PIDX RN Specification Revision Project Version 1.0

RN Specification Revision

Revision History

Date	Version	Description	Author
02-01-2008	1.0	Initial Draft – Assembled revision sections	Charles Sewell
10-1-2008	1.0	Final Draft – Incorporation of review comments	Charles Sewell

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1 Project Description

The original PIDX/RN standards contained modifications to the RosettaNet specifications that do not add value to the specifications on which they are based. The original PIDX/RN standards also contained inconsistencies, ambiguities, and omissions that do not facilitate a single interpretation of the standards. The purpose of this document is to capture the revisions to the current PIDX/RN specification to address the issues identified during the PIDX/RN Specification Analysis Project.

2 PIDX/RN Specification Revisions

2.1 Standard Modification

2.1.1 RosettaNet 2.0 Compliance

PIDX adopted RosettaNet 2.0 as a messaging standard to facilitate business document exchange between partners. ***PIDX/RN implementations should reference the RosettaNet 2.0 specification as the authoritative source for technical details.*** A variety certified RosettaNet software packages and middleware adapters are available. All aspects of the RosettaNet 2.0 messaging standard must be followed unless specifically stated otherwise in the PIDX/RN documentation. Custom messaging that does not adhere to the RosettaNet 2.0 standard is highly discouraged. While the PIDX/RN standard does not prevent custom messaging accommodations between two partners, the practice is highly discouraged because it does not facilitate common standards across the industry.

2.1.2 Notification of Failures

Failures can occur at any point during the execution of a PIDX business process. Two methods of handling failure are provided in RNIF 2.0: sending an exception signal or initiating a Notification of Failure (NOF). The two failure messages are used for communicating distinct exception conditions. To determine whether an exception signal should be sent or whether to initiate a NOF, the following guidance may be useful. Send an exception signal if the trading partner has not marked the transaction as complete; initiate a NOF if it is possible that your trading partner could have marked the transaction as complete.

Communicating errors in a standard format is essential to the scalability and cost of any automated solution. PIDX leverages the RosettaNet 2.0 standard to enable partners to communicate business messages as well as any exceptions that may arise during the processing of the documents. All PIDX implementations should be able to generate/receive the appropriate failure message when that condition exists.

Section 2.6 of the RosettaNet 2.0 specification described the flow of business message within the RNIF framework. In the diagrams below, the choreography of the business messages and the associated response documents (positive and negative) are depicted.
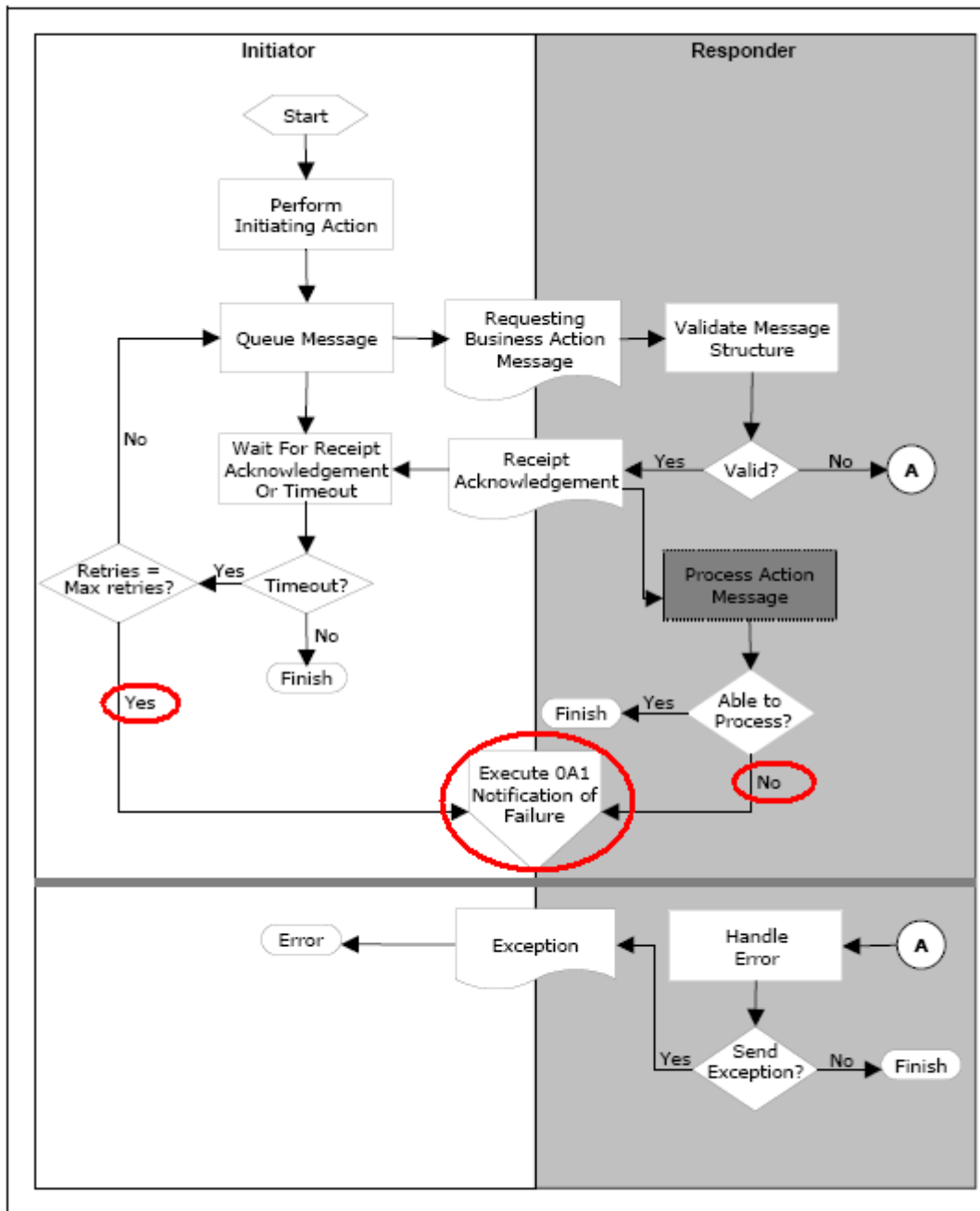
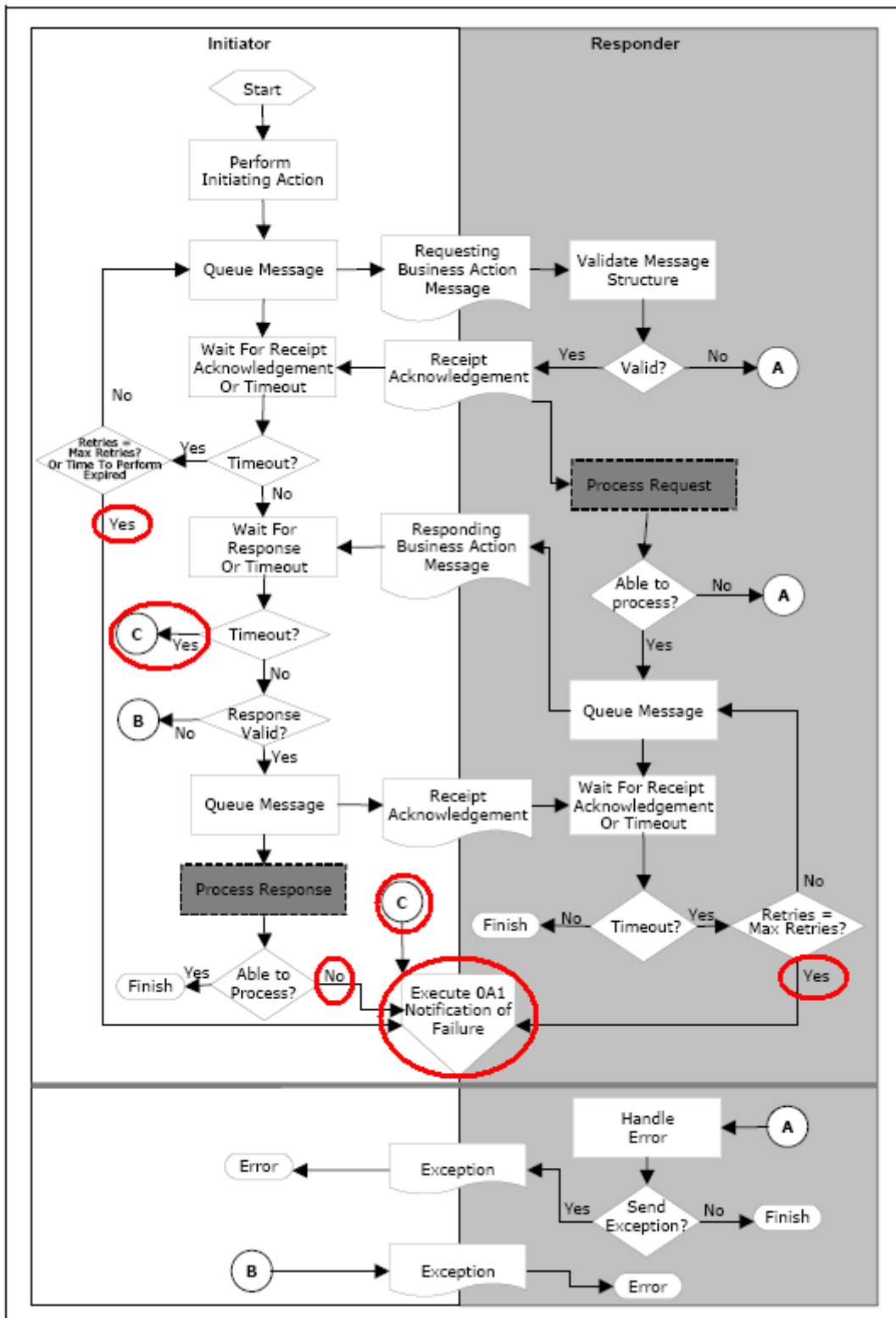Figure 20.   Single-Action Activity (Asynchronous)

Figure 21. Two-Action Activity (Asynchronous)

Single Action PIP Example (see Figure 20 above) Partner A will send Partner B a business message that has no associated response document (i.e. ASN). On receipt of the business message, Partner B will

validate the structure and return either a positive (Receipt Acknowledgement) or negative (Exception) signal to Partner A. On receipt of the positive or negative signal, Partner A will mark the transaction as complete.

<u>Notification Of Failure (NOF) Usage Guidelines (highlighted in red on Figure 20)</u>

1) If Partner B does not send either a positive (Receipt Acknowledgement) or negative (Exception) signal within a specified period of time (i.e. 2 hours). Partner A will resend the business message to Partner B. This cycle will continue until positive or negative signal message is received or until the maximum number of retries is exceeded (i.e. 4 reties). Once the number retries is exceeded, Partner A should submit a NOF to Partner B to communicate the exception. ***Note: The transaction with Partner A's system will be in limbo until a positive or negative signal is received and the purpose of the NOF document in the scenario is to resolve the status of open transactions.***

2) After sending the positive (Receipt Acknowledgement), Partner B will attempt to process the business message. In the event of a failure to process the transaction, a NOF message should be submitted to Partner A. ***Note: An Exception document at this point would not be applicable because Partner A will have marked the transaction as complete after receiving the Receipt Acknowledgement.***

*Note: In some cases, a single action business PIP could have a related single action response PIP (i.e. invoice PIP P21 is loosely coupled with invoice response P22). Under this specific the scenario, Partner B could generate either a NOF or a response document to reject the transaction.

Two Action PIP Example (see Figure 21 above)

Partner A will send Partner B a business message that has a business response document explicitly defined within the business process PIP (i.e. Field Ticket and Field Ticket Response). On receipt of the business message, Partner B will validate the structure and return either a positive (Receipt Acknowledgement) or negative (Exception) signal. On receipt of the positive or negative signal, Partner A will start a timer (Time to Respond) to wait for the business response document. Partner B will generate the response document and send it to Partner A. On receipt of the business response message, Partner A will validate the structure and return either a positive (Receipt Acknowledgement) or negative (Exception) signal to Partner B. On receipt of the positive or negative signal, Partner B will mark the transaction as complete.

<u>Notification Of Failure (NOF) Usage Guidelines (highlighted in red on Figure 21)</u>

1) If Partner B does not send either a positive (Receipt Acknowledgement) or negative (Exception) signal in reference to the business message within a specified period of time (i.e. 2 hours). Partner A will resend the business message to Partner B. This cycle will continue until positive or negative signal message is received or until the maximum number of retries is exceeded (i.e. 4 reties). Once the number retries is exceeded, Partner A submits a NOF to Partner B to communicate the exception. ***Note: The transaction with Partner A's system will be in limbo until a positive or negative signal is received in reference to the business message and the purpose of the NOF document in the scenario is to resolve the status of open transactions.***

2) If Partner B does not send the business response document within the within a specified period of time (i.e. 24 hours), Partner A submits a NOF to Partner B to communicate the exception. ***Note: The time to perform a given business transaction must be defined between the trading partners.***

3) If Partner A does not send either a positive (Receipt Acknowledgement) or negative (Exception) signal in reference to the business response message within a specified period of time (i.e. 2 hours). Partner B will resend the business response message to Partner A. This cycle will continue until positive or negative signal message is received or until the maximum number of retries is exceeded (i.e. 4 reties). Once the number retries is exceeded, Partner B submits a NOF to Partner A to communicate the exception. *Note: The transaction with Partner B's system will be in limbo until a positive or negative signal is received in reference to the business response message and the purpose of the NOF document in the scenario is to resolve the status of open transactions.*

4) After sending the positive (Receipt Acknowledgement), Partner A will attempt to process the business response message. In the event of a failure to process the transaction, a NOF message should be submitted to Partner B. *Note: An Exception document at this point would not be applicable because Partner B will have marked the transaction as complete after receiving the Receipt Acknowledgement.*

Notification of Failure (PIP 0A1)

The NOF specification (0A1_Spec_V02_00_00.pdf) is available on the RosettaNet website. In summary, the NOF document is an xml based on a DTD which contains information regarding the reason for failure and transaction identifier. The document is sent within a RNIF envelope and the receiving partner will send a Receipt Acknowledgement upon receipt. The RNIF envelope containing the NOF can be sent via an alternate delivery method (i.e. secondary HTTPS or SMTP). A sample NOF transmission is listed below.

```
POST /invoke/wm.ip.rn/receive HTTP/1.0
User-Agent: Mozilla/4.0
Accept: image/gif, */*
Host: localhost:3333
Content-type: multipart/related; type="multipart/related"; boundary="27946702.1170128833064"
x-RN-Version: RosettaNet/V02.00
 x-RN-Response-Type: async
Content-Length: 7724

 --27946702.1170128833064
Message-ID: <32476012.1170128833064>
Mime-Version: 1.0
Content-Type: multipart/related; type="application/xml";
    boundary="----=_Part_5_388100.1170128833017"

 ------=_Part_5_388100.1170128833017
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Preamble Content-ID: <9466737.1170128833017>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE Preamble SYSTEM "Preamble_MS_V02_00.dtd">
<Preamble>
 <standardName> <GlobalAdministeringAuthorityCode>RosettaNet</GlobalAdministeringAuthorityCode> </standardName> <standardVersion>
 <VersionIdentifier>V02.00</VersionIdentifier>
 </standardVersion>
 </Preamble>

------=_Part_5_388100.1170128833017
 Content-Type: Application/XML
 Content-Transfer-Encoding: quoted-printable
 Content-Location: RN-Delivery-Header
Content-ID: <25890660.1170128833017>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE DeliveryHeader SYSTEM "DeliveryHeader_MS_V02_00.dtd">
 <DeliveryHeader>
 <isSecureTransportRequired>
```

```xml
<AffirmationIndicator>No</AffirmationIndicator>
</isSecureTransportRequired>
<messageDateTime>
<DateTimeStamp>20070129T214712.985Z</DateTimeStamp>
</messageDateTime>
<messageReceiverIdentification>
<PartnerIdentification>
<domain>
<FreeFormText xml:lang="EN">DUNS</FreeFormText>
</domain> <GlobalBusinessIdentifier>111111111</GlobalBusinessIdentifier>
</PartnerIdentification>
</messageReceiverIdentification>
<messageSenderIdentification>
```

```xml
<PartnerIdentification>
<domain>
<FreeFormText xml:lang="EN">DUNS</FreeFormText>
</domain>
<GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
<locationID>
<Value>Houston</Value>
</locationID>
</PartnerIdentification>
</messageSenderIdentification>
<messageTrackingID>
<InstanceIdentifier>0af840f3f70d11d0000003ff</InstanceIdentifier>
</messageTrackingID>
</DeliveryHeader>

------=_Part_5_388100.1170128833017
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Service-Header Content-ID: <10452323.1170128833017>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE ServiceHeader SYSTEM "ServiceHeader_MS_V02_00.dtd">
<ServiceHeader>
<ProcessControl>
<ActivityControl>
<BusinessActivityIdentifier>Distribute Notification of Failure</BusinessActivityIdentifier>
<MessageControl>
<fromRole>
<GlobalPartnerRoleClassificationCode>PIP Failure Notifier</GlobalPartnerRoleClassificationCode>
</fromRole>
<fromService>
<GlobalBusinessServiceCode>PIP Failure Notifier Service</GlobalBusinessServiceCode>
</fromService>
<Manifest>
<numberOfAttachments>
<CountableAmount>0</CountableAmount>
</numberOfAttachments>
<ServiceContentControl>
<ActionIdentity>
<GlobalBusinessActionCode>Failure Notification Action</GlobalBusinessActionCode>
<standardVersion>
<VersionIdentifier>V02.00</VersionIdentifier>
</standardVersion>
</ActionIdentity>
</ServiceContentControl>
</Manifest>
<toRole>
<GlobalPartnerRoleClassificationCode>Failure Report Administrator</GlobalPartnerRoleClassificationCode>
</toRole>
<toService>
<GlobalBusinessServiceCode>Failure Report Administrator Service</GlobalBusinessServiceCode>
</toService>
</MessageControl>
</ActivityControl>
<GlobalUsageCode>Test</GlobalUsageCode>
<pipCode>
<GlobalProcessIndicatorCode>0A1</GlobalProcessIndicatorCode>
</pipCode>
<pipInstanceId>
<InstanceIdentifier>0af840f3f70d11cf000003f8</InstanceIdentifier>
</pipInstanceId>
<pipVersion>
<VersionIdentifier>V02.00</VersionIdentifier>
</pipVersion>
<KnownInitiatingPartner>
<PartnerIdentification>
<domain>
<FreeFormText xml:lang="EN">DUNS</FreeFormText>
</domain>
```

```
<GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
 </PartnerIdentification>
 </KnownInitiatingPartner>
 </ProcessControl>
 </ServiceHeader>

------=_Part_5_388100.1170128833017
Content-Type: Application/XML
 Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Service-Content
 Content-ID: <14743848.1170128833017>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE Pip0A1FailureNotification SYSTEM "0A1FailureNotificationMessageGuideline.dtd">
 <Pip0A1FailureNotification>
<ActionControl>
 <ActionIdentity>
<GlobalBusinessActionCode>Purchase Order Notification</GlobalBusinessActionCode>
 <messageStandard>
 <FreeFormText>PIDX</FreeFormText>
</messageStandard>
 <standardVersion>
 <VersionIdentifier>1.0</VersionIdentifier>
</standardVersion>
</ActionIdentity>
<messageTrackingID>
<InstanceIdentifier>0af840f3f70d118c000003a3</InstanceIdentifier>
 </messageTrackingID>
</ActionControl>
<fromRole>
 <PartnerRoleDescription>
 <ContactInformation>
 <contactName>
 <FreeFormText xml:lang="EN">BAS</FreeFormText>
</contactName>
 <EmailAddress>charles.sewell@bakerhughes.com</EmailAddress>
<telephoneNumber>
<CommunicationsNumber>281-999-0001</CommunicationsNumber>
 </telephoneNumber>
</ContactInformation>
 <GlobalPartnerRoleClassificationCode>PIP Failure Notifier</GlobalPartnerRoleClassificationCode>
 <PartnerDescription>
 <BusinessDescription>
<GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
 <GlobalSupplyChainCode>Information Technology</GlobalSupplyChainCode>
</BusinessDescription>
<GlobalPartnerClassificationCode>PIP Failure Notifier</GlobalPartnerClassificationCode>
</PartnerDescription>
 </PartnerRoleDescription>
</fromRole>
<GlobalDocumentFunctionCode>Request</GlobalDocumentFunctionCode>
<ProcessIdentity>
 <GlobalProcessIndicatorCode>P31</GlobalProcessIndicatorCode>
 <InstanceIdentifier>0af840f3f70d118b0000039e</InstanceIdentifier>
 <VersionIdentifier>1.0</VersionIdentifier>
</ProcessIdentity>
 <reason>
 <FreeFormText xml:lang="EN">Retry exceeded</FreeFormText>
 </reason>
 <thisDocumentGenerationDateTime>
<DateTimeStamp>20070130T034711.796Z</DateTimeStamp>
 </thisDocumentGenerationDateTime>
 <thisDocumentIdentifier>
<ProprietaryDocumentIdentifier>0af840f3f70d11d0000003fd</ProprietaryDocumentIdentifier>
 </thisDocumentIdentifier>
<toRole>
<PartnerRoleDescription>
<GlobalPartnerRoleClassificationCode>Failure Report Administrator</GlobalPartnerRoleClassificationCode>
```

<PartnerDescription>
<BusinessDescription>

<GlobalBusinessIdentifier>111111111</GlobalBusinessIdentifier>
<GlobalSupplyChainCode>Information Technology</GlobalSupplyChainCode>
</BusinessDescription>
<GlobalPartnerClassificationCode>Failure Report Administrator</GlobalPartnerClassificationCode>
</PartnerDescription>
</PartnerRoleDescription>
</toRole>
</Pip0A1FailureNotification>

------=_Part_5_388100.1170128833017—

--27946702.1170128833064--

RNIF 2.0 Message Correlation Overview The RosettaNet 2.0 specification defines how message correlation occurs across multiple asynchronous messages for a single transaction. In diagram below summarizes the message correlation process. The first PO transaction is received and acknowledged, the second PO transaction is received and an exception document is sent back, the third PO transaction is sent several time with no response signal (positive or negative) so a NOF is created. The NOF document is tracked as an independent transaction from the original PO transaction and the receiving partner will generate a receipt acknowledgement for the NOF transmission. Within the NOF xml document, the original tracking identifiers for the failed PO transaction indicate which specific transaction will need to be handled within the receiver's backend system.

Business Message	Delivery-MsgTackingID	InReplyTo-MsgTrackingID	ServHeader-PIPInstanceID	NOF-MsgTrackingID	NOF-ProcessInstanceID	NOF-thisDocIdentifier
PO	0af840f3f70d118c000003a3		0af840f3f70d118b0000039e			
Acknowledgement	936ce0f9f70d11940000361c	0af840f3f70d118c000003a3	0af840f3f70d118b0000039e			
PO	0af840f3f70d10dd00000280		0af840f3f70d10da0000027b			
Exception	936ce0f9f70d10e3000034c1	0af840f3f70d10dd00000280	0af840f3f70d10da0000027b			
PO	0af840f3f70d141f0000055e		0af840f3f70d141e0000055a			
PO	0af840f3f70d141f0000055e		0af840f3f70d141e0000055a			
PO	0af840f3f70d141f0000055e		0af840f3f70d141e0000055a			
PO	0af840f3f70d141f0000055e		0af840f3f70d141e0000055a			
Notification Of Failure	0af840f3f70d145600000593		0af840f3f70d14550000058d	0af840f3f70d141f0000055e	0af840f3f70d141e0000055a	0af840f3f70d145500000590
Acknowledgement	936ce0f9f70d11940000899d	0af840f3f70d145600000593	0af840f3f70d14550000058d			

2.1.3 Adoption of Two Action PIPs

The original PIDX/RN specification specifically stated that PIDX would only support single action PIP messages. PIDX business processes have been defined to incorporate two tightly coupled messages into a single process and the adoption of two action PIDX/RN PIPs will allow the PIDX Business Message Group to support the defined process outlined by the PIDX Business Process Group. Support for single action PIPs will be continued for backward compatibility and the two action PIP business processes will be differentiated by a unique PIP Code (ServiceHeader – ProcessControl – pipCode – GlobalProcessIndicatorCode). Section 2.6 of the RosettaNet 2.0 specification described the flow of business message within the RNIF framework. In the diagrams below, the choreography of the business messages and the associated response documents (positive and negative) are depicted.
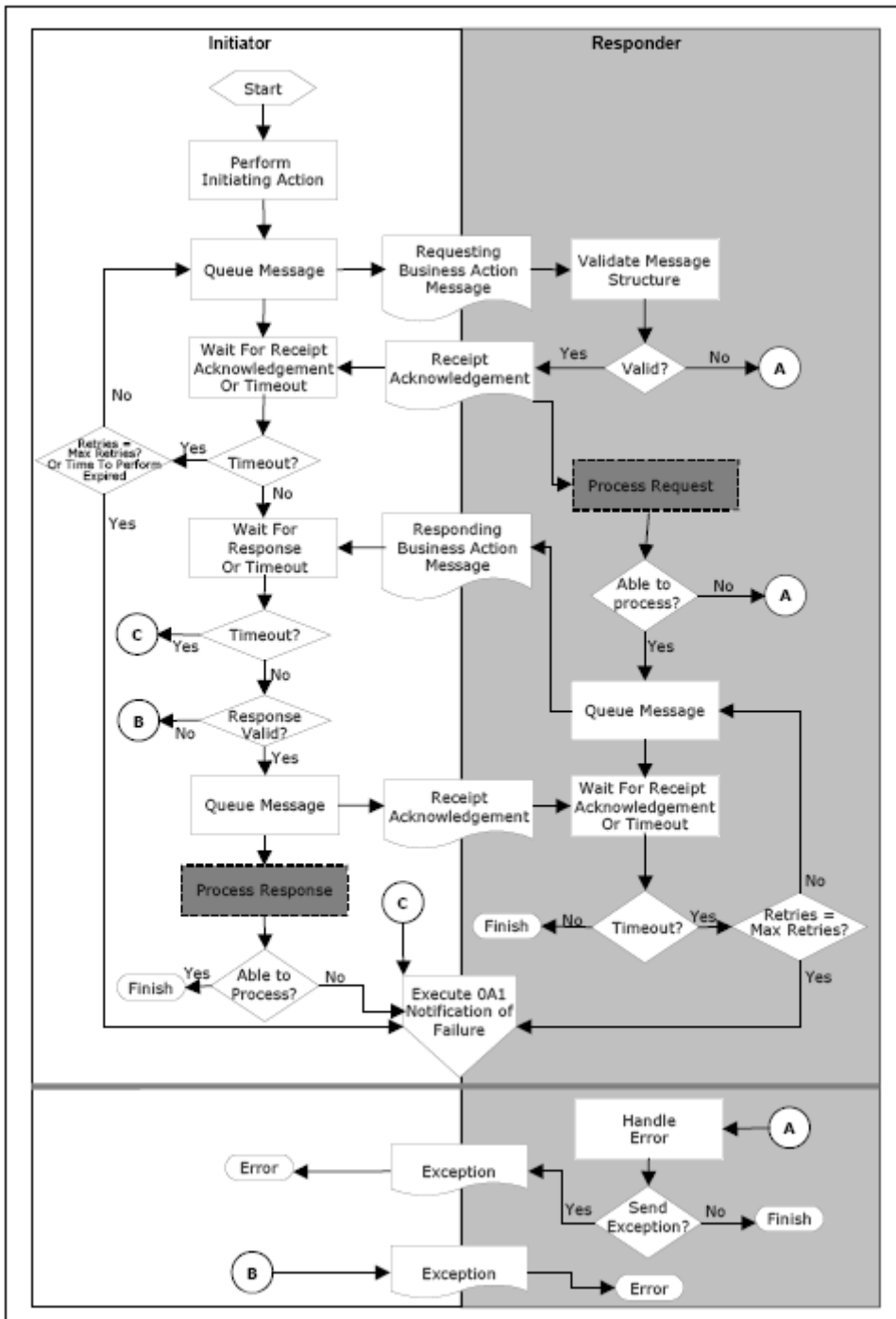
Figure 21. Two-Action Activity (Asynchronous)

Two Action PIP Example (see Figure 21 above) Partner A will send Partner B a business message that has a business response document explicitly defined within the business process PIP (i.e. Field Ticket). On receipt of the business message, Partner B will validate the structure and return either a positive (Receipt Acknowledgement) or negative (Exception) signal. On receipt of the positive or negative signal, Partner A will start a timer (Time to Respond) to wait for the business response document. Partner B will

generate the response document (i.e. Field Ticket Response) and send it to Partner A. On receipt of the business response message, Partner A will validate the structure and return either a positive (Receipt Acknowledgement) or negative (Exception) signal to Partner B. On receipt of the positive or negative signal, Partner B will mark the transaction as complete.

2.1.4 Deprecated Items

PIDX adopted RosettaNet 2.0 as a messaging standard to facilitate business document exchange between partners. PIDX/RN standard originally introduced items into the standard that were not compliant with the
RosettaNet 2.0 specification. Any additions to the PIDX/RN standard that require customization of RosettaNet compliant software must have a significant business value to justify the cost of development and maintenance of customized code. The following items have been deprecated based on not meeting these criteria:

   1) American Petroleum Institute PIDX XML Standards Group is no longer required in the RosettaNet service header. In addition to not adding business value, this addition violated a rule within the original PIDX/RN specification (No changes should be made to the Service header structure because this might impact the ability of an automated middleware tool to process the RNIF 2.0 based message).

   2) The PIDX exception xml schema will no longer be utilized within PIDX/RN messaging. The PIDX exception xml document is identical to the RosettaNet 2.0 exception message except for the use of the PIDX namespace. There is no business value for utilizing a customized exception document for communicating PIDX/RN failures.

2.2 Security

2.2.1 Digital Signatures

PIDX recommends that every messaging system for exchange of PIDX XML Schemas support both non-repudiation of receipt and non-repudiation of origin and content. Non-Repudiation is the mechanism for making sure that an originating trading partner can not deny having originated and sent a message (called Non-Repudiation of Origin and Content) and that a receiving trading partner cannot deny having received a message sent by its partner (called Non-Repudiation of Receipt).

All PIDX/RN message envelopes should include a detached PCKS7 digital signature and the receipt acknowledgement document should contain a message digest of the document being acknowledged to ensure end-to-end non-repudiation. Signing of the RosettaNet Business Message is described in Section 2.3.3 of the RNIF2.0 specification. Below are diagrams from the RosettaNet 2.0 specification related to digitally signing messages.

Example 11.   Signed RosettaNet Business Message

```
Content-Type: multipart/signed;
            boundary="RN-Signature-Boundary";
            protocol="application/pkcs7-signature";
            micalg=sha1
Content-Description: This is a Signed RosettaNet Business Message

--RN-Signature-Boundary

[The RosettaNet Business Message to be signed goes here]

--RN-Signature-Boundary
Content-Type: Application/pkcs7-signature; name="detached.p7s"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename=smime.p7s
Content-Description: This is the signature for the Business Message

[The base64-encoded PKCS7 Detached Signature goes here]

--RN-Signature-Boundary--
```
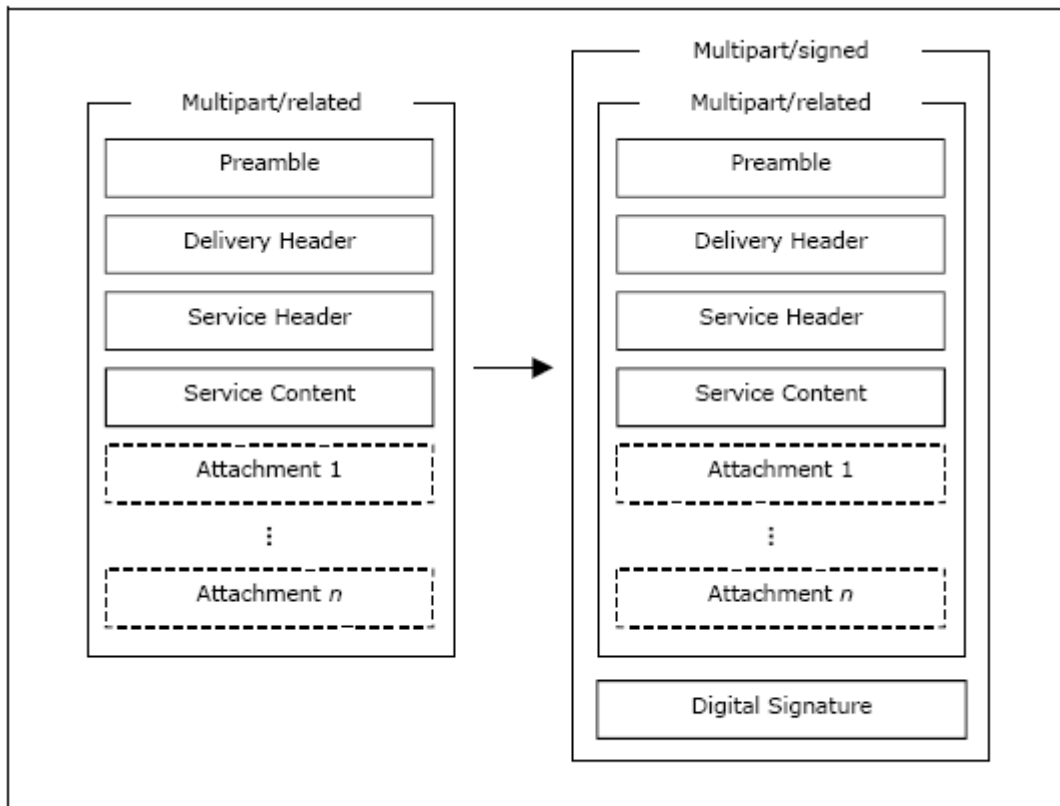
Figure 15. Signing the Unencrypted RosettaNet Business Message

2.2.2 Payload Encryption

PIDX recommends that encryption be used to ensure data confidentiality. PIDX recommends that encryption be available at the application (message payload) layer in addition to any encryption that may be applied at the transport (transmission) layer.

Use of HTTPS to encrypt the data during transport is considered sufficient for direct integrations between partners. When data is transmitted though a RNIF messaging hub, transport layer encryption is not sufficient and payload encryption (encryption of the RN service header document is optional) should be utilized to ensure data privacy. Payload encryption is described in the "Packaging with Encryption" section of 2.3.3 of the RosettaNet 2.0 specification. Below are diagrams from the RosettaNet 2.0 specification related to encrypting the RosettaNet message payload.
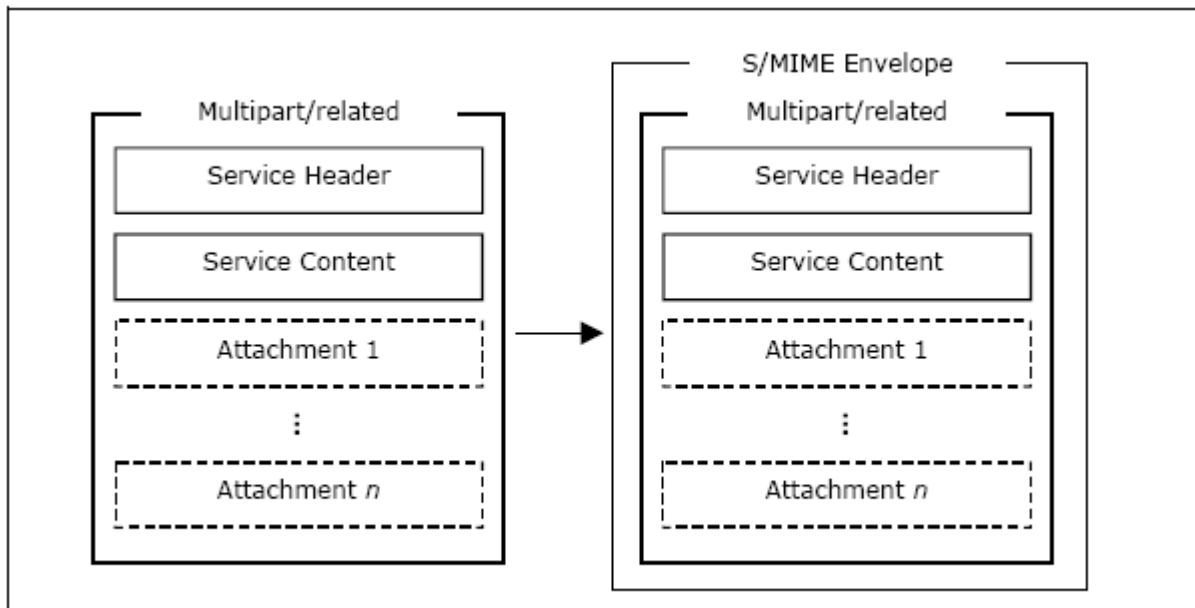
Figure 10. Encrypting the Payload Container

2.3 Interdependency of RosettaNet Components

The RosettaNet specifications facilitate business process alignment between trading partners that adhere to the Partner Interface Processes (PIPs). These processes are described in separate, interdependent documents:

PIP specifications and their associated message guidelines

Business and technical dictionaries that define elements of a RosettaNet message and where they are utilized

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To implement the business process alignment functionality provided by the RosettaNet specifications, integration software must implement specific PIPs that address processing goals, the business and technical dictionaries, and the implementation framework specifications. Figure 1 illustrates how trading partners use the specifications together to provide a public integration environment.
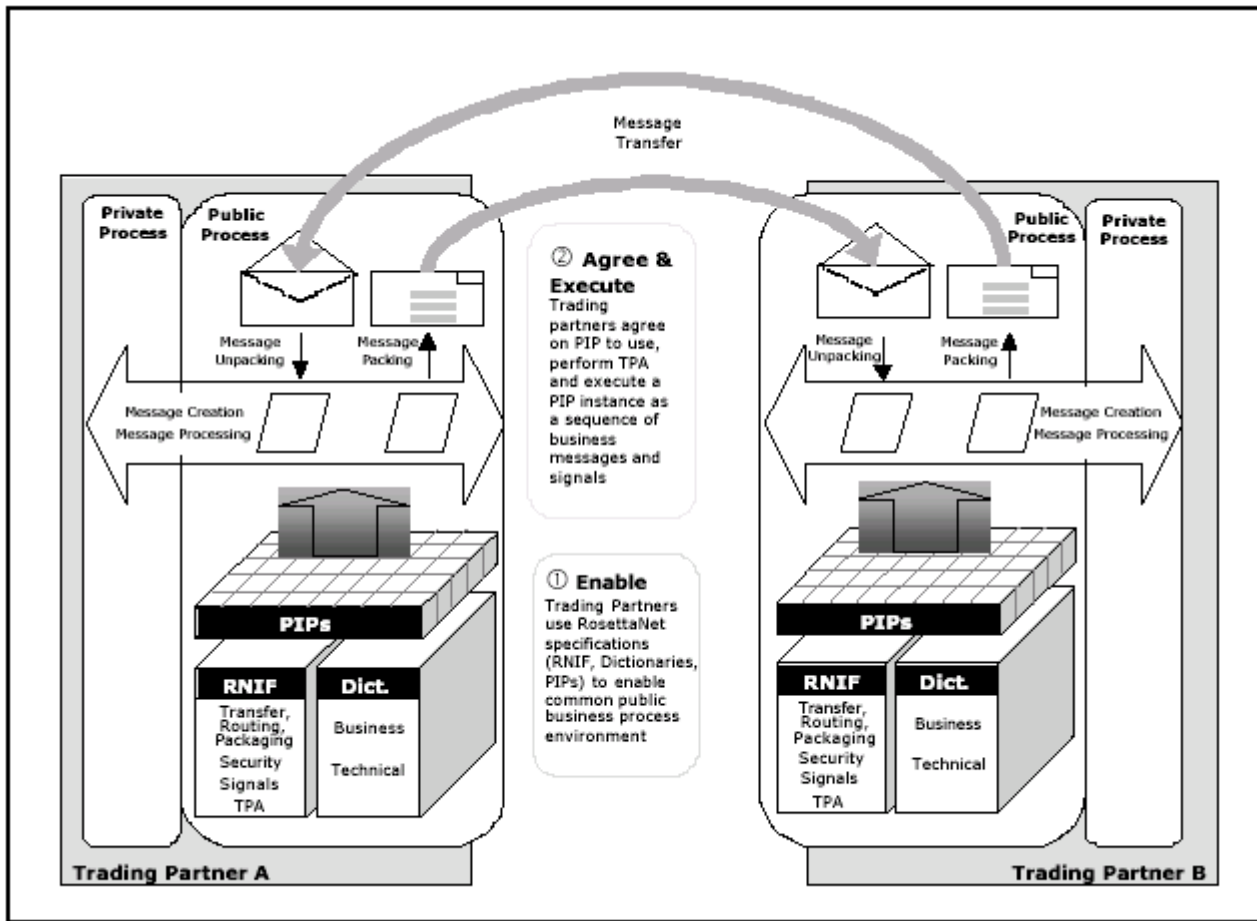
Figure 1: Interrelationships of RosettaNet Specifications (RosettaNet, 2004, p. 16)

PIPs and Message Guidelines

The RosettaNet PIP specifications define the trading partner roles, public processes, data, business rules, network components, pre-conditions and post-conditions necessary to align trading partner supply chain business processes. The documents that describe and define each PIP include the PIP specification, the business document, the Data Type Definitions (DTD) for the RosettaNet headers and service content, business and technical dictionaries, and message guidelines. The guidelines contain additional PIP-specific information that must be validated, but cannot be expressed in the DTDs. Each PIP includes:

The specification of partner business roles

The business activities executed by the roles

The type, content, and sequence of business documents exchanged by the role -interactions while performing these activities.

Business rules constraining the interactions, including the time, security, authentication, and performance constraints

The structure and content of the business documents as specified in XML schemas, DTDs, and message guidelines specific to the PIP

The XML schemas, DTDs, and the associated Message Guidelines for business actions (business messages) are specified as part of the corresponding PIP specification.

The RosettaNet specifications do not contain PIDX PIP documentation. Accordingly, PIDX/RN specifications should include a PIP specification and message guidelines for each PIDX PIP.

Business and Technical Dictionaries

The business and technical dictionaries provide a common vocabulary for aligning business processes in disparate organizations. The RosettaNet business dictionary defines business properties, business data entities, and fundamental business data entities found in PIP message guidelines. The RosettaNet technical dictionary (RNTD) provides properties used to define products and services. The RNTD eliminates the need for trading partners to use separate dictionaries when implementing multiple PIPs.

The business dictionaries do not include business concepts used in the oil and gas domain. Some PIDX artifacts such as the PIDXCodeLists.xsd do contain business definitions, but their content is incomplete. Additionally, these definitions are not included in the current RosettaNet dictionaries. Accordingly, the RosettaNet business dictionaries need to be augmented to include business entities used by organizations executing PIDX/RN compliant PIPs.

The RNTD does not contain appropriate elements for the oil and gas industries, and the PIDX standards do not include an equivalent of the RNTD. PIDX maintains a Petroleum Industry Data Dictionary (PIDD), but it is not widely distributed or consulted. Additionally, PIDX maintains a cataloging schema containing technical elements. The contents of the PIDD should be included in the PIDX/RN documentation in HTML and XML content.

RNIF 2.0

The Implementation Framework is well documented in the RosettaNet 2.0 specifications available at www.rosettanet.org . The PIDX/RN specifications (if applicable) will refine and clarify the RosettaNet artifact.

2.4   Supplemental Appendix

2.4.1   PIDX/RN Service Header parameter values
The values of the RosettaNet Service Header parameters that define what type of transaction is being sent with in a RNIF transmission between partners was not defined within the original PIDX/RN specification. Below is a list that covers the approved PIDX business transactions to date.

Below is a list that covers the approved PIDX business transactions to date.

`<ServiceHeader>` `<ProcessControl>` `<ActivityControl>` `<BusinessActivityIdentifier>`	viceHeader> `<Process Contr ol>` `<pip`	der> `<ProcessControl>` `<ActivityControl>` `<MessageControl>` `<fromRole>`	`<ServiceHeader>` `<ProcessControl>` `<ActivityControl>` `<MessageControl>` `<fromService>` `<GlobalBusinessServiceCode>`	ader> `<ProcessControl>` `<ActivityControl>` `<MessageControl>` `<toRole>`	`<ProcessControl>` `<ActivityControl>` `<MessageControl>` `<toService>` `<GlobalBusinessServiceCode>`	`<ServiceHeader>` `<ProcessControl>` `<ActivityControl>` `<MessageControl>` `<Manifest>` `<ServiceContentControl>` `<ActionIdentity>` `<GlobalBusinessActionCode>`
FieldTicket	P11	Seller	Seller Service	Buyer	Buyer Service	Field Ticket Notification
FieldTicketResponse	P12	Buyer	Buyer Service	Seller	Seller Service	Field Ticket Receipt Notification
Invoice	P21	Seller	Seller Service	Buyer	Buyer Service	Invoice Notification
InvoiceResponse	P22	Buyer	Buyer Service	Seller	Seller Service	Invoice Receipt Notification
OrderCreate	P31	Buyer	Buyer Service	Seller	Seller Service	Purchase Order Notification
OrderChange	P32	Buyer	Buyer Service	Seller	Seller Service	Purchase Order Change Notification
OrderResponse	P33	Seller	Seller Service	Buyer	Buyer Service	Purchase Order Reciept Notification
QuoteRequest	P41	Buyer	Buyer Service	Seller	Seller Service	Request for Quote
Quote	P42	Seller	Seller Service	Buyer	Buyer Service	Quote
QuoteNotification	P43	Buyer	Seller Service	Buyer	Buyer Service	Quote Notification
RequestRequisitionReturn	P51	Buyer	Buyer Service	Seller	Seller Service	Requisition Return Notification
OrderStatusRequest	P61	Buyer	Buyer Service	Seller	Seller Service	Order Status Notification
OrderStatusResponse	P62	Seller	Seller Service	Buyer	Buyer Service	Order Status Receipt Response
PipelineNominationChange	P71	Seller	Seller Service	Pipeline	Pipeline Service	Pipeline Nomination Change Notification
PipelineNominationCreate	P72	Seller	Seller Service	Pipeline	Pipeline Service	Pipeline Nomination Notification
se	P73	Pipeline	Pipeline Service	Seller	Seller Service	Pipeline Nomination Reciept Notification
PipelineSchedule	P74	Pipeline	Pipeline Service	Seller	Seller Service	Pipeline Schedule Notification
ASN	P20	Seller	Seller Service	Buyer	Buyer Service	Advance Shipment Notification
CementingTemplate	P90	Seller	Seller Service	Buyer	Buyer Service	Cementing Job Notification
CustodyTicket	P75	Buyer	Buyer Service	Seller	Seller Service	Product Custody Notification
Receipt	P80	Seller	Seller Service	Buyer	Buyer Service	Receipt Notification
BillOfLadingCreate	P81	Carrier	Carrier Service	Shipper	Shipper Service	Bill of Lading Notification
BillOfLadingResponse	P82	Shipper	Shipper	Carrier	Carrier Service	Bill of Lading Receipt Notification

2.4.2   Example RNIF envelope data

Below are sample RNIF transmission (business message containing a PIDX PO and a receipt acknowledgement). For technical details on the RosettaNet standard, please refer to www.rosettanet.org

PIDX Business Payload

PIDX Business Payload

```
POST /invoke/wm.ip.rn/receive HTTP/1.0
User-Agent: Mozilla/4.0 [en] (WinNT; I)
Accept: image/gif, */*
Host: localhost:3333
Content-type: multipart/related; type="multipart/related"; boundary="1546175.1170131673890"
x-RN-Version: RosettaNet/V02.00
x-RN-Response-Type: async
Content-Length: 10190


--1546175.1170131673890
Message-ID: <27062049.1170131673874>
Mime-Version: 1.0
Content-Type: multipart/related; type="application/xml";
    boundary="-----=_Part_10_7142895.1170131673843"

------=_Part_10_7142895.1170131673843
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Preamble
Content-ID: <22569489.1170131673828>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE Preamble SYSTEM "Preamble_MS_V02_00.dtd">
<Preamble>
 <standardName>
  <GlobalAdministeringAuthorityCode>RosettaNet</GlobalAdministeringAuthorityCode>
 </standardName>
 <standardVersion>
  <VersionIdentifier>V02.00</VersionIdentifier>
 </standardVersion>
</Preamble>


------=_Part_10_7142895.1170131673843
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Delivery-Header
Content-ID: <26112976.1170131673828>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE DeliveryHeader SYSTEM "DeliveryHeader_MS_V02_00.dtd">
<DeliveryHeader>
 <isSecureTransportRequired>
  <AffirmationIndicator>No</AffirmationIndicator>
 </isSecureTransportRequired>
 <messageDateTime>
  <DateTimeStamp>20070129T223433.796Z</DateTimeStamp>
 </messageDateTime>
 <messageReceiverIdentification>
  <PartnerIdentification>
   <domain>
    <FreeFormText xml:lang="EN">DUNS</FreeFormText>
   </domain>
   <GlobalBusinessIdentifier>111111111</GlobalBusinessIdentifier>
  </PartnerIdentification>
 </messageReceiverIdentification>
 <messageSenderIdentification>
  <PartnerIdentification>
   <domain>
    <FreeFormText xml:lang="EN">DUNS</FreeFormText>
   </domain>
   <GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
   <locationID>
    <Value>Houston</Value>
   </locationID>
  </PartnerIdentification>
 </messageSenderIdentification>
 <messageTrackingID>
  <InstanceIdentifier>0af840f3f70d1486000005ec</InstanceIdentifier>
```

```
    </messageTrackingID>
  </DeliveryHeader>

------=_Part_10_7142895.1170131673843
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Service-Header
Content-ID: <22371708.1170131673828>

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE ServiceHeader SYSTEM "ServiceHeader_MS_V02_00.dtd">
<ServiceHeader>
  <ProcessControl>
    <ActivityControl>
      <BusinessActivityIdentifier>OrderCreate</BusinessActivityIdentifier>
      <MessageControl>
        <fromRole>
          <GlobalPartnerRoleClassificationCode>Buyer</GlobalPartnerRoleClassificationCode>
        </fromRole>
        <fromService>
          <GlobalBusinessServiceCode>Buyer Service</GlobalBusinessServiceCode>
        </fromService>
        <Manifest>
          <numberOfAttachments>
            <CountableAmount>0</CountableAmount>
          </numberOfAttachments>
          <ServiceContentControl>
            <ActionIdentity>
              <GlobalBusinessActionCode>Purchase Order Notification</GlobalBusinessActionCode>
              <messageStandard>
                <FreeFormText>PIDX</FreeFormText>
              </messageStandard>
              <standardVersion>
                <VersionIdentifier>1.0</VersionIdentifier>
              </standardVersion>
            </ActionIdentity>
          </ServiceContentControl>
        </Manifest>
        <toRole>
          <GlobalPartnerRoleClassificationCode>Seller</GlobalPartnerRoleClassificationCode>
        </toRole>
        <toService>
          <GlobalBusinessServiceCode>Seller Service</GlobalBusinessServiceCode>
        </toService>
      </MessageControl>
    </ActivityControl>
    <GlobalUsageCode>Test</GlobalUsageCode>
    <partnerDefinedPIPPayloadBindingId>
      <ProprietaryReferenceIdentifier>PIDX</ProprietaryReferenceIdentifier>
    </partnerDefinedPIPPayloadBindingId>
    <pipCode>
      <GlobalProcessIndicatorCode>P31</GlobalProcessIndicatorCode>
    </pipCode>
    <pipInstanceId>
      <InstanceIdentifier>0af840f3f70d1485000005e8</InstanceIdentifier>
    </pipInstanceId>
    <pipVersion>
      <VersionIdentifier>1.0</VersionIdentifier>
    </pipVersion>
    <KnownInitiatingPartner>
      <PartnerIdentification>
        <domain>
          <FreeFormText xml:lang="EN">DUNS</FreeFormText>
        </domain>
        <GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
      </PartnerIdentification>
    </KnownInitiatingPartner>
  </ProcessControl>
</ServiceHeader>
```

```
------=_Part_10_7142895.1170131673843
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Service-Content
Content-ID: <23892011.1170131673843>

<?xml version="1.0" encoding="UTF-8" ?>
<pidx:OrderCreate pidx:transactionPurposeIndicator="Original" pidx:version="1.0"
    xmlns:pidx="http://www.api.org/pidXML/v1.0">
 <pidx:OrderCreateProperties>
  <pidx:PurchaseOrderNumber>12345</pidx:PurchaseOrderNumber>
  <pidx:PurchaseOrderIssuedDate>2006-10-23</pidx:PurchaseOrderIssuedDate>
  <pidx:PartnerInformation partnerRoleIndicator="Seller">
   <pidx:PartnerIdentifier partnerIdentifierIndicator="DUNSNumber">111111111</pidx:PartnerIdentifier>
   <pidx:PartnerIdentifier partnerIdentifierIndicator="DUNS 4Number">111111110575</pidx:PartnerIdentifier>
   <pidx:PartnerName>Supplier</pidx:PartnerName>
   <pidx:AddressInformation>
    <pidx:StreetName></pidx:StreetName>
    <pidx:CityName>HOUSTON</pidx:CityName>
    <pidx:StateProvince>TX</pidx:StateProvince>
    <pidx:PostalCode>77001</pidx:PostalCode>
    <pidx:PostalCountry>
     <pidx:CountryCode>US</pidx:CountryCode>
    </pidx:PostalCountry>
   </pidx:AddressInformation>
   <pidx:ContactInformation contactInformationIndicator="OrderContact">
    <pidx:ContactName></pidx:ContactName>
   </pidx:ContactInformation>
  </pidx:PartnerInformation>
  <pidx:PartnerInformation partnerRoleIndicator="SoldTo">
   <pidx:PartnerIdentifier partnerIdentifierIndicator="DUNSNumber">999999999</pidx:PartnerIdentifier>
   <pidx:PartnerIdentifier partnerIdentifierIndicator="DUNS 4Number">9999999998088</pidx:PartnerIdentifier>
   <pidx:PartnerName>Oil Company</pidx:PartnerName>
   <pidx:AddressInformation>
    <pidx:StreetName></pidx:StreetName>
    <pidx:CityName></pidx:CityName>
    <pidx:StateProvince></pidx:StateProvince>
    <pidx:PostalCode></pidx:PostalCode>
    <pidx:PostalCountry>
     <pidx:CountryCode>US</pidx:CountryCode>
    </pidx:PostalCountry>
   </pidx:AddressInformation>
   <pidx:ContactInformation contactInformationIndicator="OrderContact">
    <pidx:ContactName></pidx:ContactName>
    <pidx:Telephone telephoneIndicator="Voice">
     <pidx:PhoneNumber>713 999 9999</pidx:PhoneNumber>
    </pidx:Telephone>
    <pidx:Telephone telephoneIndicator="Fax">
     <pidx:PhoneNumber>713 999 9991</pidx:PhoneNumber>
    </pidx:Telephone>
   </pidx:ContactInformation>
  </pidx:PartnerInformation>
  <pidx:PurchaseOrderTypeCode>SupplyOrServiceOrder</pidx:PurchaseOrderTypeCode>
  <pidx:PrimaryCurrency>
   <pidx:CurrencyCode>USD</pidx:CurrencyCode>
  </pidx:PrimaryCurrency>
  <pidx:LanguageCode>EN</pidx:LanguageCode>
  <pidx:ReferenceInformation referenceInformationIndicator="ContractNumber">
   <pidx:ReferenceNumber>1234</pidx:ReferenceNumber>
   <pidx:Description>AssignedByBuyerOrBuyersAgent</pidx:Description>
  </pidx:ReferenceInformation>
  <pidx:Comment>PO Header Text.</pidx:Comment>
 </pidx:OrderCreateProperties>
 <pidx:OrderCreateDetails>
  <pidx:OrderCreateLineItem>
   <pidx:LineItemNumber>1</pidx:LineItemNumber>
   <pidx:LineItemInformation>
    <pidx:LineItemIdentifier identifierIndicator="AssignedBySeller"/>
    <pidx:LineItemDescription>UAT 5</pidx:LineItemDescription>
   </pidx:LineItemInformation>
```

```
<pidx:OrderQuantity>
 <pidx:Quantity>1.000</pidx:Quantity>
 <pidx:UnitOfMeasureCode>EA</pidx:UnitOfMeasureCode>
</pidx:OrderQuantity>
<pidx:JobLocationInformation>
 <pidx:WellInformation>
  <pidx:WellIdentifier wellIdentifierIndicator="Other">CustomerWellNumber</pidx:WellIdentifier>
  <pidx:WellName>1120</pidx:WellName>
 </pidx:WellInformation>
</pidx:JobLocationInformation>
<pidx:Pricing>
 <pidx:UnitPrice>
  <pidx:MonetaryAmount>10.00</pidx:MonetaryAmount>
  <pidx:UnitOfMeasureCode>EA</pidx:UnitOfMeasureCode>
  <pidx:CurrencyCode>USD</pidx:CurrencyCode>
 </pidx:UnitPrice>
</pidx:Pricing>
<pidx:LineItemTotal>
 <pidx:MonetaryAmount>10.00</pidx:MonetaryAmount>
 <pidx:CurrencyCode>USD</pidx:CurrencyCode>
</pidx:LineItemTotal>
<pidx:ServiceDateTime dateTypeIndicator="RequestedForDelivery">2006-10-23T12:00:00</pidx:ServiceDateTime>
<pidx:Comment>PO Item text for vendor</pidx:Comment>
</pidx:OrderCreateLineItem>
</pidx:OrderCreateDetails>
<pidx:OrderCreateSummary>
 <pidx:TotalLineItems>1</pidx:TotalLineItems>
 <pidx:TotalAmount>
  <pidx:MonetaryAmount>10.00</pidx:MonetaryAmount>
  <pidx:CurrencyCode>USD</pidx:CurrencyCode>
 </pidx:TotalAmount>
</pidx:OrderCreateSummary>
</pidx:OrderCreate>

------=_Part_10_7142895.1170131673843--

--1546175.1170131673890--
```

Receipt Acknowledgement

```
POST /invoke/wm.ip.rn/receive HTTP/1.0
User-Agent: Mozilla/4.0
Accept: image/gif, */*
Host: localhost:3333
Content-type: multipart/related; type="multipart/related"; boundary="21706121.1170128588370"
x-RN-Version: RosettaNet/V02.00
x-RN-Response-Type: async
Content-Length: 5726

--21706121.1170128588370
Message-ID: <12962282.1170128588370>
Mime-Version: 1.0
Content-Type: multipart/related; type="application/xml";
     boundary="----=_Part_1_13210604.1170128588074"

------=_Part_1_13210604.1170128588074
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Preamble
Content-ID: <20007442.1170128588058>

<?xml version"1.0" encoding"UTF-8" ?>
<!DOCTYPE Preamble SYSTEM "Preamble_MS_V02_00.dtd">
<Preamble>
 <standardName>
  <GlobalAdministeringAuthorityCode>RosettaNet</GlobalAdministeringAuthorityCode>
 </standardName>
 <standardVersion>
  <VersionIdentifier>V02.00</VersionIdentifier>
 </standardVersion>
```

```
</Preamble>

------=_Part_1_13210604.1170128588074
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Delivery-Header
Content-ID: <16130797.1170128588074>

<?xml version"1.0" encoding"UTF-8" ?>
<!DOCTYPE DeliveryHeader SYSTEM "DeliveryHeader_MS_V02_00.dtd">
<DeliveryHeader>
 <isSecureTransportRequired>
  <AffirmationIndicator>No</AffirmationIndicator>
 </isSecureTransportRequired>
 <messageDateTime>
  <DateTimeStamp>20070129T214308.027Z</DateTimeStamp>
 </messageDateTime>
 <messageReceiverIdentification>
  <PartnerIdentification>
   <domain>
    <FreeFormText xml:lang"EN">DUNS</FreeFormText>
   </domain>
   <GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
   <locationID>
    <Value>Houston</Value>
   </locationID>
  </PartnerIdentification>
 </messageReceiverIdentification>
 <messageSenderIdentification>
  <PartnerIdentification>
   <domain>
    <FreeFormText xml:lang"EN">DUNS</FreeFormText>
   </domain>
   <GlobalBusinessIdentifier>111111111</GlobalBusinessIdentifier>
  </PartnerIdentification>
 </messageSenderIdentification>
 <messageTrackingID>
  <InstanceIdentifier>936ce0f9f70d11940000361c</InstanceIdentifier>
 </messageTrackingID>
</DeliveryHeader>

------=_Part_1_13210604.1170128588074
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Service-Header
Content-ID: <24061782.1170128588074>

<?xml version"1.0" encoding"UTF-8" ?>
<!DOCTYPE ServiceHeader SYSTEM "ServiceHeader_MS_V02_00.dtd">
<ServiceHeader>
 <ProcessControl>
  <ActivityControl>
   <BusinessActivityIdentifier>OrderCreate</BusinessActivityIdentifier>
   <MessageControl>
    <fromRole>
     <GlobalPartnerRoleClassificationCode>Seller</GlobalPartnerRoleClassificationCode>
    </fromRole>
    <fromService>
     <GlobalBusinessServiceCode>Seller Service</GlobalBusinessServiceCode>
    </fromService>
    <inReplyTo>
     <ActionControl>
      <ActionIdentity>
       <GlobalBusinessActionCode>Purchase Order Notification</GlobalBusinessActionCode>
       <messageStandard>
        <FreeFormText>PIDX</FreeFormText>
       </messageStandard>
       <standardVersion>
        <VersionIdentifier>1.0</VersionIdentifier>
       </standardVersion>
```

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04/15/2008

```
            </ActionIdentity>
            <messageTrackingID>
                <InstanceIdentifier>0af840f3f70d1486000005ec</InstanceIdentifier>
            </messageTrackingID>
        </ActionControl>
    </inReplyTo>
    <Manifest>
        <numberOfAttachments>
            <CountableAmount>0</CountableAmount>
        </numberOfAttachments>
        <ServiceContentControl>
            <SignalIdentity>
                <GlobalBusinessSignalCode>Receipt Acknowledgment</GlobalBusinessSignalCode>
                <VersionIdentifier>V02.00</VersionIdentifier>
            </SignalIdentity>
        </ServiceContentControl>
    </Manifest>
    <toRole>
        <GlobalPartnerRoleClassificationCode>Buyer</GlobalPartnerRoleClassificationCode>
    </toRole>
    <toService>
        <GlobalBusinessServiceCode>Buyer Service</GlobalBusinessServiceCode>
    </toService>
    </MessageControl>
</ActivityControl>
<GlobalUsageCode>Test</GlobalUsageCode>
<partnerDefinedPIPPayloadBindingId>
    <ProprietaryReferenceIdentifier>PIDX</ProprietaryReferenceIdentifier>
</partnerDefinedPIPPayloadBindingId>
<pipCode>
    <GlobalProcessIndicatorCode>P31</GlobalProcessIndicatorCode>
</pipCode>
<pipInstanceId>
    <InstanceIdentifier>0af840f3f70d1485000005e8</InstanceIdentifier>
</pipInstanceId>
<pipVersion>
    <VersionIdentifier>1.0</VersionIdentifier>
</pipVersion>
<KnownInitiatingPartner>
    <PartnerIdentification>
        <domain>
            <FreeFormText xml:lang"EN">DUNS</FreeFormText>
        </domain>
        <GlobalBusinessIdentifier>999999999</GlobalBusinessIdentifier>
    </PartnerIdentification>
</KnownInitiatingPartner>
</ProcessControl>
</ServiceHeader>

------=_Part_1_13210604.1170128588074
Content-Type: Application/XML
Content-Transfer-Encoding: quoted-printable
Content-Location: RN-Service-Content
Content-ID: <8363939.1170128588074>

<?xml version"1.0" encoding"UTF-8" ?>
<!DOCTYPE ReceiptAcknowledgment SYSTEM "AcknowledgmentOfReceipt_MS_V02_00.dtd">
<ReceiptAcknowledgment/>

------=_Part_1_13210604.1170128588074--

--21706121.1170128588370--
```