Skype for Business Solution Blueprint

Reference Architecture

Version: 1.0
Status: FINAL
Published: **9/14/2017**

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Table of Contents

Table of Figures

Introduction

The purpose of the Skype for Business Solution Blueprint document is to provide a set of design practices and guidance to ensure consistent architecture approaches are used for all deployments of the Skype for Business Multimedia Connector. It provides a prescriptive list of components (both Genesys and 3rd party) that should be included in the solution. It also provides deployment guidance, including sizing considerations, and addresses several system concerns such as security, high availability, disaster recovery and serviceability.

The Genesys Skype for Business Solution consists of the following core Genesys components:

- Skype for Business T-Server and Connector
- SIP Server
- Resource Manager
- Media Server (Media Control Platform)
- Outbound Contact Server
- Workspace Desktop Edition (including Skype for Business plug-in)

The Genesys core platform components are also included. Please see the [Common Component Solution Blueprint] for further details.

Microsoft Skype for Business servers are also required. Please see the section, Microsoft Skype for Business Components, for more details.

Document Overview

The document contains the following sections:

- Chapter 2: Definitions and Acronyms
- Chapter 3: Overall Architecture
- Chapter 4: Deployment View
- Chapter 5: Interaction View
- Chapter 6: Implementation View

Intended Audience

The Blueprint Architectures are intended to provide Genesys Solution Consultants, Professional Services and

partners with information on the general architecture design and considerations for the solution. The information provided in this document should meet the needs of pre-sales and provide appropriate general guidance for professional services. This document is not intended to provide configuration level information for professional services.

Describing system and solution architectures can be difficult as there are multiple audiences each with different expectations. This document is intended for multiple audiences with various chapters being more interesting to some readers than others. It is expected that readers will already have knowledge and training on Genesys products. This document provides high-level information for completeness.

The Overall Architecture and Deployment View are likely meaningful to most audiences. However, the Interaction View and the Implementation View may be of more interest to those configuring the network and components.

Definitions, Acronyms, and Document Standards

Definitions

This document uses various abbreviations and acronyms that are commonly used in Genesys product documentation and the telecommunications and contact center industries. The following table defines terms that will be referenced subsequently in this document.

Glossary

AMD	Answering Machine Detection
ASR	Advanced Speech Recognition
CAPS	Call Arrival Per Second
CPA	Call Progress Analysis
CPD	Call Progress Detection
CTI	Computer-telephony integration, the adding of computer intelligence to monitoring and control of telephone calls
DB	Database
DBMS	Database Management System
DN	Directory number
DNS	Domain Name System
DTMF	Dual Tone Multi-Frequency
eSBC / E-SBC	Enterprise Session Border Controller
FTP	File Transfer Protocol
GA	Genesys Administrator
GAX	Genesys Administrator Extension
GIM	Genesys Info Mart
GIR	Genesys Interaction Recording
GI2	Genesys Interactive Insights
GUI	Graphical User Interface
GVP	Genesys Voice Platform
HA	High Availability
HTTP	Hypertext Transfer Protocol
ICON	Interaction Concentrator
IM	Instant Messaging
IP	Internet Protocol
ISCC	Inter-Server Call Control
IVR	Interactive Voice Response
IXN	Interaction Server
JDBC	Java Database Connectivity
LAN	Local Area Network
MCP	Media Control Platform
MCU	Media Control Unit – typically used to refer to Skype for Business media component
MGW	Media Gateway
MTLS	Multiplexed Transport Layer Security

NMS	Network Management System
OCS	Outbound Contact Server
ODBC	Open Database Connectivity
ORS	Orchestration Server
PBX	Private branch exchange
PSTN	Public Switched Telephone Network
QM	Quality Monitoring
Q&P	Qualification and Parking
RDBMS	Relational Database Management System
REST	Representational State Transfer
RM	Resource Manager
RTP	Real-time Transport Protocol, the media-stream transport used with SIP
SBA	Survivable Branch Appliance – SfB compliant media gateway and SBS collocated in one appliance
SBC	Session Border Controller
SBS	Survivable Branch Server
SCO	System Center Operations
SDK	Software Development Kit
SfB	Skype for Business
SIP	Session Initiation Protocol
SNMP	Simple Network Management Protocol
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
SRTP	Secure Real-time Transport Protocol
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
TLib	Tserver Library
TLS	Transport Layer Security
UC	Unified Communications
UCMA	Unified Communication Managed API
UI	User Interface
UM	Unified Messaging
URS	Universal Routing Server
VM	Virtual Machine
VoIP	Voice over IP, digitized voice segments transported in fixed packets across the IP network and re-assembled in sequence at the destination
WAN	Wide Area Network
WDE	Workspace Desktop Edition

Document Conventions

The following documentation and naming conventions are used throughout the document:

- `Code` and `configuration property names & values` will appear in `console font`.

- References to other documents are bracketed ([]).

Overall Architecture

The **Skype for Business Solution** provides Genesys Customer Experience capabilities integrated with the Microsoft Skype for Business unified communications system. The solution uses native (UCMA) integration with Skype for Business which offers a very tight integration with the SfB system.

The **Skype for Business Solution** targets enterprise deployments of varying sizes and complexities and takes full advantage of Genesys contact center features including Self-Service, Routing, Recording and Reporting. The solution blueprint is focused on the incorporation of Skype for Business with the appropriate Genesys integration points. Many of the additional Genesys solutions that can be included with this solution are documented in other Solution Blueprints:

- [SIP Voice Solution Blueprint]
- [Common Components Blueprint]
- [Solution Blueprint GIR and GIA]

Most of the solution guidance is based on best practices and the lessons learned through implementing the SfB solution in real-world scenarios. As Skype for Business has a very flexible deployment architecture, one of the other goals is to constrain the integration to supported deployments and highlight those constraints.

Solution Overview

This solution is a native integration with Microsoft Skype for Business using a T-Server and UCMA Connector to integrate voice, video, IM, presence and address book access, and a Workspace plug-in that interoperates with Microsoft Skype for Business clients. The solution also utilizes various Genesys and 3rd party components such as SIP Server and GVP to provide additional IVR and voice treatments capabilities.

The solution also supports a Hybrid Option that allows agents to have both Skype for Business and Genesys SIP Softphone endpoints. This option can be considered to increase the overall scalability of the solution. See the section [Hybrid Deployment] for more details.

Components of the solution

Genesys Skype for Business T-Server	"CTI like" integration server for Microsoft Lync and Skype for Business
Genesys Skype for Business UCMA Connector	UCMA based connector between the T-Server and Microsoft Skype for Business
Microsoft Skype for Business	Enterprise voice and unified communication system

Genesys SIP Server	Standards-based contact center software solution
Genesys Media Server	Delivers media services to for interactive voice response, menus, on hold treatments and call recording.
Genesys Routing	Industry-leading routing engine which allows to you provide flexible business driven routing to deliver great customer experience and drive operational efficiency.
Genesys Workspace Desktop Edition (WDE)	Agent desktop application supporting all media types
WDE Skype for Business Plug-in	A plug-in that integrates the Skype for Business client with the Workspace Desktop Edition software
Genesys SIP Softphone	A Genesys provided software based SIP endpoint used by agents to provide voice communication directly through the agent's desktop. Used as part of the Hybrid Option discussed later.
Genesys Reporting	Real-time and Historical reporting provided by Pulse (Real-time) and ICON/Info Mart/Interactive Insights (Historical)
Genesys Interaction Recording	A call recording solution, screen capture, and Quality Monitoring (QM) tool utilized to store, manage, and playback recorded voice conversations and screen captures, as well as provide quality assurance. Optional component to the solution.
Genesys Outbound Contact (OCS)	An automated system that is used to create, modify, and run outbound dialing campaigns/dialing sessions in which agents interact with customers. Optional component to the solution.

The Skype for Business Blueprint leverages the [Common Component Blueprint] for foundational elements used in orchestration, reporting and configuration/management.

Further details on Genesys Call Recording (Genesys Interaction Recording) is contained in other Reference Architecture documents [Solution Blueprint for GIR and GIA].

Logical Architecture Model

The following diagram is a logical model of the **Skype for Business Solution** architecture.

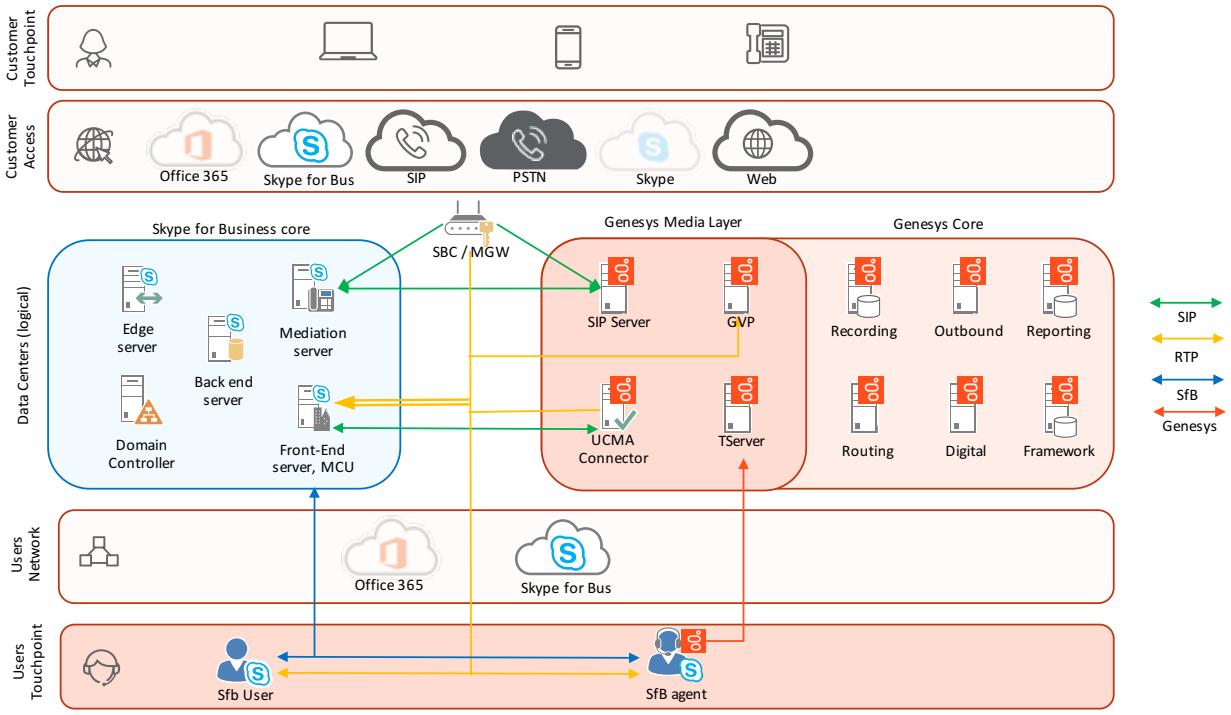

Figure 1: Logical Architecture Model

The Genesys platform is integrated into the Skype for Business deployment at three key integrations points:

- T-Server and UCMA Connector interfacing with a SfB Front-End Server pool for CTI events
- SIP Server and GVP integrated with the SfB Mediation Server for IVR and other media treatments
- Workspace Desktop plug-in for the Skype for Business desktop client to integrate endpoint media and operations with Contact Center Agent workflow

Agents can access the Genesys platform through the Genesys Workspace with the Skype for Business plug-in. The plug-in integrates with the Skype for Business client on the agent's computer; there are multiple configuration options to tune the desktop experience based on the company's interaction requirements.

Functional View

The Skype for Business Solution adds contact center capabilities to Skype for Business deployments of varying sizes and complexities. It supports both Inbound Voice and Outbound dialing scenarios as well as IM, Voice, Video and Presence. It also provides qualification and parking of inbound calls and media treatments such as announcements and IVR applications.

SMART Use Cases

This blueprint addresses the functionality in the following SMART Use Cases:

- CE01, CE02 Inbound
- CExx GVP
- CExx Outbound
- CExx Recording

The functionality can be broken down into the following areas:

- Unified Communications provided by the underlying Skype for Business infrastructure
- Contact Center Services integrated into the Skype for Business infrastructure
- Media Services and Treatment
- Consumer Endpoint – Support of consumers accessing the contact center as internal SfB Users, Federated SfB Users & Remote Users (roadmap for supporting Skype consumers and public access)
- Support for internal communications between Genesys agents and back-office SfB Experts

Unified Communications is provided by Skype for Business and is beyond the scope of this document. Please consult the following reference for more information (Skype for Business training).

Contact Center Services

The Skype for Business Solution supports all the services required to operate a multimedia contact center. These services include the following:

- IM, Voice and Video interactions controlled and monitored as Genesys interactions.
- Presence synchronization
- Intelligent call and interaction routing based upon flexible business logic (including IM, Voice and Video).
- Agent desktop to display tasks and customer information, control the agent's environment and integrated control of the underlying Skype for Business client to manage IM, voice and video interactions. Also manages agent and device state models.
- Supervisor functions including silent monitoring, whisper coaching and assistance call supervision.
- Media escalation from agents or callers.
- Outbound dialing campaigns with the ability to perform call progress detection (CPD) and answering machine detection (AMD). This mainly uses SIP Server infrastructure integrated into the solution.
- Integration to Genesys services. The solution includes a T-Server that integrates with Genesys components in the same manner as any other T-Server.

Some of the call controls provided to agents by the Genesys Workspace Desktop Edition (WDE) include:

- Answer and Reject Call
- Make Call
- Hold and Retrieve Call
- Muting Call
- DTMF for Established Calls
- Release Call
- Single Step Transfer
- Two Step/Consultative Transfer
- Single Step Conference Call
- Two Step Conference Call
- Supervisor monitoring
- Start/Pause/Stop call recording

The following Skype for Business specific controls are supported:

- Escalation of Media
- Address Book synchronization and searching between Skype for Business and Genesys directories.

Please see the Call Flows section for representative call control interactions.

Media Services and Treatments

The Skype for Business Solution provides various media services that enhance the overall contact center experience. These media services include:

- Playing announcements and greetings
- Call parking & qualification (DTMF / IVR)
- IM Treatments
- Music-on-hold
- Call Progress Detection/Answering Machine Detection (Outbound)
- Call Recording
- VXML support for advanced treatment scenarios

Note that treatments are for voice and IM only. Video treatments are not supported.

Consumer Endpoint Support

Skype for Business supports many consumer endpoints within the Skype ecosystem. The Genesys solution supports many of these endpoints. The following table notes which endpoints are supported.

Endpoint	Supported	Notes
Skype for Business (Enterprise)	Yes	Includes desktop, web and mobile clients
Skype for Business (Remote)	Yes	Includes desktop, web and mobile clients
Federated Skype for Business	Yes	Can include older Lync clients as well as SfB clients
Skype for Consumer	No	Roadmap
PSTN	Yes	

Internal Non-Agent Interactions

The solution supports interactions between Genesys desktop agents and back-office users using standard Skype for Business. The following features support these types of interactions:

- Pushing presence availability and activity from Genesys to Skype for Business
- Pushing presence from Skype for Business users to Genesys.
- Skype for Business directory access via WDE
- IM, Voice and video calls between WDE and Skype for Business users

Component View

The following table lists key Genesys components that comprise the Skype for Business architecture.

Component	Description
Skype for Business T-Server	T-Server interface to Skype for Business (through the UCMA Connector) that provides the standard CTI-like T-Library interface to other Genesys

	applications and 3rd party T-Server clients.
UCMA Connector	The Connector provides communication to the Microsoft Skype for Business facilities using the UCMA (Unified Communications Managed API). It does not have connection with the Genesys Framework.
Workspace Desktop Edition	Workspace is a Windows based desktop application for contact center agents and supervisors.
Workspace Desktop Edition Skype for Business Plug-In	The Plug-In provides integration between the Genesys Workspace Desktop Edition and the Skype for Business client which must be installed on the same desktop computer as Workspace.
SIP Server	SIP Server enables various VoIP services within the Genesys ecosystem.
Resource Manager	Provides HA and capacity management of MCP resources
Media Control Platform	The MCP provides various media capabilities including IVR, transcoding, recording, etc. and is a key element of GVP.
SIP Softphone	The SIP Softphone is only used as part of the Hybrid option explained later (see Hybrid Option). The SIP Softphone is a SIP based endpoint that integrates into Workspace to provide VoIP phone capabilities using the SIP Server as a PBX.
Genesys Interaction Recording	GIR is a solution that records most contact center interactions, including voice, video and IM. Note that only the audio component of video interactions are recorded.
Outbound Contact	Manages outbound campaigns and campaign dialing.
Universal Contact Server (UCS)	Maintains contact and interaction history in addition to other storage requirements. In this solution it is used to store IM transcripts.

Interaction Server (IXN)	Manages non-voice interactions within the Genesys environment in conjunction with the Orchestration/Routing layer. In this solution it is used by routing strategies to store contact details associated with various interactions stored in UCS.
Common Components	See the Common Component Blueprint for information on Management Framework, Orchestration/Routing and Reporting components used by this solution.

Microsoft Skype for Business Components

Microsoft's Skype for Business comes in two editions – Standard and Enterprise. The Standard Edition contains all components within a single server and is useful for lab trials, small businesses or small branch deployments. Enterprise Edition enables high availability, flexible topology deployments and many other features.

Genesys requires the Enterprise Edition for production deployments. Standard Edition may be used for labs and pilot projects.

Skype for Business consists of many components that can be installed in a variety of ways. There are also some standard Microsoft products that can also be tightly integrated with Skype for Business.

Microsoft Component	Description	SfB	Required
SfB Front End Server/Pool	Core SfB server which includes user authentication/registration, presence, IM, and application hosting. MCUs and conference focus are co-located on the Front End Server. Note that a cluster of Front End Servers can be configured and	Yes	Yes. Key integration point for Genesys application solution.

	addressed as a Front End Pool.		
SfB Back End Server/SQL Server	Database servers running Microsoft SQL Server and provide database services for the Front End Servers. Provides backup storage of user and conference data for a Front End Pool. Other persistent data stored in the Back End Server includes: • Presence Information • User Contact Lists • Conference state • Scheduled Conferences • Call Center Topology • Miscellaneous Configuration Data	Yes	Yes for Enterprise deployments
SfB Mediation Server/Pool	Mediation Server translates signaling and media. It is required for enterprise telephony as it is the main interface to a PSTN, IP-PBX or SIP Trunk via an SBC. In the Genesys solution it also provides the key integration to SIP Server, GVP, Outbound and Recording. Note that the Mediation Server may be collocated on the Front End Server/Pool but for performance reasons, a dedicated Mediation	Yes	Mandatory (required to connect SIP Server and MCPs).

	Server Pool is recommended.		
Edge Server	Edge Server is used to provide SfB services outside of the Enterprise including remote users, federated users and public IM services.	Yes	Typically
HTTP Reverse Proxy	Third party component to secure internet web traffic entering SfB.	No	Required if deploying the Edge Server
Exchange UM Servers	Microsoft Exchange Server is used for storing voicemails.	No	No
Office Web Application Servers	Office web application server or server farms enable PowerPoint slides to be shared as part of web conferences.	No	No
Persistent Chat Server	Enables persistent chat room functionality within SfB. A Compliance server can be used to ensure that the chats are stored for compliance purposes,	No	No
Survivable Branch Appliance	This appliance allows branch users to continue making phone calls, get voicemail and IM if that branch loses connectivity to the main data center hosting Skype for Business. The SBA includes a media gateway and Survivable Branch Server within a single appliance. This is a third party	Yes	No

	component typically from SBC/Media Gateway vendors.		
Survivable Branch Server	Subset of Skype for Business services to enable survivability if connection lost to the main SfB servers. Includes a SIP Registrar and Mediation Server.		
SCO Manager Server	Systems Center Operations Manager System facilitates managing the Microsoft data center environment.	No	No
Skype for Business Clients	Skype for Business clients provide users with UI access to the Skype for Business capabilities. Note that there are two versions of the client - Skype for Business clients and Skype for Business basic client. The solution supported in the Skype for Business client on Windows as installed with Microsoft Office. Mac and basic clients are not supported.	Yes	Yes

Microsoft Skype for Business supports various topologies. These include on-premise deployments, cloud PBX deployments and hybrid deployments. Genesys mainly supports on-premise deployments; Genesys' trusted application endpoints and agent pools need to be integrated to SFB Front-End Pools on-premise. However, other SfB users and applications could potentially be deployed in a hybrid fashion.

On-premise deployments can be very flexible including multiple data centers and branch offices. See the following link for more details on the various on-premise topologies available for Skype for Business.

https://technet.microsoft.com/en-us/library/gg398095.aspx

Additional Third Party Components

In addition to Genesys and Microsoft components, some third party components may be used to enhance the overall solution. These include:

- SBC/Media Gateways
- Survivable Branch Appliance
- HTTP Reverse Proxy
- Firewalls
- Administration Tools

Note that Skype for Business compatible phones are not currently supported with this solution for contact center agents.

Limits and Constraints

There are some limitations to the solution, especially considering the flexibility of Skype for Business deployments and features. The following list highlights some of the major constraints. For a complete list of the latest known issues, please see the Issues section of the [Deployment Guide].

- This solution only supports Skype for Business Enterprise Edition for production deployments.
- Genesys only supports a single Skype for Business T-Server within a Skype for Business topology. That T-Server is also limited to a cluster of UCMA Connectors attached to a single Front-End Pool within the Skype for Business topology. It supports multiple SIP Servers within the network.
- The solution only supports Workspace Desktop Edition – Workspace Web is on the roadmap but not currently supported.
- Video – SfB video is a supported interaction within the Genesys solution. However, recording of the video is not supported – only the audio from the video interaction is currently supported.
- Escalation of Media (e.g. moving an original IM chat to a phone interaction) is doable but certain escalations cannot be monitored or reported (specifically Voice to Video).
- Screen Sharing can be used from within the SfB client. However the use of SfB screen sharing can not routed, monitored or reported within the Genesys solution.
- Note that this solution replaces SmartLink for integrating Enterprise Expert Groups into the CX ecosystem.

Deployment View

Skype for Business Network Overview

As this solution centers around the integration with Skype for Business, a basic understanding of the various Skype for Business elements and topologies is required. The section, Microsoft Skype for Business Components, discusses the many elements that make up a potential Skype for Business deployment.

As mentioned earlier, Microsoft supports On-Premise, Cloud and Hybrid Skype for Business deployment models. The Genesys solution supports application components and agents on-premise; Hybrid deployments where non-agents are deployed within the cloud are supported. This section will focus on-premise network deployments.

Key Concepts	Description
Standard Edition Server	Contains all the Skype for Business elements on a single server. These can be paired for high availability. However, Genesys' integration with Standard Edition is not supported for production environments.
Paired Front End Pools	A Front End Pool can be paired with a pool at a different site to enable disaster recovery. If a failure occurs at one site, the administrator can fail over those users to the paired site.
Mirrored Back End Servers	Back End Servers are essentially SfB-purposed SQL Servers. Mirroring two Back End Servers is one way to provide database high availability. SfB also supports the use of SQL Clustering and AlwaysOn Availability groups.
Trusted Application Computer/Pools	Third party integrations (including Genesys UCMA Connector) are configured as Trusted Application Endpoints within a Trusted Application Pool. These are configured against a particular Front End Pool.

Skype for Business supports small, medium and very large organizations. Small and medium business may opt to deploy the main Skype for Business components within a Central Data Center. They may also want to provide additional capabilities to branch offices – the use of either phones connected to a PSTN or a Survivable Branch Appliance will ensure that branches can still provide phone services if there is a loss in WAN connectivity to the Central Data Center. The following diagram depicts this type of deployment.

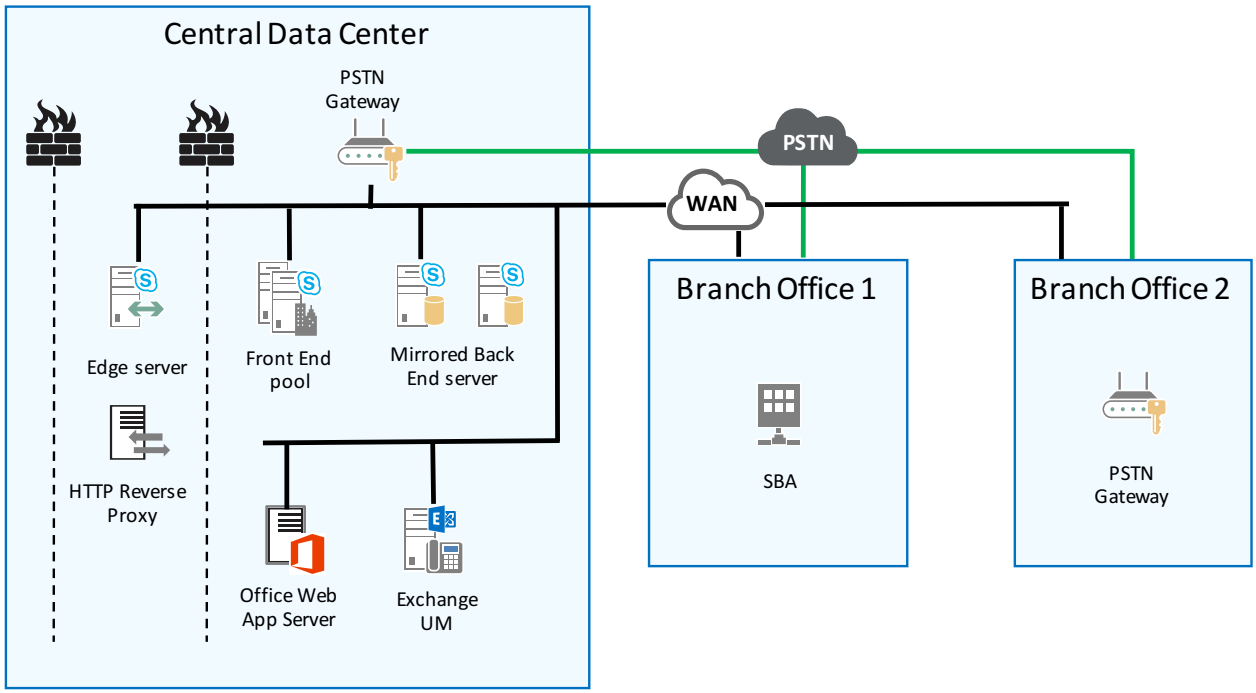

Figure 2: SfB Central Data Center

Skype for Business can support large organizations with multiple data centers as well. These types of deployments are quite flexible. Disaster recovery and multiple geographic locations are supported by this kind of topology. The following diagram depicts a dual data center with a paired pool of front end servers for disaster recovery.

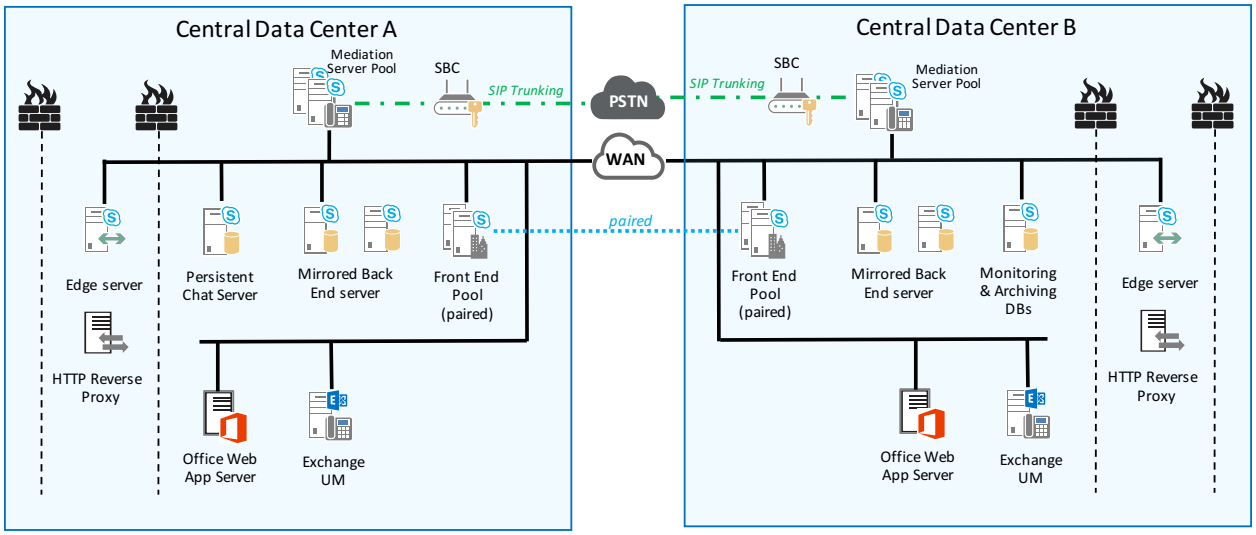

Figure 3: SfB Dual Data Center

This diagram also depicts separate Mediation Server Pools – these are required for integrating SIP Trunks from the PSTN into Skype for Business. Note that the Mediation Server is also an important integration component to the Genesys GVP and SIP features. Mediation service can be co-located with the Front End services on the Front End Pool or externalized as a separate Mediation Server Pool as shown here. For performance reasons, deploying a separate Mediation Server Pool is recommended.

Skype for Business can support more than just two data centers. There can also be multiple front end pools within each data center as well. For more information, please review this Microsoft TechNet article:

- https://technet.microsoft.com/EN-US/library/gg398095.aspx

Genesys Deployment Options

There are several deployment options to consider based on the Skype for Business network topology and Genesys features to be provided. These options include:

- Central Data Center Deployment versus Dual Data Center Deployment
- Application Pools (Single vs Dedicated vs Multiple Pools)
- SIP Server In-Front vs SfB Mediation Server In-Front
- Hybrid Deployment

Dual data center deployment will be discussed in the Disaster Recovery section. The next sections will focus on the

central data center model and delve into application pools and SIP vs Mediation server in front models within a central data center deployment.

Central Data Center Deployment

The following figure depicts a central data center with Genesys components deployed at the same site as the Skype for Business core components.

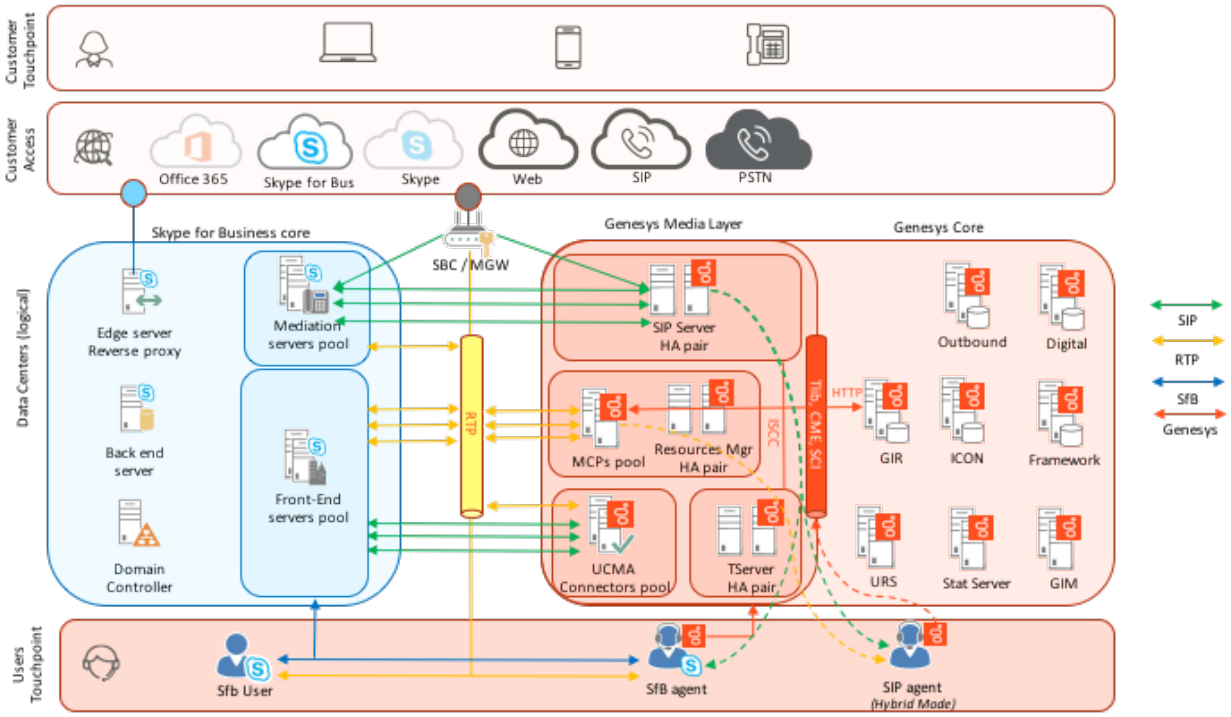

Figure 4: Central Data Center Deployment

PSTN access to the data center is through a Media Gateway or an SBC if SIP Trunking is supplied from the carrier. SIP Server and/or the SfB Mediation Server need to be in the signaling path with the SBC/MGW. A SIP trunk needs to be configured between SIP Server and the Mediation Server as well to enable features like announcements, IVR and recording.

Resource Manager and MCPs need to be configured. These are required for treatments, qualification and parking

as well as other capabilities. Depending on the features and licensing, a full scale GVP deployment can be envisioned for a complete IVR solution integrated into Skype for Business.

A pool of UCMA Connectors must be configured into a Front-End server pool as a trusted application pool. Genesys routing points need to be configured to correspond with trusted application endpoints within the trusted application pool. The UCMA connectors are then integrated into the Skype for Business T-Server. This is the key integration point between the Skype for Business environment and the Genesys world.

The T-Server and SIP Server utilize ORS/URS to handle routing calls. ISCC can be used between SIP Server and the SfB T-Server to transfer calls between the two.

Contact center agents use the Workspace Desktop Edition with the Skype for Business Plug-In to handle calls routed to them. Note that a Skype for Business 2016 client needs to be installed on the same Windows PC as the Desktop and plug-in. Voice, IM, Video and other SfB features are typically handled by the Skype for Business client. There are several desktop options (discussed in the section, Agent Experience) that control how SfB interacts with Workspace.

SIP Server can register and host SIP-based agents if required. Agents can have both a SIP and Skype for Business endpoint configured within their Desktop. This is discussed later as the Hybrid Option.

Most of the Genesys ecosystem (including Framework, InfoMart, Outbound, GIR, etc.) is available to this solution. For more information, please see the appropriate Solution Blueprint including the [Common Components Blueprint]. GIR and Outbound integration is through SIP Server and requires a SIP Server In-Front deployment.

Application Pools

When configuring Skype for Business, certain entities need to be homed on a particular Front-End Pool. These entities include users and trusted application endpoints. Contact center agents need to be configured as SfB users and homed to a particular Front-End pool. The UCMA Connectors must also be configured as a trusted application server and homed to a particular Front-End Pool.

There are several permutations that can be deployed for this solution. The easiest is a single pool that homes all users (including contact center agents) and the UCMA Connector trusted application server. This assumes that the overall Skype for Business topology can be supported in a single Front-End Pool.

The following diagram depicts the single pool for all users and applications. Note that internal Skype for Business users can communicate with Skype for Business Agents either directly using SfB or as part of a contact center routed interaction.

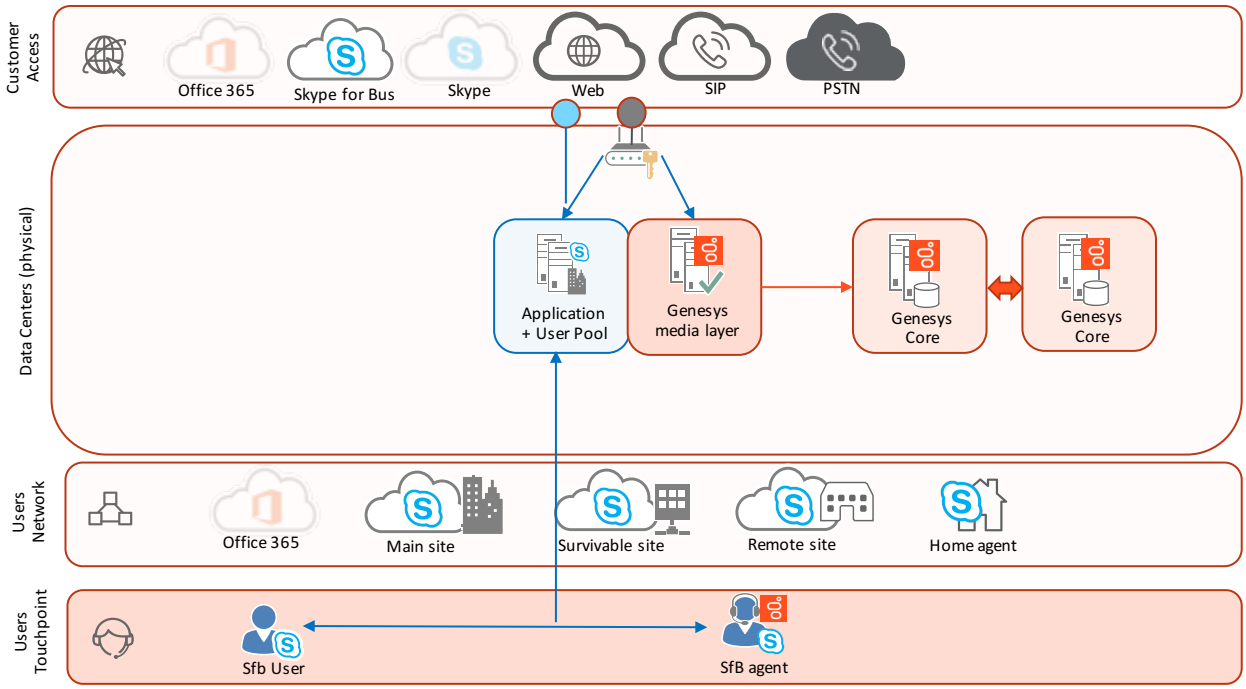

Figure 5: Single Pool

The next options is to have a dedicated Front-End Pool for contact center users and applications. This option isolates the contact center entities in its own pool which may be useful from an administrative point of view. Enterprise users can be homed on other pools as required.

The following diagram depicts the dedicated contact center pool.

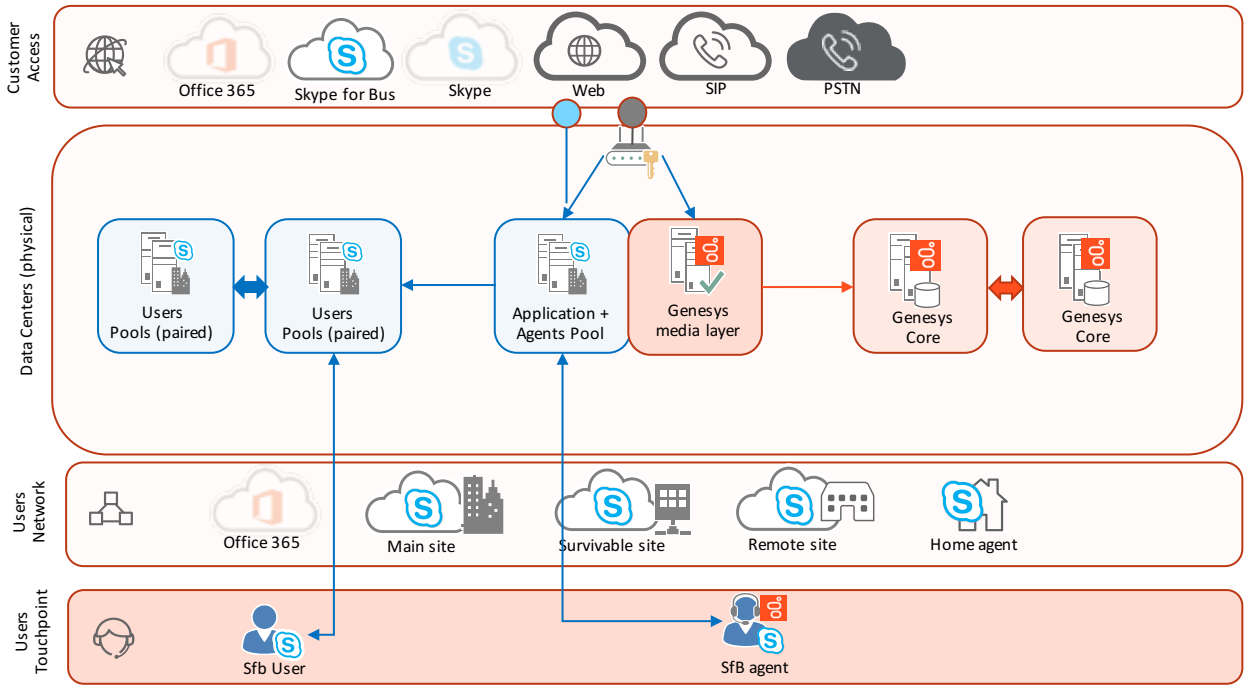

Figure 6: Dedicated Contact Center Pool

Finally, the UCMA Connector can be homed on a dedicated application pool with SfB Agents and other enterprise SfB users homed on other Front-End pools.

The following diagram depicts the dedicated application pool. Note that the pools for users and agents can be paired for disaster recovery purposes whereas the application pool cannot.

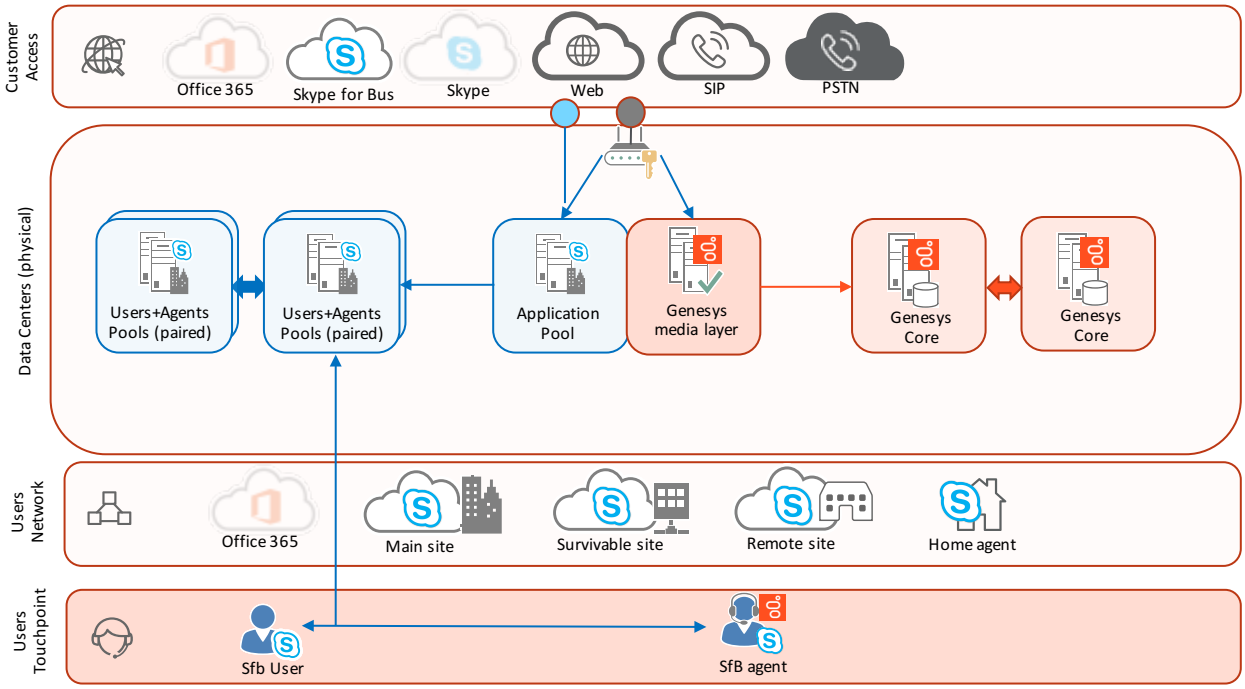

Figure 7: Dedicated Application Pool

A dedicated application pool is the most flexible deployment option and should support a larger agent population as the UCMA Connector has a Front-End Pool dedicated to supporting the Genesys infrastructure without the load of SfB agents. However, this will require more hardware and administration.

SIP Server In-Front

It is highly recommended to configure SIP Server in front of the Skype for Business infrastructure. This may be contentious to the people managing Skype for Business as it may seem counter to the notion that Skype for Business is control of the telephony. However it is required for Genesys Outbound Campaigns (in predictive and progressive modes) and recommended for Self-Service IVR and Qualification and Parking.

SIP Server In-Front can also off-load the Skype for Business infrastructure while targeting an agent (using Q&P instead of SfB's internal MCUs). Note that SIP Server In-Front is mainly targeted for handling of PSTN traffic. Internal Skype for Business traffic would be handled by SfB infrastructure.

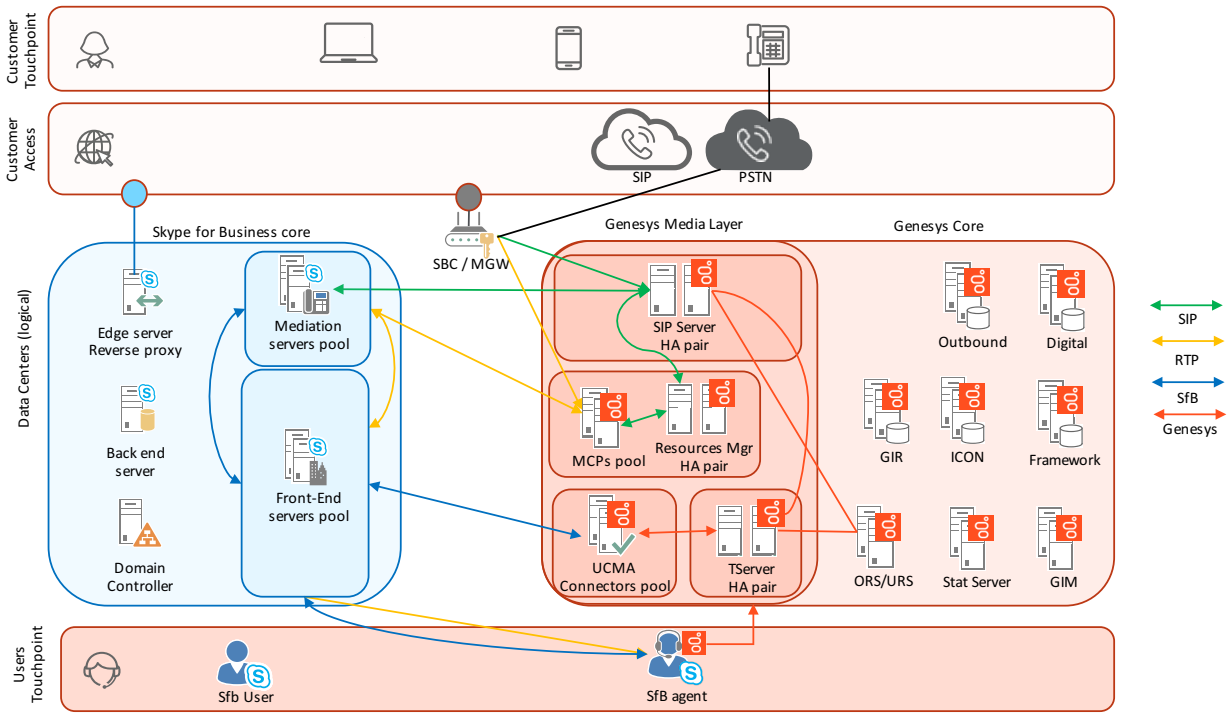

Figure 8: SIP Server In-Front

Inbound PSTN calls, usually through a toll-free number, would be routed to SIP Server with RTP routed to the MCPs. Self-service and call queuing and parking can be handled at this point. Routing would then be invoked to find an SfB Agent. Once an agent is found, an ISCC transfer occurs between SIP Server and the SfB T-Server. The T-Server and UCMA Connector allocate SfB MCU resources and connect the agent to the SfB conference on the MCU. The inbound call is linked with the ISCC and connected to the MCU.

Note that the MCPs and SIP Server will often be kept in the signaling/RTP path. This is useful for recording purposes but proper sizing of SIP Server and MCP is required.

SIP In-Front deployments (and Hybrid Deployments) effectively setup SIP Server as a separate T-Server from the SfB T-Server. Calls handled by SIP/GVP will require an ISCC transfer from the SIP environment to the SfB environment. Note that only transfers between one Skype for Business T-Server and SIP Servers is supported in this solution.

The SfB T-Server supports ISCC `route-no-token` and `pullback` transaction types (with some limitations on

pullback). This should eliminate RTP tromboning through the two voice environments. See Configuration Guidelines for more details.

Hybrid Deployment

A Hybrid Deployment adds SIP Agent support to the overall solution. This can include separate SIP agents and Skype for Business agents with two endpoints for receiving calls – Skype for Business client for SfB calls and SIP Softphone for answering SIP calls.

The deployment is very similar to the standard solution deployment. DNs for the agents will need to be added to the SIP Server configuration. Depending on the sizing of the overall solution, it may be recommended to add an additional set of SIP Servers dedicated to hosting the SIP agent traffic. More details on the deployment can be found in the [SIP Voice Solution Blueprint].

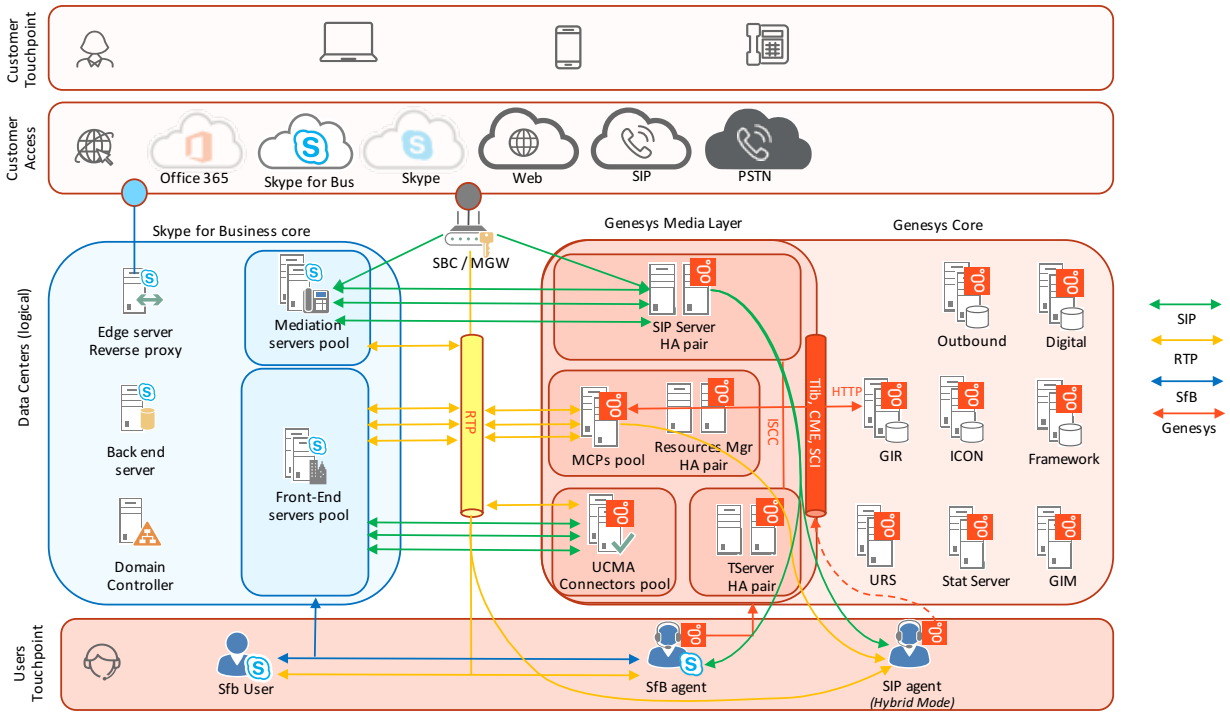

Figure 9: Hybrid Deployment

Agents using both Skype for Business and SIP endpoints will need to setup their Workspace to handle both types of

media. They will effective have two DNs configured as a single place within the Genesys environment. See the section [Hybrid Option].

Interactions can be transferred between SIP and SfB endpoints/agents. SIP and SfB are treated as separate sites within Genesys and an ISCC transfer is used to make the transfer between the sites.

High Availability

Skype for Business uses pools of Front-End Servers to provide high availability for its users.

The Genesys UCMA Connectors support an N+1 pool connected to the Front-End Server pool. The UCMA Connector pool supports load sharing/balancing capabilities. Note that the UCMA Connectors are all part of the same Skype for Business trusted application pool.

The Skype for Business T-Server supports a Primary/Backup hot standby HA model. If the primary host fails, the backup host takes over as primary immediately. The following diagram depicts High Availability within the Skype for Business solution components.

High Availability for SIP Server and the other components are documented in the associated Solution Blueprints and Deployment Guides.

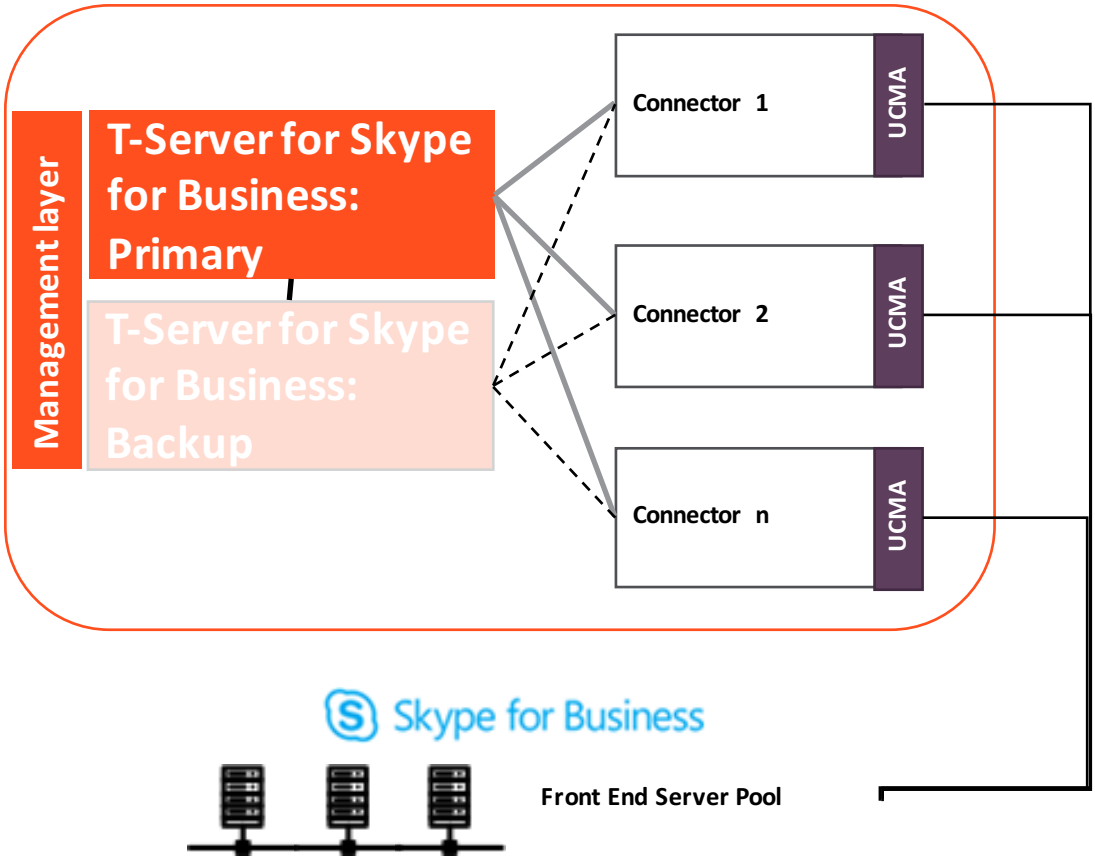

Figure 10: High Availability

Split Architecture

Ideally Genesys and Skype for Business components should be installed in the same network together. However, some customers have split the network between Skype for Business and the other components of the enterprise. In these cases, it is recommended to place the UCMA Connectors and the T-Server in the same network/subnet as the Skype for Business Front-End Servers.

Proper network sizing and firewall configuration is required to ensure that all components can be reached. Please see the [Firewalls] section for more details.

Disaster Recovery

Skype for Business supports a disaster recovery process whereby SfB users can be moved from one Front-End Pool to a paired pool at another site. Although this process can be automated it has a huge impact on the infrastructure and usually requires human decision to invoke it.

Unfortunately, only SfB users can be failed over using the paired Front-Ends. Skype for Business does not support failing over trusted applications and trusted application endpoints such as the Genesys UCMA Connector. There is also a limit of one Skype for Business T-Server in a Skype for Business topology.

A cold standby environment needs to be configured in a separate site for disaster recovery. Once the primary site goes down, the T-Server and Connectors need to be brought on-line and the trusted application endpoints need to be setup within the SfB Front End Pool at the recovery site.

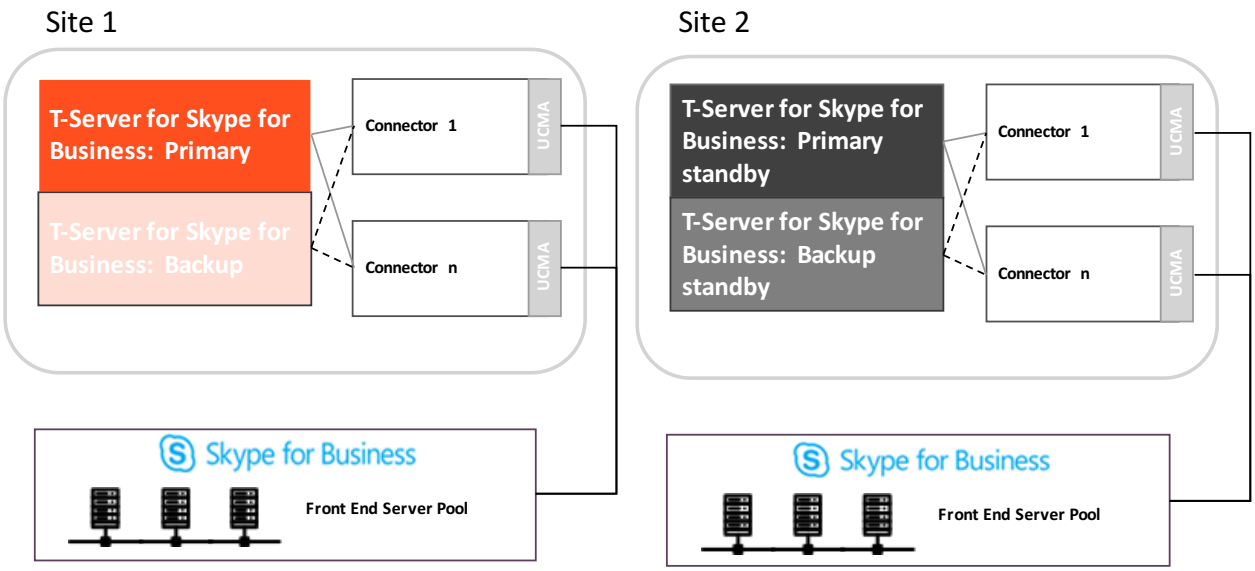

Figure 11: Disaster Recovery

Database

It is recommended to use Microsoft SQL Server Enterprise Edition with SQL Server Cluster or Always On for Skype for Business enterprise deployments.

Interaction View

Agent Experience

The user experience for the SfB contact center agent is based on the Genesys Workspace Desktop Edition integrated with the Skype for Business client using a Workspace plug-in. Workspace can be configured in several ways depending on the needs of the contact center.

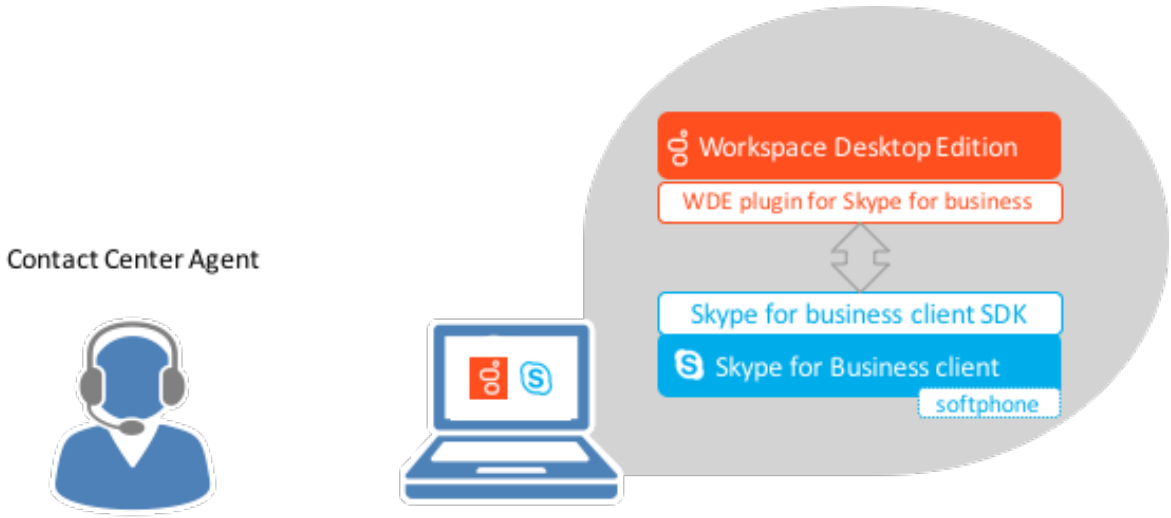

Figure 12: Workspace Plugin for SfB

There are three UI modes based on the configuration of the Workspace Plugin:

1. Suppression Mode
2. Parallel Mode
3. Hybrid Option

Suppression Mode

The first option is called Suppression Mode. In this mode, the Skype for Business client is hidden and working in the background. All user interactions are done through the Workspace UI, including making and receiving voice calls, IMs, etc. The advantage of this mode is simplicity as a single UI is used.

There are a few disadvantages. An agent cannot use certain Skype for Business features like screen sharing as they cannot directly access the SfB client. All calls in suppression mode are monitored and intercepted by the SfB T-Server and delivered as a SfB conference – this makes direct calls to an agent problematic.

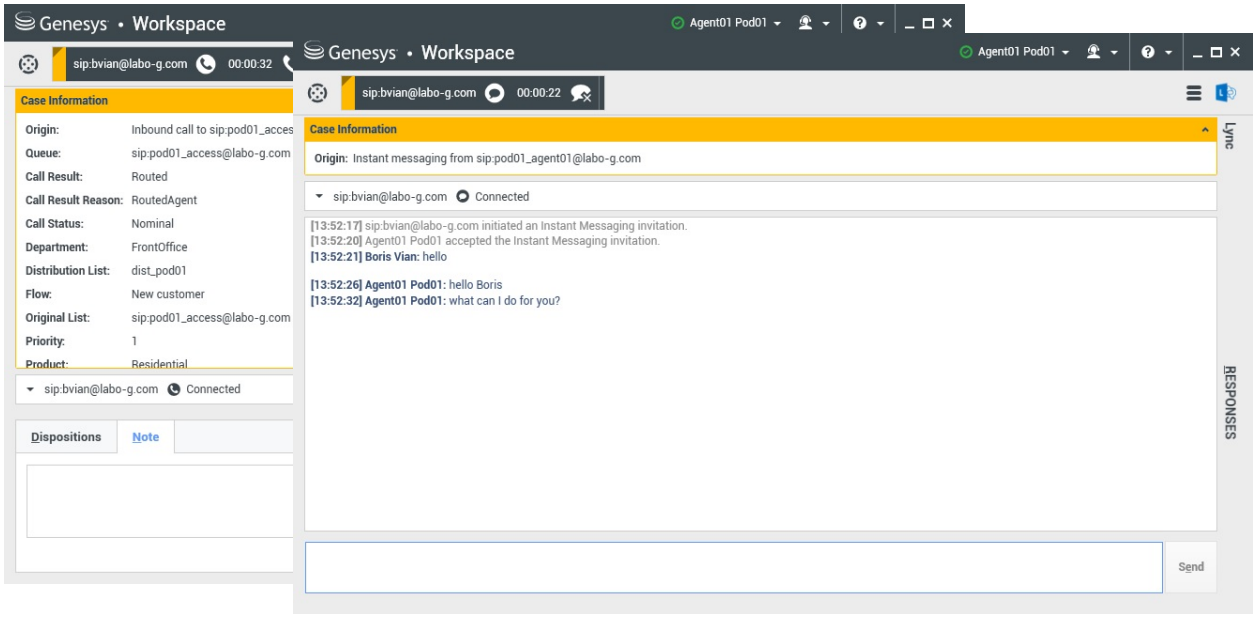

Figure 13: Suppression Mode

Suppression mode is best used for agents comfortable with Workspace and who are mainly taking PSTN calls or IM and do not need the additional features and capabilities provided by the Skype for Business clients.

Parallel Mode

Parallel mode makes the Skype for Business client visible and accessible on the same desktop as Workspace. Calls can be controlled from either UI (e.g. agent can answer a routed voice interaction on the SfB client and the customer details will be displayed in Workspace).

Direct Call Handling is a T-Server setting that controls whether Genesys controls and monitors direct calls to an Agent's DN/Skype client. When set to true direct calls are monitored and reported by Genesys; these calls will also appear as conferences. When set to false (or on_login and the user logs out of Workspace), direct calls will go directly to the SfB client.

Parallel Mode enables these direct calls to be handled by the agent outside of Genesys control. This can be useful for enterprise users that rarely use Workspace and want to use SfB directly when not working as an agent.

This also enables an agent to use advanced SfB features like screen sharing and whiteboarding. To do this, the agent must have direct call handling disabled on their DN, and then start a separate parallel interaction which is not routed/monitored by Genesys. This separate interaction is not controlled or reported within Genesys.

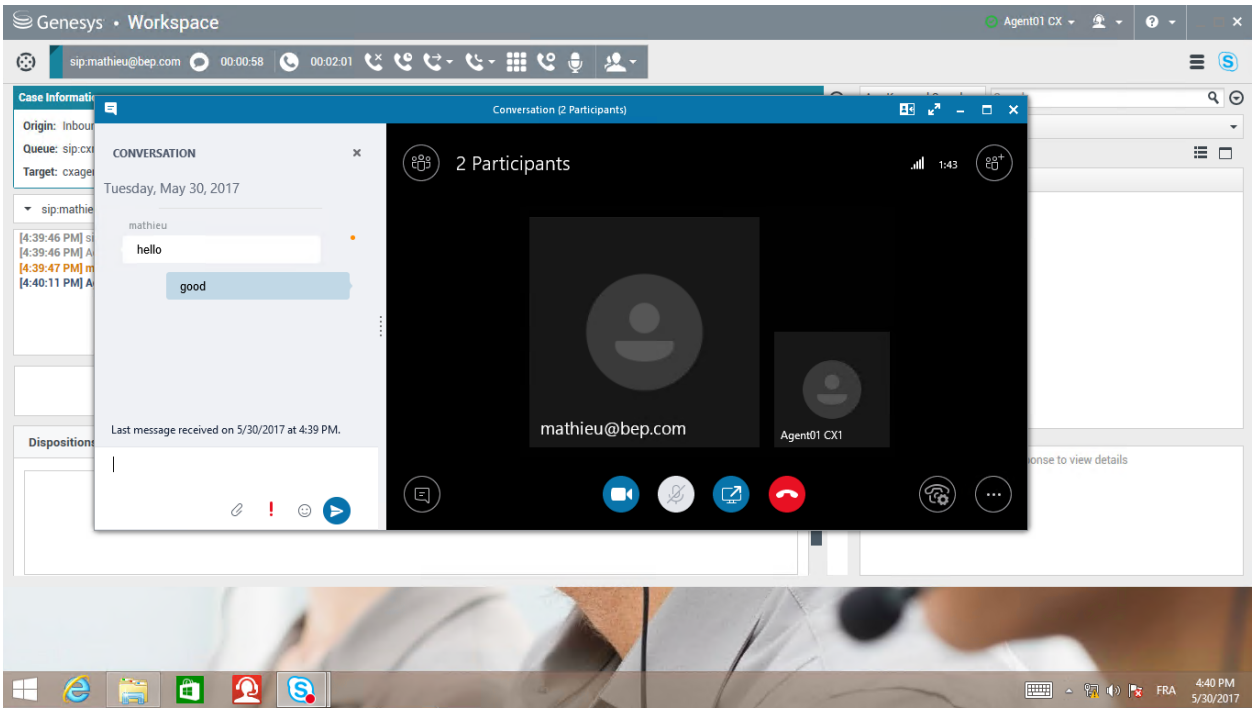

Figure 14: Parallel Mode

The advantages of this mode are flexibility, and access to Skype for Business user experience and advanced features.

The disadvantage is the complexity of the user experience and the potential training requirements for an agent. Multiple “toasts” may appear on the Genesys and SfB clients for the same call.

Hybrid Option

Since SIP Server is part of the overall solution, agents can also be setup with a SIP Server endpoint DN. This will allow voice calls to be made or delivered via SIP Server as well as from Skype for Business. This will be displayed as

a separate channel (see the “voice SipSwitch” entry in the channels screen shot below). This option is available with both Suppression and Parallel modes.

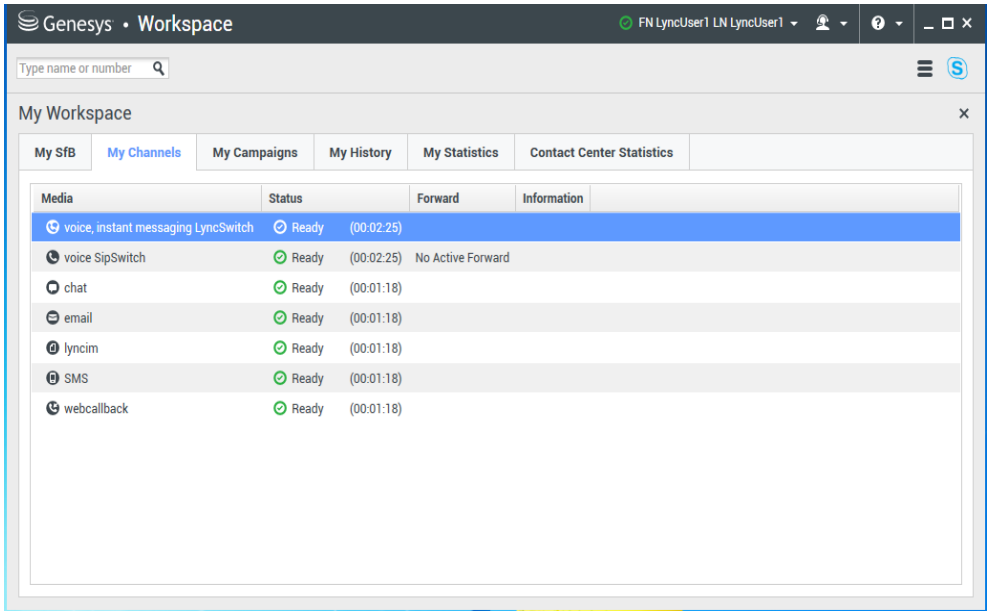

Figure 15: Hybrid Mode Channels

Although the configuration can be complex, the user experience is seemless. Workspace handles choosing the appropriate “channel” to reach an agent based on finding the simplest route (e.g. avoiding ISCC transfers between T-Servers). Conferences and Transfers will use whichever channel the initial call was made on (e.g. calls arriving from Skype for Business will utilize SfB channel to other hybrid agents).

The Hybrid Option enables scalability as SIP Server can be used to off-load inbound PSTN traffic from the enterprise Skype for Business infrastructure. If desired, it enables integration with SIP-only agents. It can also be used for Outbound Campaigns (especially those using progressive or predictive dialing).

Presence Mapping

The Presence status can be mapped between Skype for Business status and Genesys Agent status, or vice versa. Only one direction is permitted at a time for an agent (this is configured centrally at an agent or agent group level). Mapping Skype for Business presence to Genesys is handled using the following DN configuration option:

```
Switches->DNs->Presence profile DN->Annex->TServer
Map-presence-to-dnd=true
```

A presence-availability-range can also be used.

Publishing presence to Skype for Business requires an XML file that maps the Genesys' agent and device states as an aggregated state to SfB.

See [Supported Features/Presence] for more details.

Call Flows

Call Qualification and Parking

The call flows for Qualification and Parking depend on whether the customer is deploying a SIP In-Front architecture or a T-Server In-Front. The following diagram depicts the call flow for the qualification and parking of an inbound call using T-Server In-Front.

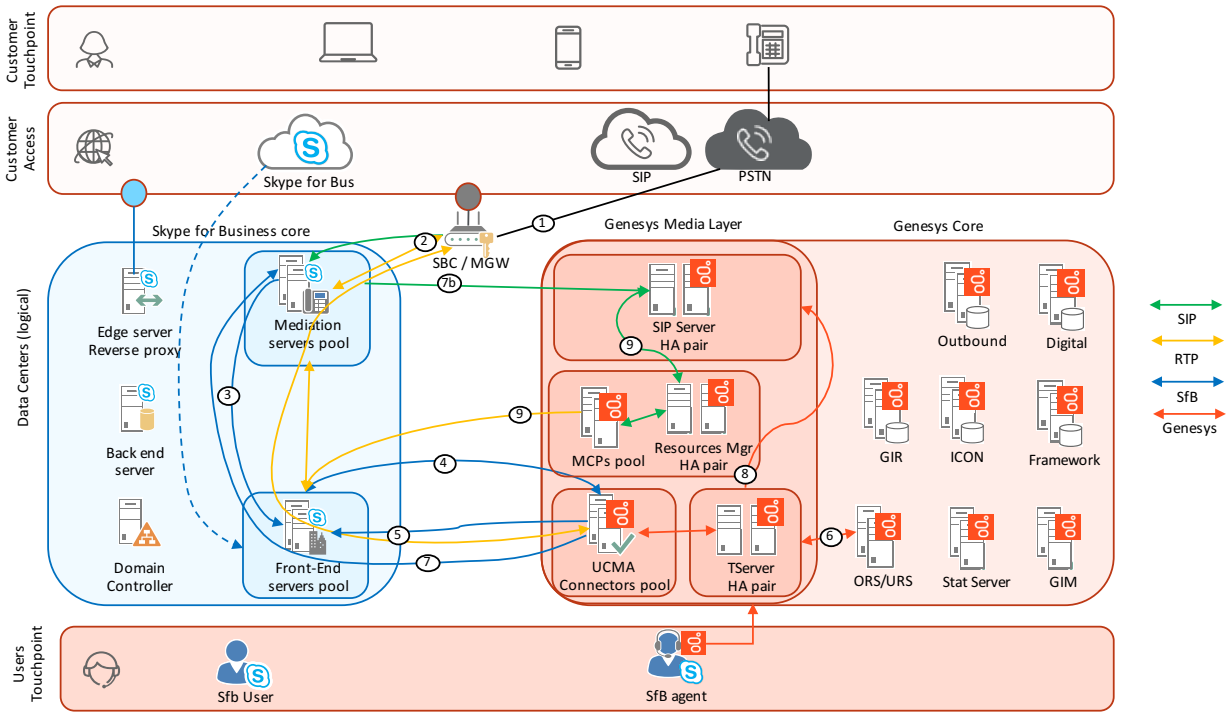

Figure 16: Qualification and Parking

1. PSTN call arrives at SBC or Media Gateway.

2. Call lands on Mediation pool
3. Mediation Server contacts the Front-End server associated with the Genesys trusted application endpoint
4. Front End Server contacts UCMA connector pool associated with the trusted application endpoint
5. UCMA Connector establishes a conference (at this point is RTP routed from Connector through Front-End and Mediation pools to the PSTN user.
6. URS/ORS applies treatment to SFB T-Server Routing Point
7. UCMA Connector connects SIP Server into the Conference for treatment.
8. SFB T-Server apples requested treatments on SIP Server (via T-Lib).
9. SIP Server starts to apply treatments using GVP/MCP.

Note that if an internal SfB client dials into the same trusted application, they would connect to the Front-End pool and proceed from step 4.

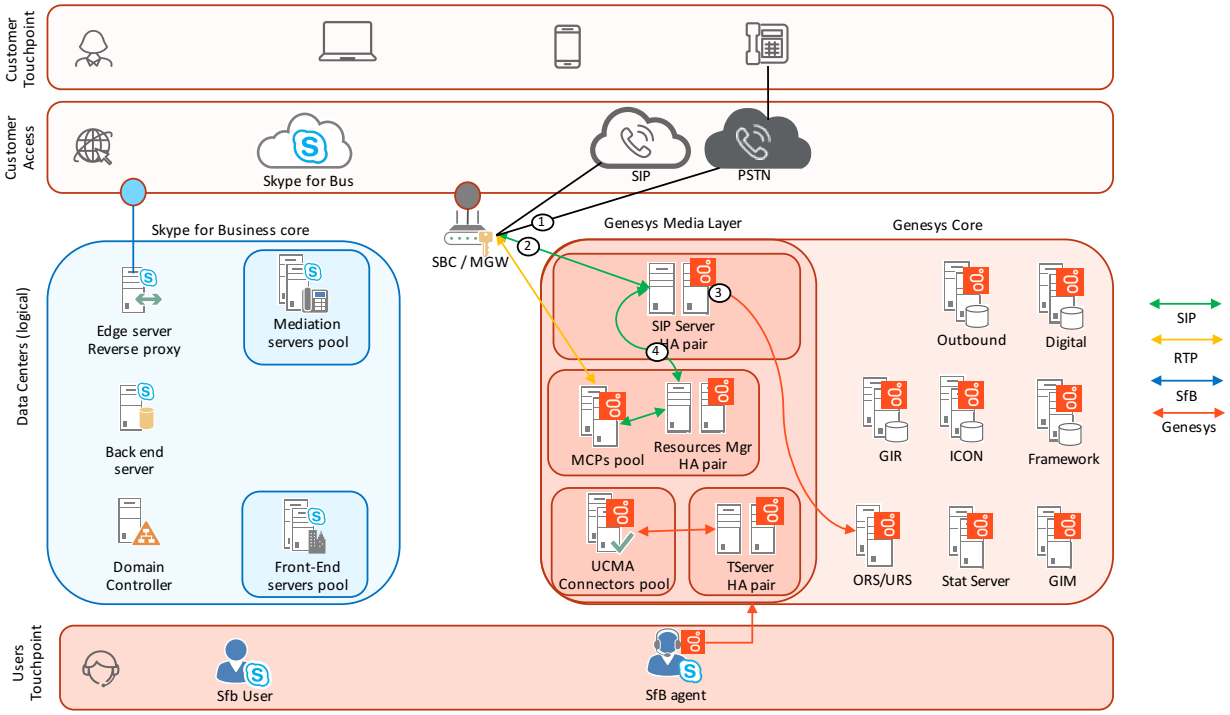

Figure 17: Qualification & Parking/SIP In-Front

The previous diagram depicts qualification and parking with a SIP In-Front architecture.

1. PSTN call arrives at SBC or Media Gateway.
2. Call is sent to SIP Server based on SBC rules. Note that this offloads SFB infrastructure.
3. SIP Server uses ORS/URS to execute the strategy for the routing point.
4. Based on the routing strategy, call is sent to GVP (RM & MCP) to send treatments to the consumer and receive any input requested.

Note how all of the processing is on the Genesys side, leaving Skype for Business to handle the enterprise workload.

Routing Call to Agent

The following diagram depicts the routing of a call to an agent. It assumes the call has already been qualified and is parked on the MCP.

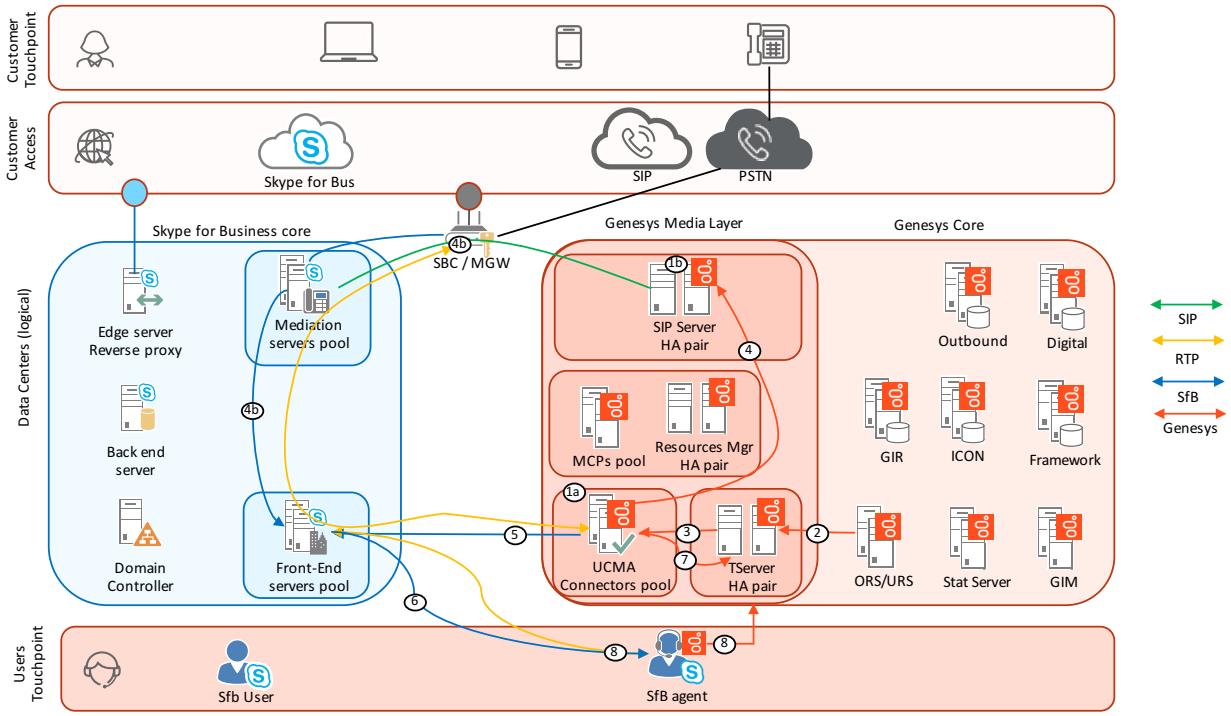

Figure 18: Route Call to Agent

1. The call is established on the UCMA Connector and treatments have been applied. In the case of SIP In-Front, the call is established on SIP Server/MCP (1b).
2. URS requests to route a call from the SfB T-Server to an SfB Agent.
3. SfB T-Server sends the request to the UCMA Connector

4. UCMA Connector disconnects the SIP Server that applied the treatments. In the case of SIP In-Front, SIP Server forwards the PSTN call through the Mediation Server to the Front-End pool and RTP through to the UCMA Connector (4b).
5. UCMA Connector sends a request to the Front-End server to dial out from the Conference to the agent.
6. The Conference invites the Agent
7. In Parallel, the UCMA Connecto sends events to the SfB T-Server about the dial out in progress.
8. The call arrives at the Agent workspace and the agent accepts the call (either via Skype client or Workspace).

Customer On Hold

The following diagram depicts putting a customer on hold. It assumes the call has already been established between the customer and the agent.

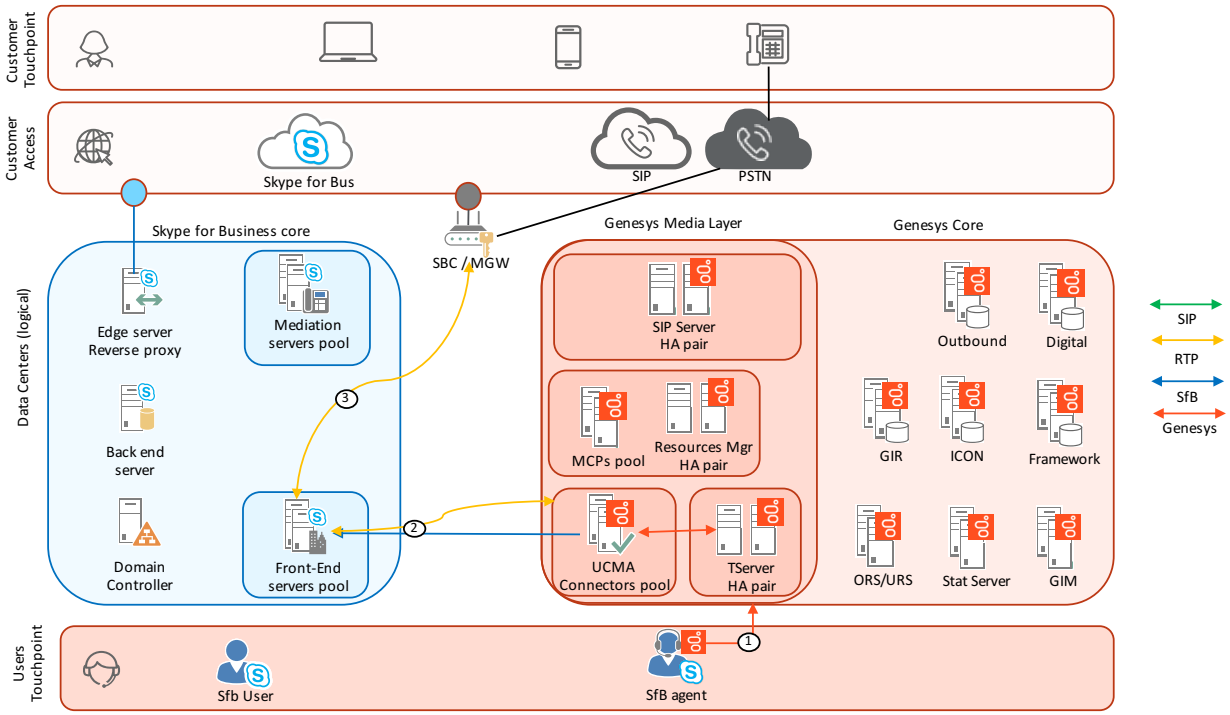

Figure 19: Customer On Hold

1. Agent selects the Hold button on the Workspace and the Hold message is sent to the T-Server.
2. UCMA Connector connects the call to the source of the configured music on hold and starts streaming the RTP.
3. Hold Music is played from the Front-End Server back towards the customer.

Consultation Between 2 Agents

The following call flow depicts conferencing between an agent – assuming the customer is already on hold.

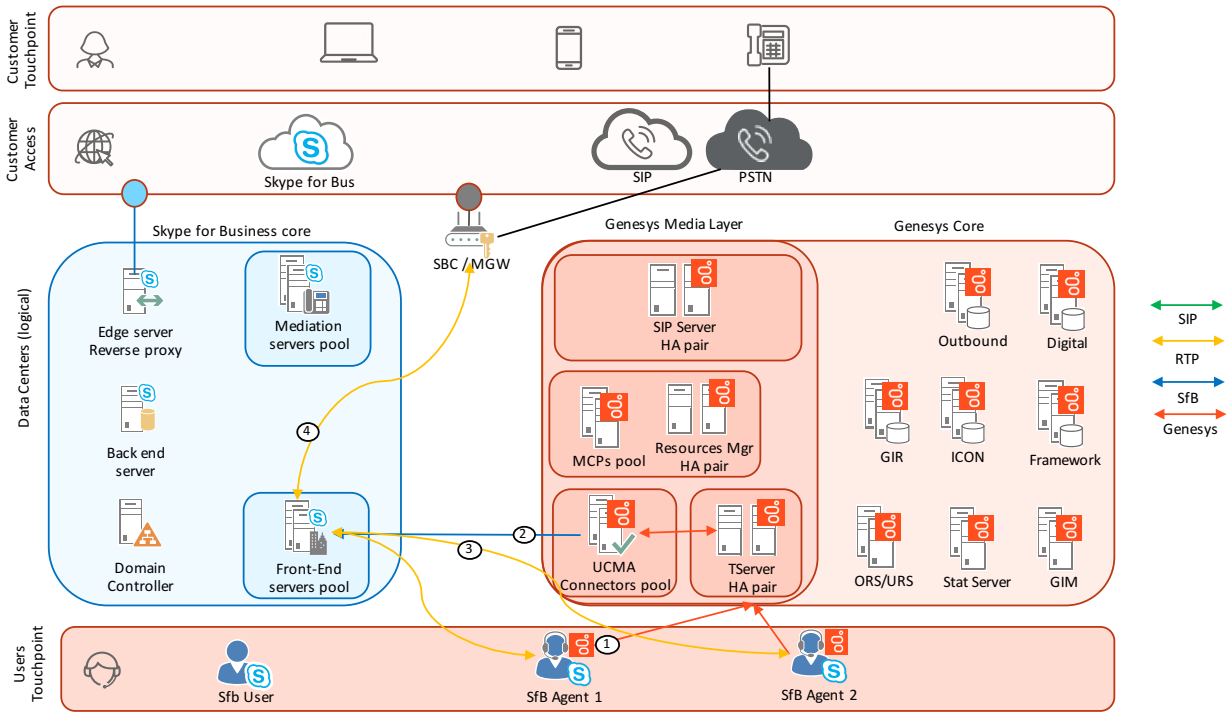

Figure 20: Conference with 2 Agents

1. Assuming the customer is on hold, the original agent looks up Agent 2 and makes a consultation request.
2. UCMA Connector (directed by T-Server) sends request for Agent 2 to the associated Front-End pool.
3. UCMA Connector creates a new audio path between the two agents on the same FE Pool/MCU. The Agents can now confer.
4. If desired, the Customer can be taken off hold (released) and added into the conference with the 2 agents. The music on hold player would stop and the audio path updated for the customer so that she is now participating in the agents' conference.

Note – a single step transfer is also feasible. The customer would not be put on hold, agent 2 would just be dialed into the existing conference between agent 1 and the customer.

Conference with Agent and Enterprise User

The following call flow depicts conferencing with an Enterprise User. Similar to the last call flow, it assumes that the customer is already on hold and that the Agent is trying to confer with an Enterprise user.

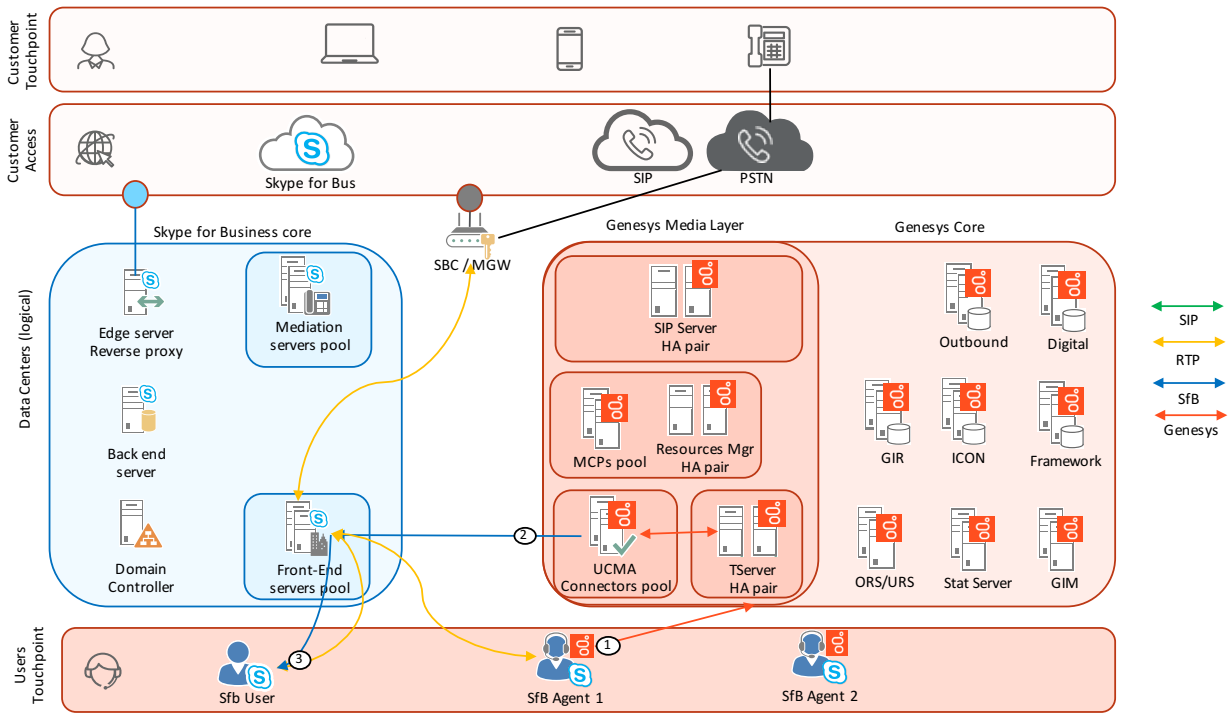

Figure 21: Conference with Enterprise User

1. Assuming the customer is NOT on hold, the Agent looks up Enterprise User and requests a conference with them
2. UCMA Connector sends a request for an Enterprise User
3. The SfB User is contacted through SfB and linked into the conference on the Front-End server.

Note this is an example of a single step conference/transfer – the customer remains in the conference as the Enterprise user is added to the conference.

Recording

The following call flow depicts call recording with the Skype for Business platform. Note that it is assumed that the call has or is being routed to an agent.

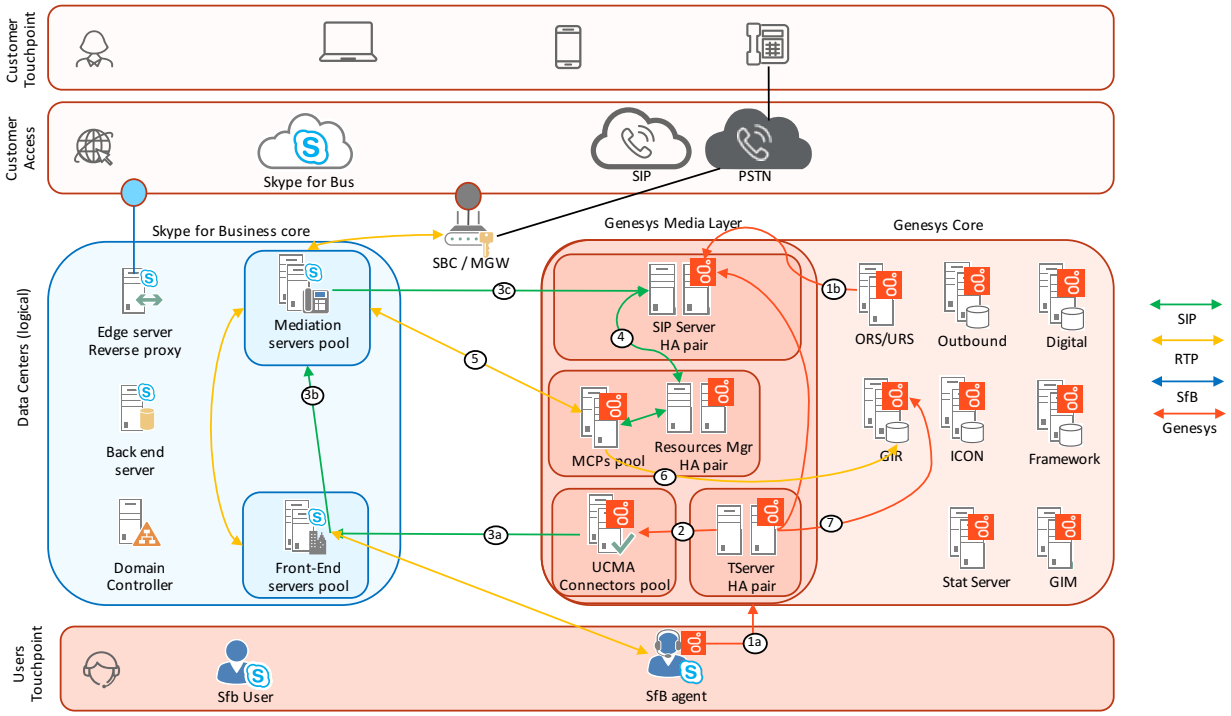

Figure 22: Recording

1. The recording can either be started automatically or manually by the Agent (a) in which case a PrivateService message is sent to the T-Server to start the recording. If automatic recording is setup then recording will be requested as part of the agent targeting.
2. The T-Server requests the UCMA connector to include the SIP Server recording port into the conference.
3. UCMA Connector invites SIP Server's recording port into the conference via the Front-End Server and Mediation Server
4. SIP Server invites the recording MCP into the conference.
5. RTP for the conference is established between the Mediation Server and the MCP.
6. Audio is sent to GIR for encryption and storage
7. T-Server send events to GIR during the recording session.

For more details on the internals of GIR consult the Interaction and Analytics Solution Blueprint.

Outbound Dialing

The following call flow depicts the Outbound campaign. This particular call flow assumes that the agent is using the Hybrid option allowing her to take SIP Server based calls directly and has registered with the dialing SIP Server. Note that this also assumes a SIP In-Front deployment.

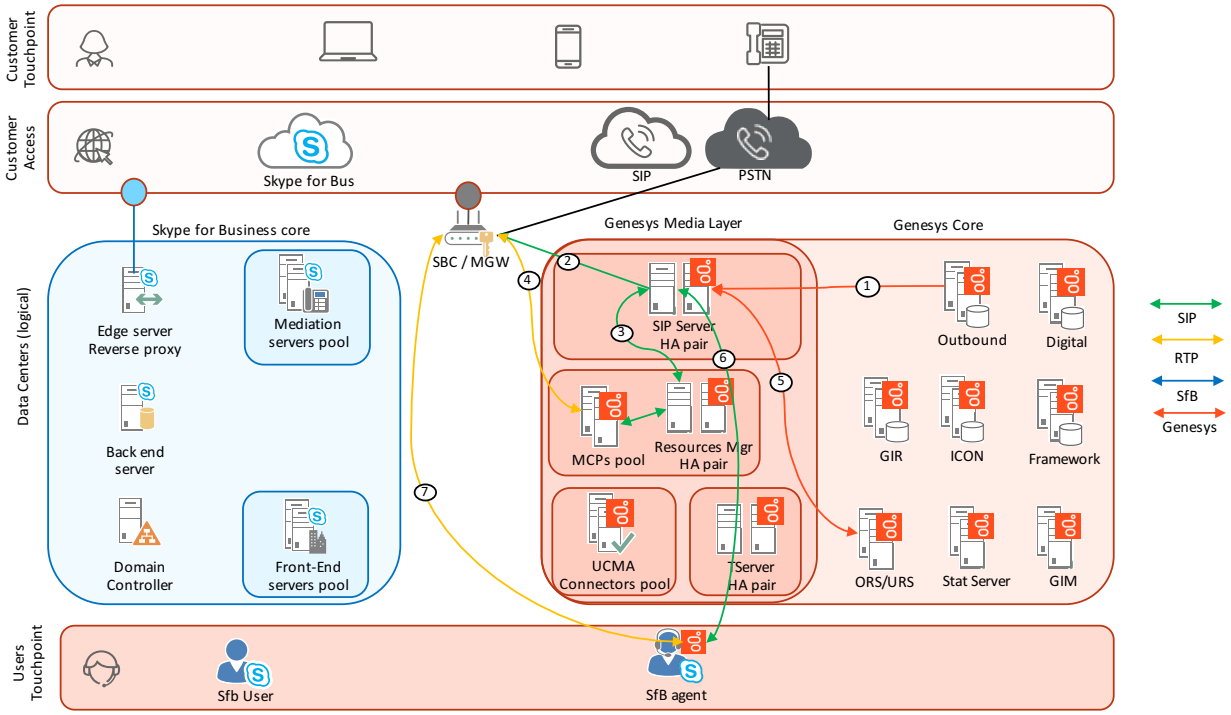

Figure 23: Outbound Dialing

1. Outbound campaign sends a number for SIP Server to dial
2. SIP Server sends the request to the SBC to dial the outbound customer
3. SIP Server invites media resources to handle call progress detection
4. MCP monitors the RTP stream for CPD. It may also handle treatments once the call is established.
5. If the agent is setup for <outbound mode>, then SIP Server will request an agent from Routing as the call is being established with the customer.
6. SIP Server invites the targeted agent into the customer call
7. RTP is established between the agent and the customer.

This scenario represents a Hybrid agent using the SIP Softphone. A similar outcome can be achieved using the Skype for Business plug-in. From step 6, SIP Server would use ISCC to get access to an SfB agent. The call would then be sent through the Mediation Server and Front-End pool to the agent using the SfB T-Server to connect the agent.

Recording can also be setup for outbound dialing.

External Interfaces

This section describes the external interface for the solution. These become the key integration points between solution components and the elements in the customers' premise. Integration between Skype for Business and the Genesys platform are covered earlier in this document. The focus of this section are on the third party components that must be configured for the system to operate.

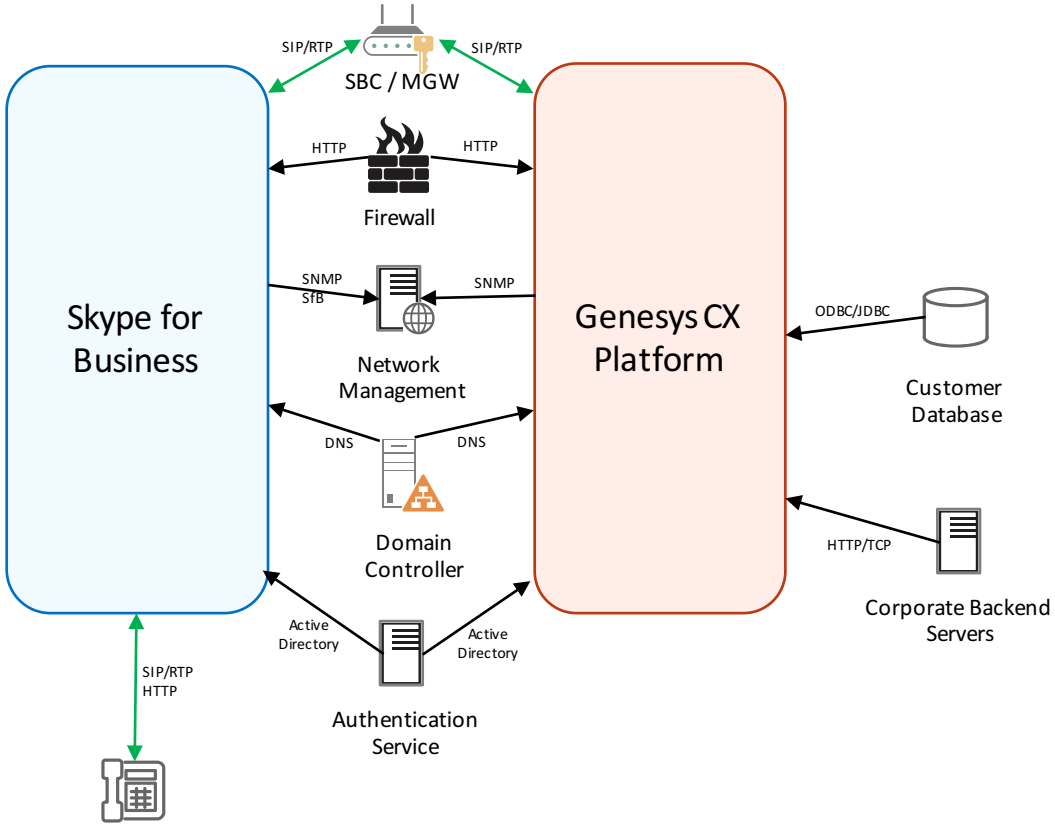

Figure 24: Skype for Business External Interfaces

Many of the external interfaces that need to be configured for Genesys also need to be configured for the Skype for Business platforms (e.g. Network Management, Session Border Controllers, etc.). Details of the SfB configuration will typically be handled by SfB administrators and is beyond the scope of this document.

The following table details each of the external interfaces, its protocols, the components within the solution that

are impacted or connected to these external interfaces and lists the integration tasks required to setup the external interfaces.

Interface	Protocol	Solution Components	Integration Tasks	Description
Media Gateway/ Session Border Controller (SBC)	SIP and RTP	SIP Proxy, SIP Server, Resource Manager, MCP, SIP Endpoints	Add the necessary bandwidth to the network Provision the network infrastructure (e.g. DNS) for the new traffic Provision the MG and SBC appropriately for the integration Configure the codec list for supported codecs.	This interface is used to handle ingress and egress voice traffic from the network. Note that the SfB Mediation Server may be the key component integrated into the SBC in which case the integration will be with the Mediation Server and not the SBC.
SfB Phones	SIP and RTP HTTP for provisioning	Skype for Business	Note that SfB phones are not currently supported for this Genesys contact center agents. Other SfB users may be able to use them.	N/A
Configuration, Log, and Reporting Databases (Relational Database/RDBMS)	TCP/SQL	Genesys Info Mart, Interaction Concentrator, GVP Reporting Server, Config, Log, etc.	Provision the network infrastructure (e.g. DNS) for the new traffic Run the database scripts (.sql) Provision appropriate user access to required database tables	This interface is used to get configuration data about the solution and log alarms. It also is used to store reporting data.
Corporate Backend Servers	HTTPS (REST or SOAP), RDMBS access methods (optional)	MCP, ORS/URS, Workspace	Provision the network infrastructure (e.g. DNS) for the new traffic Create and provision the security information (certificates, etc.)	This interface is used to get data from the corporate systems to make decisions in solution (agent desktop, routing strategy, etc.). It can also be used to perform certain business actions.

Enterprise Authentication Service	Active Directory	Configuration Server	Provision the network infrastructure (e.g. DNS) for the new traffic Create and provision the security information (certificates, etc.)	This interface is used to perform authentication of users using the solution. This solution requires that users are setup and administrated within Active Directory.
Corporate Network Management System (Optional)	SNMP	Genesys SNMP Master Agent	Provision the network infrastructure (e.g. DNS) for the new traffic Create and provision the security information (certificates, etc.)	This interface is used to integrate the solution with the Corporate network management system.
Domain Name Servers	DNS	SIP Proxy, SIP Server, Workspace, Interactive Insights, SIP Endpoints, etc (potentially any Genesys application).	Provision the DNS records along with appropriate weightings	This interface is used by the clients to perform the name/IP address translation. For specific cold standby components the DNS entries will be manually modified to redirect traffic in the event of a site failure.
Firewalls	HTTP, SIP, RTP, etc.	Most components	Provision the appropriate network address and ports for all components that need access to a separated network segment	This interface secures the network.

Table 1 - External Interfaces

Firewalls

The following tables list the port names and protocols that will need to be configured in any firewalls between the various components. Note that if a Split Architecture is used, these firewalls will need to be configured between components in the Skype for Business subnet (like the Connector and T-Server) to the rest of the Genesys framework.

Connector

Port Configuration Name	Protocol	Description
"connectorPort"	TCP	The TCP port for any incoming CTI link (e.g. Connector to T-Server)
"applicationPort"	TCP	The configured port of Trusted Application to listen to incoming connections

		(Connector to Front-End Pool).

SfB TServer

Port Configuration Name	Protocol	Description
TLib Port	TCP	The TCP port for any incoming TLib Connections (e.g. StatServer)

Remote Treatments/Remote Recording SIPServer

Port Configuration Name	Protocol	Description
TLib Port	TCP	The TCP port for any incoming TLib Connections (e.g. StatServer)
SIP-port	TCP and UDP	The configured SIP port to listen for incoming SIP connections (e.g. SBC, Mediation Server).

Operational Management

Once a Genesys solution is in place, managing the solution becomes a primary concern of the customer. As this solution will be part of a Skype for Business deployment, consideration for integrating with the customers' management systems should be considered. Genesys Administration and Genesys Administrator Extensions will need to be installed and configured to manage the solution.

Network Management Systems

If the customer does have a Network Management System (NMS), then Genesys components should be integrated into their NMS. This is typically done by setting up Net-SNMP to send SNMP events and info to their NMS.

Examples of supportable NMS include Zabbix, HP OpenView and OpenNMS (an open source NMS - http://www.opennms.org/). Microsoft also has a System Center Operations Manager that could be considered.

In addition to Genesys monitoring, the following additional recommendations should be considered:

Monitor JVM status, especially memory usage. Note that a regular saw-tooth pattern should be observed due to Java garbage collection.

Set alarms for specific disk and CPU thresholds

Additional SNMP traps

Consider the use of ELK (ElasticSearch, LogStash & Kibana) or Splunk to harvest logs and build alarming for specific conditions within the logs. ELK or similar technology may be a useful addition to monitoring.

Serviceability

Serviceability relates to the ability of technical support to identify issues and defects within the system. Many customers or partners will perform initial triage and analysis to determine whether Genesys Care should be engaged. If Genesys Care needs to be engaged, it is critical to retrieve the required logs and configuration information and pass this information back to Genesys Care. The following recommendations provide guidance on improving serviceability which can accelerate issues analysis and resolution.

Logging

Setting up logical logging locations is a best practice that makes it easier to collect logs and reduce the time to send logs to support. Configuring 3rd party components to log into the same location is ideal as well. Establishing a "log" directory in the root of the disk structure and logging there is recommended:

D:\GCTI\log

/log

Many problems can occur when trying to retrieve the log files necessary for troubleshooting. Common problems include:

- The log files for the time when the problem occurred have been overwritten or otherwise lost.
- Log files delivered are not within the event time frame.
- Log files provided were created with log levels not detailed enough for the investigation.
- The set of log files provided is inaccurate or incomplete.

The Genesys Log File Management Tool (LFMT) is an intelligent, configurable log collection utility developed by Genesys Customer Care intended to minimize these issues, and thereby reduce the time required to resolve

customer problems. It is recommended to include LFMT as a standard part of every deployment.

Log Analysis

To assist customers with performing log analysis of SIP messaging Genesys provides the SIP Span 2 utility which can provide an understanding of the SIP call flows within a Genesys environment.

In order to understand the logs and efficiently troubleshoot SIP Server and SfB T-Server issues, it is recommended to maintain a network architecture diagram showing the IP addresses of key components (including SfB T-Server, UCMA Connectors, SIP Server(s), Resource Manager(s), Media Control Platform/Media Server(s), Media Gateway(s), Session Border Controllers, etc.) and information on typical call flows. This network diagram should be maintained by customers and kept up to date to help with analysis. It is recommended to have this information readily available and, if possible, provide it to Genesys Care together with the initial problem description and logs, to help reduce overall resolution time.

Note that Skype for Business logs will also be required to understand the overall flow. For more information, please see… [TBD]

Future Tools

In 2H 2016 Genesys will be releasing the Genesys Care Workbench which is a suite of troubleshooting tools that can help you quickly and easily identify and resolve issues in your Genesys environment. Workbench collects data from multiple sources, analyzes it, and displays aggregate data and important data correlations in its Current and Historical dashboards as well as some specialized consoles.

Types of information displayed on the Workbench Dashboard include:

- **Configuration Server changes** – Workbench monitors Configuration Server events for all Application objects, and displays recent configuration changes in the environment

- **Alarms** – Workbench configures a default set of alarms in Solution Control Server and displays alarms when thresholds are triggered. If you subscribe to Remote Alarm Monitoring, additional alarms may be displayed.

- **Log events** – If *Log File Management Tool* is deployed, Workbench can monitor log files from supported Genesys applications and display important events for troubleshooting.

Once Genesys Care Workbench is released it is recommended that it is included as a standard part of any deployment.

Proactive Monitoring

Genesys can provide proactive monitoring services which delivers the most complete servicing of a customer's environment. Genesys has the ability to perform proactive monitoring through our Premium Care offering. For details on Premium Care options consult the Genesys Account Team and Genesys Customer Care.

Monitoring Details

The following provides details on additional monitoring:

Numerous SNMP traps can be provided by the various components in the system including the SfB T-Server, UCMA Connectors and SIP Server. Ensure that these are properly configured.

SIP Server has an HTTP interface for monitoring its health. This may provide a useful alternative monitoring approach. To enable, configure **http-port** in the **TServer** configuration section of the SIP Server application.

SIP Server has a Stat log that can be monitored. The log filenames ends with "**-1536**".

Implementation View

Solution Sizing Guidelines

Sizing of the Skype for Business solution must consider several factors.

- Each interaction is a SfB Conference which requires mo re resources on the SfB Front End Servers
- Burst Calls Per Seconds
- Application Pools for the Genesys UCMA Connectors trusted application endpoints
- Number of Agents

The calls per second and number of concurrent sessions within the solution impacts the number of Front End Servers that need to be deployed for this solution. A similar number of UCMA Connectors will also need to be deployed.

Depending on the chosen architecture, SIP Server and GVP sizing must be added to the overall footprint of the solution. Note that a Sip In-Front topology will require a larger SIP environment but will also free up Skype for Business resources. Outbound, IVR and Qualification and Parking sizing for SIP Server and GVP components should be based on the [SIP Voice Solution Blueprint] and the Solution Sizing Calculator.

The sizing guidance below is based on interim performance testing. Please see the Hardware Sizing Guidelines for the latest information.

The following assumptions are made regarding the sizing of this solution.

Input Assumptions	
Agent utilization	80%
Call qualification time	50s
Talk time	120s
Log retention	Debug 2 weeks

Reporting History	2 years
Non-aggregated Reporting History	3 months

The following table depicts the maximum Calls Per Second supported by varying numbers of Front End Servers and UCMA Connectors and also the supported number of sessions and agents. This does assume a SIP In-Front topology handling IVR for incoming PSTN traffic.

#Front Ends	3	4	5	6	7	8
CPS max	3.5	4	4.4	4.8	5.8	6.8
Sessions max	705	794	875	956	1161	1366
Agents max	735	827	911	996	1209	1423

The testing hardware for the Front End Server components are 8 CPU cores with 16GB memory and 90GB hard drives. UCMA Connectors use 6 CPU cores with 8GB memory and 45 GB hard drives

Once completed, the performance testing should list the number of Front-End Servers in the dedicated application pool for Genesys as well as the number of UCMA Connectors to support the sizing assumptions above.

Configuration Guidelines

Skype for Business T-Server follows most basic principles for configuring a T-Server. Details can be found in the [Deployment Guide].

Ensure that the SIP Trunk is configured between the SfB Mediation Server for qualification and parking. Setup the ISCC connection between SIP Server and the SfB T-Server (including outbound trunks, access codes and external route points). On the Skype for Business side, a PSTN Gateway also needs to be configured to point to the SIP Server external route point DN. See Using Telephony Objects in the [Deployment Guide].

The SBC may also need adjustment if a SIP Server In-Front architecture is desirable.

Note that SfB IM is reported as a “Chat” interaction. This may cause confusion within reporting if Genesys Chat is also being used in the environment as it also reports its interactions as “Chat”. KVPs may need to be added to the interactions’ attached data to differentiate between the two types of Chat.

Security

As Skype for Business will be deployed in enterprise environments and potentially provide access from the Internet, security is paramount. Skype for Business provides comprehensive security features within their system [see Security framework for Skype for Business].

From a Genesys integration perspective, the key aspects are firewalls, and certificates. Firewall settings are discussed in the section, Firewalls. Certificates will be required between the following:

- UCMA Connector and the Front-End pool.
- SIP Server hosts and Mediation Server pool (assuming TLS for SIP Trunk transport).

See the [Deployment Guide] for details on provisioning the UCMA connector certificates.

Localization and Internationalization

Localization and Internationalization are topics for numerous Genesys components, especially user interfaces and reporting. Within the Skype for Business solution, the main components to pay particular attention are:

- Media Files such as audio files
- Administration & Operation management user interfaces
- Agent desktop software
- Reports