G*plus* Adapter 6.0

G*plus* Adapter for WFM

Hardware and Software Requirements

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Preface

Welcome to the *G*plus *Adapter for WFM Hardware and Software Requirements.* This a generic guide to the installation requirements for the family of G*plus* Adapters for Workforce Management (WFM).

This document is valid only for the 6.0 releases of this product.

Note: For versions of this document created for other releases of this product, visit the Genesys Documentation website.

About G*plus* Adapter for WFM Requirements

The G*plus* Adapter for WFM refers to the four products that provide integration between four vendor Workforce Management systems and Genesys routing solutions. Presently, there are G*plus* Adapter versions for the following versions:

- Aspect
- IEX
- Teleopti
- Verint
- Universal – not specific to a WFM vendor

While there are slight differences in performance between the different vendor versions of the G*plus* Adapter, this guide presents requirements that are suitable for all five versions.

Intended Audience

This document is primarily intended for system administrators or other individuals who install and configure the G*plus* Adapter. It has been written with the assumption that those individuals have a basic understanding of:

- Computer-telephony integration (CTI) concepts, processes, terminology, and applications.
- TCP/IP Internetworking fundamentals including routing and client/server application communications via TCP sockets.
- WFM conventions and reports.
- The network configurations used in the installation computing environment.

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Chapter

1 Supported Versions

Genesys

Uses:

- Configuration Platform SDK - 8.1
- Open Media Platform SDK - 8.1
- Voice Platform SDK - 8.1
- Management SDK - 8.1

Supports:

- Framework 7.5 – 8.1 for Voice T-Server
- Framework 7.5 - 8.1 Email through Interaction Server
- Framework 8.0 - 8.1 Chat/iWD/OpenMedia through Interaction Server
- Outbound Contact Server (OCS) 7.6 - 8.1
- Outbound Contact Server (OCS) 8.0 - 8.1 for Push Preview Campaigns

Requires for 8.1 multimedia VQ event parsing:

- Orchestration Server Version 8.1.200.40
- Universal Routing Server Version 8.1.200.22

Chapter

2 General Requirements

Discussion

A discovery session with Professional Services is always recommended to finalize system design and configuration. The following are some of the considerations that impact performance and design decisions:

- Number of concurrent agents
- Number of streams the adapter will support
- Call patterns and peak loads
- Call routing
- Temporary data retention needed for historical reports.
- Hardware platform selected.
- Genesys system architecture.
- WFM reporting requirements and considerations.

The G*plus* Adapter for WFM is a standalone Java application that provides both RTA and Historical data feeds to a Workforce Management (WFM) application. A single instance of the G*plus* Adapter on a dedicated server can be expected to support up to 2 million calls per day.

Multiple instances of G*plus* Adapter can be distributed between multiple servers to scale the application for larger and/or more complex call centers. A single adapter has the capability to provide multiple Historical and RTA data "streams" to more than one WFM application.

Supported Java Version

A Java version not less than Version 1.6 of the Oracle (Sun) JRE (Java Runtime Environment) is required. Both the 32 bit and 64 bit versions of the JRE can be used with the 64 bit version recommended for larger call centers. The 64 bit version does not have the 32 bit memory constraint that may be a factor in certain implementations.

Supported Operating Systems

The JRE gives the application some isolation from the underlying operating system on the server but there are still dependencies. The G*plus* Adapter has only been installed and tested against the Oracle version of the JRE and the supported operating systems for the G*plus* Adapter have an implementation of the Oracle JRE – Version 1.6:

- Oracle - Solaris 10 and higher (32 and 64 bit)
- Microsoft - Windows Server 2003 and higher (32 bit and 64 bit)
- Linux - several versions

The page at the URL below shows the Operating Systems that Oracle has tested with Java SE 6 (Version 1.6):

http://www.oracle.com/technetwork/java/javase/system-configurations-135212.html

The page at the URL below shows the Operating Systems that Oracle has tested with Java SE 7:

http://www.oracle.com/technetwork/java/javase/config-417990.html

There are non-Oracle versions available on other operating systems but they have not been tested with the G*plus* Adapter.

Note: The Adapter supports integration with the Solution Control Server. Determining a supported operating system should also take into account that the Genesys Local Control Agent (LCA) must also be installed on the same server.

Supported Hardware

The supported hardware is essentially determined by the servers that can run the Oracle version of Java 1.6 on one of the operating systems listed above. This restricts the supported hardware to one of Intel x86 processors or the Oracle processors.

Other hardware/operating system vendors have non-Oracle versions of Version 1.6 of the Java Runtime Environment that might be compatible with the G*plus* Adapter but these versions have not been tested.

Chapter

3 Performance Considerations

Despite the fact that the 5.0 and later versions of the G*plus* Adapter now retain all of the call/interaction information in memory, the peak memory requirements for the new versions are significantly reduced. This is relevant because memory depletion during high load is the usual mode of failure when the event processing cannot keep pace with the events arriving from the monitored servers.

Prior versions dealt with this constraint by increasing the memory allocation to reduce the likelihood of an `OutOfMemory` error but Versions 5.0 and greater were designed to reduce the fluctuations in utilized memory associated with report generation.

Data Collection

Call, interaction (open media) and agent events are buffered in a queue and processed in the order that they are received. It is the growth of this event queue that causes the memory depletion and eventual failure if the event processing cannot keep up with the event stream from the connected Configuration Server, TServer(s), SIPServer(s) and Interaction Server(s).

It should be noted that other media do not usually have the event frequency associated with voice calls and the memory depletion described above is typically only a factor with high volume call centers.

The heap memory size for the JRE will determine the length of time that the higher call volumes will be handled safely as the calls are buffered until they can processed. More available memory allows for more calls to be buffered.

Streams

Streams were introduced in Version 5.1 to reduce the number of adapter instances required to provide data to possible multiple WFM vendor application instances. One adapter is capable of supplying more than one individually configured Historical or RTA data stream while still only using one connection to each of the monitored TServers, SIP Servers, Interaction Servers or Configuration Servers.

There is a significant reuse of resources when an Adapter instance is implementing more than one data Stream but it may be necessary to increase the memory available to the Adapter as there is some memory overhead associated with each stream instance.

Load tests with high call volumes found that a single adapter could only support 4 streams reliably. It should be noted that the test call volumes for each stream were in the order of 15 calls per second.

Report Generation

Report generation had been the bottleneck in prior versions as the embedded database dealt with high volumes of data in unexpected ways; none of them positive. Under high call volumes, the database would slow and the reports could take several minutes in some instances. This problem has been eliminated with the removal of the database in Version 5.0. Reports that could take minutes in prior versions now complete in seconds.

While the time taken to generate the reports will still cause some backup of the event queue with the associated increase in utilized memory, the short duration of the report generation limits this memory increase to a minimal and manageable amount. However, call centers with a high call volume will see a higher memory spike than a call center with a lower call volume and this must be taken into account in the memory allocation.

Data Retention

Supporting daily summary reports requires the G*plus* Adapter to retain two days of data to ensure that any sessions that started on the prior day are reported correctly. Data older than two days is removed so the amount of memory required for the retained agent and call data should stabilize after a few days of operation,

This retained data will be one of the mostly static portions of the utilized memory that must be taken into account when considering the base memory requirements.

RTA

Real Time Adherence (RTA) data streams do not represent a significant load or memory requirement in the G*plus* Adapter operation. Adapter instances just producing an RTA stream with no historical reports would not see the brief memory peak associated with Report Generation.

Configuration Memory

The G*plus* Adapter has used the Genesys Configuration Platform SDK to manage the connection to the Configuration Server since Version 4.5. The G*plus* Adapter relies on change notifications from the Configuration Server to maintain its configuration state and it retains all of that state in memory. This configuration state includes all of the monitored DN, Place and agent information.

The configuration state represents another static block of utilized memory that should remain reasonably consistent during the normal adapter operation. Call centers with a large number of agents (> 20,000) may require more memory than 1GB for the JVM memory allocation.

Configuration Server queries have been improved so that *disabled* configuration objects are not longer included. This may represent a significant reduction in the amount of memory allocated depending upon the number of those objects retained in the Configuration Server database.

Logging and Disk Drive Space

The G*plus* Adapter logging is reasonably verbose and the log files can consume a significant amount of the storage drive.

The adapter can be configured to produce archived log files but even those files start to get large in a very busy call center. Up to 1 GB of archived log files could be generated for each day that the adapter is running. The total amount of space used by the adapter logs can be configured but any decision as to the maximum size must also include the number of days of adapter logs are to be retained.

The removal of the embedded database has meant that a persistence mechanism had to be added so that the Adapter could still generate the daily summary report in the event of a mishap. Recovery logs were added to provide persistence; they are not intended to be viewed by operating personnel. These logs are "played back" when the adapter is restarted and the adapter is returned to the state immediately prior to the mishap. The recovery logs are compressed but a large call center could still see about a 1 GB of logs created daily. The adapter retains 7 days of these logs and automatically removes the older logs.

Virtual Images

While it is quite possible that the G*plus* Adapter can be run on a Virtual Machine successfully, it is also necessary to ensure that the G*plus* Adapter is running in a Virtual Image that meets the hardware/software requirements discussed in this document. Problems have been noted with virtual storage when the disk image is contained on a remote storage array rather than the local hard drive. Latency can affect the logging efficiency and reduce the Adapter's performance.

Installing the G*plus* Adapter in a Virtual Image puts the onus on the customer to ensure that the environment meets the minimum requirements and is not detrimentally affecting the G*plus* Adapter.

Scaling

As has been noted, the most significant performance factor is the number of calls or interactions that the call center handles daily. If the predicted call center load is less than 2 million calls per day and the number of agents is less than 20,000, it is likely that the G*plus* Adapter will run satisfactorily if the requirements listed in the next section are met. Increasing either of these numbers would necessitate design decisions beyond the scope of this document and it is recommended that Professional Services be contacted.

Maximum Memory and JRE Type

The 32 bit versions of the Java 1.6 JRE have a maximum memory limit that varies with the underlying operating system. A maximum memory limit of about 1.3 - 1.4 GB is the most that should be expected from any of the Windows 32 bit versions of the JRE while some of the other operating systems can be higher. This will be sufficient for most call centers.

The memory heap size for the 64 bit versions of the Java JRE is constrained by physical memory on the server. One problem with the 64 bit version is that the memory usage will also be higher because of the size of the 64 bit pointers. One simple study suggested that the impact of the larger pointers could be a 40 – 50% increase in memory usage. This must be taken into consideration when moving to a 64 bit JRE.

Chapter

4 Hardware Sizing

Minimum Requirement

Oracle

- UltraSparc or newer single processor
- 4 GB RAM
- Minimum 100 GB disk drive

Intel x86

- Core 2 Duo 2.66 GHz or newer processor
- 4 GB RAM
- Minimum 100 GB disk drive

Instance Parameters

1. Maximum voice calls per day - less than 2 million.
2. Number of configured agents - less than 20,000.
3. Maximum handled emails per day - less than 25 thousand.
4. Interval reports enabled and generated every 15 minutes.
5. Daily report enabled.
6. RTA enabled.
7. Event logs retained for 10 days.