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Developer's Guide

High-Level Architecture

4/21/2025

High-Level Architecture

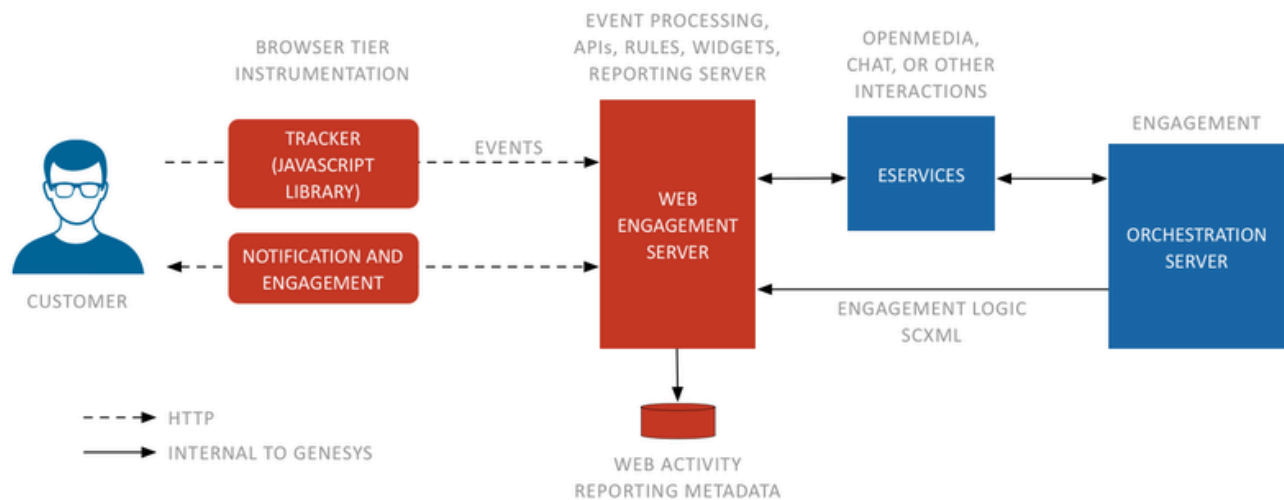
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Introduction

This article discusses the components that make up Genesys Web Engagement. Before you dive in, take a look at [What is Web Engagement?](#)

As mentioned in that article, Web Engagement has the following basic architecture:



As shown here, Web Engagement provides web services that connect your website with the Genesys contact center solution using:

- **Browser Tier Agents** (JavaScript code snippets) which are inserted into your web pages; they run in the visitor's browser and track their browsing activity.
- A **Web Engagement Server**, which includes the Web Monitoring Service and the Web Notification Service. This server is responsible for managing the data and event flow, based on a set of configurable rules and the visit's defined business events. It also stores data, submits information to the Genesys solution, and manages engagement requests to the Genesys contact center solution.

Browser Tier Agents

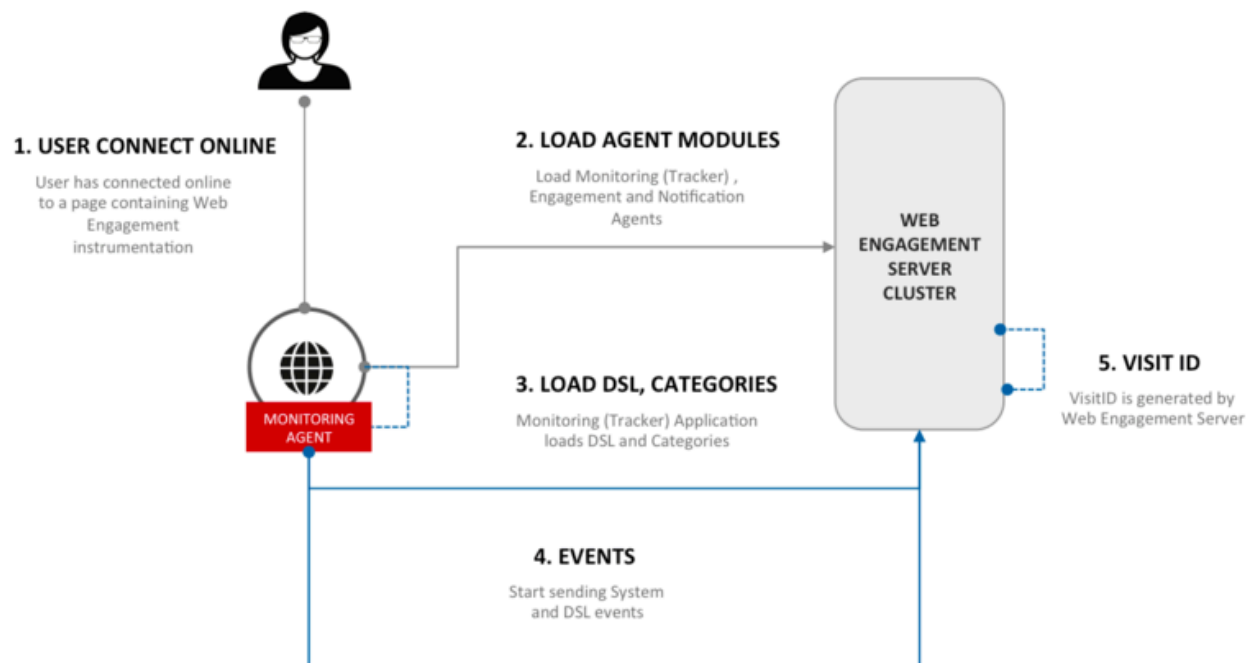
The Browser Tier Agents are implemented as JavaScript components that run in the visitor's browser. To enable monitoring on a web page, you create a short standardized section of JavaScript code with the Genesys Administrator Extension plug-in and then add this code snippet to the pages of your site.

When a customer visits the webpage, the code retrieved within the page loads all the necessary artifacts like the JavaScript libraries and Domain Specific Language (DSL) that contains the definitions of your Business Events.

The DSL covers:

- The HTML elements to monitor.
- The custom business events to send to the Web Engagement Server.
- The data to include in the events.

The Browser Tier generates categorized standard System and custom Business events, defined in the DSL definitions, and sends them to the Web Engagement Server over HTTP.



Genesys Web Engagement provides the following browser tier agents:

- The **Monitoring Agent** records the web browsing activity. It generates basic system events such as VisitStarted, PageEntered, and additional custom business events, such as 'add-to-shopping cart'. These events are sent to the Web Engagement Server for further processing. For further information about events, see [Event Workflow](#). For details about implementing monitoring, see [Monitoring](#).
- The **Notification Agent** allows a web server to push data to a browser, without the browser explicitly requesting it, providing an asynchronous messaging channel between server and browser. It is used for presenting the engagement invite. For details about implementing notification, see [Notification](#).
- The **Engagement Agent** provides the engagement mechanism, chat communication and web callback initialization. For details about implementing engagement, see [Engagement](#).

If you are only interested in Web Engagement's monitoring features, you need to configure your instrumentation script accordingly. See [Configuring the Instrumentation Script](#) for details.

Web Engagement Server

Working with the Browser Tier

The Genesys Web Engagement Server receives System and Business events from the browser's Monitoring Agent through its RESTful interface.

- **System** events track basic customer activities on your website. There are six of them, coming in two different flavors:
 - The **Visit-related** events, which are **VisitStarted**, **PageEntered**, and **PageExited**;
 - The **Identity-related** events, which are **SignIn**, **SignOut**, and **UserInfo**. See [Visitor Identification](#) for further details.
- **Business** events are additional custom events that you can create by implementing [Advanced Engagement](#):
 - You create and define these events in the DSL loaded by the monitoring agents in the browser, using the [Business Events DSL](#). For details about how to implement them, refer to [Managing Business Events](#).
 - You can submit these events from your web pages by using the [Monitoring Javascript API](#).

For details about how Business and System events are structured, see [Events Structure](#).

The Monitoring JavaScript Agent gets a list of categories from the Web Engagement Server and categorizes each event, based on the event data, prior to sending it to the server. The integrated Complex Event Processing (CEP) engine processes incoming events against the business rules and creates actionable events when the required conditions are met. For more information on rules, consult the documentation for [Genesys Rules System](#).

The Web Engagement Server also sends invitation notifications to the Notification Agent injected into the visitor's browser.

Hosting Static Resources

The Web Engagement Server is also responsible for hosting static resources, which are used in web applications such as Invite Widget, Chat Widget, and so on. These resources are all available to the newly created Web Engagement application in the ***GWE_installation\apps\application_name\resources*** folder. After deploying an active application into Web Engagement Server, these resources will be located in the ***GWE_installation\server\gwe\resources*** folder.

Note: When a new GWE application is deployed, all resources belonging to previously deployed applications are removed.

```
-conf
  resources.properties // app configuration file
-drl
  // app drl files
-dsl
  domain-model.xml    // default DSL file
-locale
  callback-en.json    // default English localization file for callback widget
  callback-fr.json    // default French localization file for callback widget
```

```
-_composer_projects      // GRDT and SCXML Composer projects
ads.html                // sample advertisement widget
callback.html           // default web callback widget
chatTemplates.html      // scripts for template-based modification of chat widget
chatWidget.html         // default chat widget
invite.html             // default invitation widget
```

You can add your own static resources under the Web Engagement Server, but Genesys recommends you do this only if the resources are related to the Genesys Web Engagement solution. Alternatively, you can host your static resources under a third-party server, as long as it supports all the features required for the Web Engagement solution.

JSONP

The Web Engagement Server supports the JSONP protocol for all resources. JSONP stands for “JSON with Padding” and it is a workaround for loading data from different domains. It loads the script into the head of the DOM and thus you can access the information as if it were loaded on your own domain, by-passing the cross domain issue.

Tip

For more information about JSONP, see <http://en.wikipedia.org/wiki/JSONP>.

For example, for this request:

```
http://{gwe server}/server/resources/invite.html?obj=myObj&callback=myMethod
```

the server returns following response body:

```
myObj.myMethod('<content of http://{gwe server}/server/resources/invite.html>');
```

Cross-origin resource sharing

Cross-origin resource sharing (CORS) is a mechanism that allows many resources (for example, fonts, JavaScript, and so on) on a web page to be requested from another domain outside the domain from which the resource originated. In particular, JavaScript's AJAX calls can use the XMLHttpRequest mechanism. These "cross-domain" requests would otherwise be forbidden by web browsers due to the same-origin security policy.

Tip

For more information about cross-origin sharing, see http://en.wikipedia.org/wiki/Cross-origin_resource_sharing.

GZIP

The Web Engagement Server can serve pre-compressed static content as a transport encoding and avoid the expense of on-the-fly compression. So if a request for **GPE.js** is received and the file **GPE.js.gz** exists, then it is served as **GPE.js** with a gzip transport encoding. By default, the Web Engagement solution ships all JavaScript resources in minified and pre-compressed version.

Tip

For more information about GZIP, see

<https://developers.google.com/web/fundamentals/performance/optimizing-content-efficiency/optimize-encoding-and-transfer#text-compression-with-gzip> and

http://en.wikipedia.org/wiki/HTTP_compression.

Working with the Enterprise Tier

The Web Engagement Server is also the engagement's entry point to the Genesys servers. It delivers web and visitor information to the contact center, which allows that information to be correlated with contact information.

On this end, the Web Engagement Server stores events, manages contexts and histories in its Cassandra database, and submits the appropriate data to the other Genesys servers.

When the Web Engagement Server is notified that it should present a proactive offer, it retrieves the engagement information, based on the visit attributes. Then, if the SCXML strategies allow it, the proactive offer is displayed.

If the visitor accepts, the Engagement service connects to the Genesys servers. Once the connection is established, the service manages the engagement context information across the visit.

The Web Engagement Server is also responsible for accepting rules deployed by the **Genesys Rules Authoring Tool** (GRAT).

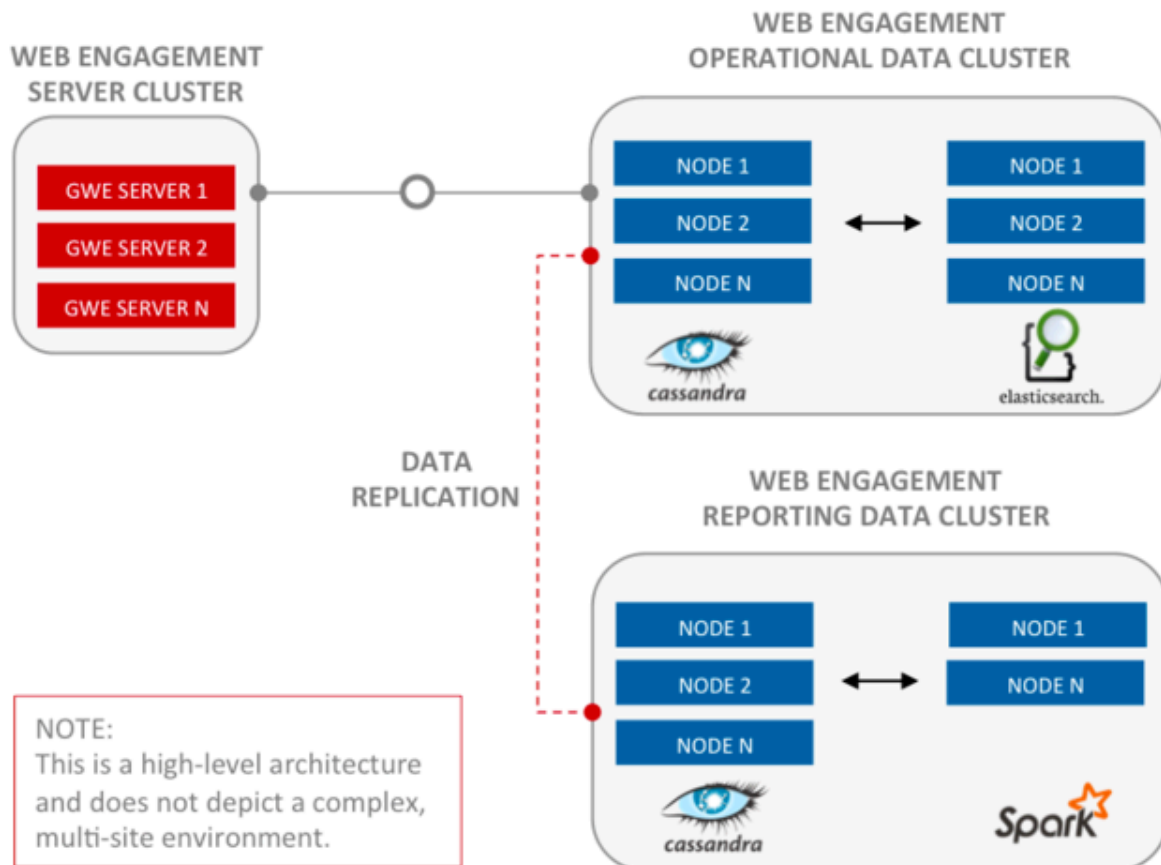
Database and Reporting

Web Engagement processes a large amount of data. To make this happen quickly enough, Genesys has combined three technologies into the database and reporting layers:

- **Apache Cassandra** is an open source distributed database management system designed to handle large amounts of data across many commodity servers, providing high availability with no single point of failure.
- **Elasticsearch** is a search server that provides a distributed, multitenant-capable full-text search engine with a RESTful web interface and schema-free JSON documents.
- **Apache Spark** is an open source cluster computing framework.

Cassandra and Elasticsearch clusters are used in the Operational Cluster that stores data for realtime processing. This Cassandra data is indexed by Elasticsearch for quick access, and the combined results are replicated in a separate Cassandra cluster in the Reporting Cluster. This Reporting Cluster uses a Spark cluster that massages the data in the Cassandra reporting cluster for more sophisticated reporting.

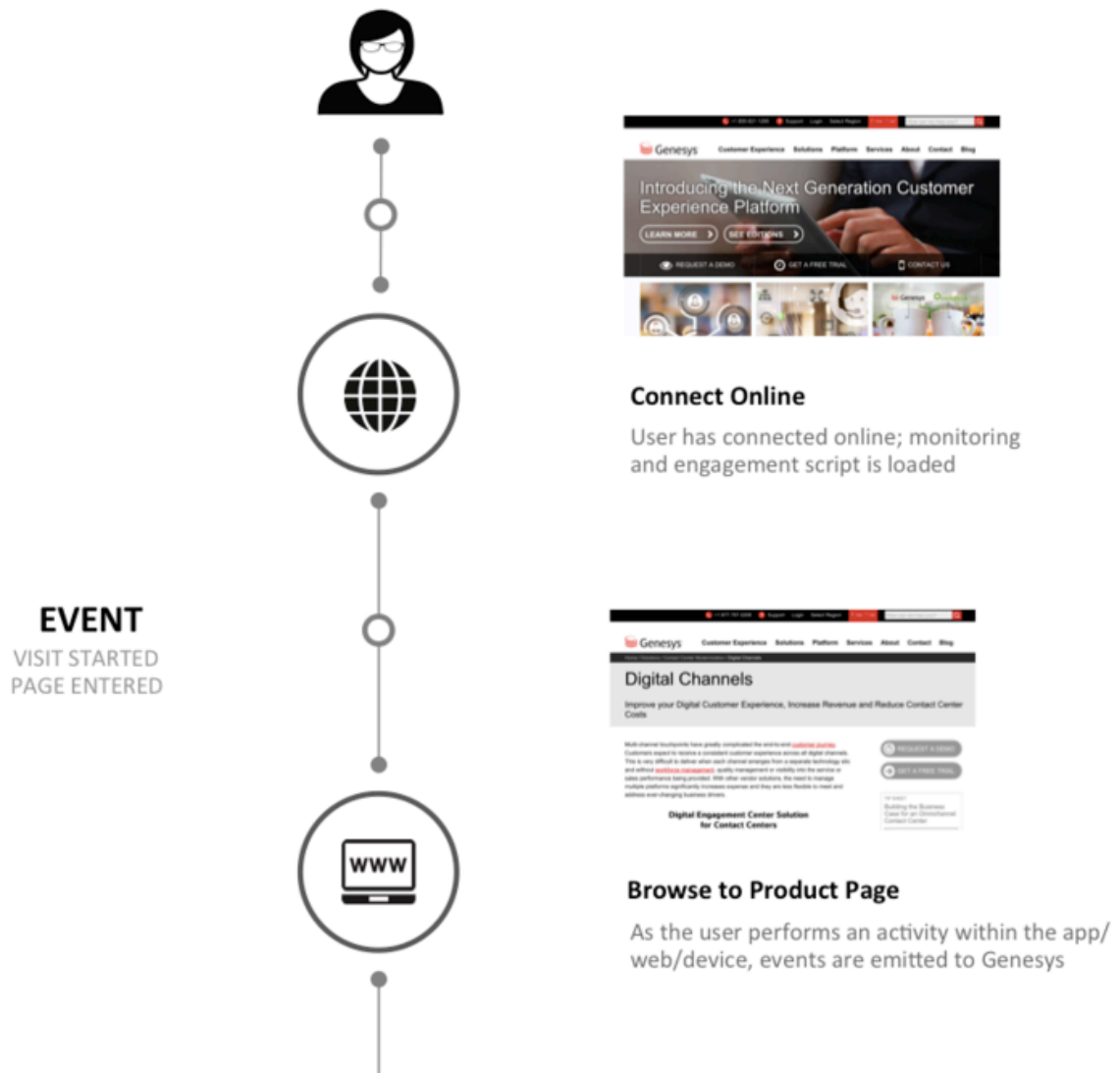
The following diagram provides a highly simplified view of how it all fits together.

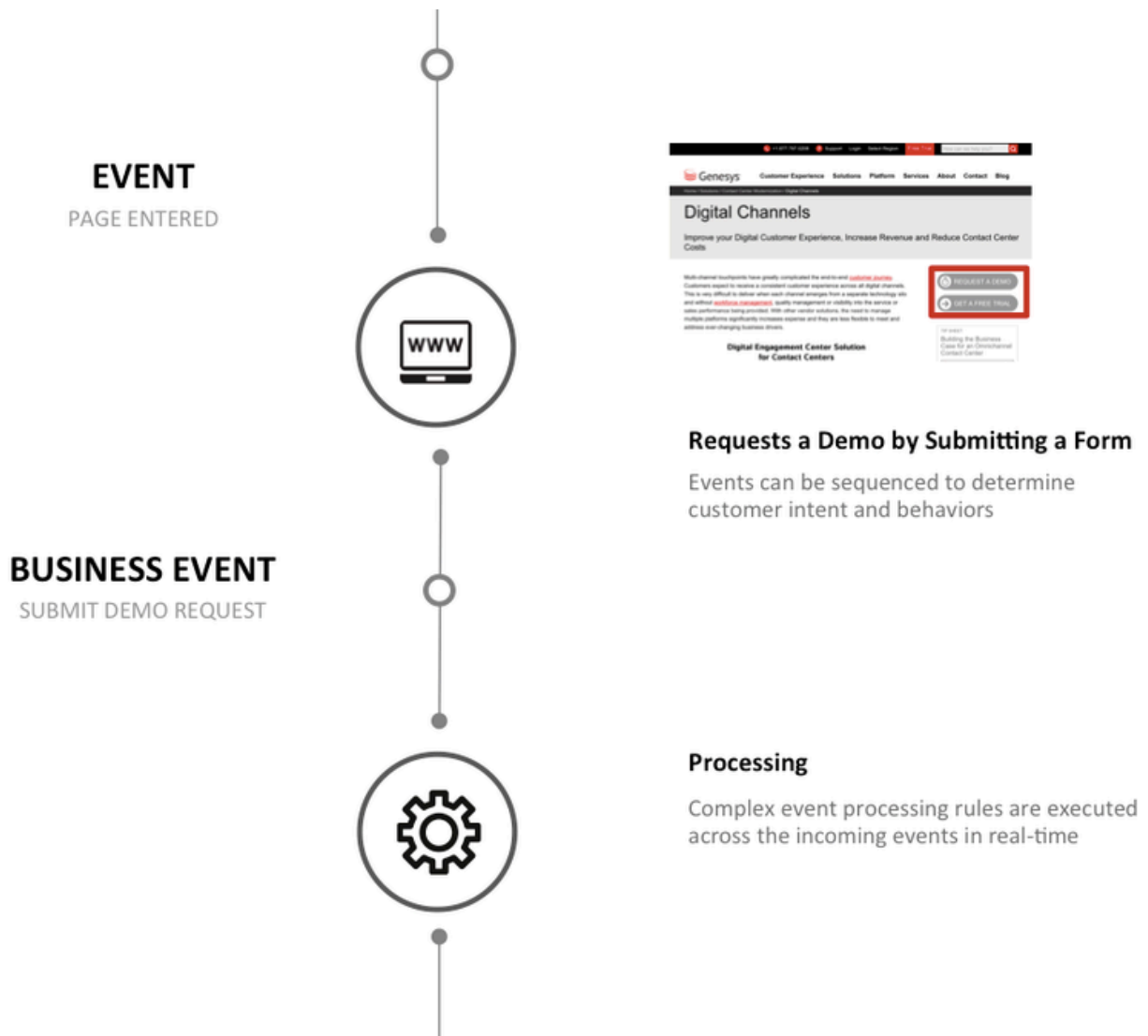


Event Workflow

The Genesys Web Engagement Server receives system and business events from the browser's Monitoring Agent. This event flow is used to create actionable events which generate requests to the Genesys solution, and make the engagement, follow up, and additional actions with the Genesys solution possible. (Note that an actionable event does not always result in a notification—sometimes an action could be "do nothing.")

Here is a high-level view of this:





ACTIONABLE
INTENTION IDENTIFIED
SEND NOTIFICATION

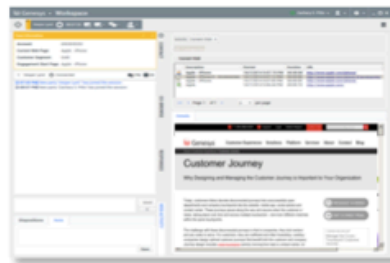


USER ACCEPTS
CHAT STARTED



Engagement Attempt

The Genesys platform takes into consideration the real-time resource availability to determine available engagement channels



Agent Accepted Chat

Agent can now see all of the user's event history and quickly understand the context

As you can see, when a customer visits your website, he or she interacts with your web pages. The Monitoring Agent handles this traffic and translates it into the relevant System and Business events, according to your DSL and category information.

The agent then submits the events to the Web Engagement Server where the Complex Event Processing embedded in the server determines the actionable events ("Hot lead Identified" in the above figure) and carries out further processing. This includes the use of SCXML-based **routing strategies** to determine whether to proactively engage, to follow up, or to implement any other action.