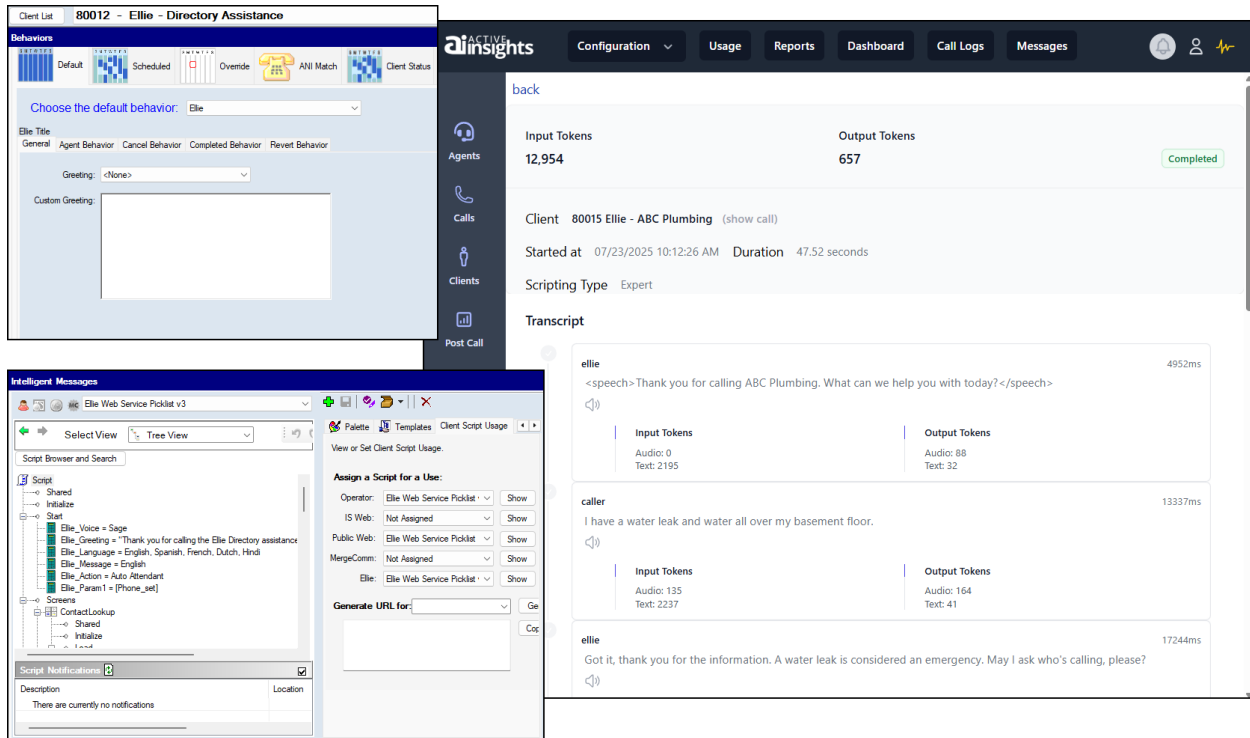


Ellie Technical Notes

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Ellie is Amtelco's integrated Intelligent Virtual Agent (IVA). Ellie utilizes a Large Language Model (LLM) and Natural Language Processing (NLP) to handle, understand, and create natural dialogue with callers.

Ellie uses Amtelco's patented Intelligent Speech-Enabled Scripting to collect information from the caller and follow a scripted call flow. Intelligent Speech-Enabled Scripting provides Ellie with the context necessary to properly communicate with the caller and gather the correct information.

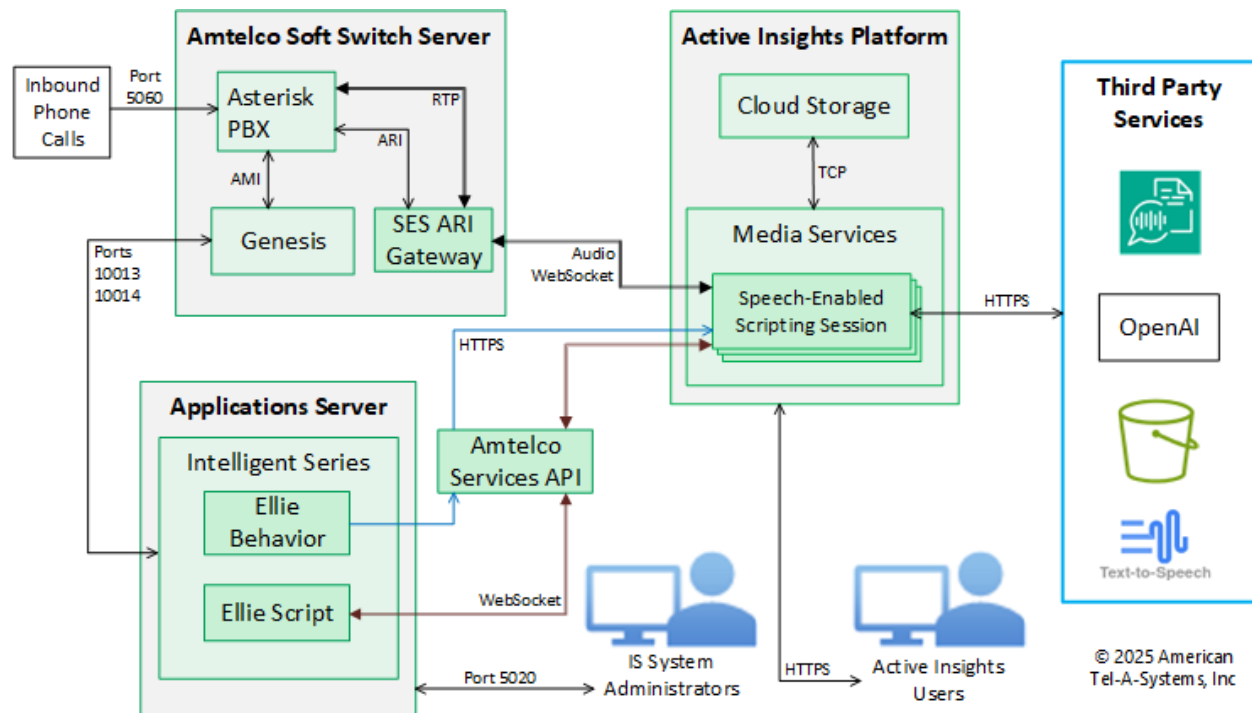
The Ellie feature is designed to:

- Provide automated call handling for script-guided calls.
- Enable systems to direct calls under certain conditions to be handled by the Ellie Virtual Agent using the Ellie behavior.
- Provide a means for quick translation into Dutch, French, German, or Spanish without needing to make translated Intelligent Message scripts.
- Allow for selecting different automated voices.

- Enable the Ellie Intelligent Virtual Agent to quickly parse on-call and directory information, making it ideal for providing directory assistance.
- Allow callers to transfer the caller from speaking with the Ellie Intelligent Virtual Agent to speaking with a live agent without losing progress on the Intelligent Messages script.
- Enable agents to transfer callers to the Ellie Intelligent Virtual Agent.
- Provide Speech-Enabled Scripting and live call monitoring through the Active Insights platform.

Ellie System Components

The Ellie system consists of the following components, working together to provide a seamless user experience.



Amtelco Soft Switch Server

The Amtelco Soft Switch Server houses the switching components of the Intelligent Series system, including the Asterisk Private Branch Exchange (PBX). It operates in tandem with the Intelligent Series applications server to direct audio data for incoming calls to Speech-Enabled Scripting sessions.

Applications Server

The Intelligent Series Applications Server houses the Ellie Behavior and any Intelligent Messaging scripts active for Ellie, which are used to initiate and guide Speech-Enabled Scripting sessions.

Active Insights Platform

Amtelco's Active Insights platform provides access to Amtelco's collection of cloud-based products and features. The Active Insights platform provides access to recordings, messages, call service statistics, auto-generated call transcripts, and post call scores for Genesis Intelligent

Series (IS) systems. The Active Insights platform also facilitates the connection between the Media Services Server and the Applications Server, the Soft Switch Server, and third-party services.

Media Services Server

The Media Services Server hosts Ellie's Speech-Enabled Scripting sessions and compiles the data submitted by the Applications Server, the SES (Amazon Simple Email Service) ARI (Asterisk RESTful Interface) Gateway, and third-party services to allow the Ellie IVA to function.

Third-Party Services

Ellie's utilizes third-party services to create an intelligent, interactive tool. Ellie utilizes, ChatGPT, Text-to-Speech services, Speech-to-Text transcription, and an LLM.

IS System Administrators

IS System administrators can edit the conditions under which Ellie is activated, as well as the script used for Speech-Enabled Scripting, by utilizing the IS Supervisor or Web Supervisor applications.

Active Insights Users

Using the Active Insights site, Active Insights users can set up automatic Post-Call Scoring scripts for Ellie calls.

Ellie Communication Process

When a call enters the Intelligent Series (IS) System, calls for Clients that are configured to use the Ellie behavior are directed to Speech-Enabled Scripting instead of being assigned to a live agent. When a call is assigned to Speech-Enabled Scripting, the IS Server connects with the Media Services server to create a session, and the Media Services server returns the session information to the IS Server. The IS Server forwards the session information to the Amtelco Soft Switch Server and requests Genesis use the Asterisk RESTful Interface send the call to the SES ARI Gateway. Asterisk uses the session information to connect to the Media Services session and then establishes a Real-time Transport Protocol (RTP) stream to send and receive audio with the Media Services Server.

Once the RTP audio stream is established, the IS Server starts an instance of the Client's Intelligent Message script that is configured for Ellie's use. The IS Server establishes a web socket connection to the media session and provides the media session with the elements and context configured in the script. Any information gathered by the Ellie IVA during the media session is sent to the IS Server and recorded in the message generated by the script.

Meanwhile, the Media Services Server uses Hypertext Transfer Protocol Secure (HTTPS) web requests to submit Intelligent Messaging script data from the IS Applications Server to ChatGPT and the LLM, which are used to give Ellie the ability to understand and respond to customers.

When the call finishes, all call data held in the media session is exported to and stored within the Active Insights cloud storage. Additionally, if a Post-Call Scoring script is selected, the call is analyzed and scored.

Ellie Communication Protocols

Component	Communicates with	Using
Asterisk	SES ARI Gateway	RTP
Asterisk	SES ARI Gateway	ARI
Intelligent Series	Media Services Server	HTTPS
Intelligent Series	Media Services Server	WebSocket
Media Services Server	Intelligent Series Server	HTTPS
Media Services Server	Active Insights Cloud Storage	TCP
Media Services Server	Third-Party Services	HTTPS
SES ARI Gateway	Media Services Server	WebSocket

Active Insights Media

The Media page of the Active Insights platform provides Active Insights users with a live feed of the exchange between the caller and the Ellie Intelligent Virtual Agent. The Active Insights Media page provides Active Insights users with a list of both completed and active Speech-Enabled Scripting calls.

IS Ellie Behavior

The Ellie behavior is used by the Genesis Soft Switch to trigger the creation of a Speech-Enabled Scripting media session and connect the current call with the media session.

The Ellie behavior enables Amtelco's Intelligent Speech-Enabled Scripting to be used under specific scenarios. This can include callers selecting the behavior as part of a navigation menu, or the Ellie behavior being set in the overflow options in IS Supervisor to help handle calls during times of heavy traffic.

Intelligent Messaging Scripts

The Intelligent Messaging scripts are used to dictate how the Ellie Intelligent Virtual Agent behaves and what information is gathered. The Intelligent Message settings contain the Ellie Client Script Usage that is used to select what script is used when the Ellie Intelligent Virtual Agent takes a call. Additionally, the script properties, screen properties, and display element properties each have an Ellie subtab that is used to determine the Ellie Intelligent Virtual Agent voice, context, what it asks, what it listens for, and how it collects information.

Ellie System Requirements

The Ellie System works in tandem with the IS System, and the Ellie System must be set up alongside an IS System. Information on the requirements for the IS System can be found in the "Intelligent Series Technical Notes" document.

In addition to the requirements of the IS System, the following changes and additions are needed for the Ellie System.

Media Services Server

The Ellie Media Server hosts the Intelligent Speech-Enabled Scripting sessions through which calls and the Ellie Intelligent Virtual Agent interact. It operates in tandem with the Intelligent Series Applications Server, the Genesis Intelligent Soft Switch Server, and the Active Insights platform.

The Media Services Server can be operated in a virtual environment, or it can be operated as a dedicated server.

Processor	Minimum	Four (4) 2.6 GHz or faster multi-core 64-bit processors
RAM	Minimum	16 GB
Storage	Minimum	100 GB Solid State Drive (SSD)
Disk Controller	General	No specific disk controller requirements
Network Adaptor	Required	Minimum of one (1) 1 GB network connection

Genesis Server Software Requirements

Operating System	Required	64-bit GNU/Linux-based Ubuntu 22 LTS ⁽¹⁾
Switching	Required	Digium Asterisk private branch exchange ⁽²⁾
Diagnostic Access	Required	SSH (secure shell protocol) client application installed on the Intelligent Series server provides remote diagnostic access to the Genesis server for Amtelco Field Engineering personnel
Virus Protection	Recommended	Customer-provided choice of solution
System Backup	Recommended	Customer-provided choice of solution

⁽¹⁾ The Ubuntu operating system is provided by Amtelco and is installed by the Genesis installation utility

⁽²⁾ The Asterisk switch is provided by Amtelco and is installed by the Genesis installation utility

Ports

The Media Services Server makes use of the following ports:

- 80 TCP Genesis Web Configuration - internal only
- 8089 TCP Asterisk HTTPS/WSS - open to public, TLS protected in transit
- 5002 TCP Genesis Background Socket - internal only
- 5038 TCP Asterisk AMI - internal only
- 5080 TCP Genesis Admin Port - internal only
- 10013-10014 TCP Intelligent/Genesis Connection Port - internal only

Browser Compatibility:

Web applications are tested with the latest release of the following browsers.

- Google Chrome
- Microsoft Edge

Changes to the Amtelco Soft Switch Server

The Genesis Soft Switch Server houses the switching components of the Intelligent Series system. It operates in tandem with the Intelligent Series Applications Server and the SQL Database Server to provide voice processing and switching resources. It also utilizes the Asterisk RESTful Interface to establish audio connections with Active Insights and the Ellie Media Services Server.

In addition to the requirements needed for the Intelligent Series System, Asterisk must be configured for use with Ellie. The following changes must be made under the Asterisk tab in the Genesis application on the Soft Switch Server.

On the HTTP Settings page, the Enable check box must be selected, and the settings saved.

Genesis

Administration Agents **Asterisk** Diagnostics Extensions Licenses Linux About

Configuration Files
Geo Location
HTTP Settings
Log Settings
MRCP
Music On Hold
Stasis
STIR/Shaken
System

General HTTP Settings

Server Name

Enable

Bind Address

Bind Port

Prefix

Session Limit (1000)

Session Inactivity (ms)

Session Keep Alive (ms)

Enable Static

TLS

TLS Enable

TLS Disable v1

TLS Disable v1.1

On the Asterisk Stasis Settings page, the Enabled check box must be selected and the settings saved.

Genesis

Administration Agents **Asterisk** Diagnostics Extensions Licenses Linux About

Configuration Files
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Music On Hold
Stasis
STIR/Shaken
System

Asterisk Stasis Settings

[ARI](#) [System](#)

Asterisk RESTful Interface Settings - RESTART REQUIRED

Enabled

Human Readable

Allowed Origins (Comma separated list of allowed origins for Cross-Origin Resource Sharing (* to allow all))

Authentication Realm (blank = Asterisk REST Interface)

Websocket Write Timeout Milliseconds (100)

Channel Variables to include (comma separated, no spaces)

Must restart Genesis for Asterisk to support any changes.

About This Document

This document is intended for the use of new Amtelco customers and potential Amtelco customers. Existing Amtelco customers who may be upgrading hardware or software should consult their Amtelco Sales Engineer, their Amtelco Project Manager, or the Amtelco Field Engineering Department to review the system requirements for the product to be upgraded.

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