Genesys PureConnect Self-Service with Intelligent Automation Solution Blueprint

Reference Architecture

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Table of Contents

Table of Figures

Introduction

The purpose of this Architecture Blueprint document is to provide a set of design practices and guidance to ensure consistent architecture approaches are used for all deployments of the PureConnect with Intelligent Automation Solution. 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 Self-Service Voice and Chat Bot Solution consists of the following core Genesys components:

- Genesys Intelligent Automation (IA)
- PureConnect IC Server
- PureConnect Media Server
- Genesys Common Microservices Cloud
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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

ASR	Advanced Speech Recognition
CAPS	Call Arrival Per Second
CIC	Customer Interaction Center
CMC	Common Microservices Cloud
DB	Database
DBMS	Database Management System
DNS	Domain Name System
DTMF	Dual Tone Multi-Frequency
GUI	Graphical User Interface
HA	High Availability
HTTP	Hypertext Transfer Protocol
IA	Intelligent Automation
IP	Internet Protocol
IVR	Interactive Voice Response
JDBC	Java Database Connectivity
LAN	Local Area Network
NMS	Network Management System
ODBC	Open Database Connectivity
PSTN	Public Switched Telephone Network
RDBMS	Relational Database Management System
REST	Representational State Transfer
RTP	Real-time Transport Protocol, the media-stream transport used with SIP
SBC	Session Border Controller
SIP	Session Initiation Protocol
SNMP	Simple Network Management Protocol
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
TTS	Text-To-Speech, i.e. speech synthesis
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

VUI	Voice User Interface
VXML	Voice eXtensible Markup Language
WAN	Wide Area Network

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 Self-Service with Intelligent Automation Solution provides businesses with the ability to rapidly deploy omni-channel self-service functionality to their customers, including intelligent call steering, for a more efficient and personalized customer experience.

The Self-Service with Intelligent Automation 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 Intelligent Automation (IA) with the appropriate Genesys integration points. Some of the additional Genesys solutions that can be included with this solution are documented as follows:

- [CIC Installation and Configuration Guide]
- [CIC Web Applications Installation and Configuration Guide]
- [VoiceXML Technical Reference]
- [CIC Language Pack Technical Reference]

Solution Overview

The Self-Service solution for the inbound voice channel enables a business to automate or partially-automate incoming customer requests. This can provide faster response times to customer queries, and reduced load on contact center agents.

Components of the solution

The main components of the solution are summarized in the table below:

Genesys Intelligent Automation (IA)	Omni-channel dialog design and execution environment.
Genesys PureConnect CIC Server	Integrated contact center software solution.
Genesys Media Server	Delivers media services to for interactive

	voice response, menus, on hold treatments and call recording.
Genesys PureConnect VXML Server	Standards-based VoiceXML interpreter.
Genesys Cloud	Cloud infrastructure providing bot gateway microservices.

Logical Architecture Model

The following diagram is a logical model of the PureConnect with IA architecture.

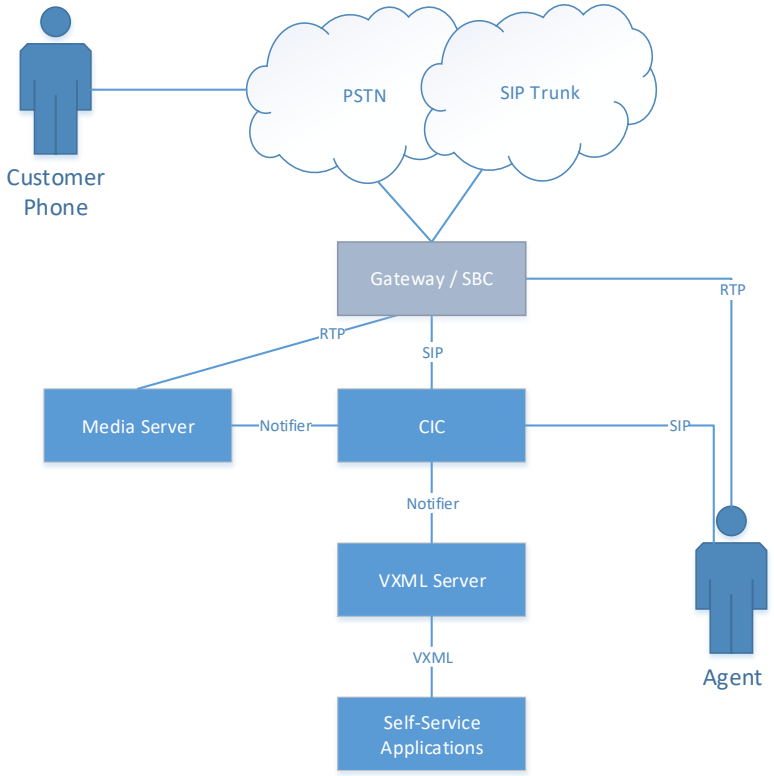

Figure 1 - SIP Solution Logical Model

Functional View

Genesys Intelligent Automation (IA), formerly known as SpeechStorm, provides non-technical users with a high level of control over the management and configuration of the self-service customer experience, using a web-based interface.

IA allows the user to create dialog flows such that a single dialog flow definition can support a range of different channels; the same sequence of messages, menus, questions, and logic is followed regardless of the channel, but the presentation method will differ from channel to channel. The supported channels are:

- Voice IVR – interact with the customer using DTMF or speech recognition (ASR) for input, and text-to-speech (TTS) or pre-recorded audio for output.

- Web IVR – display the IVR's messages, menus, and questions visually within a window in the customer's

browser. A Web IVR window can be popped up if the user clicks a link, or it can be triggered remotely by an Agent using the Genesys Chat Widget; the latter scenario allows the customer to use self-service 'microapps' outside of the chat window, e.g. for making payments.

- Messaging – display the IVR's messages, menus, and questions as text within a chat/messaging window, letting the customer type their responses. This supports third party messaging platforms such as Facebook Messenger, as well as the Genesys Chat Widget.

- Bots – Include integration with an NLU engine to parse natural language input(s), either through chat or voice channels, and then direct the session to the appropriate IA microapp based on the input(s). IA can then skip over the questions for which an answer has already been provided.

Multimodal communication allows you to take advantage of various communication channels in a single interaction, i.e. switching mid-call from Voice into Web IVR and then back to Voice.

In this document, Voice IVR, voice bots and chat bots are covered.

Standard Use Cases

This document focuses on three SMART uses cases for the **inbound voice channel**:

- CE07 – Genesys Customer Authentication
- CE08 – Genesys Voice Payments
- CE09 – Genesys IVR Personalization

Please refer to these SMART Use Cases on Genesys docs.

Other Capabilities

This section discusses the additional capabilities that are available with a self-service solution that uses IA. Dialog flows that are created using IA can be used for both the voice channel and the digital channels such as chat and WebIVR. This means that many of the features outlined below can be applied to both voice and digital channels.

Easy Dialog Flow Creation

IA's Control Centre (GUI) makes it easy to build and maintain simple and complex dialog flows by providing a drag-and-drop interface and applying intelligent defaults to each item in the dialog flow. Configuring audio prompts is

as simple as typing the text you wish to be played (when using text-to-speech) or uploading a pre-recorded audio file, just as you would when attaching a file to an email. IA also provides tools to assist with studio recording sessions and prompt translation.

For the voice channel, both DTMF ('touch-tone') and speech recognition are fully supported as inputs. Complex behaviors such as automatic confirmations, avoid same mistake, and recovery mode are built-in and easy to configure.

Deploy and Rollback

When making a change to your IVR it is important to have confidence that the change will work as expected. IA allows you to preview your changes as soon as they are made and, when you are happy with the outcome, allows you to deploy the changes to your live customers with one click. This can be done at any time of the day, with no interruption to service. If desired, the changes can be rolled back to a previous version – again, with no interruption to service.

Pre-built MicroApps

A key component of IA is the availability of over 80 pre-built MicroApps that can be triggered from any part of your dialog flow. These cover a diverse list of self- and assisted-service scenarios, including:

- Payment Capture
- Identification
- Balance Enquiry
- Direct Debit Setup
- Foreign Exchange Transactions
- Store Locator
- Auto-attendant
- PIN Change/Reset
- Surveys

These MicroApps are designed according to UX best practice and typically require few – if any – customizations to fit in with the style and branding of your existing IA IVR. MicroApps can also be extended to visual channels but is out of scope for this document.

Personas

The Personas feature of IA allows you to re-use the same dialog flow definition with multiple different languages. This means that you can apply different prompt text and speech/DTMF recognition settings for each language, without having to maintain separate versions of the same dialog flow.

IA supports a wide range of end-user IVR languages. Playback of dynamic values such as dates, currency amounts, and digit strings can be done using TTS or by uploading a set of pre-recorded audio files that will be concatenated together at runtime to convey the dynamic value in question.

The Personas feature can also be used to apply different wording to certain prompts in the system based on arbitrary concepts such as customer segment, branding, customer demographics, etc.

Reporting

In addition to the standard suite of reports that are available on PureConnect, IA also provides its own built-in suite of IVR-focused reports. The low-level data for these reports is logged automatically by IA applications, so it is not necessary to build custom 'reporting steps' into the dialog flow design. One key report is the Customer Journeys report, which describes the path that customers take through the IVR. This is unique in that it tells not just what the customer did in each part of the IVR, but also how they reached that part, and what they did next.

If desired, the raw reporting data can also be downloaded via the IA Control Centre.

Integration

When a self-service application needs to call onto an external system – such as a customer CRM system – IA allows for this using any of the following methods:

1. Using the IA standard data contract – which sends HTTP(S) POST requests and expects an XML response in the defined standard IA XML format.

2. Using IA Integration Hub. This makes it simple to call onto external web services and perform data conversions using Groovy script. Integration Hub services take care of important cross-cutting concerns such as security, connection pooling, configuration and deployment.

3. Write a custom stand-alone 'wrapper' web service that will convert any back-end web service into the expected IA HTTP interface.

Component View

Genesys Components

The following table lists key Genesys components that comprise the PureConnect with IA architecture.

Component	Description
IA VUI Server	IA runtime engine for processing dialog flows.
IA GUI Server	Intelligent design tool for creating and maintaining self-service dialog flows in IA.
IA Integration Server	The IA Integration server makes it easy to invoke and parse external web service requests from within the IA VUI Server.
CIC	Integrated contact center software solution.
Media Server	Delivers audio streaming services and interfaces to 3rd party TTS and ASR engines.
VoiceXML Interpreter Server	Standards-based VoiceXML interpreter.
Common Microservices Cloud (CMC)	Provides chatbot capabilities from the cloud by orchestrating connectivity between Widgets, CIC, and IA.
Genesys Widgets	Customizable, extensible chat interface for customer deployment. Works with Common Microservices Cloud.

The diagram below describes, at a high level, how these components interact:

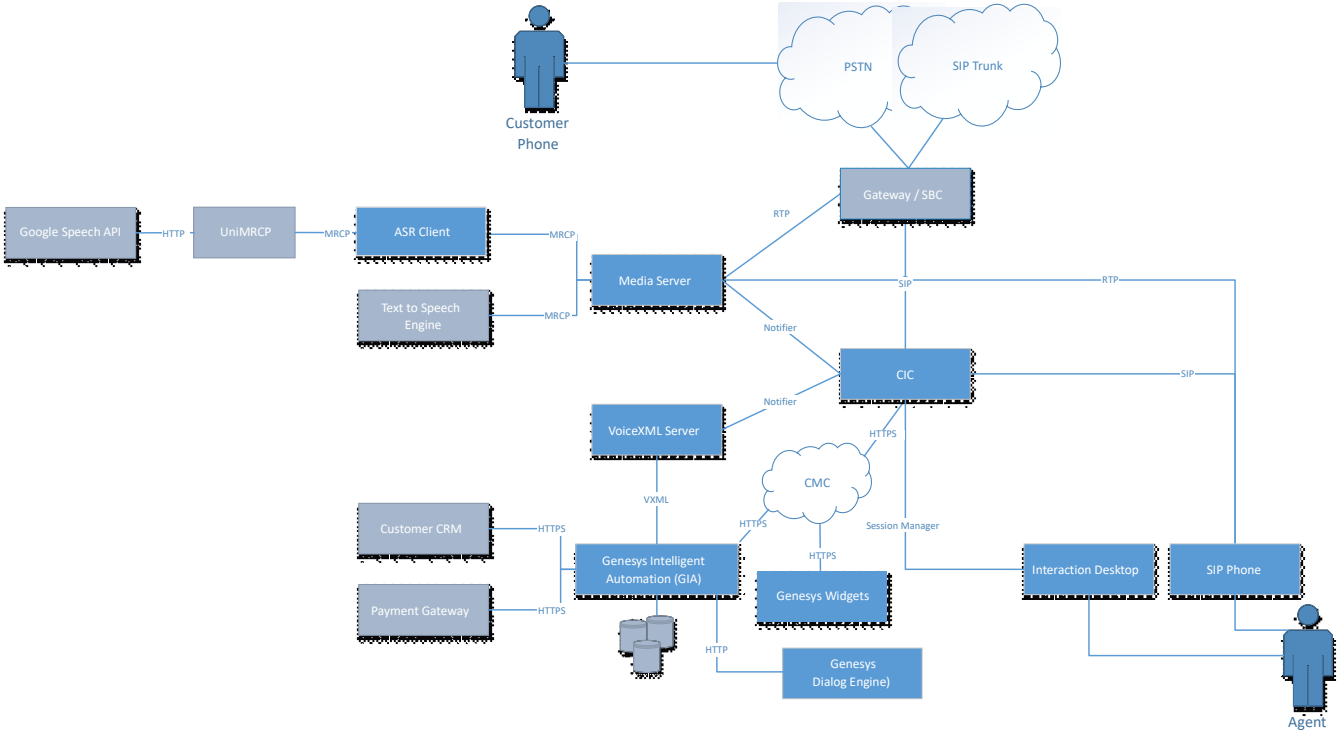

Figure 2 - Component Overview

Additional Third Party Components

In addition to Genesys components, some third-party components may be used to enhance the overall solution.

Component	Description
TTS Engine	An optional Text-to-Speech engine provides the ability to playback very dynamic types of data, such as names and addresses, that cannot be represented using audio files. It also allows administrators to create new prompts on the fly without the time and cost overheads of a traditional recording studio.
UniMRCP	A system which allows MRCP based systems to communicate with non-MRCP based ASR/TTS engines.
Google Speech API	A cloud speech transcription system which reflects exactly what was said by the caller rather than using the grammar based system used by traditional ASRs.

Other, generic 3rd party components may include:

- SBC/Media Gateways
- Firewalls
- Administration Tools

Limits and Constraints

The solution as documented in this Architecture Blueprint is limited to IVR, chat and voice bots only.

Deployment View

The deployment of Self-Service is dependent on the customer's telephony infrastructure and should take into account the expected call traffic. It must also adhere to the customer's security infrastructure including Firewalls, DMZ, Reverse Proxy, etc. The following section outlines the deployment of the solution and provides guidance on options like high availability.

Genesys Deployment Options

There are several deployment options to consider based on the level of redundancy required. These are described in the following sections.

Note that all IA servers are required to be able to contact all other IA servers via HTTP(S).

Central Data Center Deployment

The centralized deployment assumes that the customer has a data center that is reachable by all agents and telephony customers, and that the network has the capacity to support the traffic between solution components in the data center and between the agents' desktop/endpoints and the data center.

A typical deployment will be similar to that depicted in the following diagram. Note that each IA server node depicted may be installed on a hardware server or as a virtual machine image. Associate sizing will be based on VM image. Follow the [CIC Installation and Configuration Guide] for sizing/virtualization recommendations of PureConnect components.

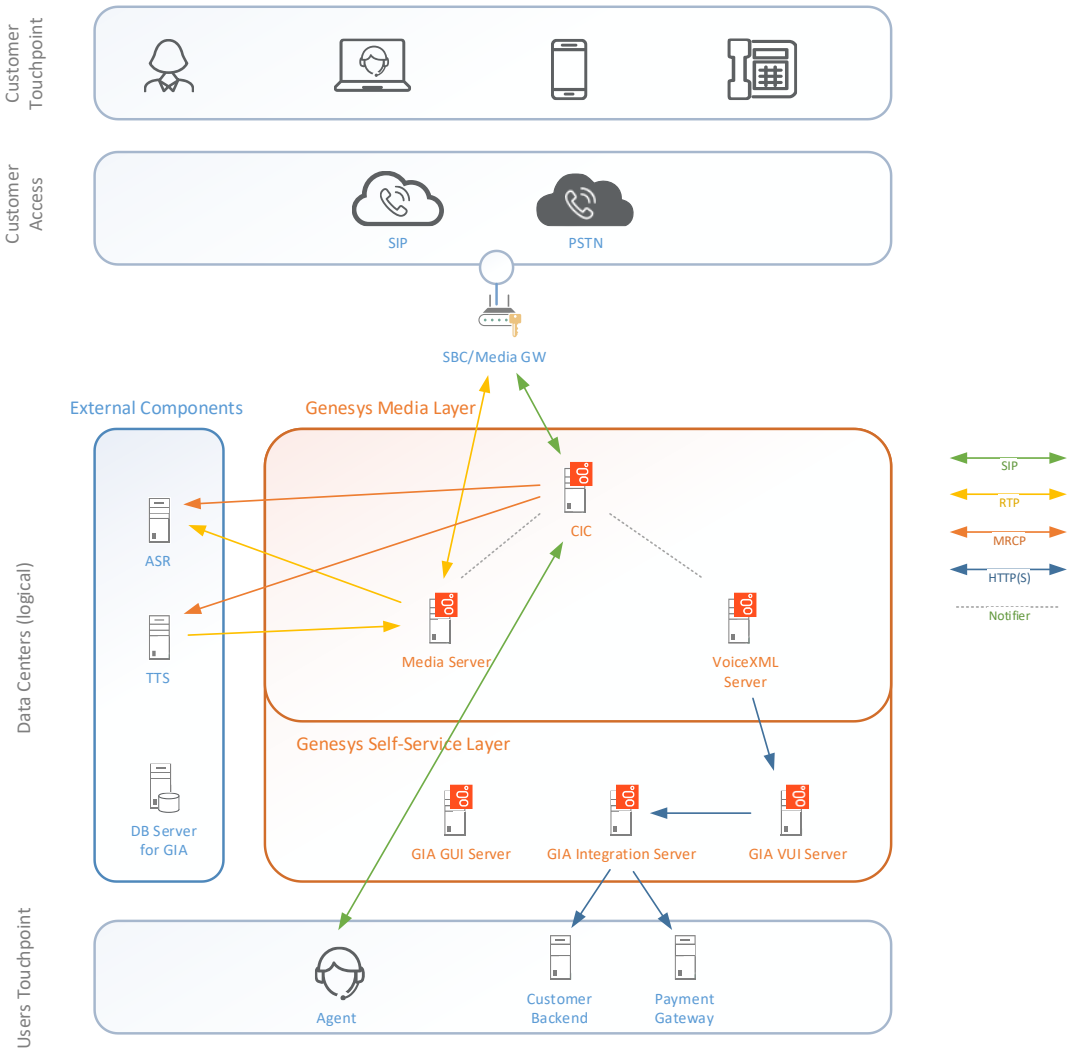

Figure 3 - Simple Deployment Model

High Availability

To provide resiliency in both deployment models, High Availability (HA) options are recommended for all components. Similar approaches should be used to setup HA in both models.

The standard approach to high availability supported by many of the Genesys components is to use a primary and

backup process. The backup process takes over from the primary if it fails. The IA backups can either be setup as a cold-standby, warm-standby or hot-standby. The Self-Service with Intelligent Automation Solution recommends hot standbys where supported.

In general, each node listed in the deployment models should have at a minimum a primary and backup. The following diagram depicts the primary and backup servers for the solution. PureConnect CIC utilizes Switchover technology, detailed in the [CIC Installation and Configuration Guide]. Other components can be clustered in an N+1 configuration (Media Servers, VXML Interpreter Servers).

IA VUI, IA Integration, and IA GUI servers will be deployed in an N+1 configuration.

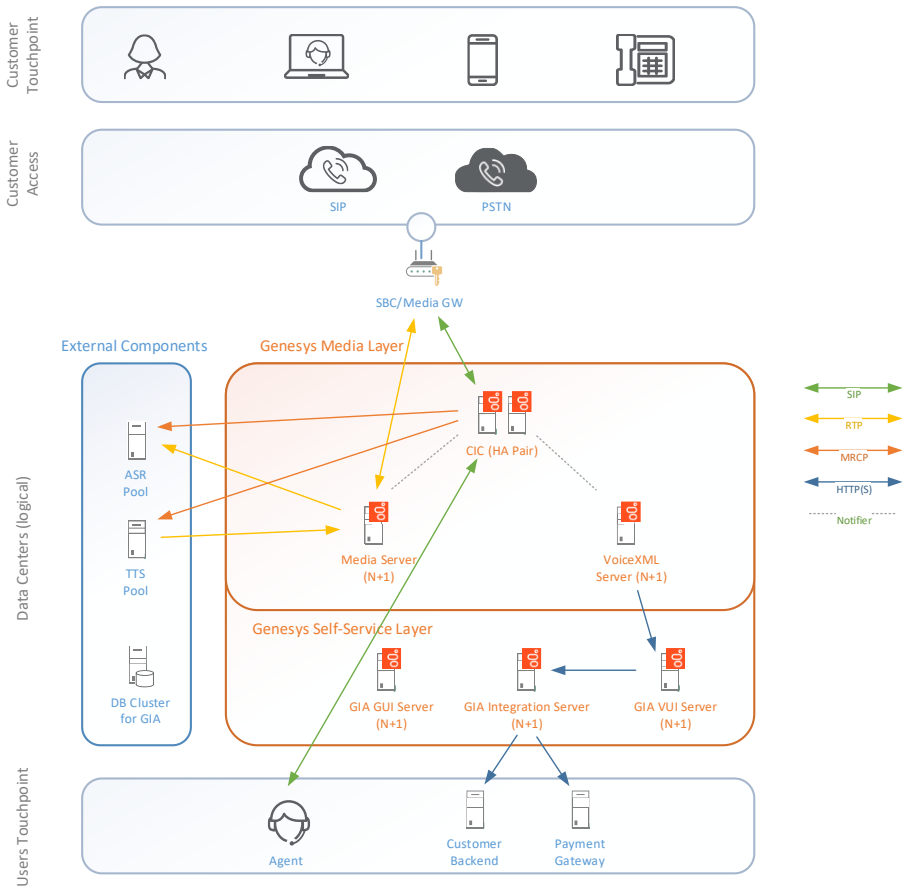

Figure 4 - High Availability Deployment Model

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

Disaster Recovery

The Self-Service with Intelligent Automation Solution allows for a multi-site deployment where the secondary site operates as a warm standby. This is illustrated in the diagram below. Note that the DB Cluster must be available for use by both data centers.

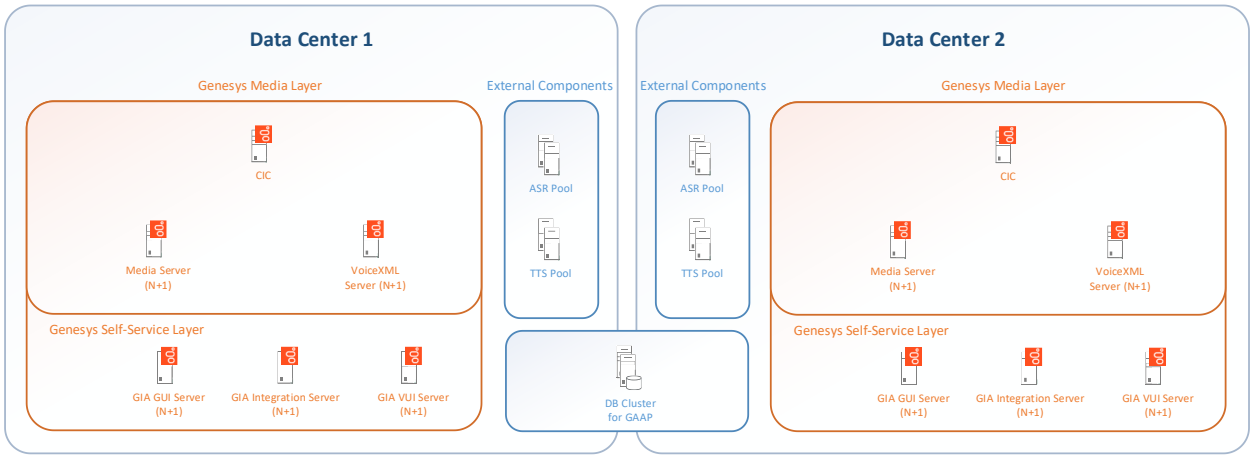

Figure 5 - Disaster Recovery Deployment Model

Database

Databases are required as per the CIC Installation and Configuration Guide. RDBMS is often a customer preference. Genesys recommends either Microsoft SQL Server 2012 or Oracle 12c. For Business Continuity there are specific requirements on the database features utilized.

The RDBMS is often a customer provided component of the solution. If not, this must be installed as part of the solution.

Genesys-specific databases need to be setup within the database system and made accessible by the Genesys components. Follow the installation guides specific for each product and database vendor. Note that appropriate language/character sets need to be configured for some product databases.

Database for IA

The diagram below illustrates some of the possible options for High Availability/Disaster Recovery for SQL Server; similar options are available for Oracle.

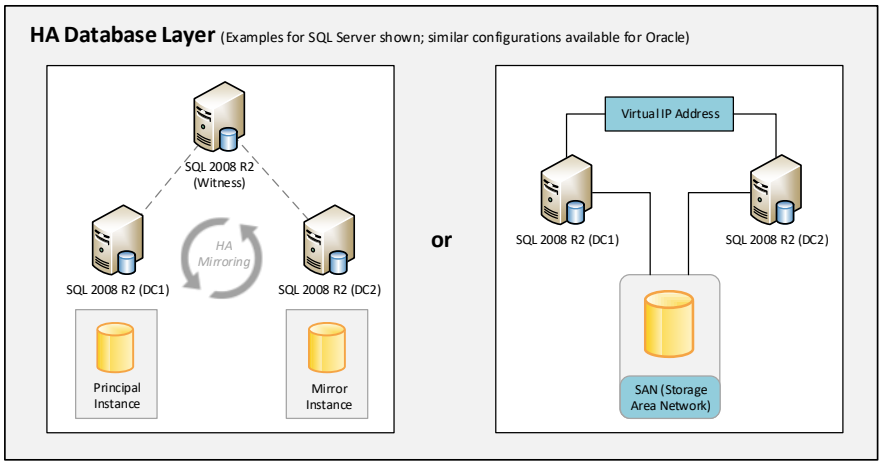

Figure 6 - IA HA Database Layer Options

Database for Other Genesys Components

Please refer to the CIC Installation and Configuration Guide document.

Interaction View

Dialog Flows

The following diagrams describe the interactions between the various solution components.

Generic Voice-Channel Dialog Flow

The following figure depicts when a customer places a telephone call to the solution and is taken through a self-service dialog flow. The sequence of events is the same regardless of the nature of the dialog flow (Payment Capture, Personalized IVR, etc.).

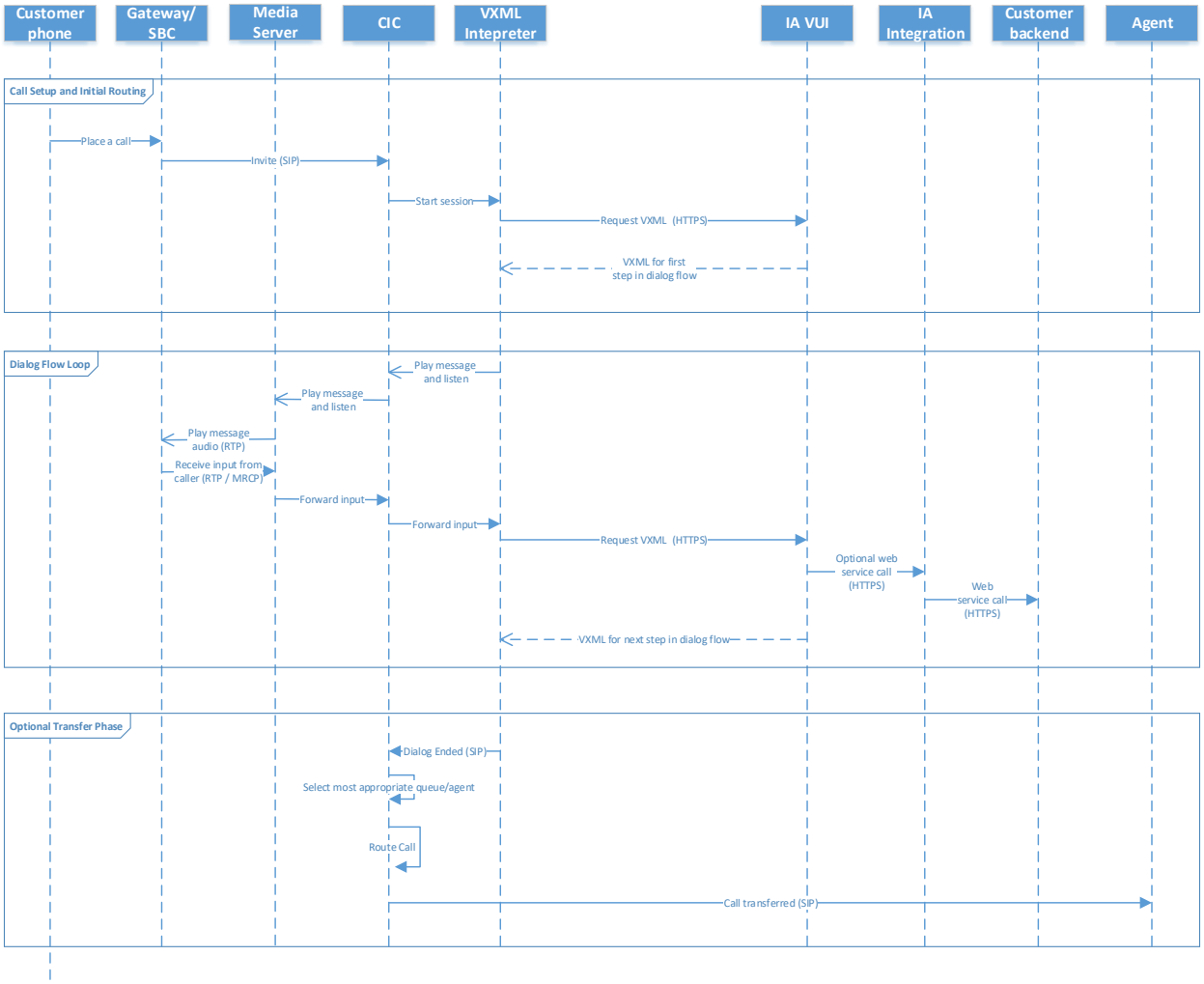

Figure 7 - Generic Voice-Channel Dialog Flow

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.

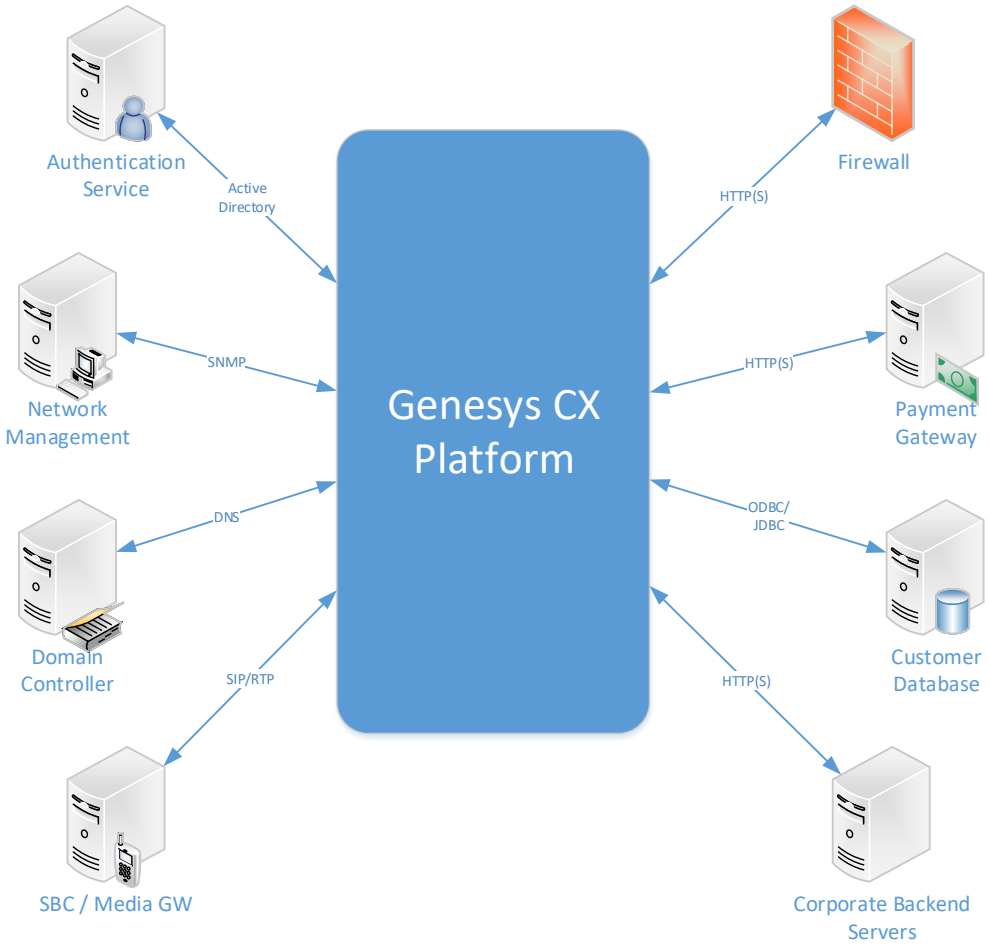

Figure 8 –External Interfaces

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	CIC, Media Server	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.
Configuration, Log, and Reporting Databases (Relational Database/RDBMS)	TCP/SQL	CIC, IA	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)	IA	Read and write customer-centric information.	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.
Payment Gateway Servers	HTTPS (REST or SOAP)	IA	Authorize payments.	This interface provides card payment services for self-service applications.

Enterprise Authentication Service (Optional)	Active Directory	CIC	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. Genesys provides the option to have user passwords authenticated an external authentication service or authentication can be managed by Genesys.
Corporate Network Management System (Optional)	SNMP	CIC, IA	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	Most components	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

Operational Management

Once a Genesys solution is in place, managing the solution becomes a primary concern of the customer. There are two primary components involved in the operational management of the Self-Service Solution that need to be considered.

1. Administration of PureConnect CIC is administrated via the Interaction Administrator application, available as an installation package on the CIC server.

2. IA is administrated via its own Control Center which runs on the IA GUI server(s).

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.

Firewall Considerations for Chatbots

Common Microservices Cloud must be able to access the CIC server via HTTPS using the ICWS REST APIs for agent escalations to complete successfully. Provisioning these ports to be accessible or using a reverse proxy can achieve this connectivity. Please refer to the CIC Web Applications Installation and Configuration Guide document.

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 volume dedicated to logs, separate from the OS and application volumes is recommended, e.g.:

```
E:\I3\IC\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.

Log Analysis

In order to understand the logs and efficiently troubleshoot SIP issues, it is recommended to maintain a network architecture diagram showing the IP addresses of key components (including CIC, Media Servers, 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.

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. Ensure that these are properly configured.

- PureConnect logs many system messages to the Windows Event Log; this can be monitored to watch for standard messages/warnings/errors.

- PureConnect Media Server has an HTTP interface for monitoring its health. This may provide a useful alternative monitoring approach.

Implementation View

Solution Sizing Guidelines

The sizing guidelines in this document focus on the considerations for IA; sizing for other Genesys components is covered in the other Genesys Blueprint documents.

Sizing of the Self-Service with Intelligent Automation Solution must consider several factors:

- The number of concurrent calls in the IVR
- Burst calls per second
- Complexity of the IA dialog flow
- Reporting data throughput and retention periods

IVR sizing for Media Server and VXML Interpreter components must also be considered and factored into the PureConnect deployment.

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

Input Assumptions	
Log retention	Debug 2 weeks
Reporting History	2 years
Non-aggregated Reporting History	1 month
IVR call duration	60 seconds
IA Call Steps per IVR call	40

IA Business Tasks recorded per call	2

The sizing information in this document is provided as a guideline only. We strongly recommend that customers run their own performance tests, as factors such as hardware, network, and callflow design can affect the overall performance of the solution.

Unless otherwise noted, the server specifications for IA servers (either physical or VM) are assumed to be:

Component	Specification
CPU	2 x quad-core (2.2GHz+)
Memory	8GB RAM
Network	2 x GB NIC
Disk Space	60 GB

IA is fully supported on VMware ESXi 4 and above.

When counting the number of required servers for each component, we are assuming a centralized configuration as described in the Central Data Center Deployment section above. For High Availability or Disaster Recovery configurations, be sure to increase the numbers of servers appropriately to match the N+1, N*2 or (N+1)*2 requirements mentioned in the appropriate Deployment View section.

The table below provides a guideline on the minimum number of IA servers required for a given solution size, based on the assumptions above.

Criteria		Small Solution (up to 250 ports)	Medium Solution (up to 1000 ports)	Large Solution (up to 2000 ports)
Assumptions	Concurrent active calls	250	1,000	2,000
	Peak CAPS	2	8	16
	Busy hour calls	5,000	20,000	40,000
Recommended Minimum Number of Servers (VM or Physical) per Data Center	IA VUI Server	1	2	4
	IA Integration Server	0 *	1	1
	IA GUI Server	1	1	1
	+ ASR Component Server (if needed)	3 (n+1)	6 (n+1)	11 (n+1)
	+ UniMRCP Server (if needed)	3 (n+1)	6 (n+1)	11 (n+1)

* Can be installed on the same VM/server as the VUI component.

+ Only required for Voicebots where Google ASR needs to be called from the media server.

IA Reporting Database Sizing

The amount of reporting data generated by IA and stored in the IA reporting database will depend heavily on factors such as number of calls and callflow complexity.

We recommend allowing around about 200KB of storage space per call for IA non-aggregated call history data. You should allow an additional 2MB of storage space per day for aggregated call history data.

Configuration Guidelines

The following configuration options relate to performance and reliability of the IA product in addition to other options that may require attention. The settings described in this section can be found in the "Default Server Settings" section of the IA Control Center.

Backlog Sizing

When it is not possible to write a call history record to the reporting database, it will be added to a local on-disk cache known as the "backlog", for later processing. If there is a database connection outage, then the amount of disk space used by the backlog could become considerable. The maximum and 'warning' thresholds for disk space should be configured according to the amount of free space on the disk:

- Backlog.DiskSpaceMonitor.MaxUsedMB
- Backlog.DiskSpaceMonitor.WarningUsedMB

Alerting

IA can send SNMP traps when various error or warning conditions occur. It can also send a periodic 'heartbeat' trap from each server for uptime monitoring purposes. The following settings control this behavior:

- SNMP.Traps.Enabled
- SNMP.Traps.ManagerHostname
- SNMP.Traps.ManagerPort
- SNMP.Traps.ServerHeartbeat.Enabled

In addition, license and security issues can be reported via email. The settings for this are configured via the log4j.properties file.

Password Reset

The IA Control Center's password reset functionality requires an SMTP server to be configured:

- Email.SMTP.Host
- Email.SMTP.Port

Inter-Server Communications

A connection to an MRCP-enabled TTS engine is required for the IA Control Center's 'preview TTS' button. The TTS engine can be located on the same server as the Control Center (i.e. the IA GUI server) if desired. This feature is configured using the following settings:

- Resources.SpeakTTS.MRCPv1.Host
- Resources.SpeakTTS.MRCPv1.Port
- Resources.SpeakTTS.MRCPv1.RTPPayloadType
- Resources.SpeakTTS.MRCPv1.RTPPayloadTypeDescription
- Resources.SpeakTTS.MRCPv1.ResourceURL

PureConnect CIC and IA Connectivity

In order for PureConnect CIC to retrieve the VXML documents (and associated files such as prompts, grammars, etc.) from the IA server, the http(s) URLs generated for call flows by IA must be called from within a 'VoiceXML Initiate' toolstep. This toolstep will instruct CIC to retrieve the relevant files through connected VXML Interpreter servers and process the call according to the VXML provided. Appropriate levels of error handling/additional call flow processing can be configured on CIC as necessary. Additional documentation of the 'VoiceXML Initiate' toolstep, including required and optional parameters, can be found in the Help file for Interaction Designer.

Security

The CIC Installation and Configuration Guide document defines its own security considerations.

In addition to these, IA provides a PA-DSS Implementation Guide which details the security considerations and settings required when installing IA as part of a PCI-DSS-compliant environment.

If secure input is required for the Voicebot solution, Nuance ASR may be required. Collecting, processing, and transmitting secure data (like credit card information) is restricted to approved Microapps.

Localization and Internationalization

Localization and Internationalization are topics for numerous Genesys components, especially user interfaces and

reporting. Within the Self-Service with IA solution, Language Packs are available for PureConnect CIC. The [CIC Language Pack Technical Reference] contains details on the language packs available. The main components to pay particular attention are:

- Media Files such as audio files
- Administration & Operation management user interfaces
- Agent desktop software
- Reports
- Audio prompt playback
- Speech recognition

Localization within IA

UTF-8 character-encoding is supported throughout the IA product suite. The following sections describe the language support available for various aspects of IA.

IA Control Center

The IA Control Center graphical user interface supports the following languages for display text and input:

- English
- French
- German
- Spanish

IA Audio Prompt Playback

IA supports playback using text-to-speech with any language pack provided by the supported TTS vendors. Settings are available for each language to fine-tune the playback of dates (i.e. whether the playback format should be month-day-year or day-month-year) and times (i.e. whether the times should be spoken as 12-hour clock or 24-hour clock).

If desired, or if no TTS engine is available, pre-recorded audio files can be used instead of TTS for playback of both 'static' pre-defined messages and dynamic values such as dates and times. For the latter, a prescribed set of pre-recorded audio snippets – known as a Concatenated Recording Prompt (CPR) set – must first be uploaded. IA will

then take care of playing back the appropriate CPR audio snippets in order to best represent a given dynamic value. CPR can be used to play back the following kinds of dynamic data: alphanumeric strings, dates, card expiry dates, natural numbers, monetary amounts, and times.

At the time of writing, IA supports CPR playback in the following languages:

Language	Description
ar-ww	Arabic
cs-cz	Czech
de-de	German
en-gb	English (UK)
en-us	English (US)
es-es	Spanish (European)
es-mx	Spanish (Mexican)
fr-fr	French
hi-in	Hindi
hu-hu	Hungarian
it-it	Italian
jp-jp	Japanese

ml-in	Malayalam
nl-nl	Dutch
pl-pl	Polish
pt-pt	Portuguese (European)
ru-ru	Russian
zh-hk	Cantonese
zh-ma	Mandarin

IA Speech Recognition

Basic support for speech recognition in a IA dialog flow requires the following settings to be configured:

- Synonyms for “yes” and “no”
- Synonyms for each character of the alphabet
- Synonyms for each of the digits 0 thru 9

These settings are already pre-configured for the following languages:

- en-gb
- en-us
- fr-fr
- es-us

In addition, IA provides pre-built speech recognition grammars for the following language families:

- English

- French
- Spanish

Additional custom grammars for any language that is supported by the ASR vendor may be developed by the customer and/or by Genesys Professional Services, and the resulting SRGS-compliant grammar uploaded through the IA Control Center.