To: RosettaNet Members

From: RosettaNet Technical Office

Subject: RosettaNet Implementation Framework, v1.1

               Technical Recommendation #2 – Synchronous Responses

The implementation of a Technical Recommendation is optional. A Technical Recommendation describes features or enhancements not yet available in a published version of the subject specification. Features or enhancements described by a Technical Recommendation may be, but are not guaranteed to be, included in a future release of the subject specification.

A Technical Recommendation is obsolete once the features or enhancements it describes are included in an official release; at that time, implementation of those features is required. A Technical Recommendation can also be deemed obsolete if the subject requirement no longer exists or if improvements in technology provide another way to address the requirement.

This Technical Recommendation describes how to support synchronous responses in PIP 2A9 using RNIF v1.1. This recommendation is being issued to promote consistency and interoperability between software implementations supporting PIP 2A9 using RNIF v1.1.

It is possible to implement support for PIP 2A9 without supporting this Technical Recommendation. However, not implementing the recommendation may limit the universe of trading partners within which a solution can interoperate.

1   Use of Synchronous Responses

The purpose of PIP 2A9 (Query Electronic Component Technical Information) is to support the transmission on request of product information for electronic components (EC). This PIP provides significant value across the entire EC supply chain by giving component information customers a consistent, implementation-independent method to request the information that they need for their business process when they need it, and receive it in a computer-sensible format.

Support for synchronous responses allows trading partners to implement and rapidly deploy, simple, inexpensive, and lightweight applications that will enable them to participate in these types of information exchange networks.

1.1 *Issue*

The published RNIF v1.1 specification does not explicitly specify how responses to a query/request can be returned synchronously within the same HTTP connection.   In order to promote consistency and interoperability between software implementations, RosettaNet is issuing this proactive recommendation.

1.2 *Terminology*

Use of HTTP shall mean HTTP1.0 all related terms, such as HTTP message, connection, request, response, shall have the semantics defined in RFC1945.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this Recommendation are to be interpreted as described in RFC 2119.

1.3 *Synchronous Responses*

A synchronous response is one that is sent by the receiver of a query/request back to the originator over the same HTTP connection on which the request was received.

The requesting business action shall send the corresponding RosettaNet Object via an HTTP POST. While POSTing this request, the sender indicates that a synchronous response is required. The rules for the response type specification in the POST are described in a later section.

Based upon the sender's indication, the receiver of a request determines whether the response must be sent synchronously, over the same connection. If so, the receiver should not immediately send a "200 OK" as it does in other PIPs. Instead, it should begin processing the RosettaNet Object using the following rules:

a. If the incoming message contains a signature and the signature cannot be verified, the receiver should return either a "403" error HTTP response code or close the connection with no response.

b. If the incoming message is delivered via HTTPS (SSL) and any errors occur during handshaking, the receiver should return either a "403" error HTTP response code or close the connection with no response.

c. If the grammar/schema of the incoming service content is invalid, the receiver should send a General exception back on the same connection with an HTTP response code of "200 OK".

d. If a content validation or a performance exception is encountered after processing of the incoming message has begun, the receiver should send a General Exception back on the same connection with an HTTP response code of "200 OK".

If the incoming message was processed successfully, the receiver should send a response message with a service-content that conforms to the DTD of the business action defined for the response by the PIP with an HTTP response code of "200 OK".

Exactly one of the following shall be true about what the sender sees over said connection:

1. The sender receives no response within the Time-to-Perform designated in the corresponding PIP Specification. This may be because an error occurred while sending the request, while processing the request, or while sending the response. Since it is not possible for the sender to determine the state of the receiver with respect to this PIP instance, the sender must close the connection if it is not already closed and must not retry this PIP instance. However, if retry is necessary, a new PIP instance may be restarted. The number of retries is always specified as zero in such PIPs. Therefore, the Notification of Failure PIP must not be initiated.

2. The sender receives an HTTP response code of "200 OK" and an entity body that is a RosettaNet Object as specified in RNIF 1.1, wherein the service-content either:

    a. conforms to the DTD of the business action associated with the business action of the request as defined by the PIP.

    b. conforms to the DTD of the General Exception described earlier.

3. The sender receives an HTTP response code other than "200 OK". In this case, the sender shall consider this to be a transport error, and shall take appropriate action, as defined by the PIP Specification, or if not specified, may be handled in a manner of the sender's choice.

4. The sender receives an HTTP response code of "200 OK" and an entity body that either:

    a. is non-existent.

    b. is not a RosettaNet message wherein the service content conforms either to the DTD of an appropriate exception, or the DTD of the business action associated with the business action of the request as defined by the PIP.

    In this situation, the receiver may consider the transaction timed-out, and take whatever action is appropriate, as defined by the PIP Specification, or if not specified, may be handled in a manner of the sender's choice.

1.4   *Response Type Specification*

A request message shall indicate whether the receiver must send the response synchronously or asynchronously by means of an HTTP entity header field with the name "x-RN-Response-Type" and a value of "sync" or "async", meaning "synchronous" or "asynchronous", respectively. Additionally,

1. If the x-RN-Response-Type header field is absent, the meaning shall be "async".

2. If the value is not one of these, the value shall be interpreted to be "async".

1.5   *Ownership of Response Type Specification*

A PIP specifies whether the response must be synchronous, asynchronous, or either. This shall be stated in section 2.7 Business Process Activity Controls in the PIP Blueprint, and the corresponding section 3.7 in the PIP Specification.

In the absence of any definition in the PIP specification, the default shall be that all responses must be asynchronous.

1. When the PIP Specification requires a response to be asynchronous, an initiating partner shall always designate the transaction to be asynchronous and shall not designate synchronous.

2. When the PIP Specification requires a response to be synchronous, an initiating partner shall always designate the transaction to be synchronous and shall not designate asynchronous.

3. When the PIP Specification allows responses to be either asynchronous or synchronous, an initiating partner may designate either asynchronous or synchronous. The receiving partner shall provide the response in the manner indicated.

1.6   *Limitations On The Use Of Synchronous Responses*

A synchronous response is NOT possible in all PIPs. The following is not an exclusive list of all the conditions under which such response is not a possibility. This Technical Recommendation applies to PIP2A9 and, hence, it is not necessary to list all such conditions. This list serves only as documentation and will be clearly specified in the PIP meta-model when the meta-model is updated.

- A PIP activity that requires receipt acknowledgement cannot require synchronous responses, as this recommendation allows the responder to send exactly one message in response to the original message.

- A PIP activity that requires non-repudiation cannot require synchronous responses, as there is no way currently to supply a digest of the incoming message without using the receipt acknowledgement mechanism.

- A PIP activity with a time-to-perform that inherently exceeds the reasonable/acceptable time for leaving an HTTP connection open cannot require synchronous responses.

- A PIP activity that has more than two actions cannot follow this model.

- A PIP that requires guaranteed delivery and retries cannot follow this model.

2   Additional Comments

The **RNIF 2.0: Core Specification addresses these requirements.**