

Genius™ Event Bridge
Interface Specification

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1 Introduction

1.1 Scope

This document describes example messages an integration engineer should expect to see while configuring the Genius Event Bridge for the Genius Digital Diagnostics System.

1.2 Abbreviations

- DC Digital Cytology
- IMS Genius Image Management Server
- DB Database
- RS Genius Review Station
- GEB Genius Event Bridge
- GDDS Genius Digital Diagnostics System
- UUID Universally Unique Identifier
- UML Unified Modeling Language

1.3 Notation

All diagrams use UML for notation unless noted otherwise.

1.4 Overview

The Genius Event Bridge is an interface between the Genius Digital Diagnostics System and any third-party software system. This guide gives a system integration engineer the expected formats and payloads for integration with the Genius Event Bridge.

The Genius Events Bridge supports eight (8) outgoing events and three (3) incoming events.

2 Detailed Design

2.1 Configuration

The Genius Event Bridge is configured with a list of subscribers and publishers. The subscribers are a list of the systems with information to determine the format of the messages, the transfer mechanism for the message, the events to receive messages for, and other information about where to send the messages. The publishers are a list of static IP addresses that the system validates as systems that are authorized to control the Review Station via the Incoming events defined in section 2.3.

2.2 Outgoing Events

Outgoing Events are notifications of events that happen while the Genius Digital Diagnostics System is operating. A sequence of events in a Genius workflow looks like:

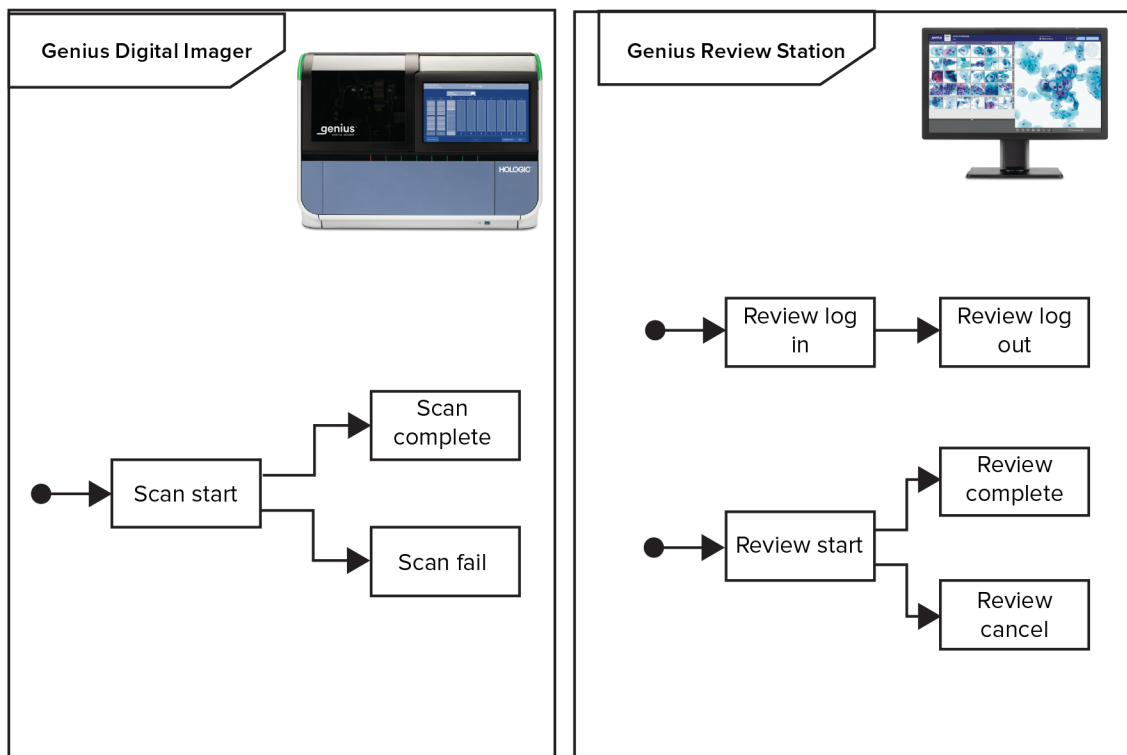


Figure 1. Events and their order in a typical Genius workflow

Each event has corresponding payload information to help third-party systems react to the events in meaningful ways. For example, if a third-party system receives a Scan Complete event, the system could update a list of cases and move them into a “ready for review” state. The system does not guarantee the ordering of events in this diagram. Systems integrating events into their workflow should be resilient to missing events for slides.

2.2.1 Scan Start

This event happens when the Digital Imager reads the barcode of a slide.

Example HL7 message:

```

MSH|^~\&||Hologic Marlborough|Test LIS|Test LIS Re-
ceiver|20241211134727.6846||OML^021|0acbdb76-6ab7-4fd0-ad1c-f944ce0f4366|P|2.4
SAC|||||00010101000023
ORC|NW|0^^7d077b54-e8b8-4bde-abae-033f677cb993|0^^7d077b54-e8b8-4bde-abae-
033f677cb993
OBR|1|0|0|654^PAP^STAIN^^PAP|||00010101000000|||||||231fa160-efe1-47cc-
9cb4-2dd76df348c0^scan/start^8/10/1997 12:00:00 AM^^AB\E\CD^AB_CD^^^^^^^^^^^^^^|

```

Example JSON message:

```
{
  "Id": "a9b18d8a-816e-409b-8b03-0c30176929cf",
  "Type": "scan/start",
  "EventTimestamp": "1997-08-10T00:00:00",
  "BarcodeValue": "AB\\CD",
  "AccessionId": "AB_CD"
}
```

2.2.2 Scan Fail

This event happens when the Digital Imager fails to complete scanning a slide due to a slide event.

Example HL7 message:

```
MSH|^~\&|Sample Imager|Hologic Marlborough|Test LIS|Test LIS Re-
ceiver|20241211134727.7381||OML^021|28e25979-c66e-4825-9a70-add1b84bdc32|P|2.4
SAC|||||19970810000023
ORC|NW|1234^^d06e49c7-2ac8-4f1d-80ba-478397b3f97d|1234^^d06e49c7-2ac8-4f1d-80ba-
478397b3f97d
OBR|1|1234|1234|654^PAP^STAIN^^PAP|||19970810000000|||||||8bfe91a5-5443-
4035-b0e7-d654f3688847^scan/fail^8/10/1997 12:00:00 AM^^AB\E\CD^AB_CD^1234^Samp1
Imager^^1^8/10/1997 12:00:00 AM^8/10/1997 12:00:00 AM^1^Gyn^1^Gyn^^|
```

Example JSON message:

```
{
  "Id": "2dfe0a7c-58af-4b2c-afee-a9334678efc0",
  "Type": "scan/fail",
  "EventTimestamp": "1997-08-10T00:00:00",
  "BarcodeValue": "AB\\CD",
  "AccessionId": "AB_CD",
  "SlideImageId": 1234,
  "ImagerId": "Sample Imager",
  "SlideEvent": 1,
  "ImagingStartDateTime": "1997-08-10T00:00:00",
  "ImagingEndDateTime": "1997-08-10T00:00:00",
  "CaseTypeId": 1,
  "CaseTypeName": "Gyn",
  "ScanProfileId": 1,
  "ScanProfileName": "Gyn"
}
```

2.2.3 Scan Complete

This event happens when the Genius Digital Imager computer finishes sending data to the Genius IMS.

Example HL7 message:

```
MSH|^~\&|Sample Imager|Hologic Marlborough|Test LIS|Test LIS Re-  
ceiver|20241211134727.7115||OML^021|68dc7f06-3ce4-4a28-b293-903eb6b4fc4e|P|2.4  
SAC|||||19970810000023  
ORC|NW|1234^^43993eec-f61c-424b-aaeb-92d7ab0cd115|1234^^43993eec-f61c-424b-aaeb-  
92d7ab0cd115  
OBR|1|1234|1234|654^PAP^STAIN^^PAP|||19970810000000|||d63c6a93-2c38-  
4149-8b9a-af3910b59e56^scan/complete^8/10/1997 12:00:00  
AM^^AB\E\CD^AB_CD^1234^Sample Imager^^8/10/1997 12:00:00 AM^8/10/1997 12:00:00  
AM^1^Gyn^1^Gyn^^|
```

Example JSON message:

```
{  
  "Id": "7a336332-38d7-410c-97c0-2133ca38be4a",  
  "Type": "scan/complete",  
  "EventTimestamp": "1997-08-10T00:00:00",  
  "BarcodeValue": "AB\\CD",  
  "AccessionId": "AB_CD",  
  "SlideImageId": 1234,  
  "ImagerId": "Sample Imager",  
  "ImagingStartDateTime": "1997-08-10T00:00:00",  
  "ImagingEndDateTime": "1997-08-10T00:00:00",  
  "CaseTypeId": 1,  
  "CaseTypeName": "Gyn",  
  "ScanProfileId": 1,  
  "ScanProfileName": "Gyn"  
}
```

2.2.4 Reviewer Login

This event happens when a user at the Review Station enters a valid username and password.

Example HL7 message:

```
MSH|^~\&|Sample Review Station|Hologic Marlborough|Test LIS|Test LIS Re-
ceiver|20241211134727.5338||OML^021|c4728a39-4da9-40fc-948f-31dfbb978a1c|P|2.4
SAC|||||00010101000023
ORC|NW|0^^0bc22e14-c1c0-4aac-a3bb-2eea2674f317|0^^0bc22e14-c1c0-4aac-a3bb-
2eea2674f317
OBR|1|0|0|654^PAP^STAIN^^PAP|||00010101000000|||c7bc4f01-55ab-486d-
8c63-5ed1c9b3ed81^review/login^8/10/1997 12:00:00 AM^HolxTester^^^^Sample Review
Station^^^^^^|
```

Example JSON message:

```
{
  "Id": "b787022a-cb27-41a1-8a97-1a2c0db3508c",
  "Type": "review/login",
  "EventTimestamp": "1997-08-10T00:00:00",
  "Username": "HolxTester",
  "ReviewStationId": "Sample Review Station"
}
```

2.2.5 Reviewer Logout

This event happens when a user at the Review Station has logged out or met the timing criteria for terminating an active session.

Example HL7 message:

```
MSH|^~\&|Sample Review Station|Hologic Marlborough|Test LIS|Test LIS Re-
ceiver|20241211134727.5726||OML^021|d11bf935-d5a6-498c-9b7b-95cc382cca22|P|2.4
SAC|||||00010101000023
ORC|NW|0^^f182ea1a-1c2b-4c9e-86bb-4bdb24c86b4f|0^^f182ea1a-1c2b-4c9e-86bb-
4bdb24c86b4f
OBR|1|0|0|654^PAP^STAIN^^PAP|||00010101000000|||b9c18505-8fb1-4ad7-
abe7-948c789e5113^review/logout^8/10/1997 12:00:00 AM^HolxTester^^^^Sample Re-
view Station^^^^^^|
```

Example JSON message:

```
{
  "Id": "4ddcc844-b55b-49a6-ad00-664ec19701b0",
  "Type": "review/logout",
  "EventTimestamp": "1997-08-10T00:00:00",
  "Username": "HolxTester",
  "ReviewStationId": "Sample Review Station"
}
```

2.2.6 Review Start

This event happens when the Review Station starts to display the Case Review screen on a Review Station for a specified case, because a Review Station user has opened the case.

Example HL7 message:

```
MSH|^~\&|Sample Review Station|Hologic Marlborough|Test LIS|Test LIS Re-
ceiver|20241211134727.6022||OML^021|1b58bb72-43c2-4908-99a5-b4d28108bdd5|P|2.4
SAC|||||00010101000023
ORC|NW|4^^cdebadd6-cce2-4813-aa2b-ce8dec54917f|4^^cdebadd6-cce2-4813-aa2b-
ce8dec54917f
OBR|1|4|4|654^PAP^STAIN^^PAP|||00010101000000|||||||6ec4ac2f-ff59-4d99-
8472-e73c35fd688a^review/start^8/10/1997 12:00:00 AM^HolxTester^^9301166^4^^Sam-
ple Review Station^^^^^^^^^|
```

Example JSON message:

```
{
  "Id": "be988e67-5301-44c9-ad3e-a80a104c230e",
  "Type": "review/start",
  "EventTimestamp": "1997-08-10T00:00:00",
  "Username": "HolxTester",
  "AccessionId": "9301166",
  "SlideImageId": 4,
  "ReviewStationId": "Sample Review Station"
}
```

2.2.7 Review Cancel

This event happens when a user at the Review Station closes the Case Review screen for a specified case, without saving the case as in progress nor completing the review for the case.

Example HL7 message:

```
MSH|^~\&|Sample Review Station|Hologic Marlborough|Test LIS|Test LIS Re-  
ceiver|20241211134727.6287||OML^021|424ebc6f-e8cf-484c-a532-e7f4a8819731|P|2.4  
SAC|||||00010101000023  
ORC|NW|4^^7378d838-5382-4536-9b20-8dad69434b58|4^^7378d838-5382-4536-9b20-  
8dad69434b58  
OBR|1|4|4|654^PAP^STAIN^^PAP|||00010101000000|||||||c73f223b-ff4b-482c-  
aa5e-738b4e0b5e0f^review/cancel^8/10/1997 12:00:00 AM^HolxTester^^9301166^4^^Sam  
ple Review Station^^^^^^^^^|
```

Example JSON message:

```
{  
  "Id": "26a8fe6e-7b2a-485d-b201-7d89e38040b4",  
  "Type": "review/cancel",  
  "EventTimestamp": "1997-08-10T00:00:00",  
  "Username": "HolxTester",  
  "AccessionId": "9301166",  
  "SlideImageId": 4,  
  "ReviewStationId": "Sample Review Station"  
}
```

2.2.8 Reviewer Complete

This event happens when a user at the Review Station completes a review of a case.

Example HL7 message:

```
MSH|^~\&|Sample Review Station|Hologic Marlborough|Test LIS|Test LIS Re-  
ceiver|20241211134727.6548||OML^021|c27a46da-88ea-494f-bac0-9dd06db9a02c|P|2.4  
SAC|||||00010101000023  
ORC|NW|4^^c0c093e8-afa9-4a5c-b869-c6e707fd2faf|4^^c0c093e8-afa9-4a5c-b869-  
c6e707fd2faf  
OBR|1|4|4|654^PAP^STAIN^^PAP|||00010101000000|||||||3585fed4-0177-49a6-  
ad7a-c62ceb32f1c6^review/complete^8/10/1997 12:00:00  
AM^HolxTester^^9301166^4^^Sample Review Station^^^^^^^^^|
```

Example JSON message:


```
{
  "Id": "b1d037ba-da3c-43ad-b198-4bba0f09e370",
  "Type": "review/complete",
  "EventTimestamp": "1997-08-10T00:00:00",
  "Username": "HolxTester",
  "AccessionId": "9301166",
  "SlideImageId": 4,
  "ReviewStationId": "Sample Review Station"
}
```

2.3. Incoming Events

2.3.1 Case Open

This event controls the Review Station by opening the specified user to the case requested. If the user specified is currently logged into the Review Station, they will be navigated to the Case Review page for the case requested automatically.

Example Request:

POST <https://geniusevtbridge.com/api/events/incoming/case/open>

Headers:

```
Content-Type: "application/json"
```

Body:

```
{
  "Username": "Administrator",
  "AccessionId": "SAMPLE1"
}
```

2.3.2 Case Cancel

This event controls the Review Station by canceling the review for the specified user requested. Any annotations, marks or comments made by the reviewer are not saved if a review is canceled. If the user is currently viewing the Case Review page on the Review Station, they will be navigated to back to the Case List.

Example Request:

POST <https://geniusevtbridge.com/api/events/incoming/case/cancel>

Example Request:
Headers:
Content-Type: "application/json"
Body:
<pre>{ "Username": "Administrator", "AccessionId": "SAMPLE1" }</pre>

2.3.3 Case Complete

This event controls the Review Station by completing the review for the specified user requested. Any annotations, marks or comments made by the reviewer are saved with the review record. If the user is currently viewing the Case Review page on the Review Station, they will be navigated to back to the Case List.

Example Request:
POST https://geniusevtbridge.com/api/events/incoming/case/complete
Headers:
Content-Type: "application/json"
Body:
<pre>{ "Username": "Administrator", "AccessionId": "SAMPLE1" }</pre>

2.4 HL7 Report format

The HL7 report section is defined as follows. The event may not have all the information as defined in this table depending on the event that was generated. The positions of the information are fixed no matter what event happened.

Section Index	Description
0	Id – string UUID of the Genius Event.
1	Type – string type of the Genius Event. Example: “scan/complete”
2	EventTimeStamp – string timestamp of when the Genius Event was created.
3	Username – string representation of the username that is conducting actions.
4	BarcodeValue – string representation of the value embedded in the barcode of the slide.
5	AccessionId – string representation of the Accession Id of the slide.
6	SlideImageId – string representation of the Genius System slide image ID
7	ImagerId – the imager that created this event.
8	ReviewStationId – the Review Station that created this event.
9	SlideEvent – String representation of the code corresponding with a slide event.
10	ImagingStartDateTime – date the imaging started.
11	ImagingEndDateTime – date the imaging ended.
12	CaseTypeId – string representation of the type of the case. Corresponds to a Case Type primary key value.
13	CaseTypeName – string representation of the name of the case type. Corresponds to a user-entered Case Type name.
14	ScanProfileId – string representation of the ID of the scan profile. Corresponds to a Scan Profile primary key value.
15	ScanProfileName – string representation of the name of the scan profile. Corresponds to a Scan Profile name.
16	Review – JSON stringified Review information, including Annotations and comments from the Review Station.

Section Index	Description
17	ExtraData – JSON stringified extra data. As of this release, this is unused but could be used in the future.

2.5 Implementation Best Practices

If implementing a workflow where the Case Open event is sent by a third-party system, the integration engineer must implement the Case Cancel or Case Complete events with their third-party system. This is required because cases that are marked as “In Progress” by the Review Station are not archived or deleted.

The system does not guarantee the ordering of events. Events are processed as they come into the Genius Events Bridge (GEB). Systems integrating events into their workflow should be resilient to missing events for slides.

Use static IP addresses for the Publishers list.

Technical Service and Product Information

For technical service and assistance related to use of the Genius Digital Diagnostics System, contact Hologic:

Telephone: 1-844-465-6442

Fax: 1-508-229-2795

For international or toll-free blocked calls, please contact 1-508-263-2900.

Email: info@hologic.com

Revision History

Revision	Date	Description
AW-32576-001 Rev. 001	5-2025	Initial release



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