



PIDX XML Standards Master

Version 1.0

2002-02-14

**Complex Products and Services Task Group (Com.Pro.Serv.)
Petroleum Industry Data eXchange (PIDX)
American Petroleum Institute (API)**

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Change Management Log

Version Date (YYYY-MM-DD)	Person	Description of Change
2001-11-30	Com.Pro.Serv. Task Group	Original Version 1.0 issued
2002-02-14	Michael Tunstall	Change naming convention to issue for review by PIDX Standards Subcommittee

1. Com.Pro.Serv. XML Standards

1.1. Overview

The PIDX Procurement User Group and Standards Subcommittee sanctioned the Complex Products and Services Task Group (Com.Pro.Serv.) as a project to promote standard processes for non-catalog, configurable products and services using eBusiness technology. A group of petroleum industry representatives and technology service providers collaborated to define a set of industry specific XML standards.

The PIDX Com.Pro.Serv. Task Group created the Com.Pro.Serv. XML Standards document for the American Petroleum Institute (API) Petroleum Industry Data eXchange (PIDX). The purpose of this document is to describe the standards and conventions used to write the Com.Pro.Serv. XML Schemas.

1.2. Purpose

The purposes of the Com.Pro.Serv. XML Standards document are

- To document decisions made and conventions used during the Com.Pro.Serv. project
- Submission to the PIDX Standards Process for recognition as an API Recommended Practice
- To allow future PIDX projects to create new PIDX XML Schemas that are compatible with the current XML Schemas.

1.3. Scope

The Com.Pro.Serv. XML Standards document addresses three major areas:

- Data names
- XML Schemas
- Routing, Transport, and Packaging

1.4. Change Management Process

Submit change requests for this document to the PIDX Standards Sub-Committee. The PIDX Standards Sub-Committee will evaluate the request, make the necessary changes, update the Change Management Log in this document and store the revised document.

The version number of the document should be changed according to the following recommended guidelines. The version number is of the form x.y where x and y are decimal integers. Major changes to a Com.Pro.Serv. XML Standards document are given the next sequential version number with a .0 decimal number (4.3 moves to 5.0). Minor changes including error corrections and relatively minor additions and deletions to the Com.Pro.Serv. XML Standards document are given the next decimal digit (4.3 moves to 4.4). No specific guidelines are given to differentiate between a major and a minor change.

1.5. Audience

The target audiences of the Com.Pro.Serv. XML Standards document are petroleum industry members who are responsible for creating and maintaining Com.Pro.Serv. XML documents. This document assumes an understanding of XML instance (data) documents, W3C XML Schemas including XML Datatypes and XML Namespaces, and a general knowledge of business data processing.

This document does not attempt to teach a person who is unfamiliar with XML instance documents or W3C XML Schemas how to use these technologies.

2. Com.Pro.Serv. Data Standards

2.1. Purpose

The PIDX Com.Pro.Serv. Data Standards section describes naming conventions for XML Schema information items which are used in Com.Pro.Serv. XML instance documents and XML Schemas. The objectives of these naming standards are:

- To create consistency in component names used in Com.Pro.Serv. XML documents
- To build a base set of data names for future PIDX XML use
- To gain understanding and experience with names for XML use
- To eliminate name duplication for elements and attributes
- To reduce maintenance and enhance extensibility through the use of intuitive naming standards

2.2. Scope

The PIDX Com.Pro.Serv. Task Group identified and documented all data elements used in the Com.Pro.Serv. XML Schemas. The Com.Pro.Serv. data elements have been submitted to PIDX for inclusion in the Petroleum Industry Data Dictionary (PIDD). The Com.Pro.Serv. Task Group has also requested that additional data columns be added to the PIDD to store XML-specific information. The PIDD will become the official repository for XML Schema data element names.

2.3. References

2.3.1. CIDX Data Dictionary 2.0

The PIDX Com.Pro.Serv. Task Group used the Chemical Industry Data exchange (CiDX) Data Dictionary 2.0 as one source of information item names. The CiDX data dictionary can be accessed at www.cidx.org.

2.3.2. xCBL and OFS Portal

To a lesser extent than the CiDX data dictionary, the Com.Pro.Serv. Task Group used xCBL and OFS Portal data names. xCBL names may be found at www.xcbl.org. OFS Portal names are currently not available from the web site. The OFS Portal web site is www.ofsportal.com.

2.3.3. PIDD

The Com.Pro.Serv. Task Group also used the PIDX Data Dictionary (PIDD) as a source for information item names as well as the ultimate target for Com.Pro.Serv. data elements. The PIDD data dictionary can be accessed at www.pidx.org.

2.4. General XML Naming Conventions

2.4.1. Naming Source

The general Com.Pro.Serv. Task Group approach for information item names was to use existing names wherever possible. If an existing name was not available, a name consistent with established standards was invented. The Com.Pro.Serv. Task Group followed this sequence for assigning names:

1. Use an applicable CIDX data name with a matching definition if available
2. Use an applicable existing PIDD name. Convert the PIDD name to an XML name by eliminating spaces between words and capitalizing the first letter of each word.
3. Use another standard name. Look at OFS Portal, xCBL, or another standard for an existing name. Convert the name to the PIDX standard format to conform with the rules listed in section 2.4.2.
4. Invent a new name. Conform to the rules listed in section 2.4.2.

2.4.2. Naming Conventions

The Com.Pro.Serv. naming standards for new XML-specific data names follow the RosettaNet naming standards, which are used by CiDX. The CiDX naming standards are outlined in the CiDX Chemical eStandards document in section 1.5.4 Message Elements:

“When new element names are required, follow the RosettaNet naming convention of:

- creating element names comprised of one to several words
- using letters only; no underscores, hyphens or other non-letter words
- using upper case for letters that begin words, and lowercase for all other letters
- using singular tense
- avoiding abbreviations and acronyms
- not using numbers in names (e.g. AddressLine1, AddressLine2, etc.)”

2.4.2.1. Use Mixed Case to Create a Compound Name

A compound name is made from more than one word. An example is SellerAddress. Make the compound name more readable and reduce its length by using mixed case letters to separate each word. In this case each word is capitalized and the body of the word is in lowercase letters.

2.4.2.2. Use Upper Case for the First Letter of an XML Element Name

Use upper case for the first letter of each word of an Element name including the first letter of the element name.

2.4.2.3. Use Lower Case for the First Letter of an XML Attribute

Use lower case for the first letter of an Attribute name. Use an upper case letter for all subsequent names.

2.4.2.4. Use Standard Suffix Words

Use standard suffixes to indicate information item names. The following table lists standard information item name suffixes and the associated meaning of the suffix.

Suffix	Definition
Amount	Dollar amount
Flag	Boolean. Values are “true” or “false”, “1” or “0”
Indicator	Used on attribute names that “indicate” the type of an element

Suffix	Definition
Information	Group(complex) data element
Type	Datatype definition

2.4.2.5. Element Usage

Use elements to define individual data fields needed by application systems. Do not consolidate multiple data elements in a single field if they will need to be separated. For instance create individual elements for FirstName, MiddleName and LastName rather than a single element for PersonName.

2.4.2.6. Attribute Usage

Use attributes to qualify general names. For instance use the “partnerIndicator” attribute to qualify the “PartnerInformation” element by assigning values of “BillTo”, “ShipTo”, “Buyer”, “Seller”, etc. to “partnerIndicator”.

2.4.2.7. Choose Simple Names

When presented with multiple naming choices, choose the simplest of the choices. Complex names tend to increase the time it takes to understand the intention of the original designer and the level of expertise of the reader is never guaranteed.

2.4.2.8. Avoid Abbreviations; Use Only When Needed.

Use commonly accepted abbreviations that are meaningful to the reader. An example of this is the abbreviation “Mr” for “Mister”.

Do not use abbreviations that could have multiple meanings. “Acct” could either mean “Acceptance” or “Account.”

You may use commonly accepted petroleum industry abbreviations. However, if possible reduce the use of abbreviations when clearer names can be used.

2.4.2.9. Design for Regional Differences

Be aware of International usage. Where possible, information item names should not be misinterpreted, offensive, or confusing to users in other countries.

2.5. Petroleum Industry Data Dictionary (PIDD)

2.5.1. PIDD

The Com.Pro.Serv. Task Group has include all information item names, definitions, and associated data characteristics into the Petroleum Industry Data Dictionary (PIDD). This required that the PIDD be modified to collect such XML-specific data fields as XML name, simple or complex, and datotyping information. The Com.Pro.Serv. Task Group also request that the PIDD be modified to include additional XML related information and the new Com.Pro.Serv.-identified data elements.

The Com.Pro.Serv. Task Group used the following approach to define changes for the PIDD.

1. Reviewed the existing PIDD to become familiar with the baseline columns.
2. Decided what new columns should be added to the PIDD to collect XML-specific data fields.
3. Submitted a request to PIDX to add a new column to the PIDD to store the XML-specific data.

2.5.2. Documentation Scope

The Com.Pro.Serv. Task Group documented Com.Pro.Serv. elements and attributes. The Com.Pro.Serv. Task Group did not address PIDD names that were not needed for the Com.Pro.Serv. documents.

2.5.3. Documentation Tools

The Com.Pro.Serv. Task Group collected data element information using two tools.

- Excel Spreadsheets named "Com.Pro.Serv. Data Element Spreadsheet"
- A Com.Pro.Serv. Access database.

3. XML Schema Standards

3.1. Purpose

The XML Schema Standards section describes the standards and conventions used by the Com.Pro.Serv. Task Group to create XML Schemas. The objectives of these standards are:

- To create consistency among the Com.Pro.Serv. XML Schemas
- To utilize reusable components throughout the Com.Pro.Serv. XML Schemas
- To allow future XML Schema developers to create additional schemas that are compatible with the Com.Pro.Serv. XML Schemas
- To reduce maintenance and enhance extensibility through the use of reusable components

3.2. Scope

The XML Schema Standards section addresses the standards and conventions used to create Com.Pro.Serv. XML Schemas.

Com.Pro.Serv. XML Schemas were designed based on W3C XML Schema standards. These XML Schemas were created by the Com.Pro.Serv. Task Group to define transactions that are passed between trading partners to support business processes for the procurement and delivery of complex products and services. Com.Pro.Serv. XML Schemas include XML Schemas for specific transactions, one product or service template, and a library of reusable components which are used by all other Com.Pro.Serv. XML Schemas.

3.3. References

The Com.Pro.Serv. XML Schema Standards conform to the May 2, 2001 XML Schema Recommendation published by the World Wide Web Consortium (W3C).

XML Schema Part 0: Primer : <http://www.w3.org/TR/2001/REC-xmlschema-0-20010502/>
XML Schema Part 1: Structures: <http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/>
XML Schema Part 2: Datatypes: <http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/>

3.4. Replicable

The Com.Pro.Serv. XML Standards section promotes the creation of consistent XML Schemas for the Com.Pro.Serv. project and can be replicated for subsequent PIDX projects. The Com.Pro.Serv. XML Schema Standards document allow future developers to

- Create new XML Schemas which are consistent with existing Com.Pro.Serv. XML Schemas
- Reuse standard components which the Com.Pro.Serv. project has developed
- Document best practices for XML Schemas

3.5. Payload Only

The Com.Pro.Serv. XML Schema Standards section addresses the creation of XML Schemas for the data-carrying XML instance documents. Within the context of the RosettaNet Implementation Framework 2.0 (RNIF 2.0), the Com.Pro.Serv. XML Schema Standards address the service content of the data

payload. The XML Schema Standards section do not address the RNIF 2.0 headers, RNIF 2.0 signal messages, RNIF 2.0 MIME headers, or RNIF 2.0 attachments.

Please see Section 2 Com.Pro.Serv. Data Standards section that addresses naming and defining data elements.

Please see Section 4 Com.Pro.Serv. Transport, Routing, and Packaging Standards for RNIF 2.0 usage.

3.6. Business Rules

XML Schemas support strong datatyping through the use of primitive and derived datatypes. Where possible XML data types are used to define data elements and define business rules which are likely to apply to all implementations.

XML Schema does not provide a mechanism to adequately define complex (especially conditional) business rules. In general, complex business rules are not implemented by the XML Schema. The enforcement of business rules should be implemented by mechanisms outside of the XML Schema such as

- an XSL stylesheet,
- an Enterprise Application Integration (EAI) product
- a custom program written by the trading partners

The PIDX Implementation Guideline document defines each Com.Pro.Serv. transaction and associated general business rules and constraints. Trading partners can use the PIDX Implementation Guideline to define specific business rules for their particular transactions and as a basis for partner-specific rules.

3.6.1. XML Schema Change Management Process

To change a Com.Pro.Serv. XML Schema submit requested changes to the API PIDXProcurement User Group Standards Sub-Committee. The API PIDX Standards Sub-Committee reviews, revises, approves, or denies change requests.

3.6.2. XML Schema Design Principles

The Com.Pro.Serv. XML Schema Standards attempt to find a middle ground between very restrictive XML Schemas and un-restrictive XML Schemas. If a Com.Pro.Serv. XML Schema is too restrictive, some trading partners may not be able to use the XML Schema because data that they need to transmit or receive may not be allowed. If the XML Schema is totally unrestricted, the XML Schema cannot be used to guarantee that data conforms to predefined requirements.

The Com.Pro.Serv. Task Group built on work performed by other standards organizations:

- Chemical Industry Data Exchange (CiDX)
- ebXML
- OFS Portal
- PIDX
- RosettaNet
- xCBL

3.7. XML Structure

3.7.1. Com.Pro.Serv. XML Schema Structure Objectives

The objectives of the Com.Pro.Serv. XML Schema structure are:

- To enable the creation of straight-forward, easy to construct XML instance (data) documents

All Com.Pro.Serv. instance document attributes and elements are assigned to a single PIDX namespace. Com.Pro.Serv. instance documents may specify a default namespace that will associate all instance element and attribute names to the PIDX namespace. A situation we want to avoid is the need to qualify some but not all element names in instance documents which potentially causes more effort and more errors during the creation of instance documents.

- To enable XML instance documents to be validated against Com.Pro.Serv. XML Schemas

Com.Pro.Serv. XML instance documents should be validated against Com.Pro.Serv. XML Schema documents in a clear and understandable manner.

- To create straightforward, easy to construct Com.Pro.Serv. XML Schemas

Com.Pro.Serv. XML Schema writers should be able to reuse standard XML Schema components. The XML Schema writers will need to understand XML Schema namespaces, attribute and element qualification, default namespace usage, and target namespace usage.

3.7.2. Standard Schema Structure

Com.Pro.Serv. XML Schemas utilize the following standard code. This code and its ramifications are described in following sections.

```
<?xml version="1.0" encoding="UTF-8"?>
<schema xmlns = "http://www.w3.org/2001/XMLSchema"
  targetNamespace= "http://www.api.org/pidXML/v1.0"
  xmlns:pidx= "http://www.api.org/pidXML/v1.0"
  elementFormDefault = "qualified"
  attributeFormDefault = "unqualified"
  version= "0.0">

  <annotation>
    <documentation>
      Schema Name: Place Schema Name here
      Schema Purpose: Describe purpose of Schema here
      Copyright: American Petroleum Institute (API)
                  Petroleum Industry Data Exchange (PIDX)
                  2001
      Schema Version Number: 0.0
      Version Date: CCYY-MM-DD
      Change Management Log:
      Version Person          Date          Description
      0.0.0 Place Name Here CCYY-MM-DD Describe change here
    </documentation>
  </annotation>

  <include . . . >
```

```
. . .  
</schema>
```

3.7.3. Namespaces

Com.Pro.Serv. XML Schemas use two namespaces:

1. The PIDX namespace

- `xmlns:pidx= "http://www.api.org/pidXML/v1.0"`

2. The W3C XML Schema namespace which is the default namespace

- `xmlns:= "http://www.w3.org/2001/XMLSchema"`

These two namespaces define the PIDX and W3C Schema vocabularies which are used in the Com.Pro.Serv. XML Schemas. Com.Pro.Serv. XML instance (data) documents use the PIDX vocabulary for all tag names.

3.7.4. Default Namespace

Com.Pro.Serv. XML Schemas set the default namespace to the W3C XML Schema namespace with the following attribute assignment for the `schema` element:

```
xmlns:= "http://www.w3.org/2001/XMLSchema"
```

This default namespace assignment means that W3C XML Schema elements and attributes such as `schema`, `element`, `attribute`, `complexType`, and `name` do not need to be qualified using a namespace prefix.

3.7.5. targetNamespace

Com.Pro.Serv. XML Schemas set the `targetNamespace` attribute to the PIDX namespace with the following attribute assignment for the `schema` element:

```
targetNamespace= "http://www.api.org/pidXML/v1.0"
```

References to global PIDX information items must use a namespace prefix ("`pidx:`") to identify that they belong to the PIDX namespace. Since all reusable components are global information items all reusable items must be qualified with the PIDX namespace prefix when they are referenced in a Com.Pro.Serv. XML Schema.

3.7.6. PIDX Namespace Prefix

Com.Pro.Serv. XML Schemas use the PIDX namespace for all PIDX element names. Set the PIDX namespace prefix with the following attribute assignment for the `schema` element:

```
xmlns:pidx= "http://www.api.org/pidXML/v1.0"
```

Use the PIDX namespace prefix "`pidx:`" when referring to global PIDX information items.

3.7.7. elementFormDefault and attributeFormDefault

Com.Pro.Serv. XML Schemas use the elementFormDefault attribute to force the assignment of the PIDX namespace and namespace prefix to all element names.

Com.Pro.Serv. XML Schemas use the attributeFormDefault attribute to specify that attributes do not need to be qualified with a namespace prefix. Attributes will assume the namespace of their associated element.

Set elementFormDefault and attributeFormDefault with the following attribute assignments for the schema element:

```
elementFormDefault = "qualified"  
attributeFormDefault = "unqualified"
```

3.7.8. Reusable Components

The Com.Pro.Serv. XML Schema component library stores reusable Com.Pro.Serv. components. The name of the Com.Pro.Serv. XML Schema component library, itself an XML Schema, is PIDXLib.xsd.

Each Com.Pro.Serv. XML Schema can use, extend, or restrict the components in the Com.Pro.Serv. XML Schema component library as needed.

Access the PIDXLib.xsd schema with an include element which is a child of the root schema element.

```
<include schemaLocation = "location of PIDXLib.xsd" >
```

Set the include to access the PIDXLib.xsd schema.

Com.Pro.Serv. recommends that PIDXLib.xsd be placed in the same directory structure as the Com.Pro.Serv. XML Schemas but it is the responsibility of each Com.Pro.Serv. user to point the include to its own implementation location of the PIDXLib.xsd schema.

Most of the Com.Pro.Serv. elements are defined in the reusable component library. The three major exceptions are 1) some elements associated with the templates, 2) the topmost elements for each business message schema (OrderCreate, OrderChange) schema, and 3) their direct children.

For example, the topmost elements that are not defined in the reusable library for the OrderCreate schema are OrderCreate and OrderCreate's direct children: OrderCreateProperties, OrderCreateDetails, and OrderCreateSummary.

3.7.8.1. PIDXLib.xsd

- The PIDXLib.xsd XML Schema library is structured in alphabetical order by information item name within information item type. All global elements are in an alphabetized list followed by an alphabetized list of global attribute names.
- Each reusable information item is a global information item by being a child of <schema . . . >.

3.7.8.2. ref

Access reusable components using the `ref` attribute:

```
< . . . ref = "pidx:informationitemname" . . . >
```

3.7.9. XML Data Formats

Use the XML Schema standard conventions for data formats. A few of the standard formats are presented here for convenience. Definitive definitions can be found at

<http://www.w3.org/TR/xmlschema-2/> (XML Schema Part 2: Datatypes)
<http://www.w3.org/TR/2000/WD-xml-2e-20000814> (XML 1.0 Second Edition)

3.7.9.1. boolean

Use one of four values: "true" "false" "1" "0". "1" is "true." "0" is "false."

3.7.9.2. date

A date is a Gregorian calendar date in the form CCYY-MM-DD. C, Y, M, and D are all decimal digits. An optional time zone indicator may be specified.

3.7.9.3. dateTime

A dateTime is a specific instance in time in the form CCYY-NN-DDThh:mm:ss. An optional time zone indicator may be specified. Note that the letter T separates the date and time.

3.7.9.4. decimal

A decimal is string of decimal digits with an optional decimal point. The string of decimal digits may be preceded with a minus sign or a plus sign. The decimal string may begin with a zero.

3.7.9.5. integer

An integer is a string of decimal digits. It may be preceded with a plus or minus sign. It may begin with a zero.

3.7.9.6. NMTOKEN

A NMTOKEN is a string of alphabetic characters, numeric characters, and the characters ". " " -" "_ " and ":". The NMTOKEN string must begin with an alphabetic character. A NMTOKEN may not begin with any combination of uppercase or lowercase letters that spell XML. Spaces are not allowed.

3.7.9.7. string

A string is a sequence of alphabetic, numeric, and special characters. Spaces are allowed. XML characters including "<" ">" "&" "\"" "" must be represented by the special names `<` `>` `&` `'` `"` or `<` `>` `` `'` `"` respectively.

3.7.10. Required Elements

Place required elements at the top of the XML Schema structure.

3.7.11. Attribute Enumerations

List attribute enumerations in alphabetical order. Include the attribute `Other` in enumerations where appropriate.

3.7.12. Com.Pro.Serv. XML Instance Documents

Com.Pro.Serv. XML instance (data) documents use a default namespace assignment (`xmlns = "http://www.api.org/pidXML/v1.0"`) to assign all element names to the PIDX namespace without requiring that each or some element names be qualified with a prefix. If the following code is used, *element names do not need to be qualified in instance documents.*

```
<?xml version = "1.0" encoding="UTF-8"?>
  <elementname xmlns = "http://www.api.org/pidXML/v1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:pidx="http://www.api.org/pidXML/v1.0"
    xsi:schemaLocation="http://www.api.org/pidXML/v1.0/ schema-
      location ">
    < . . . >

    </ . . . >
  </elementname>
```

Local attributes do not require a prefix; they default to the `pidx:` prefix. All of the attributes used in the Com.Pro.Serv. XML Schemas are local attributes with the exception of two global attributes. Global attributes require a prefix. At the current time two global attributes are used in the Com.Pro.Serv. XML Schemas:

- `pidx:transactionPurposeIndicator`
- `pidx:version`

Global attributes, like global elements, require a qualification prefix to associate the attribute with a namespace. It is necessary to use the `pidx:` prefix qualifier for these two attributes and to define the `pidx:` prefix qualifier with the `xmlns:pidx=http://www.api.org/pidXML/v1.0` attribute definition as shown above. If additional global attributes are defined in the future they will also require a prefix in instance documents.

The `schemaLocation` attribute is optional. Its use depends upon the implementation agreement between the two trading partners. The W3C XML standards does not require that an XML processor use the `schemaLocation` to validate the instance document. Depending on the implementation agreement the `schemaLocation` attribute may be used, ignored, or omitted.

3.8. Required Behavior

The required behavior described in this section refers to what a Com.Pro.Serv. XML processing system must do. The Com.Pro.Serv. XML processing system consists of:

- System input (XML Schemas, XML instance documents, and optionally XSL stylesheets)
- Processing applications (XML processors, stylesheet translators)
- System output (signal acknowledgement)

This section describes how behavior is determined but does not describe in detail the system's required behavior. The system must:

1. Receive the XML instance document.
2. Store the received XML instance document.
3. Validate that the XML instance document conforms to the business rules documented within and outside of a schema. Validate against an XML Schema and validate with a stylesheet or another external program.
4. Create an acknowledgement to the sender that the instance document was received and validated. This will be accomplished with an RNIF 2.0 positive or negative Signal message.
5. Pass the validated transaction to an application processor.

Validation success or failure depends on the extent an instance document conforms to the business rules described by the Com.Pro.Serv. XML Schema, by the stylesheet, or by an external program.

The focus of this section is the role Com.Pro.Serv. XML Schemas play in determining required behavior. Specifically this section addresses what kinds of rules Com.Pro.Serv. XML Schema can and cannot validate, additional limitations imposed on the Com.Pro.Serv. XML Schemas by the schema design approach, which business rules are included and excluded in the Com.Pro.Serv. XML Schema, and how the business rules should be addressed.

3.8.1. Business Rule Realizations

Com.Pro.Serv. XML Schemas define and describe the XML vocabularies used in XML instance documents. Schemas provide a way to constrain and document the meaning, usage, and relationships of datatypes, elements and their content, and attributes and their values. The constraints are largely drawn from business rules. For example:

1. An invoice will have one and only one buyer and seller, and zero to many ship to locations.
2. The total of an invoice must equal the sum of the net amount of each line.
3. The remit-to address is optional.

However, W3C XML Schemas cannot describe all business rules. W3C XML Schemas cannot easily express what to do if some condition is not met. The second business rule is an example of this kind of business rule. Additionally, the Com.Pro.Serv. design approach places additional limitations on the constraints the Com.Pro.Serv. XML Schema can provide. The Com.Pro.Serv. schema design emphasizes component reusability at the expense of providing XML instance document constraints.

3.8.2. Business Rule and Component Reusability

As a general rule Com.Pro.Serv. XML Schemas do not try to enforce business rules. The following XML Schema fragment illustrates how reusable components are used to specify multiple types but do not enforce business rules.

```
<element ref="pidx:ContactInformation" minOccurs="0" maxOccurs="unbounded"/>
. . .
<element name="ContactInformation">
  <complexType>
    <sequence>
```

```

<element ref="pidx:ContactIdentifier" minOccurs="0"/>
<element ref="pidx:ContactName" minOccurs="0"/>
<element ref="pidx:ContactDescription" minOccurs="0"/>
<element ref="pidx:Telephone" minOccurs="0" maxOccurs="unbounded"/>
<element ref="pidx:EmailAddress" minOccurs="0"/>
<element ref="pidx:AlternativeCommunicationMethod" minOccurs="0"/>
</sequence>
<attribute name="contactInformationIndicator" use="optional">
  <simpleType>
    <restriction base="string">
      <enumeration value="BuyerDepartment"/>
      <enumeration value="DeliveryContact"/>
      <enumeration value="DesignEngineer"/>
      <enumeration value="EnteredBy"/>
      <enumeration value="Engineer"/>
      <enumeration value="FieldRepresentative"/>
      <enumeration value="OfficeRepresentative"/>
      <enumeration value="OrderContact"/>
      <enumeration value="PurchasingAgent"/>
      <enumeration value="RFQContact"/>
      <enumeration value="SalesRepresentative"/>
      <enumeration value="Other"/>
    </restriction>
  </simpleType>
</attribute>
</complexType>
</element>

```

The `ContactInformation` component in this example is used repeatedly in XML instance documents in the procurement process. The XML Schema provides the ability to specify the type of `ContactInformation` by setting the `contactInformationIndicator` attribute to `PurchasingAgent` or one of the other enumerated values.

3.8.3. Functional Acknowledgements, Signals, Receipts, Exceptions

The acknowledgement Signal of an XML instance document is addressed in the Transport, Routing, and Packaging section of this document. A Signal refers to an acknowledgement that a message has been received and validated according to RNIF 2.0 standards.

3.8.4. Dependencies

The XML Schema specification describes three levels of conformance for schema processors. The specification describes a three layer architecture implied by the three conformance levels. The layers are:

1. The **validation core**: Instance information items are validated against the XML Schema by relating schema components and instance information items.
2. **Schema representation**: The connections between XML representations and schema components, including the relationships between namespaces and schema components.
3. **XML Schema web-interoperability guidelines**: instance->schema and schema->schema connections for the WWW.

Additional details on each of the three layers is provided in the W3C XML Schema Recommendation specification. The Com.Pro.Serv. schemas conform to the first two levels of conformance.

3.8.5. Constraints

The Com.Pro.Serv. XML Schemas conform to the W3C XML Schema Recommendation May 2, 2001.

3.8.5.1. ASCII Text

Com.Pro.Serv. XML Schemas are created and maintained in ASCII text format to enable distribution for both UNIX and Windows operating systems.

3.8.6. Conditions

The Com.Pro.Serv. XML Schema Standards assume that an XML Schema parser will be used to validate the XML instance document. The parser must conform to the second level of the W3C XML Recommendation. Namespaces, XML Schema, etc. must be supported.

3.9. Documentation

3.9.1. Documentation Scope

Two types of documentation are associated with each XML Schema: internal and external. Internal documentation is placed inside the XML Schema document; external documentation is a document outside the XML Schema document.

3.9.2. Version Numbers

Com.Pro.Serv. XML Schemas are given version numbers of the form x.y where x and y are decimal integers. Changes to a Com.Pro.Serv. XML Schema which are not backward compatible are given the next sequential version number with a .0 decimal number (4.3 moves to 5.0). Changes to a Com.Pro.Serv. XML Schema that are backward compatible are given the next decimal digit (4.3 moves to 4.4).

“Backward compatible” means that a document that previously validated against the Com.Pro.Serv. XML Schema continues to validate against the new Com.Pro.Serv. XML Schema. Documents that previously did not validate against the Com.Pro.Serv. XML Schema may validate against the new Com.Pro.Serv. XML Schema.

“Not backward compatible” means that documents that previously validated against a Com.Pro.Serv. XML Schema may not validate against the new Com.Pro.Serv. XML Schema.

3.9.3. Patterns, Regular Expressions

Use internal documentation to explain the purpose of regular expressions used in a Com.Pro.Serv. XML Schema pattern element. Include an example of the data that would be parsed by the regular expression.

3.10. XML Spy

The Altova XMLSpy Integrated Development Environment 4.0 or higher is the primary tool for creating and manipulating Com.Pro.Serv. XML Schemas.

4. Transport, Routing, and Packaging (TRP) Standards

4.1. Purpose

The purpose of the Transport, Routing, and Packaging (TRP) Standards section is to describe the standards and conventions used to implement and maintain a robust and reliable messaging architecture for the exchange of XML documents based on PIDX-defined XML Schemas to support business process automation for the procurement and delivery of Complex Products and Services in the upstream petroleum industry.

4.2. Scope

The Transport, Routing, and Packaging (TRP) Standards section addresses the PIDX use of the RosettaNet Implementation Framework 2.0 (RNIF 2.0) standard. RosettaNet has not validated, sanctioned, or authorized the PIDX use of RNIF 2.0.

4.3. References

The Com.Pro.Serv. Transport, Routing, and Packaging Standard is an extension of RNIF 2.0. Documents that explain and describe RNIF 2.0 may be accessed at the following:

<http://www.rosettanet.org/rosettanet/Rooms/DisplayPages/LayoutInitial>

The "RosettaNet Implementation Framework: Core Specification, Version: Validated 02.00.00, 13 July 2001" (RNIF: CS) document, its supporting DTDs, and Message Guidelines must be understood to use the Transport, Routing, and Packaging (TRP) section.

4.3.1. Audience

The target audience of the Transport, Routing, and Packaging Standards section are petroleum industry individuals responsible for creating and maintaining connectivity for B2B applications designed to exchange Com.Pro.Serv. XML documents with external trading partners. This section assumes an understanding of the RNIF 2.0 and the documents in the References section (4.3).

This document does not attempt to teach a person who is unfamiliar with RNIF 2.0 the details of or how to apply and use RNIF 2.0.

4.3.2. Overview

To facilitate effective implementation of a messaging architecture for data interchange, the Com.Pro.Serv. Task Group defined specific requirements for the preparation, packaging, routing, and transmission of the component XML documents that comprise a business message used to facilitate electronic data exchange. These requirements were developed based on a consideration of the need for data security and integrity in the petroleum industry and a review of data transmission and security procedures currently in use in the industry. The Com.Pro.Serv. Task Group evaluated and leveraged the requirements defined by RNIF 2.0 to develop these requirements and standards.

RosettaNet is an electronic data exchange standards body that focuses on the high technology, electronics manufacturing industry. It seeks to establish a common data and process model for B2B interaction among semiconductor, electronic components, and information technology manufacturers, suppliers, and distributors. The maturity of RosettaNet's standards for data packaging and routing, and

the standard's ability to address the requirements defined for enabling a rthird party routing, attachments, and document encryption led the Com.Pro.Serv. Task Group to incorporate its transport, routing, and packaging standard into the PIDX standard.

4.4. Requirements

PIDX seeks to implement a standard that enforces end-to-end security and integrity of both the messaging process, known as the "conversation" and the transactional data. To this end, the Com.Pro.Serv. Task Group identified the following aspects for transaction TRP:

- Message Identification
- Authentication
- Authorization
- Non-Repudiation
- Confidentiality, Data Integrity
- Reliable Messaging
- Error Handling

RosettaNet's standard for data packaging and transmission, the RosettaNet Implementation Framework 2.0 (RNIF 2.0) targets many of same benefits PIDX sought for its standard.

This Requirements section (4.4) describes key business requirements PIDX has incorporated into its standard to fully address the needs of the petroleum industry.

4.4.1. Message Identification

Message identification requires a message have sufficient information expected by the receiver to allow the receiver to identify the transmission and packaging format in order to begin processing the message. Message identification is essential to a secure end-to-end transmission. This information includes details that tell the receiver the envelope format of the message. Once the receiving application (either middleware for routing or application code) begins to process the message, further descriptive details are needed. The business function the message fulfills and routing information should be included in the message identification. Routing information must be detailed enough to permit proper transmission through one or multiple intermediate points such as electronic marketplaces or hubs, without the hub needing to open the message and without the routing data exposing unnecessary confidential information regarding the destination, origin, or content of the message.

4.4.2. Authentication

Authentication is the act of verifying that the sender of a message is who they claim to be. Trading partners can have an assurance that they are sharing information only with trading partners whose identities have been verified. Combined with authorization, authentication is a vital part of secure electronic message exchange. Authentication requires trading partners to agree to mutual validation of their electronic transmissions, usually by an independent third party.

For PIDX's purposes, the basic means for performing this monitoring is some form of digital certificate or signature associated with each message sent. A digital certificate provides a trading-partner-specific identifier that can be independently managed and used to verify a sender's claim of identity. PIDX requires use of an independently managed or independently verifiable means of message authentication for the exchange of business transactions for complex products and services.

4.4.3. Authorization

Authorization ensures that an authenticated trading partner is permitted to send the type of data or transaction they actually transmit. Once a trading partner's identity is known, the application behind an exchange must determine what capabilities are granted to the partner. This includes the capabilities for sending specific types of messages. Typically, each partner grants authorization rights to involved partners.

Trading partners must agree prior to initiating a messaging process that an initiating partner has the rights to send a specific business message and a receiving partner has the rights to act on that message. Authorization must be verified at two levels. The first level is the trading partner organizational level. For example "Does Company A have rights to send purchase orders to Company B?" The second level is that of the individual or application that is sending the message. To build on the previous example 'Does corporate purchasing agent Jones have the right to approve a \$10,000 purchase order from Company A to Company B'? To support full authorization, both conditions must be satisfied before Company B acts upon the purchase order it receives from Company A.

4.4.4. Non-Repudiation

Non-repudiation is required to ensure the integrity of the business message that is being transmitted. Non-repudiation is designed to permit each side in a business message exchange to capture proof of the contents of each message they send and proof that their transacting partner has received a message sent to them. If the data exchange culminates in a legally binding transfer of products or dollars, non-repudiation is typically required to insure that messaging systems meet the same audit standards applied to accounting and other systems where similar transactions are tracked.

PIDX requires 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 of receipt permits the sender of a document to prove that the intended recipient has received the document. Non-repudiation of origin and content provides a message sender proof of what they have sent and when. The seller is protected from the buyer denying that it sent a request.

Both forms of non-repudiation are accomplished by implementing reliable messaging protocols.

4.4.5. Confidentiality

Confidentiality is the protecting data from view or use by parties other than the intended recipient. The use of public networks requires that data be secured from entities (i.e. hackers) that are not part of the legitimate data exchange. Data must also be protected from normally legitimate partners if they are not the intended recipients. Typically data encryption ensures data confidentiality.

PIDX requires that encryption be available at the application (message) layer in addition to any encryption that may be applied at the transport (transmission) layer.

PIDX considered several factors in assessing encryption standards to ensure that data remains confidential. First is the time sensitivity of the data. Data must be protected throughout the amount of time it maintains business validity. The second factor is the media the data uses as a transmission conduit. Data transmitted via public networks such as the Internet require encryption to achieve the same level of confidentiality as that achieved for data transmitted via a private or virtual private connection. The final factor PIDX considered is the cost of each encryption level. Cost is measured in processing time and system resources and/or in dollar cost for encryption technology.

4.4.6. Data Integrity

Data integrity provides a message recipient the ability to verify that a message is complete and accurate. Accurate does not mean that data has the correct meaning for the business context of the data exchanged. It means only that the message received is equal to the message sent. Data integrity guards against changes made to the data either intentionally or unintentionally via corruption during transmission.

4.4.7. Reliable Messaging

Reliable messaging in electronic commerce is the ability of a receiver to receive a message *once and only once*. Reliable messaging is based on a mutually agreed message choreography that covers the number of transmission retries for sending process initiating messages, response messages, and Signal messages.

PIDX requires that reliable messaging be an inherent part of its standard for data transport, routing, and packaging.

Reliable messaging also addresses the need for persistent storage complementing the application logic that maintains reliable messaging, and as a means of supporting non-repudiation. Knowledge of what messages have been both sent and received on both sides of communication is required for guaranteed reliable messages. Requirements for the medium of storage should not be prescriptive and can be determined at the time of implementation of the message exchange, but should support long term, persistent storage.

4.4.8. Error handling and reporting

Robust data exchange requires error handling that identifies when a message was not received properly and identifies the reason for message failure. Error reporting to facilitate reliable messaging means that if a message is received but cannot be processed, the routing and transport system should provide a message to the sender that the message was received but could not be processed. In addition, if a message can be processed at the transport and communications session layers, but fails at the application layer, then an application level error messages should be sent.

4.5. RNIF 2.0 Transmission and Packaging Standard

The RNIF 2.0 standard supports many of the requirements defined above. RNIF 2.0 is based on needs for reliable messaging and non-repudiation defined by RosettaNet members. RosettaNet's RNIF communications model identifies the operations that execute within the application and session layers, dividing the application layer into the action, transaction, process, service, agent, message handling, and security layers (see diagram 1 below). RNIF 2.0 utilizes existing standards including MIME multi-part/related, HTTP(S), SSL, PKCS#7, SMTP, and XML.

RNIF 2.0 provides a consistent envelope format for use across all types of transactions, indicates appropriate message headers to bind message to transport protocols, and provides a standard for digitally signing and encrypting messages.

The PIDX TRP standard does not follow every aspect of RNIF 2.0 standard. Changes have been made to some values in XML data elements in RNIF 2.0 headers. In each of these instances, the PIDX TRP standard seeks to clearly identify the differences between the PIDX TRP standard and RNIF 2.0 to facilitate implementation of a PIDX-based process using available tools that use RNIF 2.0.

4.6. RNIF 2.0 Usage

The following sections highlight PIDX additions and modifications to the RNIF 2.0 standard. This document does not duplicate the "RosettaNet Implementation Framework: Core Specification" (RNIF: CS) document but does refer to it.

This section assumes the reader has a solid understanding of the "RosettaNet Implementation Framework: Core Specification, Version: Validated 02.00.00, 13 July 2001" (RNIF: CS) document, its supporting DTDs, and Message Guidelines.

4.6.1. PIDX MIME Usage

The PIDX TRP standard utilizes the RNIF 2.0 MIME standard according to the RNIF: CS 2.2.1 Use of S/MIME within RosettaNet. RNIF 2.0 follows the IETF RFG 2311 S/MIME Version 2 Message Specification for enveloped and signed data types. The ETF RFG 2311 S/MIME Version 2 Message Specification may be found at <http://www.ietf.org/rfc/rfc2311.txt>.

The following MIME parameters must be used with RNIF 2.0:

MIME Parameter	PIDX Implementation
Content-Type: Application/XML	Used for all RNIF 2.0 headers (Preamble, Deliver, and Service) and the Service content (XML payload).
Content-Location: RN-Preamble Content-Location: RN-Delivery-Header Content-Location: RN-Service-Header Content-Location: RN-Service-Content	The Content-Location for the Preamble, Deliver, and Service headers and the Service content (XML payload).

During implementation planning the trading partners may need to establish the following MIME parameters:

MIME Parameter	PIDX Implementation
Boundary (within Content-Type:)	The trading partners may select boundary values. The value selection may be influenced by the requirements of middleware software that processes the RNIF 2.0 MIME document. Multiple boundaries will be used for encrypted data and digital signatures.
Content-ID	The trading partners may select values for the Content-ID parameters (there are multiple Content-ID parameters). The value selection may be influenced by the requirements of middle ware software that processes the RNIF 2.0 MIME document.
Content-Description	The trading partners may select a value for the Content-Description parameter.

All other MIME parameters should be set as specified in RNIF: CS 2.2.1 and 2.2.2.

4.6.2. Usage with XML Schema

The RNIF 2.0 standard specifies that XML documents are identified by XML DTDs. The PIDX standard specifies that XML documents are identified using XML Schemas. XML Schemas, unlike DTDs, do not require an internal reference to the XML Schema through a doctype parameter. It is the responsibility of the XML Schema validation processor to identify what XML Schema is required for validation and to obtain that validating XML Schema.

The PIDX TRP Standard uses DTDs to define the following XML files as specified in the RNIF: CS.

- Preamble Header
- Delivery Header
- Service Header

The PIDX TRP Standard uses an XML Schema to define the PIDX Service Content instead of a DTD as specified by RNIF 2.0.

Note: *The trading partners may need to use a DTD to define the Service Content if the middleware software validates the Service Content using a DTD.*

4.6.3. RNIF Authentication, Validation, and Non-Repudiation

RNIF 2.0 supports authentication via the use of digital certificates. Digital certificates in RNIF 2.0 are part of an encrypted and digitally signed object created as part of the packaging and enveloping of a business message. PIDX recommends the use of digital certificates for enhanced authentication.

To support robust non-repudiation, PIDX requires its members establish archival systems that support persistent storage of business messages. The length of time for storage of transactions must be determined by the trading partners during implementation planning to meet legal and business requirements. This includes archiving received messages, sent messages, and acknowledgement receipts.

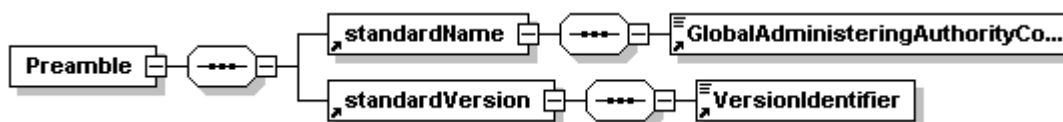
In cases where multiple partners need to agree on a timeframe for data archiving (i.e. exchange via an independent information portal), PIDX recommends using the longest period all parties require.

4.6.4. RNIF Header Details

Preamble

The RNIF 2.0 Preamble header is the first MIME part of the MIME multipart/related document. The Preamble header structure is constant for all RNIF 2.0 messages. RNIF's Preamble contains the following elements (represented schematically).

Figure 1. RNIF 2.0 Preamble Header Schematic



The PIDX TRP standard follows RNIF 2.0 format and content definitions. The Preamble XML must contain a DOCTYPE statement that specifies the DTD for the Preamble header:

```
<!DOCTYPE Preamble SYSTEM "Preamble_MS_V02_00.dtd">
```

Note: No changes should be made to the Preamble header structure because this might impact the ability of an automated middleware tool to process the RNIF 2.0-based message. The middleware tool may require access to the DTD to validate the Preamble header.

Preamble Header Data Element	PIDX Implementation
GlobalAdministeringAuthorityCode	"RosettaNet"
VersionIdentifier	"V02.00"

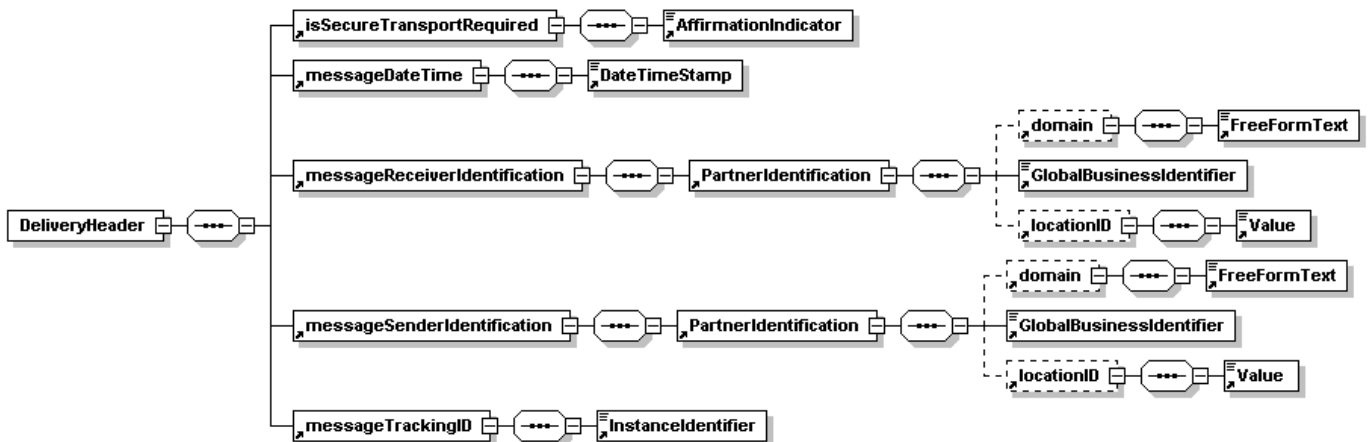
Delivery Header

The RNIF 2.0 Delivery header is the second MIME part of the MIME multipart/related document. The Delivery header structure is constant for all RNIF 2.0 messages.

RNIF 2.0 uses two separate headers for routing and authorization: a Delivery header and a Service header. The Delivery Header is never encrypted. The Service header may be encrypted which permits sensitive information from being read by a third party message router.

RNIF's Delivery header contains the following elements (represented schematically)

Figure 2. RNIF 2.0 Delivery Header Schematic



PIDX requires the Delivery header to follow the RNIF 2.0 format and content definitions. The Delivery header must contain a DOCTYPE statement that specifies the DTD for the Delivery header:

```
<!DOCTYPE DeliveryHeader SYSTEM "DeliveryHeader_MS_V02_00.dtd">
```

Note: No changes should be made to the Delivery header structure because this might impact the ability of an automated middleware tool to recognize the RNIF 2.0-based message. The middleware tool may require access to the DTD to validate the Delivery header.

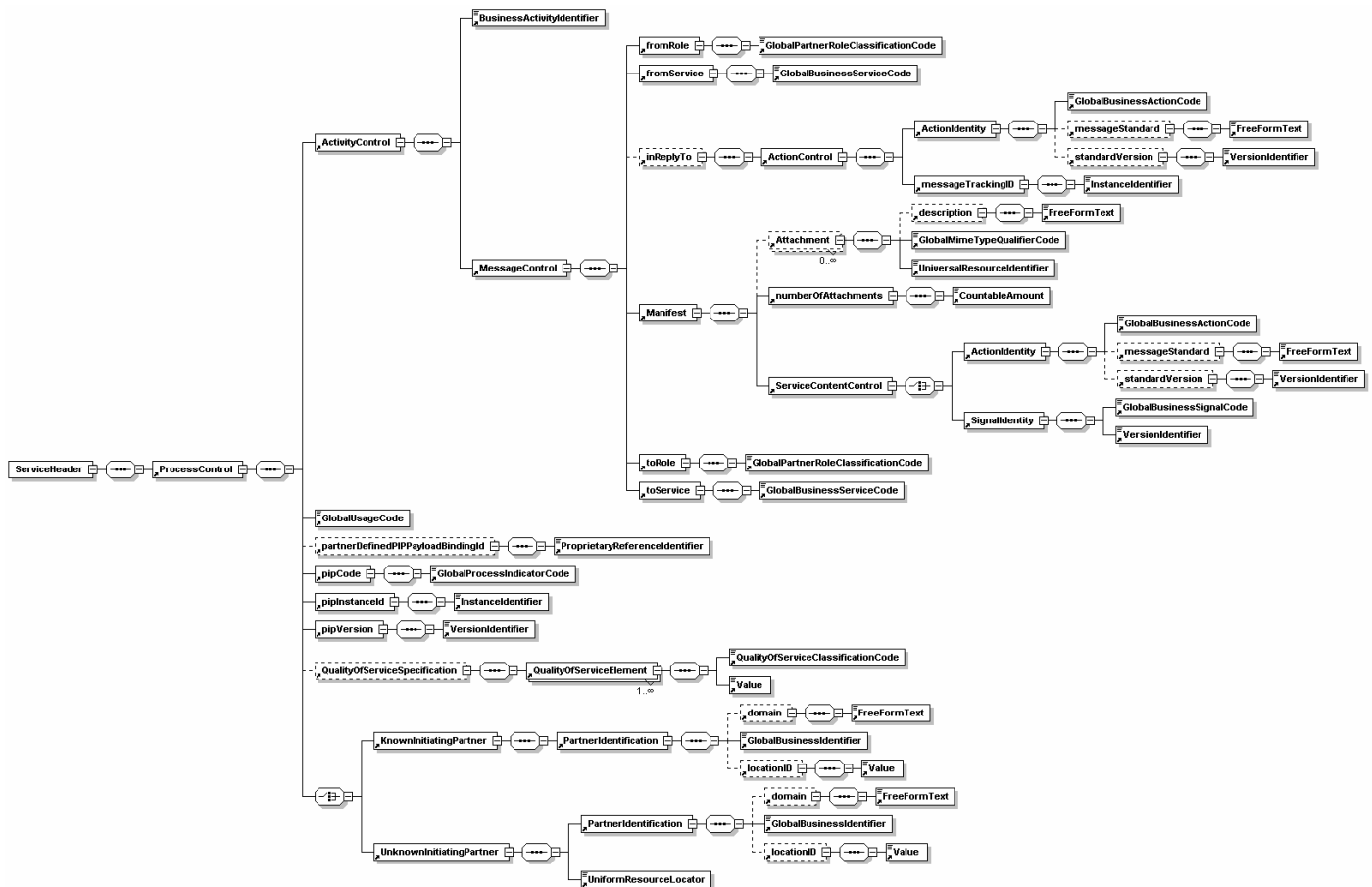
Delivery Header Data Element	PIDX Implementation
AffirmationIndicator	"Yes" The next hub must transmit this message securely "No" The next hub does not need to transmit this message securely
DateTimeStamp	The date and time of the message. The timestamp must be as close to the time of the first attempt as possible. The RNIF 2.0 format is CCYYMMDDTHHMMSS.000Z . This is not the standard XML Schema dateTime.
FreeFormText (under messageReceiverIdentification, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (under messageReceiverIdentification, PartnerIdentification)	The nine digit DUNS number for receiver
Value (under messageReceiverIdentification, LocationID, value)	Location of receiver
FreeFormText (under messageSenderIdentification, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (under messageSenderIdentification, PartnerIdentification)	The nine digit DUNS number for sender
Value (under messageSenderIdentification, LocationID, value)	Location of sender
InstanceIdentifier (under messageTrackingID)	A unique alphanumeric identifier that represents a specific instance of a business process, business transaction, business action, or business signal. The instance identifier must be unique for a particular instance of a business process, business transaction, business action and business signal. The value MUST be unique within the context of the message sender. The InstanceIdentifier is used for subsequent signals.

Service Header

The RNIF 2.0 Service header is the third MIME part of the MIME multipart/related document. The Service header structure is constant for all RNIF 2.0 messages. The Service header may be encrypted which permits sensitive information from being read by a third party message router.

RNIF's Service header contains the following elements (represented schematically)

Figure 3. RNIF 2.0 Service Header Schematic



PIDX requires the Service header to follow the RNIF 2.0 format and content definitions. The Service header must contain a DOCTYPE statement that specifies the DTD for the Service header:

```
<!DOCTYPE ServiceHeader SYSTEM "ServiceHeader_MS_V02_00.dtd">
```

Note: 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. The middleware tool may require access to the DTD to validate the Service header.

The PIDX TRP standard requires that Service header data elements be populated with the following values:

Service Header Data Element	PIDX Implementation
<p>BusinessActivityIdentifier (under ActivityControl)</p>	<p>An identifier which specifies a business activity.</p> <p>RNIF 2.0 requires this data element be populated with either the value populated in the corresponding "Activity" element based in the PIP specification for the specific PIP and activity or based on the values defined in the PIP specification for Business Activity Description. PIDX will use the name of the XML Schema as the BusinessActivityIdentifier:</p> <p>"FieldTicket" "FieldTicketResponse" "Invoice" "InvoiceResponse" "OrderChange" "OrderCreate" "OrderResponse" "Quote" "QuoteNotification" "QuoteRequest" "RequestRequisitionReturn"</p> <p><i>Note: This data element is used for application level process automation – therefore PIDX can define additional values.</i></p>
<p>GlobalPartnerRoleClassificationCode (Under ProcessControl, ActivityControl, MessageControl, fromRole)</p>	<p>This data element is populated with the role the sending or receiving party plays given the specific action they are carrying out in the business message.</p> <p>See Appendix B GlobalPartnerRoleClassificationCode Values for RosettaNet standard values.</p> <p>For signal messages, the value in the fromRole must be the same as the value in the toRole in the action message to which this message is replying.</p> <p><i>Note: This data element is used for application level process automation – therefore PIDX can define additional values. If PIDX defines a small number of new roles, they can be listed here along with references to the specific transactions they are used for.</i></p>
<p>GlobalBusinessServiceCode (Under ProcessControl, ActivityControl, MessageControl, fromService)</p>	<p>This data element is populated with a code defining the type of business service fulfilled by the sending or receiving party given the specific action carried out in the business message.</p> <p>See Appendix C GlobalBusinessServiceCode Values for RosettaNet standard values.</p> <p>For signal messages, the value in the fromService must be the same as the value in the toService in the action message to which this message is replying</p> <p><i>Note: This data element is used for application level process automation – therefore PIDX can define additional values here or in its PIP descriptions. If PIDX defines a small number of new roles, they can be listed here along with references to the specific transactions they are used for.</i></p>

Service Header Data Element	PIDX Implementation
<p>InReplyTo (Structure) (Under ProcessControl, ActivityControl, MessageControl)</p>	<p>This structure must be present if not the first action message in an activity.</p> <p>PIDX transactions are generally a single transmission and this structure will not be used except for signals.</p> <p>This structure must be present for all signals.</p>
<p>GlobalBusinessActionCode (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity)</p>	<p>The Action Code corresponding to the action to which this message is in reply.</p> <p>See Appendix D GlobalBusinessActionCode Values for RosettaNet standard values.</p> <p>PIDX may define custom code values for this data element representing PIDX specific transactions.</p> <p><i>Note: This data element is populated only if the message exchange requires the transaction initiator to refer to another, separate transaction.</i></p>
<p>FreeFormText (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity, messageStandard)</p>	<p>This data element represents the standard or authority used to validate the structure of the message being created. For communication of all PIDX designed messages, this data element must be populated with the literal value</p> <p>“American Petroleum Institute PIDX XML Standards Group”</p> <p><i>Note: Although RosettaNet defines this data element as optional, it is required in every instance for PIDX transactions.</i></p> <p><i>Note: The value defined as the default message standard can be anything PIDX wants – above is my recommendation.</i></p>
<p>VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity, astandardVersion)</p>	<p>This data element is used to indicate the version of the message standard the Service Content must adhere to.</p> <p>For PIDX, this will correspond to the version number of the validated Com.Pro.Serv. XML Schemas. This will initially be:</p> <p>“1.0”</p>
<p>InstanceIdentifier (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, messageTrackingID)</p>	<p>Identifies the instance ID of the action to which this message is a reply. The value MUST come from the Message Tracking ID (InstanceIdentifier under messageTrackingID) in the Delivery header of the original received message.</p>
<p>FreeFormText (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment, description)</p>	<p>Details of the attachment. Not present if the number of attachments is 0. MUST have exactly one occurrence for each attachment.</p>

Service Header Data Element	PIDX Implementation
<p>GlobalMimeTypeQualifierCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment)</p>	<p>The MIME content type for the attachment. Examples:</p> <p>"text/XML" "application/msword" "application/pdf" "application/vnd.ms-excel"</p> <p>See Appendix F GlobalMimeTypeQualifierCode Values for RosettaNet standard values.</p> <p>The "official" list of possible values may be found in the Media Types Directory maintained by the Internet Assigned Numbers Authority at the following web site:</p> <p>http://www.isi.edu/in-notes/iana/assignments/media-types/media-types</p> <p>A somewhat more readable version can be found at:</p> <p>http://www.utoronto.ca/webdocs/HTMLdocs/Book/Book-3ed/appb/mimetype.html#mult</p>
<p>UniversalResourceIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment)</p>	<p>Attribute of Attachment Details. Reference to the content ID of the attached document. This value MUST follow the Content-ID reference syntax per RFC 2111 and MUST name the MIME Content-ID of the attachment.</p>
<p>CountableAmount (Under ProcessControl, ActivityControl, MessageControl, Manifest, numberOfAttachments)</p>	<p>The number of attachments. If no attachments the only allowed value is "0" (the number zero).</p>
<p>GlobalBusinessActionCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity)</p>	<p>The Action Code corresponding to the action to which this message is in reply.</p> <p>See Appendix D GlobalBusinessActionCode Values for RosettaNet standard values.</p> <p>PIDX may define custom code values for this data element representing PIDX specific transactions.</p> <p><i>Note: This data element is populated only if the message exchange requires the transaction initiator to refer to another, separate transaction.</i></p>
<p>FreeFormText (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity, messageStandard)</p>	<p>"PIDX"</p> <p>The standard with which the Service Content MUST be compliant. MUST be set if and only if this is a non-RosettaNet-specified Service Content Message.</p>
<p>VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity, standardVersion)</p>	<p>"1.0"</p> <p>The version of the standard with which the Service Content MUST be compliant. MUST be set if and only if this is a non-RosettaNet-specific Service Content Message.</p>

Service Header Data Element	PIDX Implementation
<p>GlobalBusinessSignalCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, SignalIdentity)</p>	<p>The Signal Code if this is a Signal Message. The two choices are: "Receipt Acknowledgement" "Exception"</p>
<p>VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, SignalIdentity)</p>	<p>"V02.00" for Signals. Not used for Action business messages.</p> <p>The version of the business Signal that is carried in the Service Content. The value for this element MUST be obtained from the Signal Version Identifier field in the Business Signal's Message Guideline.</p> <p>The Receipt Acknowledgement Message Guideline is in the RosettaNet document AcknowledgementOfReceipt_MG_V02_00_00.htm</p> <p>The Exception Message Guideline is the RosettaNet document Exception_MG_V02_00_00.htm</p>
<p>GlobalPartnerRoleClassificationCode (Under ProcessControl, ActivityControl, MessageControl, toRole)</p>	<p>This data element is populated with the role the sending or receiving party plays given the specific action they are carrying out in the business message.</p> <p>See Appendix B GlobalPartnerRoleClassificationCode Values for RosettaNet standard values.</p> <p>For signal messages, the value in the toRole must be the same as the value in the fromRole in the action message to which this message is replying.</p> <p><i>Note: This data element is used for application level process automation – therefore PIDX can define additional values. If PIDX defines a small number of new roles, they can be listed here along with references to the specific transactions they are used for.</i></p>
<p>GlobalBusinessServiceCode (Under ProcessControl, ActivityControl, MessageControl, toService)</p>	<p>This data element is populated with a code defining the type of business service the fulfilled by the sending or receiving party given the specific action carried out in the business message.</p> <p>See Appendix C GlobalBusinessServiceCode Values for RosettaNet standard values.</p> <p>For signal messages, the value in the toService must be the same as the value in the fromService in the action message to which this message is replying</p> <p><i>Note: This data element is used for application level process automation – therefore PIDX can define additional values here or in its PIP descriptions. If PIDX defines a small number of new roles, they can be listed here along with references to the specific transactions they are used for.</i></p>
<p>GlobalUsageCode (Under ProcessControl)</p>	<p>"Test" "Production"</p>

Service Header Data Element	PIDX Implementation																						
<p>ProprietaryReferenceIdentifier (Under ProcessControl, partnerDefinedPIPPayloadBindingId)</p>	<p>This data element is used to identify a proprietary binding ID that permits the RosettaNet based parts of a multipart message to bind to non-Rosettanet parts. This element is populated to cover where the trading partners wish to exchange messages based on proprietary document formats (non RosettaNet Schema) using a RosettaNet PIP.</p> <p>PIDX requirements support the use of the RNIF Framework but will not use existing RosettaNet PIPs. Given that this is the case, Trading Partners will typically not populate this data element.</p>																						
<p>GlobalProcessIndicatorCode (Under ProcessControl, PipCode)</p>	<p>This data element is populated with an alphanumeric code assigned to the transaction implemented by PIDX. PIDX has defined additional valid values here based on PIDX transactions.</p> <p>The PIDX codes are:</p> <table data-bbox="808 783 1211 1052"> <tr><td>FieldTicket</td><td>"P11"</td></tr> <tr><td>FieldTicketResponse</td><td>"P12"</td></tr> <tr><td>Invoice</td><td>"P21"</td></tr> <tr><td>InvoiceResponse</td><td>"P22"</td></tr> <tr><td>OrderChange</td><td>"P32"</td></tr> <tr><td>OrderCreate</td><td>"P31"</td></tr> <tr><td>OrderResponse</td><td>"P33"</td></tr> <tr><td>Quote</td><td>"P42"</td></tr> <tr><td>QuoteNotification</td><td>"P43"</td></tr> <tr><td>QuoteRequest</td><td>"P41"</td></tr> <tr><td>RequestRequisitionReturn</td><td>"P51"</td></tr> </table> <p>See Appendix A PIDX XML Schema to PIDX "PIP" Number for PIDX standard values.</p>	FieldTicket	"P11"	FieldTicketResponse	"P12"	Invoice	"P21"	InvoiceResponse	"P22"	OrderChange	"P32"	OrderCreate	"P31"	OrderResponse	"P33"	Quote	"P42"	QuoteNotification	"P43"	QuoteRequest	"P41"	RequestRequisitionReturn	"P51"
FieldTicket	"P11"																						
FieldTicketResponse	"P12"																						
Invoice	"P21"																						
InvoiceResponse	"P22"																						
OrderChange	"P32"																						
OrderCreate	"P31"																						
OrderResponse	"P33"																						
Quote	"P42"																						
QuoteNotification	"P43"																						
QuoteRequest	"P41"																						
RequestRequisitionReturn	"P51"																						
<p>InstanceIdentifier (Under ProcessControl, PipInstanceID)</p>	<p>A unique alphanumeric identifier for the initiating partner.</p>																						
<p>VersionIdentifier (Under ProcessControl, pipVersion)</p>	<p>This data element is populated with the version number assigned to the transaction implemented by PIDX.</p> <p>"1.0"</p>																						
<p>QualityofServiceSpecification (Under ProcessControl)</p>	<p>Structure not used by RNIF 2.0. Optional structure may be omitted. Receiver must ignore if sent.</p>																						
<p>QualityofServiceSpecificationCode (Under ProcessControl, QualityOfServiceSpecifiction, QualityOfServiceElement)</p>	<p>Element not used by RNIF 2.0. Receiver must ignore if sent.</p>																						
<p>Value (Under ProcessControl, QualityOfServiceSpecifiction, QualityOfServiceElement)</p>	<p>Element not used by RNIF 2.0. Receiver must ignore if sent.</p>																						

Service Header Data Element	PIDX Implementation
FreeFormText (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification)	Nine digit DUNS number for known partner
Value (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification, locationID)	Location of known partner
FreeFormText (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification, domain)	"DUNS" PIDX will not use an unknown initiating partner.
GlobalBusinessIdentifier (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification)	Nine digit DUNS number for unknown partner. PIDX will not use an unknown initiating partner.
Value (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification, locationID)	Location of unknown partner. PIDX will not use an unknown initiating partner.
UniformResourceLocator (Under ProcessControl, UnknownInitiatingPartner)	URL of unknown Partner. PIDX will not use an unknown initiating partner.

4.6.5. Response Messages

Response messages facilitate reliable messaging conversations. PIDX requires two forms of response messages be enabled in every message exchange. functional (Signal) responses and business (Action) responses.

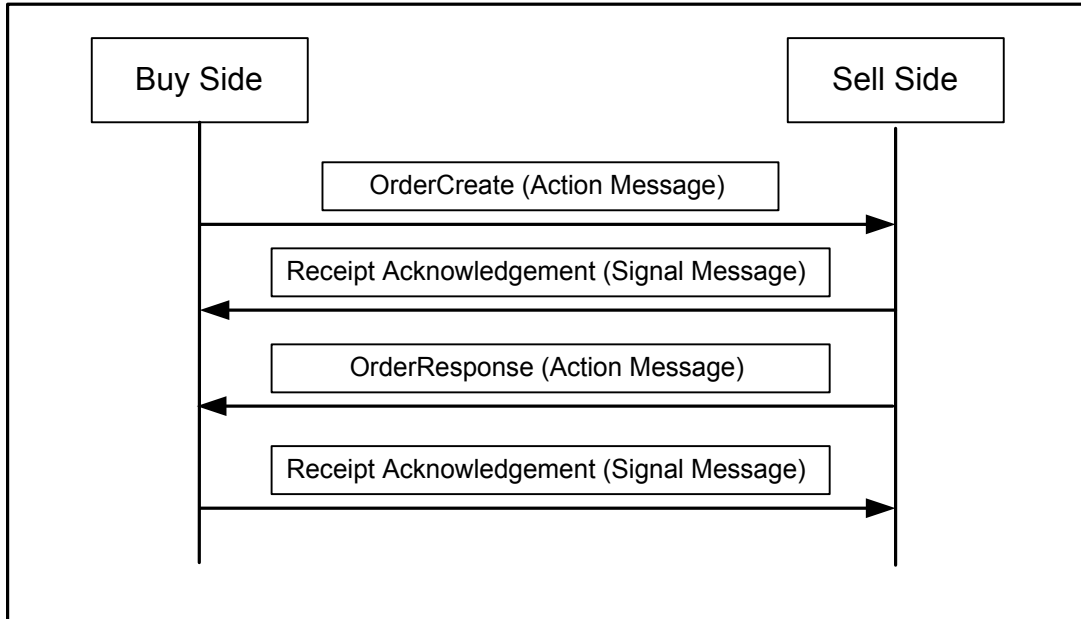
Functional responses include

- An Acknowledgement of Receipt to confirm receipt of a transmitted message
- An Exception message to indicate an error with the received message

PIDX requires that an Acknowledgement of Receipt or Exception be sent as a functional response for every message received according to the RNIF 2.0 standards. API members should not circumvent the use of the response messages either in the message flow they define in their application architecture or in the trading partner agreements they define.

The following diagram illustrates The PIDX TRP standard request-response messaging paradigm including functional responses.

Figure 4. PIDX TRP Request-Response



Messages may require a positive or negative signal response. Particular attention needs to be given to Signal Exception messages. RNIF 2.0 recommends that Signal Exception methods not be sent for certain Preamble, Delivery, and Service header errors. PIDX recommends that trading partners follow the RNIF 2.0 guidelines for Signal Exception messages (RNIF: CS 1.2.2.1 and 1.2.4.2).

4.6.6. Signal Response Receipt Acknowledgement (Positive Response)

The Receipt Acknowledgment Signal uses the standard RNIF 2.0 Preamble, Delivery, and Service Headers and a special Receipt Acknowledgment Service Content. The contents of the Preamble, Delivery, Service Headers and Receipt Acknowledgment Service Content are presented below.

The trading partners must agree on the contents for each element for each header and the service content.

4.6.6.1. Preamble Header for Receipt Acknowledgement

Preamble Header Data Element	PIDX Implementation
GlobalAdministeringAuthorityCode	"RosettaNet"
VersionIdentifier	"V02.00"

4.6.6.2. Delivery Header for Receipt Acknowledgement

Delivery Header Data Element	PIDX Implementation
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Delivery Header Data Element	PIDX Implementation
AffirmationIndicator	"Yes" The next hub must transmit this message securely "No" The next hub does not need to transmit this message securely
DateTimeStamp	The date and time of the message. The timestamp must be as close to the time of the first attempt as possible. The RNIF 2.0 format is CCYYMMDDTHHMMSS.000Z . This is not the standard XML Schema dateTime.
FreeFormText (under messageReceiverIdentification, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (under messageReceiverIdentification, PartnerIdentification)	The nine digit DUNS number for receiver
Value (under messageReceiverIdentification, LocationID, value)	Location of receiver
FreeFormText (under messageSenderIdentification, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (under messageSenderIdentification, PartnerIdentification)	The nine digit DUNS number for sender
Value (under messageSenderIdentification, LocationID, value)	Location of sender
InstanceIdentifier (under messageTrackingID)	A unique alphanumeric identifier that represents a specific instance of a business process, business transaction, business action, or business signal. The instance identifier must be unique for a particular instance of a business process, business transaction, business action and business signal. The value MUST be unique within the context of the message sender. The InstanceIdentifier from the acknowledged message is used for the Receipt Acknowledgement Signal.

4.6.6.3. Service Header for Receipt Acknowledgement

Service Header Data Element	PIDX Implementation
BusinessActivityIdentifier (under ActivityControl)	Use the BusinessActivityIdentifier from the acknowledged message.

Service Header Data Element	PIDX Implementation
GlobalPartnerRoleClassificationCode (Under ProcessControl, ActivityControl, MessageControl, fromRole)	For signal messages, the value in the fromRole must be the same as the value in the toRole in the action message to which this message is replying.
GlobalBusinessServiceCode (Under ProcessControl, ActivityControl, MessageControl, fromService)	For signal messages, the value in the fromService must be the same as the value in the toService in the action message to which this message is replying
InReplyTo (Structure) (Under ProcessControl, ActivityControl, MessageControl)	This structure must be present if not the first action message in an activity. This structure must be present for all signals.
GlobalBusinessActionCode (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity)	The Action Code corresponding to the action to which this message is in reply. See Appendix D GlobalBusinessActionCode Values for RosettaNet standard values.
FreeFormText (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity. messageStandard)	"American Petroleum Institute PIDX XML Standards Group"
VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity. astandardVersion)	"1.0"
InstanceIdentifier (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, messageTrackingID)	Identifies the instance ID of the action to which this message is a reply. The value MUST come from the Message Tracking ID (InstanceIdentifier under messageTrackingID) in the Delivery header of the original received message.
FreeFormText (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment, description)	"0" No attachments allowed on a Signal.
GlobalMimeTypeQualifierCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment)	Not used on a signal.
UniversalResourceIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment)	Not used on a signal.

Service Header Data Element	PIDX Implementation
CountableAmount (Under ProcessControl, ActivityControl, MessageControl, Manifest, numberOfAttachments)	"0"
GlobalBusinessActionCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity)	The Action Code corresponding to the action to which this message is in reply. See Appendix D GlobalBusinessActionCode Values for RosettaNet standard values.
FreeFormText (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity, messageStandard)	"PIDX"
VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity, standardVersion)	"1.0"
GlobalBusinessSignalCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, SignalIdentity)	"Receipt Acknowledgement"
VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, SignalIdentity)	"V02.00" This is the Signal Version Identifier from the AcknowledgementOfReceipt Message Guidelines. See RosettaNet document AcknowledgementOfReceipt_MG_V02_00_00.htm
GlobalPartnerRoleClassificationCode (Under ProcessControl, ActivityControl, MessageControl, toRole)	For signal messages, the value in the toRole must be the same as the value in the fromRole in the action message to which this message is replying.
GlobalBusinessServiceCode (Under ProcessControl, ActivityControl, MessageControl, toService)	For signal messages, the value in the toService must be the same as the value in the fromService in the action message to which this message is replying
GlobalUsageCode (Under ProcessControl)	"Test" "Production"
ProprietaryReferenceIdentifier (Under ProcessControl, partnerDefinedPIPPayloadBindingId)	Not used for Signal messages.
GlobalProcessIndicatorCode (Under ProcessControl, PipCode)	Use the GlobalProcessIndicator code from the Service message of the acknowledged message.

Service Header Data Element	PIDX Implementation
InstanceIdentifier (Under ProcessControl, PipInstanceID)	Use the InstanceIdentifier from the acknowledged message.
VersionIdentifier (Under ProcessControl, pipVersion)	"1.0"
QualityofServiceSpecification (Under ProcessControl)	Not used
QualityofServiceSpecificationCode (Under ProcessControl, QualityOfServiceSpecification, QualityOfServiceElement)	Not used
Value (Under ProcessControl, QualityOfServiceSpecification, QualityOfServiceElement)	Not used
FreeFormText (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification)	Nine digit DUNS number for known partner
Value (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification, locationID)	Location of known partner
FreeFormText (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification, domain)	Not used
GlobalBusinessIdentifier (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification)	Not used
Value (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification, locationID)	Not used Not used
UniformResourceLocator (Under ProcessControl, UnknownInitiatingPartner)	Not used

4.6.6.4. Service Content for Receipt Acknowledgement

Service Content Data Element	PIDX Implementation
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OriginalMessageDigest (under NonRepudiationInformation)	The base-64 encoded digest of the entire original MIME message received. The digest must be generated using the same algorithm as the original signed message.
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4.6.7. Signal Response Exception (Negative Response)

The Exception Signal uses the standard RNIF 2.0 Preamble, Delivery, and Service Headers and a special Exception Service Content. The contents of the Preamble, Delivery, Service Headers and Exception Service Content are presented below.

The trading partners must agree on the contents for each element for each header and the service content.

4.6.7.1. Preamble Header for Exception

Preamble Header Data Element	PIDX Implementation
GlobalAdministeringAuthorityCode	"RosettaNet"
VersionIdentifier	"V02.00"

4.6.7.2. Delivery Header for Exception

Delivery Header Data Element	PIDX Implementation
AffirmationIndicator	"Yes" The next hub must transmit this message securely "No" The next hub does not need to transmit this message securely
DateTimeStamp	The date and time of the message. The timestamp must be as close to the time of the first attempt as possible. The RNIF 2.0 format is CCYYMMDDTHHMMSS.000Z . This is not the standard XMLSchema dateTime datatype.
FreeFormText (under messageReceiverIdentification, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (under messageReceiverIdentification, PartnerIdentification)	The nine digit DUNS number for receiver
Value (under messageReceiverIdentification, LocationID, value)	Location of receiver

Delivery Header Data Element	PIDX Implementation
FreeFormText (under messageSenderIdentification, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (under messageSenderIdentification, PartnerIdentification)	The nine digit DUNS number for sender
Value (under messageSenderIdentification, LocationID, value)	Location of sender
InstanceIdentifier (under messageTrackingID)	<p>A unique alphanumeric identifier that represents a specific instance of a business process, business transaction, business action, or business signal. The instance identifier must be unique for a particular instance of a business process, business transaction, business action and business signal. The value MUST be unique within the context of the message sender.</p> <p>The InstanceIdentifier from the acknowledged message is used for the Exception Signal.</p>

4.6.7.3. Service Header for Exception

Service Header Data Element	PIDX Implementation
BusinessActivityIdentifier (under ActivityControl)	Use the BusinessActivityIdentifier from the acknowledged message.
GlobalPartnerRoleClassificationCode (Under ProcessControl, ActivityControl, MessageControl, fromRole)	For signal messages, the value in the fromRole must be the same as the value in the toRole in the action message to which this message is replying.
GlobalBusinessServiceCode (Under ProcessControl, ActivityControl, MessageControl, fromService)	For signal messages, the value in the fromService must be the same as the value in the toService in the action message to which this message is replying
InReplyTo (Structure) (Under ProcessControl, ActivityControl, MessageControl)	<p>This structure must be present if not the first action message in an activity.</p> <p>This structure must be present for all signals.</p>
GlobalBusinessActionCode (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity)	<p>The Action Code corresponding to the action to which this message is in reply.</p> <p>See Appendix D GlobalBusinessActionCode Values for RosettaNet standard values.</p>

Service Header Data Element	PIDX Implementation
FreeFormText (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity, messageStandard)	"American Petroleum Institute PIDX XML Standards Group"
VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, ActionIdentity, astandardVersion)	"1.0"
InstanceIdentifier (Under ProcessControl, ActivityControl, MessageControl, inReplyTo, ActionControl, messageTrackingID)	Identifies the instance ID of the action to which this message is a reply. The value MUST come from the Message Tracking ID (InstanceIdentifier under messageTrackingID) in the Delivery header of the original received message.
FreeFormText (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment, description)	"0" No attachments allowed on a Signal.
GlobalMimeTypeQualifierCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment)	Not used on a Signal.
UniversalResourceIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, Attachment)	Not used on a Signal.
CountableAmount (Under ProcessControl, ActivityControl, MessageControl, Manifest, numberAttachments)	"0"
GlobalBusinessActionCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity)	The Action Code corresponding to the action to which this message is in reply. See Appendix D GlobalBusinessActionCode Values for RosettaNet standard values.
FreeFormText (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity, messageStandard)	"PIDX"
VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, ActionIdentity, standardVersion)	"1.0"

Service Header Data Element	PIDX Implementation
GlobalBusinessSignalCode (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, SignalIdentity)	"Exception"
VersionIdentifier (Under ProcessControl, ActivityControl, MessageControl, Manifest, ServiceContentControl, SignalIdentity)	"V02.00" This is the Signal Version Identifier from the Exception Message Guidelines. See RosettaNet document Exception_MG_V02_00_00.htm
GlobalPartnerRoleClassificationCode (Under ProcessControl, ActivityControl, MessageControl, toRole)	For signal messages, the value in the toRole must be the same as the value in the fromRole in the action message to which this message is replying.
GlobalBusinessServiceCode (Under ProcessControl, ActivityControl, MessageControl, toService)	For signal messages, the value in the toService must be the same as the value in the fromService in the action message to which this message is replying
GlobalUsageCode (Under ProcessControl)	"Test" "Production"
ProprietaryReferenceIdentifier (Under ProcessControl, partnerDefinedPIPPayloadBindingId)	Not used for Signal messages.
GlobalProcessIndicatorCode (Under ProcessControl, PipCode)	Use the GlobalProcessIndicaor code from the Service message of the acknowledged message.
InstanceIdentifier (Under ProcessControl, PipInstanceID)	Use the InstanceIdentifier from the acknowledged message.
VersionIdentifier (Under ProcessControl, pipVersion)	"1.0"
QualityofServiceSpecification (Under ProcessControl)	Not used
QualityofServiceSpecificationCode (Under ProcessControl, QualityOfServiceSpecifiction, QualityOfServiceElement)	Not used
Value (Under ProcessControl, QualityOfServiceSpecifiction, QualityOfServiceElement)	Not used

Service Header Data Element	PIDX Implementation
FreeFormText (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification, domain)	"DUNS"
GlobalBusinessIdentifier (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification)	Nine digit DUNS number for known partner
Value (Under ProcessControl, KnownInitiatingPartner, PartnerIdentification, locationID)	Location of known partner
FreeFormText (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification, domain)	Not used
GlobalBusinessIdentifier (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification)	Not used
Value (Under ProcessControl, UnknownInitiatingPartner, PartnerIdentification, locationID)	Not used
UniformResourceLocator (Under ProcessControl, UnknownInitiatingPartner)	Not used

4.6.7.4. Service Content for Exception

Service Content Data Element	PIDX Implementation
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Service Content Data Element	PIDX Implementation
GlobalMessageExceptionCode (under ExceptionDescription, errorClassification)	"UNP.MESG.SIGNERR" Error during unpackaging – Verifying the signature of the RosettaNet Business Message "UNP.PRMB.READERR" Error during unpackaging – Reading the Preamble "UNP.PRMB.VALERR" Error during unpackaging – Validating the Preamble "UNP.DHDR.READERR" Error during unpackaging – Reading the Delivery Header "UNP.DHDR.VALERR" Error during unpackaging – Validating the Delivery Header "UNP.SHDR.READERR" Error during unpackaging – Reading the Service Header "UNP.SHDR.VALERR" Error during unpackaging – Validating the Service Header "UNP.SHDR.MNFSTERR" Error during unpackaging – Verifying Manifest against the actual attachment body parts "UNP.MESG.SEQERR" Error during unpackaging – Validating the message sequence "UNP.MESG.RESPTYPERR" Unexpected Response type in the HTTP header "UNP.MESG.DCRYPTERR" Error Decrypting the message "UNP.SCON.READERR" Error during unpackaging – Reading the Service Content "UNP.SCON.VALERR" Error during unpackaging – Validating the Service Content "PKG.MESG.GENERR" Error during packaging – General error "PRF.ACTN.GENERR" Error during action performance – General Error "PRF.DICT.VALERR" Error during action performance – Validating the Service Content against a PIP-specified dictionary "UNP.MESG.GENERR" Error during unpackaging – General error
FreeFormText (under ExceptionDescription, errorDescription)	
GlobalMessageComponentCode (under ExceptionDescription, offendingMessageComponent)	Where error was detected: "Preamble" "DeliveryHeader" "ServiceHeader" "ServiceContent" "Attachment"
GlobalExceptionTypeCode	"General Exception" "Receipt Acknowledgement Exception"

4.6.8. Standard Transmission Protocols: HTTP(S), SMTP

PIDX transactions support message transmission via documented RNIF supported transport protocols. This includes transport via a standard or secure http post or via secure (encrypted) SMTP transport.

PIDX recommends the use of HTTP/S in areas where network bandwidth and processing overhead would not affect process performance.

4.6.9. Other Protocols

RNIF 2.0 has been developed with the intent of supporting binding to additional transport protocols in addition to HTTP(S) and SMTP. RosettaNet anticipates that support for additional transports will be documented in the future. PIDX recommends that only fully documented transport protocols be implemented.

In cases where trading partners wish to implement a messaging process via a non-documented transmission protocol, PIDX recommends this be done only across a secure (closed) connection such as a dedicated connection, a Virtual Private Network encrypted session, or a Virtual Local Area Network (VLAN).

4.6.10. Digital Signature, Certificates

RNIF 2.0 delegates most of the specific procedures and protocols for managing and validating digital certificates to the trading partner agreement. To ensure successful certificate handling, PIDX recommends the following if certificates are used:

- The Implementation Guide specifies the certificate format used. The Implementation Guide specifies any proprietary certificate format extensions used and specifies that certificates without the extensions present should not pass validation.
- For implementations where an independent B2B exchange is trading documents across multiple partners to facilitate transactional processes, the certificate management authority should be independent from the B2B exchange
- The certificate administering authority use independently verifiable administration processes
- The certificate administering authority refresh all digital certificates every 6 months

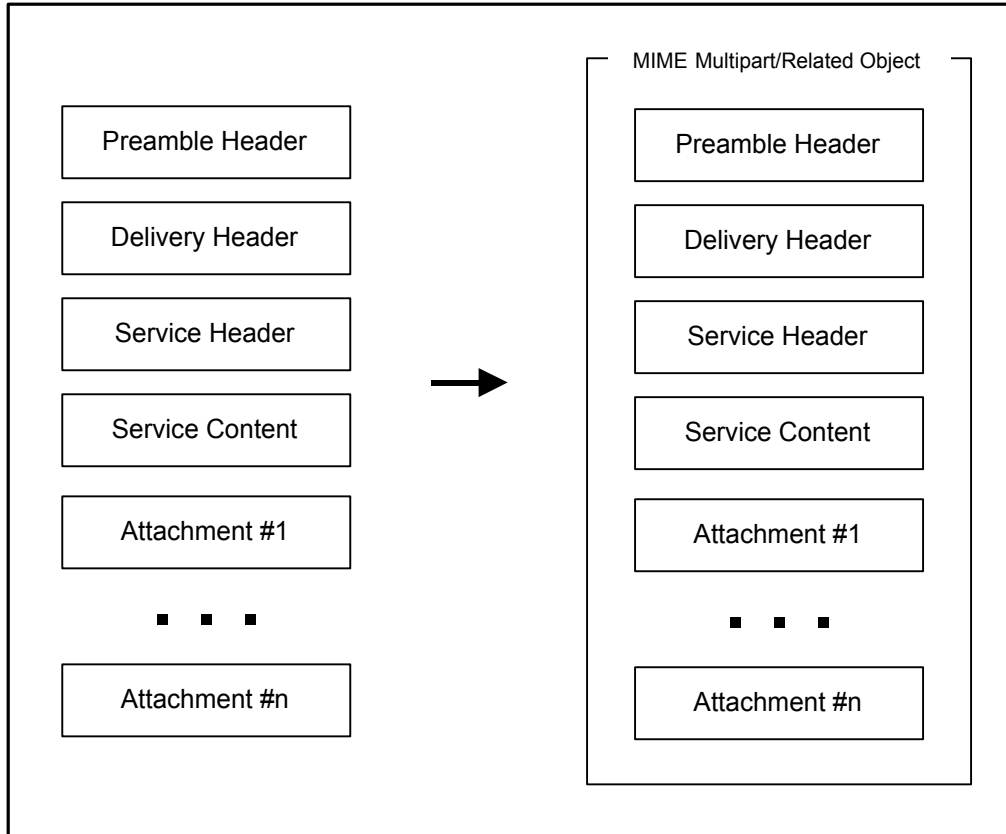
4.6.11. Data Packaging

To facilitate preparing a message for transport, RNIF supports packaging the separate XML documents and attachments that comprise a single business message / transaction into a multipart MIME message that can then have a digital signature and encryption attached to ensure authentication and secure transmission.

PIDX requires use of the RNIF 2.0 and MIME defined identifying wrappers used to delineate and join separate XML documents into a multipart MIME message, including definition of the boundary for a digital signature attachment and the MIME container used as an encryption envelope. These wrappers include the MIME-specified content-type headers with specific references to RosettaNet and RosettaNet standards. These MIME-based wrappers must be used exactly as defined by RNIF 2.0 to support proper handling transport and handling by applications working with SMTP. This includes values for the Content-Type, Content-Description, and Content-Location header fields.

The MIME headers identified by RNIF for data packaging are illustrated in the following diagrams

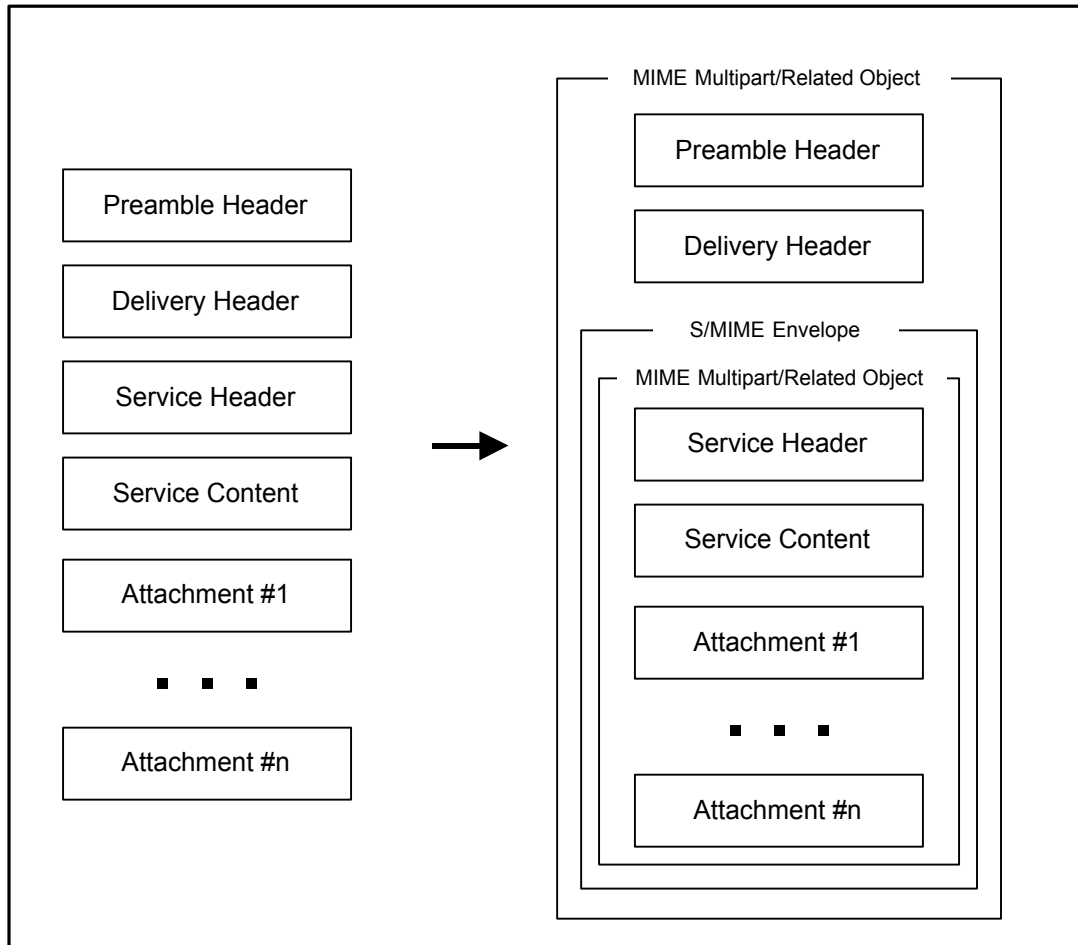
Figure 5. RNIF 2.0 MIME Multit-part/Related Document



Each RNIF 2.0 component (Preamble Header, Delivery Header, Service Header, Attachment) is a MIME part. Each MIME part is identified by a MIME boundary, Content-Type, Content-ID, and Content-Location.

In this example nothing is encrypted and no electronic signature is used.

Figure 6. RNIF 2.0 MIME Multi-part/Related Document with Encryption



In this example a MIME Multipart/Related document is encrypted within another MIME Multipart/Related document. The "internal" MIME Multipart/Related document includes the Service Header, Service Content, and Attachments. This "internal" MIME document is encrypted. The "external" MIME Multipart/Related document includes the Preamble Header, Delivery Header, and the encrypted object. The Preamble Header, Delivery Header, and the encrypted object are all MIME Multipart/Related parts.

4.7. Implementation Partner Agreements

Trading partners must document agreements which define the implementation of PIDX TRP standards. The PIDX Implementation Guide provides a framework for identifying required decisions and agreements and documenting decisions and agreements made.

The Implementation Guide describes:

- technical and business aspects of how the transaction occurs between the partner organizations
- the data to be exchanged,
- the messaging paradigms (sequence and timeframes for message exchange)

- the responses required to each message
- how execution systems outside the message exchange tie into the process (usually based on message contents)
- the transport protocols, timeout and retry parameters,
- security related information (certificate maintenance procedures, etc)
- application related and other requirements

The Implementation Guide may be a legal agreement that also addresses the transactional and liability aspects related to the message exchange including data ownership, transactional responsibility, liability, and indemnification. PIDX recommends that each of these issues be considered for inclusion in the Implementation Guide.

4.7.1. Application Related Requirements

In addition to clarifying the messaging paradigms and requirements, several application-related requirements should be addressed by the Implementation Guide.

Application requirements specific to message exchange include the following:

- The expected timeframe for transmission of an Acknowledgement of Receipt document in response to receipt of a well formed message (the timeout parameter). If an Acknowledgement of Receipt or Exception signal message is not received within the agreed timeframe, a retransmission of the initial document (up to a specific number of retransmission attempts) is typically called for.
- Number of retransmission attempts in case of a timeout while waiting for an Acknowledgement: This performance parameter specifies the number of times the retransmission attempt should be made when an initial message never receives a functional response. PIDX recommends partners agree to two retransmission attempts in addition to the initial attempt for a total of three transmission attempts.
- Timeframe for transmission of the response message: This parameter is defined for a message exchange that includes a business request and business response. This parameter is context sensitive. Its duration largely depends on the response time supported by the applications behind the message exchange and by the response times called for in the business process the data exchange facilitates (for example, the timeframe for response to a request for quotation). This timeframe should be based on an analysis of existing contractual obligations around the business process and on constraints placed on the process by operational systems such as applications that support execution of the underlying business process.

PIDX has not defined default values for these parameters because they are typically agreed to among trading partners at the time of implementation. PIDX anticipates that the timeout and retry parameters will be set at different values for different types of transactions. In addition, middleware tools that support automated implementation of an RNIF 2.0 compliant process will generally require initial configuration of these parameters for each messaging process they manage. PIDX recommends that the message processing timeframes that Trading Partners agree to be tested during implementation to verify that back end applications perform at a level consistent with the agreed upon timeframes.

For synchronous messaging, a single application-related messaging parameter is required that applies to both the timeout and transmission response timeframe parameters described above. To support the real time nature of synchronous messaging, this parameter must be defined as a very short timeframe. PIDX

recommends that trading partners agree to a synchronous timeout of 30 seconds or shorter. If a human is waiting for a response a shorter timeframe may be called for.

4.7.2. Other Issues to Address When Implementing PIDX Standards

The following RNIF 2.0 standards may need to remain unchanged to permit valid handling of messages by middleware tools that are RNIF 2.0 compliant:

- RNIF defined boundary designators used in the header applied to each component of the multipart MIME message. This header creates a structured multipart MIME document from the separate XML documents sent in a single transactional message. These headers include the following variations:

```
--RN-HTTP-Boundary--  
--RN-Outer-Boundary--  
--RN-HTTP-Body-Boundary--
```

These headers must be implemented as described by the RNIF specification

- MIME headers encoded around a message to permit binding to an outbound HTTP post, include the following header lines:

```
x-RN-Version: RosettaNet/V02.00  
x-RN-Response-Type: sync or async
```

These headers must be implemented as described by the RNIF specification

A final issue that must be addressed is the decision on how to enable a PIDX compliant message handling and transport process. Options include developing the necessary run-time code from scratch, modifying existing middleware connections with trading partners to support PIDX-defined documents, transport and routing standards, or implementing middleware that directly supports PIDX and RNIF 2.0. To assess the applicability of each option, PIDX recommends analysis in three areas.

- First, the flexibility and extensibility of current middleware solutions. If current connections will support the correct transport protocols and data volume, they can be leveraged for parts of the message handling (additional code may need to be developed to support RNIF 2.0 based messaging choreography.)
- Second, an assessment of the availability of resources knowledgeable in developing the required communications processes should be done, especially if developing from scratch.
- Last, an analysis of the expected volume of transactions and data that will be sent across the enabling technology. This benchmark will be for comparing the assumptions made around performance and scalability of each enabling technology.

If, in selecting an enabling technology, RNIF compliant middleware is selected as the choice for implementation, PIDX has prepared the next section to provide guidance regarding review of available middleware vendor tools.

4.8. Qualification of B2B Application Integration Tools

4.8.1. Criteria to Review to Assure Vendor Compliance

PIDX recognizes that selecting a middleware vendor who supports the RNIF 2.0 communications framework may require significant vendor review. RosettaNet has developed partnership and certification programs that help define a specific middleware vendor's level of participation in RosettaNet and level of support for RosettaNet's standards. In addition to reviewing information regarding RosettaNet's Solution Partners, (available on their web site at www.rosettanet.org), PIDX recommends comparing potential middleware vendors using the following criteria:

- The vendor's history of support for RNIF.
- Participation in RNIF certification / compliance testing programs.
- Experience in working with RNIF 2.0 during the standard's validation phase from November 2000 to June 2001.
- Support for direct interface into the application where your source data lies.
- Current involvement in RNIF 2.0 compliance certification program.
- Compliance certification of RNIF 2.0 by RosettaNet (see below)

4.8.2. RosettaNet Certification

An additional aspect of assessing the capabilities of middleware vendor tools is compliance with RosettaNet's RNIF 2.0 standard is RosettaNet's certification program. RosettaNet will begin providing RNIF 2.0 compliance certification in December 2001. Vendors who have had their solutions certified will be listed on RosettaNet's web site. Complete details about RosettaNet's certification program, including a list of vendors who have qualified, is available on RosettaNet's web site at www.rosettanet.org/ready/

There are two primary steps to RosettaNet's validation process. The first is running a series of stand-alone test scripts based on test scenarios for nine separate transactions included in RosettaNet's developer tools library. The second phase of vendor compliance testing requires that vendors implement a PIP connection to RosettaNet's test instance. The compliance of this connection to RNIF 2.0 is then validated by RosettaNet based on testing multiple transaction types across the connection. This includes both positive and negative test scenarios.

RosettaNet will begin providing RNIF 2.0 compliance certification in December 2001. Vendors who have had their solutions certified will be on listed on RosettaNet's web site. Complete details about RosettaNet's certification program, including a list of vendors who have qualified, is available on RosettaNet's web site at www.rosettanet.org/ready/

Appendix A: PIDX XML Schema to PIDX "PIP" Number

PIDX XML Schema	New PIDX "PIP" Number for RNIF 2.0
FieldTicket	P11
FieldTicketResponse	P12
Invoice	P21
InvoiceResponse	P22
OrderChange	P32
OrderCreate	P31
OrderResponse	P33
Quote	P42
QuoteNotification	P43
QuoteRequest	P41
RequestRequisitionReturn	P51

Appendix B: GlobalPartnerRoleClassificationCode Values

This table extracted from the RosettaNet EntityInstances.htm document.

GlobalPartnerRoleClassificationCode	
Value	Definition
Financing Processor	The organization that processes the request for financing.
Product Provider	The partner role that creates a differentiated product, owns the registration process and creates a list of eligible products.
Credit Reference Requester	This partner role is responsible for requesting credit information about potential customers.
Account Supplier	Any trading partner that buys or sells products/services from customers and/or vendors.
Sales Marketing Claimant	The partner role that requests reimbursement from a Sales Marketing Claim Processor.
Sales Lead Processor	The party who receives the sales lead. This party is responsible for accepting or rejecting the lead, and if accepted, reports the status of the lead.
Sales Lead Originator	The party assigning a sales lead to another party.
Status Requester	The functional partner role, that could be a Product Provider, that creates a differentiated product, owns the registration process and creates a list of eligible products, or who is responsible for identifying the opportunity (that is, it could be a Demand Creator).
Payer	The party issuing a payment.
Status Responder	The organizational partner role, that could be a Product Provider, that creates a differentiated product, owns the registration process and creates a list of eligible products, or who is responsible for identifying the opportunity (that is, it could be a Demand Creator).
Return Receiver	A third-party or warehousing operation responsible for receiving returns, inspecting the package contents and comparing to the issued RMA to assure the contents are what was authorized on the RMA.
Return Provider	The party responsible for authorizing and/or processing the return.
Return Requester	Any party wishing to return a product. This role could be played by a large end-user such as the Government Services Administration (GSA), a distributor, or a reseller.
Authorizer	The partner role that provides product authorization, from a product owner or manufacturer, for a reselling organization to resell a product.
Anonymous Buyer	A requestor of information that chooses to remain anonymous.
Payee	The party receiving a payment.
Seller	An organization that sells products to partners in the supply chain.
Solution Provider	The party that may architect, configure, engineer, sell, or determine the fulfillment of the configured solution to partners in the supply chain.
Sales Marketing Program Reimbursers	The partner role that is currently processing a sales marketing claim, (or providing a payment without a claim submitted) and who provides information on the status of the claim processing.
Shipment Information User	The party who receives shipment status information.
Supplier	This partner role supplies product to customers in the supply chain.
Sales Facilitator	This partner role facilitates the sale of product between partners in the supply chain.
Product Supplier	This partner role supplies product to customers in the supply chain.

GlobalPartnerRoleClassificationCode	
Value	Definition
Customer	This partner role creates a demand for a product or service.
Credit Provider	This partner role is responsible for providing credit information about potential customers.
Customer Manager	This partner role manages the relationship with the business customers.
Specification Provider	The partner role that creates or passes on manufacturing specifications. This may be a Solution Provider, an OEM who is sub-contracting manufacturing tasks like fabrication or assembly, or another party.
Buyer	An employee or organization that buys products for a partner type in the supply chain.
Product Information User	The partner role that uses product information to create or update enterprise systems and online promotion systems such as electronic catalog systems.
Product Information Distributor	The partner role that distributes new product information to product information users and buyers.
Marketing Activity Initiator	The partner role that distributes information about marketing activities being sponsored by the organization.
Marketing Activity Information User	The party who uses information about Marketing Activities. This party might include distributors, and retail operations.
Sales Marketing Claim Processor	The partner role that processes the claim and/or remits compensation to the Sales Marketing Claimant.
Demand Creator	The partner role responsible for identifying the opportunity; submits design registration; provides engineering support to advance the opportunity to the higher stage towards design win and to generate revenue.
Product Information Subscriber	The business partner that subscribes to product information from other business partners.
ShipmentController	The party who is authorized to make decisions regarding a shipment while in-transit.
Catalog Distributor	The partner role that distributes catalog information to catalog producers and buyers.
Catalog Producer	The partner role that produces catalog information for a partner type in the supply chain.
Tender Information User	The stakeholder(s) in the tendering activity.
Account User	Any trading partner that requires an account to buy or sell products/services.
Shipper	The party who relinquishes a shipment to a Transport Service Provider.
Claim Requester	The owner of the shipments who is responsible for the intact delivery.
Transport Service Provider	The party that provides transportation services for a Shipment Requester.
In-transit Information User	The party who receives shipment status information.
Appointment Provider	The stakeholder(s) in the shipment delivery activity.
Consignee	The receiver of the shipment.
Decision Stakeholder	The party (such as suppliers, customers and others) who is responsible for the review and approval of the Engineering Change Approval Request. The stakeholders may be from multiple organizations.
Invoice Receiver	The organization being invoiced.
Invoice Provider	The organization that generates the invoice.
Invoice Reject Receiver	The organization being issued an Invoice Reject Notification.
Shipment Requester	The party requesting transportation services.
Sales Marketing Program Reimbursement Recipient	The partner role that receives status on a previously submitted sales marketing claim, or who receives reimbursement without submitting a claim.
Product Distributor	The party authorized by a Product Supplier to purchase goods and services from the Product Supplier and resell to customers.
Implementation Plan Creator	The partner role that creates, maintains and manages an implementation plan associated with an Engineering Change Order.
Invoice Reject Provider	The organization that rejects an invoice.
Specification User	The partner role that uses a manufacturing specification. This might be a sub-contract assembler or fabricator.
Change Requester	A party who has an interest in requesting a review of a possible change to the component. The requester may be any party including customers and suppliers.
Forecast Owner	The party that creates a sales or order forecast and is ultimately responsible for it.
Forecast Recipient	The party that receives a sales or order forecast.
Delivery Appointment Provider	A party that receives a request for a change to a previously scheduled delivery appointment.
Solution Requester	This party that creates a demand for a product or service, or has contracted with a Solution Provider for the manufacture or fulfillment of a product(s).
Delivery Appointment Requester	A party that requests a change to a previously scheduled delivery appointment.
Change Review Forum	A party who has responsibility for the review of Engineering Change Requests and the drafting and review of Engineering Change Orders. The Change Review Forum is assumed to be at the company that has responsibility for the engineering aspects of the component affected by the change.

GlobalPartnerRoleClassificationCode	
Value	Definition
Stakeholder	The party that is required to implement an Engineering Change Order. The Stakeholder may include all levels of suppliers, customers or other parties. The Stakeholder may represent multiple organizations. The Stakeholder may draft and or be responsible for completing tasks in an implementation plan

Appendix C: GlobalBusinessServiceCode Values

This table extracted from the RosettaNet EntityInstances.htm document.

GlobalBusinessServiceCode	
Value	Definition
Product Supplier Service	
Product Information Distributor Agent	
Product Information User Service	
Product Information Distributor Service	
Customer Manager Service	
Product Information Subscriber Service	
Buyer Service	
Customer Service	
Supplier Service	
Sales Facilitator Service	
Seller Service	

Appendix D: GlobalBusinessActionCode Values

This table extracted from the RosettaNet EntityInstances.htm document.

GlobalBusinessActionCode	
Value	Definition
Failure Notification	An unsolicited informal notification of the failure to perform a business activity.
Product Information Notification	A product information notification contains unstructured sales catalog information.
Product Resource Update	A product resource update contains structured technical information and sales catalog information for updating online sales catalogs and enterprise systems.
Transportation Projection Notification	
Advance Shipment Notification	
Return Product Response	
Billing Statement Notification	
Remittance Advice Notification	
Shipper's Manifest Notification	
Purchase Order Status Notification	An unsolicited informal notification of the status of an existing open Purchase order. The status reflects the current state of the Purchase Order at the time of the request.
Financing Response	
Subscription Cancellation	Cancellation of an existing subscription.
Financing Request	
Shipment Status Query	
Shipment Status Response	
Invoice Reject Notification	
Shipment Status Notification	

GlobalBusinessActionCode	
Value	Definition
Purchase Order Status Query	A query to request the status of an existing purchase order.
Shopping Cart Transfer Acceptance	Confirms that the receiving partner is accepting the transfer of a shopping cart's contents for fulfillment.
Shopping Cart Transfer	A request for a partner to accept the contents of a shopping cart.
Technical Information Response	Response to a technical information user's query for technical information.
Technical Information Query	A query for technical information to a product information distributor.
Product Information Response	Response to a product information user's query for product information.
Product Information Query	A query for product information from a product information distributor.
Price and Availability Response	Response to customer query for price and availability.
Stock Keeping Unit Creation Notification	A notification informing the customer manager that a new Stock Keeping Unit (SKU) has been created for the product.
Purchase Order Status Response	A response to a query requesting the status of an existing purchase order. The status reflects the current state of the Purchase Order at the time of the request.
Invoice Notification	
Purchase Order Acceptance	Confirms the creation, change or cancellation of a Purchase Order.
Purchase Order Cancellation	Cancellation of an existing Purchaser Order.
Purchase Order Change	A change of an existing Purchase Order.
Purchase Order Request	A request to accept a Purchase Order for fulfillment.
Subscription Confirmation	Confirms the creation, change, or cancellation of a subscription.
Subscription Request	A request to create a subscription for product information distribution.
Sales Promotion and Rebate Information Query	
Price and Availability Query	A query for product price and availability from a product supplier.
Marketing Information Query	
Account Change Request	
Account Setup Acknowledgment	
Account Request	
Product Discontinuation Information Query	
Shipment Change Confirmation	
Delivery Appointment Response	
Delivery Appointment Request	
Shipment Receipt Notification	
Transportation Claim Response	
Account Change Response	
Create Remittance Advice	
Shipment Change Request	
Marketing Information Response	
Quote Response	
Quote Request	
Product Discontinuation Information Response	
Inspection Result Notification	
Subscription Change	Change of an existing subscription.
Lifecycle Information Response	
Product Lifecycle Query	
Sales Promotion and Rebate Information Response	
Transportation Claim Request	
Return Product Request	
Delivery Exception Notification	
Return Result	
Pending Return Notification	
Credit Reference Query	
Ship From Stock And Debit Authorization Response	
Ship From Stock And Debit Authorization Request	
Ship From Stock And Debit Claim Request	
Ship From Stock And Debit Claim Response	
Ship From Stock And Debit Claim Status Notification	
Updated Authorization Status Notification	Updated authorization status report notification to the product seller on active contracted resellers.

GlobalBusinessActionCode	
Value	Definition
Ship From Stock And Debit Authorization Status Query	
Credit Reference Response	
Ship From Stock And Debit Authorization Status Response	
Purchase Order Acceptance Notification	A notification of additional purchase order acceptance information.
Engineering Change Request	
Engineering Change Response	
Engineering Change Response Notification	
Engineering Change Approval Request	
Engineering Change Approval Response	
Engineering Change Order Notification	
Engineering Change Implementation Plan Notification	
Basic Product Information Change	
Registration Status Query	
Change Product Technical Information Confirmation	
Product Lifecycle Information Change	
Change Product Lifecycle Information Confirmation	
Optional Product Information Query	
Optional Product Information Response	
Product List Notification	
Design Registration Response	
Open Ship From Stock And Debit Authorization Status Notification	
Registration Status Notification	
Product Technical Information Change	
Registration Status Response	
Change Product Sales Promotion and Rebate Information Confirmation	
Win Claim Request	
Product Sales Promotion and Rebate Information Change	
Change Product Marketing Information Confirmation	
Product Marketing Information Change	
Change Basic Product Information Acceptance	
Blanket Ship From Stock And Debit Authorization Notification	
Win Claim Response	
Design Registration Request	

Appendix E: GlobalBusinessActionCode Values

This table extracted from the RosettaNet EntityInstances.htm document.

GlobalBusinessActionCode	
Value	Definition
Failure Notification	An unsolicited informal notification of the failure to perform a business activity.
Product Information Notification	A product information notification contains unstructured sales catalog information.

Appendix F: GlobalMimeTypeQualifierCode Values

This table extracted from the RosettaNet EntityInstances.htm document.

GlobalMimeTypeQualifierCode
Value
model/iges
application/news-transmission
application/wordperfect5.1
application/iges
image/vnd.wap.wbmp
application/vnd.motorola.flexsuite.kmr
application/cybercash
application/pdf
application/zip
video/vnd.motorola.videop
application/remote-printing
model/vrml
model/mesh
model/vnd.dwf
model/vnd.gtw
application/news-message-id
application/mathematica
application/slate
model/vnd.flatland.3dml
application/msword
application/macwriteii
application/octet-stream
application/vnd.accpac.simply.aso
message/partial
message/external-body
message/news
message/rfc822
multipart/byteranges
multipart/encrypted
message/http
message/delivery-status
application/dec-dx
message/s-http
application/mac-binhex40
application/postscript
application/oda
application/atomicmail
application/andrew-inset
application/wita
application/dca-rft
application/activemessage
application/rtf
application/applefile
message/disposition-notification
image/vnd.dxf
image/gif
text/richtext
text/plain
image/vnd.fastbidsheet
image/prs.tif
image/vnd.xiff
image/vnd.net-fpx
video/vnd.motorola.video
image/png

GlobalMimeTypeQualifierCode
Value
video/vnd.vivo
image/vnd.svf
image/vnd.dwg
image/naplps
image/cgm
image/tiff
image/g3fax
application/vnd.ufdl
image/vnd.fpx
audio/vnd.rhetorex.32kadpcm
image/prs.pti
image/vnd.cns.inf2
image/vnd.mix
audio/basic
audio/32kadpcm
audio/vnd.qcelp
audio/vnd.digital-winds
text/enriched
audio/vnd.octel.sbc
image/jpeg
audio/vnd.vmx.cvsd
audio/vnd.nortel.vbk
audio/vnd.cns.anp1
audio/vnd.cns.inf1
audio/L16
video/mpeg
video/quicktime
audio/vnd.lucent.voice
application/ipp
image/ief
application/pkix-cert
application/vnd.hp-hpid
application/vnd.pg.osasli
application/vnd.pg.format
application/vnd.mediastation.cdkey
application/vnd.previewsystems.box
application/vnd.Mobius.TXF
application/ocsp-request
application/vnd.Mobius.PLC
application/vnd.vcx
application/riscos
application/vnd.accpac.simply.imp
application/eshop
application/vnd.motorola.flexsuite.ttc
application/vnd.motorola.flexsuite.gotap
application/vnd.motorola.flexsuite.fis
application/ocsp-response
application/index.cmd
application/sdp
application/http
application/vnd.dpgraph
application/vnd.powerbuilder75-s
application/vnd.powerbuilder75
application/vnd.triscape.mxs
application/index.vnd
application/pkix-crl
application/index.response
application/vnd.motorola.flexsuite.adsi
application/index

GlobalMimeTypeQualifierCode
Value
application/vnd.cups-raw
application/vnd.cups-postscript
application/vnd.cups-raster
application/vnd.Mobius.MSL
application/vnd.Mobius.DAF
application/vnd.Mobius.DIS
application/index.obj
application/vnd.claymore
application/marc
application/vnd.fujitsu.oasysprs
application/vnd.fujitsu.oasysgp
application/vnd.visio
application/vnd.netfpx
application/vnd.audiograph
application/vnd.epson.salt
application/vnd.3M.Post-it-Notes
application/vnd.novadigm.EDX
application/vnd.ecowin.seriesrequest
application/vnd.novadigm.EDM
application/vnd.ibm.modcap
application/vnd.comsocaller
application/pkcs7-mime
application/pkcs7-signature
application/pkcs10
application/vnd.yellowriver-custom-menu+A91
application/vnd.ecowin.chart
application/vnd.ecowin.series
application/vnd.ecowin.filerequest
application/commonground
application/vnd.novadigm.EXT
application/vnd.lotus-screencam
application/vnd.FloGraphIt
application/vnd.intercon.formnet
application/vemmi
application/vnd.ms-asf
application/vnd.ecdis-update
application/vnd.powerbuilder6
application/vnd.powerbuilder6-s
application/vnd.lotus-wordpro
application/vnd.lotus-approach
application/vnd.fujitsu.oasys3
application/vnd.lotus-organizer
application/vnd.acucobol
application/vnd.lotus-freelance
application/vnd.fujitsu.oasys
application/vnd.fujitsu.oasys2
application/vnd.swiftview-ics
application/vnd.dna
application/prs.cww
application/vnd.wt.stf
application/vnd.dxr
application/vnd.mitsubishi.misty-guard.trustweb
application/vnd.ecowin.seriesupdate
application/vnd.lotus-1-2-3
application/vnd.epson.msf
application/vnd.uplanet.cacheop-wbxml
application/vnd.uplanet.list-wbxml
application/vnd.uplanet.listcmd-wbxml
application/vnd.uplanet.channel-wbxml

GlobalMimeTypeQualifierCode
Value
application/vnd.uplanet.bearer-choice-wbxml
application/vnd.epson.quickanime
application/vnd.commonspace
application/vnd.fut-misnet
application/vnd.xfdl
application/vnd.ecowin.fileupdate
application/vnd.epson.ssf
application/vnd.uplanet.bearer-choice
application/vnd.powerbuilder7
application/vnd.powerbuilder7-s
application/vnd.lotus-notes
application/pkixcmp
application/vnd.wap.wmlc
application/vnd.wap.wmlscriptc
application/vnd.motorola.flexsuite
application/vnd.wap.wbxml
application/vnd.motorola.flexsuite.wem
application/vnd.intu.qfx
application/vnd.is-xpr
application/EDIFACT
application/EDI-X12
application/EDI-Consent
application/vnd.wrq-hp3000-labelled
application/vnd.minisoft-hp3000-save
application/vnd.ffsns
application/vnd.hp-hps
application/vnd.fujixerox.docuworks
application/xml
application/vnd.uplanet.alert-wbxml
application/vnd.anser-web-certificate-issue-initiation
application/vnd.uplanet.signal
application/vnd.intu.qbo
application/vnd.publishare-delta-tree
application/vnd.cybank
application/batch-SMTP
application/vnd.uplanet.alert
application/vnd.uplanet.cacheop
application/vnd.uplanet.list
application/vnd.uplanet.listcmd
application/vnd.uplanet.channel
application/vnd.hp-PCL
application/vnd.anser-web-funds-transfer-initiation
application/vnd.intertrust.digibox
multipart/appledouble
application/vnd.businessobjects
application/vnd.meridian-slideshow
application/vnd.xara
application/sgml-open-catalog
application/vnd.rapid
application/vnd.enliven
application/vnd.japannet-registration-wakeup
application/vnd.japannet-verification-wakeup
application/set-registration
application/vnd.japannet-directory-service
application/set-registration-initiation
application/vnd.intertrust.nncp
application/prs.alvestrand.titrax-sheet
application/vnd.noblenet-web
multipart/signed

GlobalMimeTypeQualifierCode
Value
multipart/voice-message
multipart/report
multipart/related
multipart/form-data
application/vnd.musician
application/vnd.japannet-payment-wakeup
application/vnd.ms-tnef
application/sgml
application/cals-1840
application/pgp-encrypted
application/pgp-signature
application/pgp-keys
application/vnd.framemaker
application/vnd.mif
application/vnd.ms-excel
application/vnd.ms-powerpoint
application/vnd.seemail
application/vnd.ms-works
multipart/parallel
application/vnd.svd
application/vnd.music-niff
application/vnd.ms-artgalry
application/vnd.truedoc
application/vnd.koan
application/vnd.street-stream
application/vnd.fdf
application/set-payment-initiation
application/set-payment
application/vnd.ms-project
application/vnd.shana.informed.package
multipart/header-set
text/sgml
text/html
text/tab-separated-values
application/vnd.noblenet-sealer
application/vnd.noblenet-directory
application/prs.nprend
application/vnd.webturbo
application/hyperstudio
text/vnd.latex-z
application/vnd.shana.informed.formdata
text/vnd.fmi.flexstor
application/vnd.shana.informed.interchange
application/vnd.\$commerce_battelle
application/vnd.osa.netdeploy
application/vnd.ibm.MiniPay
application/vnd.japannet-jpnstore-wakeup
application/vnd.japannet-setstore-wakeup
application/vnd.japannet-verification
application/vnd.japannet-registration
application/vnd.hp-HPGL
application/x400-bp
application/vnd.shana.informed.formtemplate
text/calendar
multipart/digest
multipart/alternative
multipart/mixed
text/vnd.fly
text/vnd.motorola.reflex

GlobalMimeTypeQualifierCode
Value
text/vnd.wap.wml
application/vnd.hp-PCLXL
text/directory
text/vnd.in3d.3dml
text/uri-list
text/vnd.wap.wmlscript
text/rfc822-headers
text/rtf
text/prs.lines.tag
text/vnd.in3d.spot
text/css
text/xml
text/vnd.abc