVoice Business)
Multi-node network	A network containing more than one node.
node network element	A MiVoice Business platform, whether it is hosted on a 3300 ICP, an industry standard server, MiVoice Business Multi Instance, or on a VMware virtual machine. Sometimes called a controller.
OIG Mitel OIG	Mitel Open Integration Gateway - The Mitel Open Integration Gateway (Mitel OIG) is a web server that provides each Mitel OIG application a single point of access to web services available within a Mitel communication system.

ACRONYM	DESCRIPTION
PSTN	Public Switched Telecommunications Network Public Switched Telephone Network
RAD	Recorded Announcement Device
SDS	System Data Synchronization Refer to the *Using SDS Solutions Guide*, available on Mitel OnLine.
SMDR	Station Message Detail Recording - provides additional details about call rerouting and call transfer when ACD is enabled.
SSML	Speech Synthesis Markup Language (SSML) - An XML-based markup language for speech synthesis applications.
TDM	Time Division Multiplexing
UPiQ	Updated Position in Queue
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
WAN	Wide Area Network