

Standards/Guidelines for the Producers of Web Services/APIs to decide whether to develop asynchronous or synchronous integrations

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1. Summary:

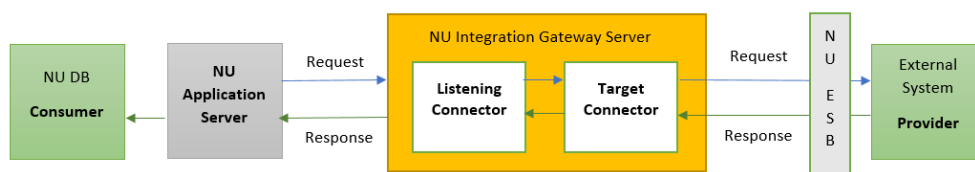
In an effort to standardize how Northwestern IT (NIT) departments determine whether to build synchronous or asynchronous services, a working group comprised of developers from all of the major NIT systems/departments have come up with the some basic criteria and considerations for NUIT developers and architects. The decision to build a synchronous or asynchronous service depends on many factors outlined below, such as the need for an immediate response, the need for a request to do complex processing, or the need for manual intervention by the providers.

2. What is a synchronous web service?

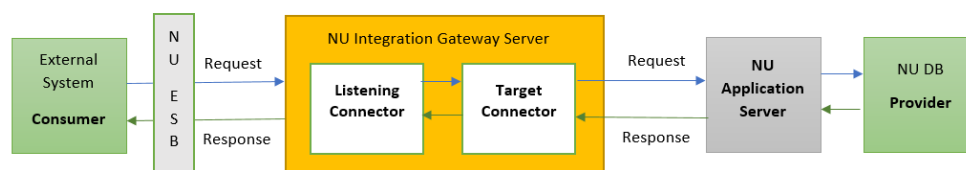
A web service is a communication framework used to transfer data between two systems or integration points. A synchronous web service involves a consumer – a system that consumes and uses a web service housed in another internal or external system - system sending a request for return data to a providing system – a system that provides a web service to transfer/manipulate data another internal or external system - to be consumed and the providing system sending back an immediate response to the consumer upon receiving and processing the request.

The key to a synchronous service is that an immediate response is always sent back to the consuming system from the provider. This type of communication is ideal for communications where the consumer needs to know immediately that the provider received their request.

Synchronous Web Service Flow – NU is Consumer



Synchronous Web Service Flow – NU is Provider

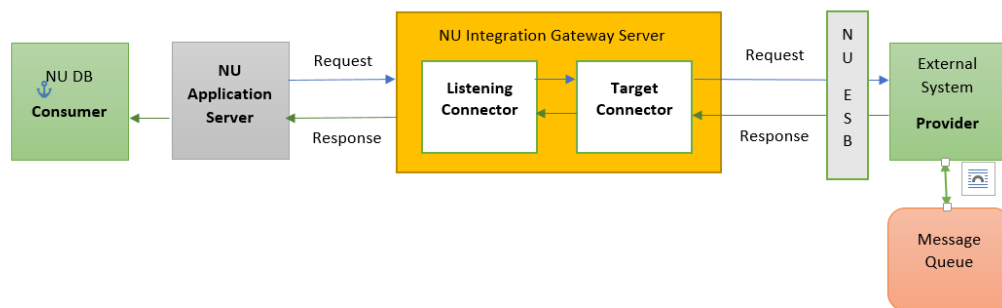


3. What is an asynchronous web service?

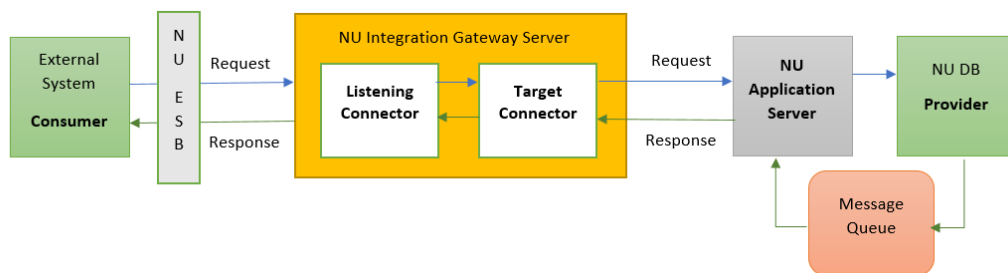
A web service is a communication framework used to transfer data between two systems or integration points. An asynchronous web service involves a consumer – a system that consumes and uses a web service housed in another internal or external system - system sending a request for return data to a providing system – a system that provides a web service to transfer/manipulate data another internal or external system - to be consumed and the providing system sending back a non-immediate response to the consumer upon receiving and processing the request.

The key to a synchronous service is that an immediate response is not always sent back to the consuming system from the provider. This type of communication is treated similar to an email and the request is handled and processed by the provider based on the business processes put in place by that provider. Often times a queue is used to process request and return responses to the consumer based on complex business logic or rules.

Asynchronous Web Service Flow – NU is Consumer



Asynchronous Web Service Flow – NU is Provider



4. Guidelines for choosing to produce a synchronous web service:

1. Is the requested data available for immediate return to the consumer?
2. Does the consumer need to be notified immediately that the provider received their request?

3. Do the business rules/logic governing the return of data contain only static rules and not involve any user intervention or approval?

5. Guidelines for choosing to produce an asynchronous web service:

1. Is the requested data not always available for immediate return to the consumer?
2. Is the consumer alright if they are not notified immediately that the provider received their request?
3. Do the business rules/logic governing the return of data require any user intervention or approval?
4. Does the provider need to call or collect data from other systems before returning a response to the consumer?
5. Is the providers business logic extremely resource intensive, thus possibly causing a system time-out if a synchronous service was used.