Conversation Manager Product Guide

Conversation Manager 8.5

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Conversation Manager Product Guide

Welcome to the *Genesys Conversation Manager Product Guide*. Use this guide to help you set up Genesys Conversation Manager.

> ## Important
>
> Much of the information in this guide is shared with the *Genesys Mobile Services Deployment Guide*. Wherever you see "GMS" mentioned, please note that the information is also pertinent to Conversation Manager.

Before you begin

Use this section to learn more about the necessary prerequisites for Conversation Manager.

Prerequisites

Requirements

Use these sections to learn more about system requirements for Conversation Manager.

Sizing Calculator

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Prerequisites

To work with Genesys Mobile Services (GMS), you must ensure that your system meets the software requirements established in the Genesys Supported Operating Environment Reference Manual, as well as meeting the following minimum requirements:

Hardware Requirements

The following are minimum requirements:

- CPU: Quad core
- Memory: 4GB
- Disk: 160GB
- At least 2-3 nodes recommended for redundancy and availability

OS Requirements

- Genesys Supported Operating Environment Reference Guide

Important
For Linux installations, the Linux compatibility packages must be installed prior to installing the Genesys IPs.

Browser Support

- Genesys Supported Operating Environment Reference Guide

Java Requirements

- Before 8.5.103, Callback requires JDK 7.
- Starting in 8.5.103, Callback requires JDK 8.

> **Tip**
>
> Edit JAVA_HOME to point to the JDK installation folder, for example,
> C:\Program Files\Java\<your JDK>.

Cassandra Support on Linux

- Cassandra 2.x: Tested version is 2.2.9

> **Tip**
>
> Cassandra is not required if you deploy Genesys Mobile Environment for Chat API V2,
> Email API V2, and Open Media API V2.

Genesys Environment

In addition to having a Genesys Management Framework 8.1 environment installed and running, the following table lists the Genesys components that are used with a GMS installation.

Genesys Component	Minimum Version Required	Comments
Orchestration Server (ORS)	8.1.400.26	Optional, installed and running: • An HTTP port must be enabled in the related Application object. • The ORS server must use the `Orchestration Server` type in Configuration Manager. **Important** You need a minimum of ORS 8.1.300.30 to be able to do Load Balancing with GMS.
Universal Routing Server (URS)	8.1.400.39	Mandatory, required for the GMS services and if you plan to use URS-based dialing in Callback applications.
Interaction Routing Designer (IRD)	8.1.400.26	Mandatory, required for strategies running on URS.

Genesys Component	Minimum Version Required	Comments
SIP Server	8.1.100.67	• SIP or Inbound Voice is required for agents. • SIP Server is recommended for outbound calling for Callback.
Chat Server	8.1.000.26	Used for Chat support.
	8.5.105+	Required if you plan to use features related to file management.
	8.5.109+	Required if you plan to use Digital Channels Chat over CometD API feature.
Interaction Server	8.0.200.11	Used for Chat support.
Stat Server	8.x	Used to obtain statistics.
Media Server	8.1.410.33	Used for Callback services, in order to play treatments and use Call Progress Detection (CPD) for outbound calls.
Resource Manager	8.1.410.13	Used for Callback services, in order to play treatments and use Call Progress Detection (CPD) for outbound calls.
Workspace Desktop Edition	**(optional)** 8.5.111.21	Support for Genesys Callback. This component is not mandatory.

Sizing Calculator

Before deploying Context Services (CS) for your Conversation Manager solution, you must estimate the size of solution that will be able to handle the expected user load. Genesys recommends that you download the **CS Storage Sizing Calculator**, an Excel spreadsheet that you can use to help calculate the number of Context Services nodes required for your production deployment.

CS Storage Sizing Calculator
CS-StorageSizing.xlsx

Using the Sizing Calculator Spreadsheet

To use the sizing calculator, The following information is required:

- Approximate event size in bytes for event start/end/update of service/state/task (including extension data). You can extract this information from the JSON of the events.
- Number of update events per services/states/tasks
- Number of states/tasks per service
- Number of Cassandra nodes and replication factor
- Retention policy in days and number of conversation per day

The sizing calculator takes into account Cassandra storage specifics such as Replication Factor (storage size is multiplied by 3 as default replication), compression (ratio is estimated to 0.40 by default), and compaction overhead which requires more storage during cycles of data re-organization by Cassandra.

Input Example

Genesys Context Services - Sizing Input Parameters			
Events Parameter	**Event Size (bytes)**	**Number of Events**	**Comments**
service start event	246	1	
service end event	227		
service update event(s)	291	0	
state start event	210	5	
state end event	225		
state update event(s)	192	0	
task start event	208	10	
task end event	228		
task update event(s)	165	0	
Volume Parameter	**Value**	**Comments**	
Number of Conversations per Day	160000		
Conversations life (days)	90		
Number of storage nodes	4		
Replication Factor	3		
Constants	**Value**	**Comments**	
Compression ratio	0,50		
CommitLog Size (MB)	8192,00		

Output Example

Calculations		
Description	**Value**	**Comments**
Number of events per conversation	32	
Size of conversation in storage (bytes)	7008	
Number of Activities	2560000	
Description	**Total**	**Comments**
Estimated disk size (MB)	80117,80	

Genesys Context Services - Sizing Output	
Data Size (MB)	80 118
Cluster Data Size (MB)	240 353
Data Size per node MB)	60 088
Disk usage per node (MB)	128 369
Grand Total (MB)	513 475

Example of Hardware Sizing

This example shows an initial GMS and CS cluster deployment and ensures that performance is correct in scale.

In this example, GMS and CS 8.5.003.00 and later instance is used with external Cassandra 2.0.8.

Host	Specifications	Software Components
4 similar hosts	Windows Server 2008 R2 Standard SP 1 Intel Xeon X3440 @ 2.53 GHz, quad core 8 GB RAM Low Price disks	JMeter 2.11 GMS 8.5.003.00 and later Xmx is 2G for java Cassandra 2.0.8 external
Genesys Framework	Windows Server 2008 R2 Standard SP1	Runs Genesys Framework/Suite 8: • Config Server: 8.1.100.14 • DB Server: 8.1.100.04 • Message Server: 8.1.100.02

GMS and CS are configured to handle a constant average CPU of 50%. This allows for burst and Cassandra background activities to happen correctly, high load prevent cleaning to occur correctly, and increasing latencies over time.

Configuration

Start from a database with 2.5GB data on each node. Complex statistics (requiring fetch of "start" event during processing of "end" event) are enabled for States/Tasks. All statistics are available for Services.

Special settings and enhancements:

- Cassandra 2.0.8

- Replication Factor = 2

- Consistency Level = 1/1 (read/write)

- Correctly Balanced Cassandra node tokens for each node to own 25% data

Options:

- cview/data-validation=false

JMeter:

- Modified to add constant time between events (200ms), allowing constant load of GMS nodes

Results

Captured measure	Value	Comments
Database size	68 GB / node (after 120h+ run by set of 48h) = 272 GB	272 GB corresponds to 16.5 M conversations or 264 M activities that make a ratio of 0.54KB for each activity. Multiply by replication factor to reflect correct disk size.
Throughput	Approximately1000 tx/s (approximately 30.5 scenario/s)	Constant through 24h testing
Size of conversation	Approximately10kB in JSON	This matches a conversation of 16 activities, with extension data as returned by Query Service, State, and Tasks by CustomerId
CPU	Approximately 20% to 60%	Each node was around an average of 30% with peaks to 60% from time to time
Memory	2.4GB	For each GMS process, less than 2 GB for Cassandra processes.
I/O Disc	Approximately 3 MB/s (Cassandra measure)	Disk I/Os fluctuate a lot (between 0 MB/s and 20 MB/s)
I/O Network	Approximately 3 MB/s	Between 20Mbps and 60Mbps.

Conclusion

This test showed successful long running tests for more than 48h with an average of 1000 tx/s on a 4 node cluster GMS with external Cassandra 2.0.8. To scale on higher throughput, you should allow more nodes into the cluster.

In the testing environment, it was possible to have up to 2x better throughput but Cassandra could not sustain very long before getting late in compaction state, resulting in increase of latencies after a few hours load (4-8h).

The throughput tested in this scenario is about 2x maximum speed required (approximately 25 CAPS, approximately 400 tx/s expected).

Performance and Sizing Data

This page provides an example of sizing and performance for Context Services in a GMS deployment.

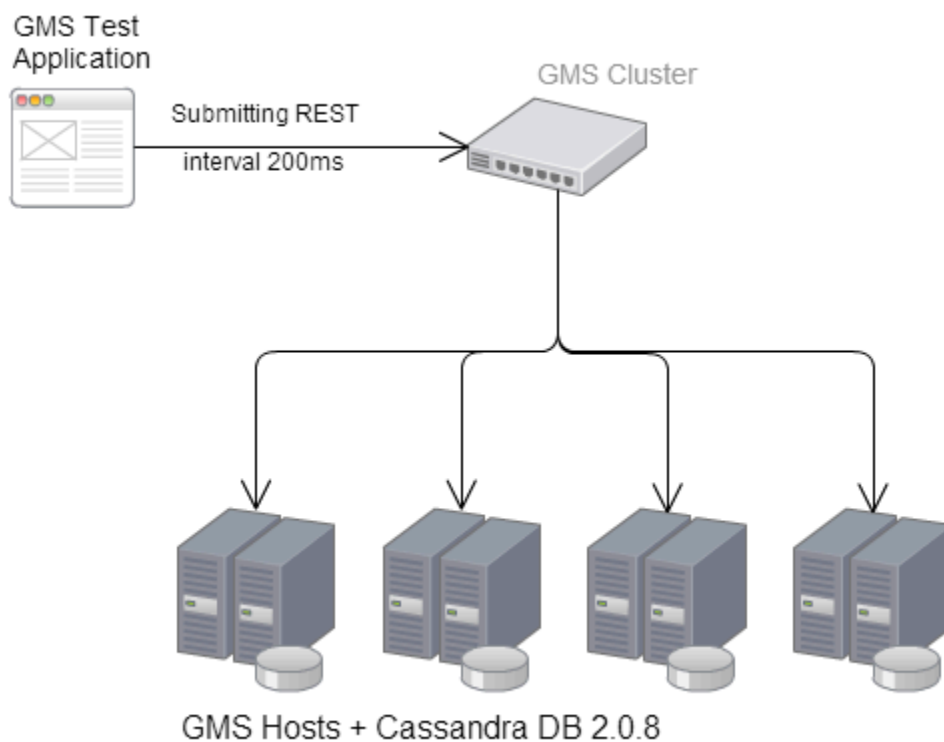## Sizing Scenario
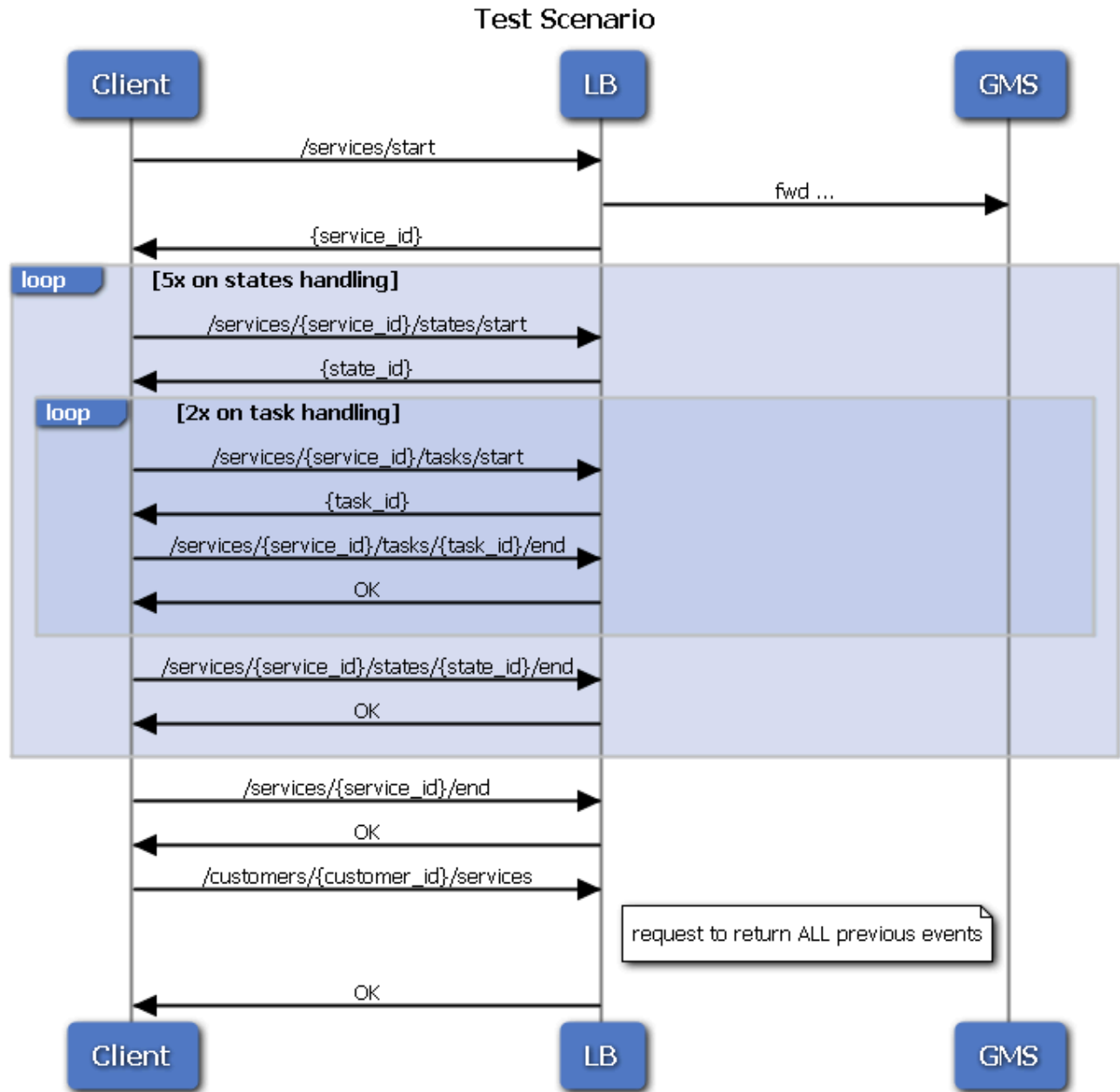
Test Scenario

A Load Balancer (LB) receives the REST queries and dispatch them to GMS applications.

Our test scenario create a conversation implemented with one service including 5 states and tasks, which are equivalent to **33 REST queries** to handle on GMS side.

- 1 to 4 extension attributes are submitted in start events for services, states, and tasks.

- All the event attributes are set in Start and complete events using random values for integer a strings.

Sizing Settings

Number of hosts in use	4 (one per GMS cluster node)
Host Specifications	- Windows Server 2008 R2 Standard SP 1 - Intel Xeon X3440 @ 2.53 GHz, quad core 8 GB RAM - Low Price disks
Components	- GMS 8.5.003.00+ - Cassandra 2.0.8 external
GMS Configuration	- Constant average CPU of 50% - Cassandra 2.0.8 (database of 2.5GB dat each node) - Replication Factor = 2

Sizing Results

Captured measure	Value	Comments
CPU	~20% to 60%	Each node was around an average of 30% with peaks to 60% from time to time.
Database size	68 GB / node (after 120h) = 272 GB	272 GB corresponds to 16.5 M conversations or 264 M service/state/task events, for a ratio of 0.54KB per conversation (1 service, 5 states, 10 tasks).
I/O Disk	~3 MB /s (Cassandra measure)	Disk I/Os are fluctuating a lot (between 0 MB/s and 20 MB/s)
I/O Network	~3 MB /s	Between 20Mbps and 60Mbps.
Memory	2.4GB	For each GMS processes. Less than 2 GB for Cassandra processes.
Size of conversation (1 service, 5 states, 10 tasks)	~10kB in JSON	This matches a conversation (1 service, 5 states, 10 tasks), for 33 REST queries events, including extension data returned with queries by CustomerId.

Captured measure	Value	Comments
Throughput	~1000 queries/s (~30,5 scenario/s)	Constant through 24 hours of testing

Load Balancing

> ### Important
>
> - Configure `/genesys/1/cs/` for the Genesys UCS **base-url** option.
> - Configure destination URLs to include the full path.
> - Configure Genesys Composer to point to Load Balancer (**Window > Preferences > Composer > Context Services**).
> - Configure Genesys Orchestration application to point to Load Balancer (**Genesys Administrator > Provisioning > Routing/eServices > Orchestration > (Your application) > Context Manager Parameters**).
> - Both short and long URL formats are required to support mixed environments (for example `/services` and `/genesys/1/cs/services`).

Function	LB Interface	LB Pool	Host	Port
Data Center A				
GMC/CS	nllaba-gpoc-bigip1	nllaba-gpoc-bigip1_6175	nllaba-gpoc-eservices1a	6175
GMS/CS	nllaba-gpoc-bigip1	nllaba-gpoc-bigip1_6175	nllaba-gpoc-eservices1b	6175
UCS/CS	nllaba-gpoc-bigip1	nllaba-gpoc-bigip1_9080	nllaba-gpoc-eservices1a	9080
UCS/CS	nllaba-gpoc-bigip1	nllaba-gpoc-bigip1_9080	nllaba-gpoc-eservices1b	9080
Data Center B				
GMS/CS	nllabb-gpoc-bigip1	nllabb-gpoc-bigip1_6175	nllabb-gpoc-eservices1b	6175
UCS/CS	nllabb-gpoc-bigip1	nllabb-gpoc-bigip1_9080	nllabb-gpoc-eservices1b	9080

Location	LB Pool - Data Center A	LB Pool - Data Center B	Destination URL Format
Function: GMS/CS			
/services	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/1/services
/genesys/1/services	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/1/services
/genesys/1/service	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/1/service
/customers	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/1/cs/customers
/genesys/1/cs/	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/1/cs/

Location	LB Pool - Data Center A	LB Pool - Data Center B	Destination URL Format
customers			customers
/genesys/admin	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/admin
/genesys	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys
/genesys/develop	nllaba-gpoc-bigip1_6175	nllabb-gpoc-bigip1_6175	/genesys/develop
Function: UCS/CS			
/profiles	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/profiles
/genesys/1/cs/profiles	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/profiles
/server	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/server
/genesys/1/cs/server	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/server
/metadata	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/metadata
/genesys/1/cs/metadata	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/metadata
/interactions	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/ interactions
/genesys/1/interactions	nllaba-gpoc-bigip1_9080	nllabb-gpoc-bigip1_9080	/genesys/1/cs/ interactions

Security

See the Security page in the *Genesys Mobile Services Deployment Guide* for information on security configurations that can be used with Conversation Manager.