

Error Handling Standards for the Producers of Web Services/APIs

Stephen Brawn

11-02-2016

Table of Contents

| | |
|--|--------|
| 1. Summary | Page 2 |
| 2. Error Handling at the Web Server Level | Page 2 |
| 3. Error Handling at the Gateway/Application Server Level | Page 2 |
| 4. Error Logging at the Gateway/Application Server Level | Page 3 |
| 5. Handling System Timeouts | Page 3 |
| 6. Appendix - Gateway/Application Server Sample Messages | Page 4 |
| 7. Appendix - PeopleSoft Integration Broker Gateway Logging Settings | Page 4 |

1. Summary:

In an effort to standardize the error, warning, and informational messages for all web services/APIs that are produced by Northwestern IT (NIT) departments, a working group comprised of developers from all of the major NIT systems/departments have come up with the below recommendations for how to handle error, warning, and informational messages as well as the logging of those messages and their respective details. The intention of this document is to provide Northwestern developers – staff members that are developing web services or APIs to be consumed by other NIT departments or 3rd parties – with a common understanding of how NIT would like to handle error, warning, and informational messages from the web services/APIs that we provide. For all of the messages that come from the provider, the working group is recommending that any intermediaries - such as our Enterprise Service Bus (ESB) - just pass through the messages from the provider to the consumer and do not change or modify them in any way. This practice allows for the consumer to know right away that the message is referring to a status from the provider and not any intermediaries.

2. Error Handling at the Web Server Level:

The production of descriptive and understandable messages at the web server level are the most important, as these are the messages that consumers will see first when trying to make a connection when consuming a web service that has been provided by another system. We have determined that most of our enterprise systems use standard HTTP status codes to return error, warning and informational messages. Since the use of HTTP status codes at the web server level seem to be a standard practice, we are recommending that, where possible, the provider of web services return the standard HTTP status codes at their web layer.

A listing of standard HTTP status codes can be found here:

http://www.w3schools.com/tags/ref_httpmessages.asp

3. Error Handling at the Gateway/Application Server Level:

The production of descriptive and understandable messages at the gateway/application server level are also important, but, unlike the web server messages, comprise of more than just server related messages, but also business logic and application code messages. Just like messages at the web server level, all errors, warnings, or information directly related to the functioning of the gateway/application server should, where possible, return, from the provider of the service, the standard HTTP status codes.

A listing of standard HTTP status codes can be found here:

http://www.w3schools.com/tags/ref_httpmessages.asp

In addition to server related messages, typical messages returned by the gateway/application server include errors, warnings, or information relevant to the application layer of the provider's system, such as SQL errors, authentication errors, business logic errors, or application code errors. For security purposes, we recommend that the details in messages, sent from the provider to the consumer, that are not server messages - but are SQL errors, authentication errors, business logic errors, or application code errors - be descriptive as to the type of message, but do not include parameters or values associated with the error or warning. All relevant parameters or values associated with the message should be logged on the provider's gateway/application server. Please see the appendix for sample messages.

4. Error Logging at the Gateway/Application Server Level:

For security purposes, we recommend that the details in messages, sent from the provider to the consumer, that are not server messages - but are SQL errors, authentication errors, business logic errors, or application code errors - be descriptive as to the type of message, but do not include parameters or values associated with the error or warning. All relevant parameters or values associated with the message should be logged on the provider's gateway/application server. Application/gateway servers usually have multiple logging levels. We recommend that you set your application/gateway server to log at a level that includes detailed errors, warnings, and important information, but does not include standard and low importance information. This will allow for important information related to your errors and warnings to be logged for troubleshooting without making the logs more cumbersome to peruse by adding low importance and standard information that in most cases will not be relevant to troubleshooting an issue. An example of log settings from the PeopleSoft Integration Broker Gateway can be seen in the appendix. Additionally, if the gateway/application sever has the ability to scramble sensitive fields in the logs – this is available delivered setup in the PeopleSoft Integration Broker Gateway - that setting should be turned on for all fields that are deemed sensitive pursuant to our data governance policies.

5. Handling System Timeouts:

Appendix

6. Gateway/Application Server Sample Messages:

- User [User Name Value] not authorized to invoke Service Operation [Service Operation Value].
- A SQL error occurred while generating codeset value matches.
- Integration Gateway: The [Field Name] field must have an integer value.
- The request contains invalid XML.
- Invalid schema.

7. PeopleSoft Integration Broker Gateway Logging Settings:

| Logging Level Name | Logging Level Value | Logging Level Information Contained |
|----------------------------|---------------------|--|
| SUPPRESS ANY LOGGING | -100 | Suppresses any message logs |
| LANGUAGE_EXCEPTION | -1 | Logs language exceptions only |
| STANDARD_GATEWAY_EXCEPTION | 1 | Logs language and standard exceptions |
| WARNING | 2 | Logs all errors & warnings |
| IMPORTANT_INFORMATION | 3 | Logs errors, warnings, and important information |
| STANDARD_INFORMATION | 4 | Logs errors, warnings, important information, and standard information |
| LOW_IMPORTANCE_INFORMATION | 5 | Logs errors, warnings, important, standard, and low importance information |