

# **GENESYS**

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# Voice Microservices Private Edition Guide

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Learn about Voice Microservices and how it works in Private Edition.

#### **Related documentation:**

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# Supported Kubernetes platforms

Voice Microservices are supported on the following Kubernetes platforms:

- Azure Kubernetes Service (AKS)
- Google Kubernetes Engine (GKE)

See the Voice Microservices Release Notes for information about when support was introduced.

#### Voice Microservices

Voice Microservices is an application cluster that provides the following functionality:

- Handle incoming voice (SIP) interactions
- Route voice and digital (IXN) interactions
- Support outbound interactions
- · Provide events stream for reporting
- · Support agents across regions

Voice Microservices comprises the following microservices:

- Voice SIP Cluster Service
- Voice SIP Proxy Service
- Voice Tenant Service
- Voice Orchestration Service

- · Voice Agent State Service
- · Voice Call State Service
- · Voice Dial Plan Service
- · Voice Config Service
- · Voice Registrar Service
- Voice Front End Service
- · Voice Redis (RQ) Service
- Voice Voicemail Service

#### Voice SIP Cluster Service

The Voice SIP Cluster Service provides the following functionality:

- Handles SIP signaling by running multiple nodes: each node is tenant-independent and uses a Voice Dial Plan Service to resolve tenant-specific information.
- N+1 scalable: Each node starts from a predefined configuration file, which is the same for every node in the cloud.
- Includes a **js** controller providing traditional services to SIP Server (LCA, HA link), as well as:
  - Publishing TLib events and user data requests for Voice Call State, Voice Orchestration, and Voice Tenant Services.
  - Providing the Rest API to handle TLib requests from a Voice Front End Service.

## Voice SIP Proxy Service

The Voice SIP Proxy Service is an intermediate interface among services and the Voice SIP Cluster Service. The Voice SIP Proxy Service provides the following functionality:

- Balances load of SIP signaling across Voice SIP Cluster Service instances.
- Processes SIP REGISTER requests and relays them to Voice Registrar Service.

SIP Proxy adds the following URL into the SIP messaging sent to the SBC:

```
voice-sipproxy.{{k8s-namespace }}.svc.cluster.local
```

This is an SRV record created in the K8s DNS when the SIP Proxy Service is deployed. This FQDN depends on the name of a namespace where SIP Proxy Service is deployed.

The DNS used by an SBC is integrated with the K8s DNS service to forward .svc.cluster.local FQDNs K8s DNS.

#### Voice Tenant Service

The Voice Tenant Service is a core service of the Genesys Multicloud CX platform that serves as an application layer between front-end Genesys Multicloud CX solutions and shared back-end core services in a region.

The Voice Tenant Service instances are dedicated to a tenant of Genesys Multicloud CX platform and provide these main functions: provisioning of tenant resources, such as agents and DNs; routing of interactions within a tenant; execution of outbound campaigns for a tenant; providing call control functionality; participation in authentication workflow for tenant's agents.

#### Voice Orchestration Service

The Voice Orchestration Service provides the following functionality:

- Interacts with each Voice Tenant Service.
- Provides routing instructions to a Voice Front End Service.
- Provides local routing session states through a storage system.
- Retrieves Route Points (RP) configuration with URLs and parameters of associated Designer SCXML Application from the Voice Config Service.
- Dynamically retrieves Applications from Designer Application Server.
- Compiles Designer Application into a javascript code to be executed with each session.
- Monitors Redis streams for new interactions from SIP Cluster Service, IXN Service or GWS. Orchestration Services retrieve triggering events in a round-robin fashion, thus new interactions are evenly distributed between Orchestration Nodes.
- Starts and executes Voice and digital Sessions when triggered by routing events.
- Reads from Voice RQ Service streams TLib events and user data requests published by Voice SIP Cluster Service.
- Reads from Voice RQ Service streams Interaction (IXN) events and user data requests published by IXN Service.
- Delivers call control and user data update requests to a proper Voice SIP Cluster Service node via the Restful API.
- Delivers new call control requests to a Voice Front End Service via the Restful API.
- Sends requests to URS via a corresponding Tenant Redis stream as a session requires.
- Reads from Voice RQ Service streams URS responses and events.
- · Serializes context of sessions into Redis for HA.
- Recovers sessions from Redis in case of ORS failover and continues session execution from the last state it was serialized.
- Processes HTTP requests from MCP and sends events back.
- Provides monitoring and health metrics using the Prometheus API.

# Voice Agent State Service

The Voice Agent State Service provides the following functionality:

- Maintains agent states in a storage system. Recovers agent states from failure and in case of autoscaling events.
- Reads agent state requests (RequestAgentLogin, RequestAgentReady, ...) from a Voice Front End Service.
- · Updates agent login sessions (through a Voice Config Service) based on those requests.
- Generates agent state events according to the TLib model and provides them to a Voice Tenant Service and reporting clients.
- Reads agent-related interaction events (EventRinging, ...) from a Voice Call State Service and updates agent session accordingly. Provides those events to reporting clients.
- Reads device notifications (in service/out of service) from a Voice Registrar Service and updates agent states accordingly.
- Reads agent reservation requests (RequestReserveAgent) from a Voice Front End Service and grants agent reservation to clients.

#### Voice Call State Service

The Voice Call State Service provides the following functionality:

- Reads interaction events from a Voice SIP Cluster Service.
- · Reads user data requests from a Voice Front End Service and updates call user data states accordingly.
- Maintains call-thread states in a storage system.
- · Recovers call-thread states from failure and in case of auto-scaling events.
- Produces agent-related call events to a Voice Agent State Service.

#### Voice Dial Plan Service

The Voice Dial Plan Service provides the following functionality:

- Provides the HTTP interface to the Voice SIP Cluster Service for device type resolution (internal, external) and dial plan execution, including the number translation.
- · Supports Voicemail scenarios.
- Provides the following information to the SIP Cluster Service:
  - · Device contact
  - · Agent logged in on the device
  - Options configured on the DN or at Person CME object.

# Voice Config Service

The Voice Config Service provides the following functionality:

- · Provides access to tenant configuration data through the Rest API.
- Provides the Rest API for services to store and access device registration and agent login information.
- The following services access the configuration:
  - Voice Orchestration Service (for obtaining SCXML application details of a Route Point).
  - Voice SIP Cluster Service (for obtaining details about a tenant trunk and softswitch).
  - Voice Dial Plan Service (for obtaining details about tenants and Dial Plan provisioning).
  - Voice SIP Proxy Service (for obtaining details about tenants).
  - Voice Registrar Service (for saving details about device registration).
  - Voice Agent State Service (for saving details about agent logins).

# Voice Registrar Service

The Voice Registrar Service provides the following functionality:

- Maintains device states by processing SIP REGISTER messages.
- Stores device registrations through a Voice Config Service.
- Distributes device notifications (EventDNBackInService, EventDNOutOfService) to a Voice Tenant Service. Device notifications can also be used by a Voice Agent State Service for agent state updates.

#### Voice Front End Service

The Voice Front End Service provides the following functionality:

- Delivers call control, user data updates, and distribute event requests to a proper Voice SIP Cluster Service node that handles the call.
- Writes agent state, agent reservation, DND status requests to a storage system (Kafka topic), consumed by a Voice Agent Service.

## Voice Redis Queue Service

The Voice Redis Queue (RQ) Service provides the following functionality:

• Distributes TLib events for each voice call or digital interaction to a Voice Orchestration Service from other services, such as a Voice SIP Cluster Service and Interaction Service.

- The Voice RQ Service works as a cluster of nodes, where each node in the cluster accepts client connections and plays primary and backup roles.
- To interact with the Voice RQ Service, the rq-client library is used by other services that take care of computing the RQ node, to which TLib events are sent.

#### Voice Voicemail Service

The Voice Voicemail Service is part of the multi-tenant microservice architecture. It provides the following functionality:

- Provides deposit of voicemail messages to agent and agent group mailboxes.
- Provides access to voice mailboxes by dialing to a voicemail access number.
- Uses the Voice Config Service to retrieve agent configuration and states.
- Stores voicemail recordings and metadata in a storage system.
- Provisioning is done through Agent Setup.