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GVP Deployment Guide

Resource Manager

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Resource Manager

The Resource Manager controls access and routing to all resources in a GVP 9.0 deployment.

The Resource Manager is the first element to process requests for services, and it interacts with the Configuration Server to determine the Interactive Voice Recognition (IVR) Profile, Voice Extensible Markup Language (VoiceXML), Call Control Extensible Markup Language (CCXML), Announcement, and Conference application, resource, and service profile required to deliver the service. It then pushes the profile to a component that can deliver the service, such as the Media Control Platform or Call Control Platform, or CTI Connector.

Hierarchical Multi-Tenant Configurations

The Resource Manager also supports Hierarchical Multi-Tenant (HMT) configurations for service providers, enabling them to apportion a select number of inbound ports for each customer, which provides greater flexibility when enforcing policies during service selection. For more information about HMT policy enforcement, see [Service Parameters](#).

This section provides an overview of the following topics:

- [Resource Manager Roles](#)
- [Resource Manager Functions](#)

Resource Manager Roles

The Resource Manager performs the following key roles in a GVP deployment SIP Proxy, SIP Registrar, and SIP Notifier.

SIP Proxy

The Resource Manager resides between all SIP resources within the GVP system architecture. It acts as a proxy for SIP traffic between any two SIP components.

As a SIP proxy, the Resource Manager is the interface to a collection of media-processing resources, such as the Media Control Platform, the Call Control Platform, audio and video conferencing, and other resources. SIP devices and VoiceXML or CCXML applications can then make use of media-centric services through the proxy, without information about the actual location of these resources or how to manage various routing decisions:

- External clients, such as media gateways or soft switches, can access GVP services without knowing the topology or other details of the resource fulfilling the request.
- Internal media resources can access the services offered by other components without knowing the location or status of the resource that are fulfilling the request.

SIP Registrar

The Resource Manager acts as a registrar for GVP resources; however, it accepts registration only

from those resources that are added to the Connections section of the Resource Manager Application object. Registration occurs through SIP REGISTER messages; therefore, GVP supports transparent relocation of call-processing components.

Currently, the Media Control Platform, Call Control Platform, and CTI Connector do not register with the Resource Manager at startup. The Resource Manager detects instances of these components through configuration information that is retrieved from the Configuration Database.

If the Media Control Platform Resource group has been configured for monitoring, the Resource Manager monitors resource health by using SIP OPTIONS messages. For example, to determine whether the resources in the group are alive, the Resource Manager periodically sends SIP OPTIONS messages to each Media Control Platform resource in the group. If the Resource Manager receives a 200 OK response, the resources are considered alive.

SIP Notifier

The Resource Manager acts as a notifier, accepting SIP SUBSCRIBE requests from SIP Server and maintaining multiple independent subscriptions for the same or different SIP devices. The subscription notices are targeted for the tenants that are managed by the Resource Manager. In this role, the Resource Manager periodically generates SIP NOTIFY requests to subscribers (or tenants) about port usage and the number of available ports.

The Resource Manager supports multi-tenancy by sending notifications that contain the tenant name and the current status (in- or out-of-service) of the Media Control Platform (active or passive) that is associated with the tenant. For information about how the Resource Manager provides resource status information, see [Notification of Resource Status](#).

Resource Manager Functions

The Resource Manager performs the following functions:

- **Resource management**—The Resource Manager allocates and monitors SIP resources to maintain a current status of the resources within a GVP deployment. The Resource Manager provides load balancing and high availability for each resource type, as the workload is evenly distributed among resources of the same type. These processes ensure that new, incoming services are not interrupted when a resource is unavailable. (See also the description of the [resource selection](#), and [High Availability and Scalability](#).)
- **Session management**—The Resource Manager combines two logical functions of session management:
 - **Physical resource management**—The Resource Manager monitors the status of the various GVP resources and, based on request-for-service and capability mapping, routes to other resources that offer a particular set of capabilities or services.
 - **Logical service management**—The Resource Manager applies high-level application and business logic to select the service that is delivered and the parameters that are applied. This means that the resource to fulfill the service does not need to be specified in advance.

In this way, the Resource Manager provides session management functions to handle logical call sessions, individual calls within a logical session, and the lifetime and coordination of call legs within

a call session.

- **Service selection**—When a call session arrives at the Resource Manager, the Resource Manager maps the call to an IVR Profile and, if applicable, to a tenant, and selects a service for the request.

Application Selection

There are various ways in which the Resource Manager determines which IVR Profile to execute. GVP most commonly uses one of the following methods:

- Dialed Number Identification Service (DNIS) mapped to the IVR Profile GVP uses the DNIS to identify which application to run. In this scenario, the incoming call corresponds directly to the DNIS.
- Voice application specified as a treatment within a call Another Genesys component (for example, the CTI Connector) acts as a master and executes a number of slave applications on GVP. When a service is required as part of a call flow, the voice application invokes a treatment on GVP. In this scenario, the voice service is invoked as part of the master call flow that the master application executes.

Tip

For a description of how the Resource Manager executes IVR Profiles when the CTI Connector is deployed, see [How the CTI Connector Works](#).

Tenant Selection

When the platform administrator segregates services into a multi-tiered hierarchy, the Resource Manager also identifies the tenant for which a request is intended. The IVR Profile, policy enforcement, and service parameters are determined by the tenant that is associated with the request. In an HMT environment, when a tenant is selected, the policies enforced, and application and service parameters associated with that tenant, also affect the child tenants within that tenant object.

Service Selection

After the Resource Manager has determined the IVR Profile for a session, it identifies the service type and the service prerequisites for each call leg.

The Resource Manager supports the Differentiated Services (DS) Field for outbound SIP message packets for UDP, TCP, and TLS transport protocols. The DS Field value, which prioritizes the type-of-service (ToS), is configured in the `sip.transport.[n].tos` parameter. For a complete list of supported TOS standard values, see the [Genesys Voice Platform 8.5 User's Guide](#).

Tip

A separate set of SIP transports are used for processing SUBSCRIBE requests (for which the Resource Manager acts as a SIP User Agent). However, subscribers can also use the Resource Manager proxy transport for subscriptions.

Service Parameters

For each type of service within an IVR Profile, you can configure a set of service parameters that the Resource Manager forwards to the VoiceXML or CCXML application to affect the way that the application is executed. For example, you can configure the default languages for the VoiceXML services for voice applications.

- **Policy enforcement:** For each IVR Profile and, if applicable, for each tenant, you can configure policies such as usage limits, dialing rules, and service capabilities. The Resource Manager enforces policies by imposing them on the VoiceXML or CCXML application to determine whether or not to accept a SIP session. If the session is accepted, the Resource Manager locates a resource to handle it. The Resource Manager also enforces policies related to how a VoiceXML or CCXML application uses a resource.
- **Multi-tenant policy enforcement:** For multiple tenants, you can configure the Resource Manager to apply and enforce policies in a hierarchical manner. HMT enables you (a service provider or parent tenant) to allocate portions of its inbound ports to each reseller (or child tenant). The reseller can, in turn allocate ports to a number of child tenants within its tenant object. When tenant policies are enforced at the child tenant level, the policies are propagated to all other child tenants within that child tenant object. For more information about how the Resource Manager enforces tenant policies in a multi-tenant environment, see [HMT Policy Enforcement](#).
- **Service request modification:** Before the Resource Manager forwards a request to a resource that can handle the mapped service, it can modify the SIP request to add, delete, or modify the SIP parameters. You can configure this user-defined information on a per-service/per-application basis.

Tip

Definitions of the service parameters that are required for a service within a voice or call-control application are specific to the component that is providing the service. The Resource Manager merely provides the framework within which an application defines the parameters that influence the way an application is executed.

- **Resource selection:** After the Resource Manager has identified an IVR Profile and service type, it identifies a Resource Group that can provide the service. Then, on the basis of the load-balancing scheme for the group and the status of individual physical resources in the group, it allocates the request to a particular physical resource.
- **Resource selection with geo-location information:** When the Resource Manager receives a request with geo-location information from a gateway resource (SIP Server), it checks the Resource Groups to determine if the geo-location parameter that is configured for the group matches the geo-location in the request. If it finds a match, the Resource Manager routes the call to the group based on port availability, preference and other criteria.

For more information about how the Resource Manager processes geo-location information during resource selection, see [Notification of Resource Status](#).

- **Resource selection for outbound campaigns:** For outbound-call campaigns, the Resource Manager can predict the ratio of agent calls to customer calls by using a prediction factor (factor-P) parameter and, when there are multiple Media Control Platforms in a deployment, it can distribute calls based on the maximum number of calls and free ports for a particular campaign.

Requests for conference services are not handled in the same manner as requests for other services, because the Resource Manager must route requests for a particular conference ID to the

same conference resource, even if it is from a different Resource Manager session. For more information, see [Resource Selection for Conference Services](#).

For service types other than conferencing, there is no special correlation required for requests from different Resource Manager sessions.

- **Call-data reporting:** When data collection and logging events occur, the Resource Manager sends these log events to the Reporting Server. For more information, see [CDR Reporting](#).

For the CTI and PSTN Connectors, the Resource Manager submits Component Arrival and Peak data for Historical reporting services.

For a description of how Resource Manager selects resources when the CTI Connector is deployed, see the section [CTI Connector](#).

For information about installing the Resource Manager with a basic configuration, see [Installing GVP](#).

- **Detection and monitoring of Recording Servers and Clients:** To provide and facilitate GVP call recording services, when the Media Control Platform is acting as a Recording Client and to support third-party recording devices. See also the section *Recording Servers and Clients*, Chapter 3 in the [Genesys Media Server 8.5 Deployment Guide](#).

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