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Genesys Predictive Routing Deployment and Operations Guide

[Integrate with Genesys Reporting](#)

7/26/2024

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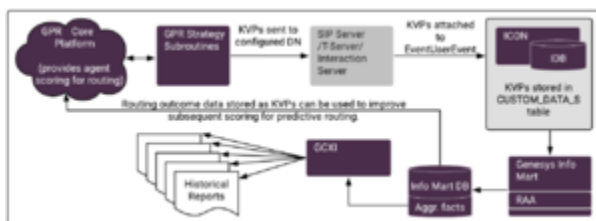
Feature coming soon

Genesys Predictive Routing (GPR) can supply a variety of information about routing outcomes for use by the Genesys reporting applications. GPR sends data for historical reporting in Key-Value Pair. This KVP data, which is stored in the Info Mart database, can also be fed back into GPR to refine predictors. In addition, Stat Server sends this KVP data to Pulse for real-time reporting.

Related documentation:

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GPR Reporting Data Flow



GPR Reporting Data Flow

1. GPR data in the form of KVPs is attached to EventUserEvent TEvents.
The UserEvent contains **AttributeThisDN** with a value of `Route Point`, which identifies where the strategy is executed and **AttributeUserData**, which holds a list of KVPs containing data about the interaction.

This `Route Point` should also be specified in the ***vq-for-reporting*** option.
2. Interaction Concentrator stores the KVP data in the Interaction Database (IDB), in the `CUSTOM_DATA_S` table.
3. Genesys Info Mart gathers this raw data from IDB and prepares it for use in Genesys CX Insights historical reporting on GPR activity and performance.
 - Genesys Info Mart has specific requirements for the KVPs that must be attached (see GPR KVPs for Genesys Reporting, below).
4. Reporting and Analytics Aggregates (RAA) further transforms the data in preparation for use by the presentation layer.
5. Using Genesys CX Insights, you can create the following reports based on the GPR data. These reports are described in the *Genesys Customer Experience Insights User's Guide*:
 - Predictive Routing - AHT & Queue Dashboard
 - Predictive Routing - Model Efficiency Dashboard
 - Predictive Routing Agent Occupancy Dashboard

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- Predictive Routing A/B Testing Report
 - Predictive Routing Detail Report
 - Predictive Routing Operational Report
 - Predictive Routing Queue Statistics Report
6. Using **Pulse**, you can access the *Agent Group KPIs by Predictive Model* and *Queue KPIs by Predictive Model* templates for real-time reporting. These templates are available from the Genesys Dashboard Community Center.
- NOTE:** Because Place objects do not have a Logged Out status, unlike Agent objects, some discrepancies appear in the Logged In, % Ready, and % Not Ready statistics in the GPR Agent KPI template between reports run on the Agent Group object and the Place Group object. By default, the Place object takes the NotReadyForNextCall status. As a result, a Pulse GPR Agent KPI report on a Place Group object does the following:
- Displays all places in the Place Group as Logged In and in Not Ready, even though the associated DN is not logged in.
 - If an agent is logged out from the associated DN, the status of the Place is changed to NotReadyForNextCall from WaitForNextCall.

In addition to the powerful Genesys Reporting solution, the GPR web application offers various reports and windows enabling you to Monitor trends and performance (described in the *Predictive Routing Help*).

The following topics provide in-depth information about how Universal Routing Server (URS) makes routing decisions when you are using Predictive Routing and how GPR scores agents in various scenarios. Use the material covered in these topics to inform your understanding about what data the KVPs described in this topic store and how to create the most useful reports from the available data:

- Routing Scenarios Using GPR
- How Does GPR Score Agents?

Configure Historical Reporting

Genesys Info Mart release 8.5.014.19 or higher and later provides support for GPR reporting out-of-box in a Hybrid environment, with no additional configuration required on the Genesys Info Mart side. However, to send GPR data to Genesys Info Mart, as well as to see GPR data in Genesys CX Insights reports, you need to modify the configuration of GPR, Interaction Concentrator, and Reporting & Analytics Aggregates (RAA, the aggregation engine hosted by Genesys Info Mart).

Tip

For general information about how Genesys Info Mart uses attached user data, see the Genesys Info Mart and Attached User Data section of the *Genesys Info Mart*

Deployment Guide.

1. Ensure that ICON and IDB have been deployed as Genesys Info Mart requires, and that ICON is connected to the T-Server(s) or SIP Server(s) handling the GPR interactions. For details, see Preparing Interaction Concentrator in the *Genesys Info Mart Deployment Guide*.
2. Configure a DN for GPR reporting data.
 - Open Genesys Administrator Extension (GAX) and specify a DN to use with GPR. This DN can be a VQ DN, a Trunk Group DN, or any other recognized type, as long as you configure ICON to monitor it. The name of the DN is used inside URS strategy subroutines, so it should be meaningful and recognizable.
3. Configure URS:
 - In the connections of your Universal Routing Server application, add the T-Server/SIP Server used to define the reporting Switch and DN in the GPR configuration. For example, GPR_Switch.
4. In IRD, set up your routing solution to attach the required KVPs in UserEvents. For an example to guide you, refer to the GPRIxnCompleted subroutine provided with GPR.
5. Configure Interaction Concentrator to store the GPR KVPs:
 1. Set the store-event-data option to all, the recommended setting in GPR deployments, or conf. This option controls which KVP data from AttributeUserData of EventUserEvent ICON stores in the G_CUSTOM_DATA_S table.
 - To simplify configuration in deployments where GPR data is extracted for reporting, Genesys recommends setting the **[custom-states].store-event-data** configuration option to all, which ensures that ICON stores all the UserEvent-based KVPs that Genesys Info Mart requires. However, be aware that setting **store-event-data=all** has performance and security implications:
 - Performance — Processing and storing a large number of UserEvent-based KVPs increases database resource requirements and can impact performance.
 - Security — Sensitive data (for example, credit card information) might be sent in UserEvents that are not used for reporting. Unlike the situation for call-based attached data, where the G_SECURE_USERDATA_HISTORY table is available to provide secure IDB storage, there is no secure IDB table parallel to G_CUSTOM_DATA_S that provides separate, secure storage for sensitive data.
 - If you set **store-event-data** to conf, use the following EventData options to specify which KVPs to store:
 - EventData=char,gpmVQDBID,char,gpmGlobalScore,char,gpmMedianScore, char,gpmAdjustedAgentScore,char,gpmVQGUID
 - EventData_1=char,gpmModelId,char,gpmMinScore,char,gpmDefaultScoreUsed, char,gpmTargetSize,char,gpmWaitTime
 - EventData_2=char,gpmAgentRank,char,gpmUse,char,gpmVQNumber, char,gpmRouteAttemptId,char,gpmPredictorType
 - EventData_3=char,gpmPredictorId,char,gpmScoreAboveMedian, char,gpmSuitableAgentsCount,char,gpmDefaultScoredAgents,char,gpmPredictor
 - EventData_4=char,gpmInitialScoreThreshold,char,gpmMessage, char,gpmResult,char,gpmMode,char,gpmCustomerFound

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- EventData_5=char,gpmSwitchName,char,gpmMaxScore, char,gpmDefaultAgentScore,char,gpmAgentScore,char,gpmAgentID
 - EventData_6=char,gpmAgentDBID,char,gpmModel,char,gpmGlobalScoreCount, char,gpmPriorityIncrement,char,gpmFinalScoreThreshold
 - EventData_7=char,CALLID,char,START_TS,char,ServiceType, char,CustomerID,char,context_id
 - EventData_8=char,gpmStatus,char,gpmRoutingMethod
2. Ensure that you have added the T-Server/SIP Server corresponding to the DN you created earlier for GPR to the **Connections** tab of the Interaction Concentrator Application object.
6. Configure GPR to attach KVP data by configuring the following options on the **Predictive_Route_DataCfg** Transaction List object:
 - send-user-event - Enables attaching the Predictive Routing-specific key-value pairs.
 - vq-for-reporting - Indicates the virtual queue or DN where URS sends the GPR user event data. The user event data, in the form of key-value pairs (KVPs), is attached to EventUserEvent in the AttributeUserData attribute. For the list of KVPs to be attached, see GPR KVPs for Genesys Reporting, below. The following KVPs are mandatory for data to be available for Genesys Reporting:
 - gpmResult
 - CALLID
 - START_TS
 - ADDED_TS
 7. Ensure that your deployment has been configured as required for Genesys Info Mart to support reporting on contact center activity in general. For a summary of the configuration requirements, see Enabling Reporting on Voice Activity in the *Genesys Info Mart Deployment Guide*.
 8. Enable aggregation of GPR data. (Required for Genesys CX Insights reporting or other applications that use RAA aggregation.)
 - In the **[agg-feature]** section on the Genesys Info Mart application object, specify the enable-gpr and enable-gpr-fcr options.
 9. Verify the reporting data chain. After a few interactions have been routed with GPR in an operational mode, verify that the required KVPs are being sent, stored, and used as expected:
 - Check the T-Server/SIP Server logs to verify that UserEvents are being sent with the required KVPs.
 - Check the ICON logs and the G_CUSTOM_DATA_S table in IDB to verify that ICON is recording the required KVPs.
 - Check the GPM_* tables in the Info Mart database to verify that Genesys Info Mart is correctly transforming the data.

For more information about configuring user data storage in Interaction Concentrator to work with Genesys Info Mart, see Important custom-states ICON Configuration Options and Configuration Considerations in the *Genesys Info Mart Deployment Guide*.

GPR KVPs for Genesys Reporting

The following table describes the KVPs that Genesys Info Mart uses to enable

GPR reporting.

Tip

- Use the Search box to quickly locate a specific KVP.
- Although the Predictive Routing short name is GPR, the gpm* prefix shown in the table below is correct. It reflects an earlier name for the product.

KVP	Description	KVP Type	Info Mart Database Target
KVP	Description	KVP Type	Info Mart Database Target

"> ADDED_TS

UTC timestamp, indicating the date and time when the record was added as inherited from the T-Server TEvent.

Default value: no default value

Valid values: any valid UTC timestamp

Note: This KVP is mandatory for Genesys Info Mart reporting. INT

GPM_FACT.ADDED_TS"> CALLID

Value of AttributeCallUUID for the interaction.

Default value: a valid CALLID

Note: This KVP is mandatory for Genesys Info Mart reporting. CHAR(32)

GPM_FACT.MEDIA_SERVER_IXN_GUID"> CustomerID

Introduced: 9.0.016.00 The GPRIxncleanup subroutine takes this KVP from user data attached to the interaction, and passes it to the Genesys Historical Reporting solution in the EventUserEvent event. GPR does not generate this KVP.

Postgres: varchar(255); Oracle: VARCHAR2(255 CHAR); Microsoft SQL:

varchar(255)/nvarchar(255) IRF_USER_DATA_GEN_1.CUSTOMER_ID">

gpmAdjustedAgentScore

Introduced: 9.0.015.00 The final agent score used to route the associated interaction to the selected agent. This score is calculated from the gpmAgentScore combined with any agent occupancy factor.

Default value: 0

Valid values: any non-negative float value FLOAT

GPM_FACT.ADJUSTED_SCORE"> gpmAgentDBID

Optional. The DBID of the agent to whom the interaction was routed.

Default value: no default value INT RESOURCE_.RESOURCE_CFG_DBID

(referenced through GPM_FACT.RESOURCE_KEY)"> gpmAgentRank
The rank of the agents in the target group, based on agent scores sorted in descending order.

Default value: 0

Valid values: 0, any positive integer SHORT GPM_FACT.AGENT_RANK">

gpmAgentScore

The score of the agent to whom the interaction was routed.

Default value: 0

Valid values: any non-negative float value FLOAT GPM_FACT.AGENT_SCORE">

gpmCustomerFound

Indicates whether features from the customer record specified in the routing strategy were successfully retrieved from the Customer Profile schema uploaded to the AI Core Services and used to calculate agent scores.

Default value: unknown

Valid values: 0 (= No), 1 (= Yes), unknown Enum

GPM_RESULT.CUSTOMER_FOUND (referenced through

GPM_FACT.GPM_RESULT_KEY)"> gpmDefaultAgentScore

Introduced: 9.0.015.00 This default agent score for the associated interaction. The value is the outcome, for this interaction, of the setting specified in the default-agent-score configuration option.

Default value: 0

Valid values: any non-negative float value FLOAT GPM_FACT.DEFAULT_SCORE">

gpmDefaultScoredAgents

Introduced: 9.0.015.00 The number of agents assigned the default score for the associated interaction.

Default value: 0

Valid values: 0, any positive integer INT GPM_FACT.DEFAULT_SCORES_COUNT">

gpmDefaultScoreUsed

Introduced: 9.0.015.00

- 0 - The agent score for the associated interaction is taken from the scoring response returned by GPR.
- 1 - The agent score for the associated interaction is calculated based on the value set for the default-agent-score configuration option.

Default value: 0

Valid values: 0, 1 INT GPM_FACT.DEFAULT_SCORE_USED"> gpmDeploymentType

Introduced: 9.0.017.00 The URS Strategy Subroutines read the value for this KVP from the **deployment-type** configuration option, which is set once, when a new Predictive Routing account is initially configured.

Note: This KVP is not currently stored as a separate column in the Genesys Info Mart database. It can be accessed from the score_log file using the GPR API.

Default value: hybrid

Valid values: hybrid, cloud N/A N/A"> gpmFinalScoreThreshold

Introduced: 9.0.015.00 The final threshold value used to route the associated interaction to the selected agent. The routing strategy calculates the value from the configured score threshold combined with values resulting from any agent holdout options.

Default value: 0

Valid values: any integer INT GPM_FACT.FINAL_SCORE_THRESHOLD">

gpmGlobalScore

The mean score calculated for an interaction using the Global Model.

Default value: 0

Valid values: any non-negative float value FLOAT GPM_FACT.GLOBAL_SCORE">

gpmGlobalScoreCount

Introduced: 9.0.015.00 Describes the number of agent scores returned for an interaction using a GLOBAL model.

Default value: 0

Valid values: 0, any positive integer INT GPM_FACT.GLOBAL_SCORES_COUNT">

gpmInitialScoreThreshold

Introduced: 9.0.015.00 The initial threshold value used for the interaction, taken from the value set in the score-base-threshold configuration option.

Default value: 0

Valid values: any integer INT GPM_FACT.INITIAL_SCORE_THRESHOLD">

gpmMaxScore

The score of the best-matching agent in the target group.

Default value: 0

Valid values: any non-negative float value FLOAT GPM_FACT.MAX_SCORE">

gpmMedianScore

The median score for the target group of agents to which the agent who received the interaction belongs.

Default value: 0

Valid values: any non-negative float value FLOAT GPM_FACT.MEDIAN_SCORE">

gpmMessage

The message that displays when the Predictive Routing result reported in the gpmResult KVP is an error.

Default value: no default value CHAR(255) GPM_FACT.MESSAGE">

gpmMinScore

The score of the worst-matching agent in the target group.

Default value: 0

Valid values: any non-negative float value `FLOAT GPM_FACT.MIN_SCORE">`
`gpmMode`

Modified: 9.0.015.00 - The value `off` was added. The mode in which Predictive Routing is operating, as specified by the `pr-r-mode` configuration option. For information about turning predictive routing off, see [Turn Off Predictive Routing](#).

Default value: unknown

Valid values: `prod, off, dry-run, ab-test-time-sliced, unknown Enum`
`GPM_RESULT.GPM_MODE (referenced through GPM_FACT.GPM_RESULT_KEY)">`
`gpmModel`

The name of the Model used to calculate agent scores for the interaction.

Default value: unknown

Valid values: The name of any Model in your environment `CHAR(255)`
`GPM_MODEL.MODEL (referenced through GPM_FACT.GPM_MODEL_KEY)">`
`gpmModelId`

The UUID of the Model used to calculate agent scores for the interaction.

Default value: unknown

Valid values: The ID for any Model in your environment `CHAR(24)`
`GPM_MODEL.MODEL_ID (referenced through GPM_FACT.GPM_MODEL_KEY)">`
`gpmPredictor`

The name of the Predictor. If an error is encountered, the section name specified in the **Predictive Route DataCfg** Transaction List object is used as the Predictor name.

Default value: unknown

Valid values: The name of any Predictor in your environment `CHAR(255)`
`GPM_PREDICTOR.PREDICTOR (referenced through`
`GPM_FACT.GPM_PREDICTOR_KEY)">` `gpmPredictorId`

The UUID of the Predictor used for scoring.

Default value: unknown

Valid values: The ID for any Predictor in your environment `CHAR(24)`
`GPM_PREDICTOR.PREDICTOR_ID (referenced through`
`GPM_FACT.GPM_PREDICTOR_KEY)">` `gpmPredictorType`

Introduced: 9.0.016.00 Describes whether the applied predictor is used for Sales KPI or Service KPI.

Default value: unknown

Valid values: `Sales, Service CHAR[32] GPM_DIM1.PREDICTOR_TYPE">`
`gpmPriorityIncrement`

Introduced: 9.0.016.00 If the value is 0, the priority of the interaction did not increase above the configured `base_priority` value. If the value is 1, the priority of the interaction did increase above the configured `base_priority` and, as a result,

the selected agent was not verified for the expected threshold score.

Note: This KVP is not currently stored as a separate column in the Genesys Info Mart database. It can be accessed from the score_log file using the GPR API.

Default value: 0

Valid values: 0,1 N/A N/A"> gpmPriorityIncrement

Introduced: 9.0.016.00 Specifies whether the priority of the interaction was increased above the configured base priority value. If set to 0, the interaction was routed at the base priority. If the value for this KVP is 1, the priority was incremented above the base priority and, as a result, the selected agent was not verified for the expected threshold score.

- This KVP is sent only to the score_log file. It is not stored in any Genesys Info Mart table.

Default value: 0

Valid values: 0, 1 CHAR[32] Not mapped"> gpmResult

Modified: 9.0.015.00 - The values 12, 13, 14, and 15 were added. 9.0.018.00 - The value 16 was added. 9.0.018.01 - The value 17 was added. The result of Predictive Routing processing. If there is an error, the gpmMessage KVP contains the error message.

- 1 - Ok
- 2 - Authentication to scoring engine failed
- 3 - Scoring request failed
- 4 - Agent list is empty
- 5 - URS overload, interaction skipped
- 6 - Predictor not found
- 7 - Failed to build scoring request
- 8 - SetIdealAgent or SetReadyCondition execution error
- 9 - Interaction log not found in global map
- 10 - Unknown error
- 11 - Channel is not supported
- 12 - Reserved for future use
- 13 - Call Abandoned
- 14 - Call Routing Failed
- 15 - Predictive Routing is turned off or not used for this interaction

-
- 16 - No agents found with a score above minimum threshold
 - 17 - Empty WFM target list

Default value: no default value
Valid values: 1-17

Note: This KVP is mandatory for Genesys Info Mart reporting. Enum
GPM_RESULT.GPM_RESULT (referenced through GPM_FACT.GPM_RESULT_KEY)">
gpmRouteAttemptId

The sequence number of the attempt to route an interaction using Predictive Routing. The value of this KVP is incremented each time the ActivatePredictiveRouting subroutine is called by the strategy, starting from 1.

Default value: 0

Valid values: integers starting from 1 INT GPM_FACT.ROUTE_ATTEMPT_ID">
gpmRoutingMethod

Introduced: 9.0.015.00 Reserved for future use.

Default value: unknown CHAR[32] GPM_DIM1.ROUTING_CRITERIA">
gpmScoreAboveMedian

Indicates whether the score for the selected agent was better than the median score for the target group.

Default value: unknown

Valid values: 0 (no), 1 (yes), unknown Enum
GPM_FACT.SCORE_ABOVE_MEDIAN"> gpmStatus

Indicates the scenario under which the interaction was processed. For more information about the scenarios, see Routing Scenarios Using GPR.

Default value: unknown

Valid values: agent-surplus, call-surplus, unknown Enum
GPM_RESULT.GPM_STATUS (referenced through GPM_FACT.GPM_RESULT_KEY)">
gpmSuitableAgentsCount

Introduced: 9.0.015.00 The number of agents who had scores greater than or equal to the initial threshold value when the scoring response was received.

Default value: 0

Valid values: 0, any positive integer INT
GPM_FACT.SUITABLE_AGENTS_COUNT"> gpmTargetSize

The size of the scored target group (in other words, the length of the list of agents received from the scoring engine).

Default value: 0

Valid values: 0, any positive integer SHORT GPM_FACT.TARGET_SIZE"> gpmUse
The meaning depends on the mode in which Predictive Routing is operating (see the description of the gpmMode KVP). This field is set to one of the following

values:

- 1 - When the mode is `ab-test-time-sliced`, indicates that the interaction was selected for Predictive Routing. When the mode is `prod`, indicates the normal case, when Predictive Routing occurred without error.
- 0 - When the mode is `ab-test-time-sliced`, indicates the interaction was processed with skill-based routing. When the mode is `dry-run`, indicates that the interaction completed without error.
- unknown - For any mode, indicates that an error occurred in one of the Predictive Routing subroutines, and the solution defaulted to skill-based routing.

Default value: unknown

Valid values: 1, 0, unknown Enum `GPM_RESULT.GPM_USE` (referenced through `GPM_FACT.GPM_RESULT_KEY`)"> `gpmVQDBID`

Introduced: 9.0.016.00 The DBID of the virtual queue or DN configured in the `vq-for-reporting` configuration option (configured on the `Predictive_Route_DataCfgTransaction` List object).

- Requires Genesys Info Mart release 8.5.014.19 or higher.

Default value: No default value

Valid values: Any valid DBID INT `RESOURCE_.RESOURCE_CFG_DBID` (referenced through `GPM_FACT.VQ_RESOURCE_KEY`)"> `gpmVQGUID`

Introduced: 9.0.016.00 Value of the Virtual Queue ID (RPVQID) stored in the interaction user data. This is a special GUID value that uniquely identifies the entrance of the interaction into certain virtual queues. The RPVQID is created by URS when the interaction enters into the virtual queue and is present in all `VirtualQueue` events that URS distributes.

- Requires Genesys Info Mart release 8.5.014.19 or higher.

Default value: No default value

Valid values: Any valid Virtual Queue GUID `CHAR[32]` `GPM_FACT.VQ_GUID`"> `gpmWaitTime`

The amount of time, in seconds, the interaction spent in the queue used for Predictive Routing decision-making, starting from when the strategy started to process the interaction until it was routed to the agent. Note that the point when processing starts might depend on how you have configured your strategy.

Default value: 0

Valid values: 0, any positive integer INT `GPM_FACT.WAIT_TIME`"> `ServiceType`

Introduced: 9.0.016.00 The GPRixnCleanup subroutine takes this KVP from user data attached to the interaction, and passes it to the Genesys Historical Reporting solution in the EventUserEvent event. GPR does not generate this KVP. Oracle: VARCHAR2(255 CHAR); Postgres: varchar(255); Microsoft SQL: nvarchar(170) INTERACTION_DESCRIPTOR.SERVICE_TYPE"> START_TS UTC timestamp, indicating the time when the interaction arrived at the contact center.

Note that this value is different from gpm-ixn-timestamp, which, in release 9.0.014.04 and earlier, indicates the time when the strategy started processing the interaction. gpm-ixn-timestamp is configured in the default_skill_data object, from which it is passed to the ActivatePredictiveRouting_v3 subroutine.

In URS Strategy Subroutines 9.0.015.00 and higher, gpm-ixn-timestamp is not used, and START_TS must be passed in the default_skill_data parameter. gpmWaitTime (the actual wait time of the interaction in the queue before an agent is selected) is calculated based on the difference between the UTC time when agent is selected minus the START_TS value.

Default value: no default value

Valid values: a valid UTC timestamp

Note: This KVP is mandatory for Genesys Info Mart reporting. INT GPM_FACT.START_DATE_TIME_KEY