

THOMSON REUTERS NEWS FEED DIRECT

DEVELOPER'S GUIDE DOCUMENT VERSION 2.1



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CHAPTER 1 INTRODUCTION

News Feed Direct (NFD), formerly known as NewsScope Direct (NSD), delivers an ultra-low latency feed of Thomson Reuters' world-class news content. NFD was designed specifically for application consumption. It offers full text and comprehensive metadata via streaming broadcast with assured delivery to ensure you never miss an important event.

1.1 PRODUCT FEATURES AND FUNCTIONALITY

NFD offers the following features and functionality:

- Machine-readable, world-class, market-moving news and news analytics content from Reuters and third parties
- Ultra-low latency streaming broadcast of news story headlines, body, and metadata
- Flexible data delivery options including the Internet or dedicated leased lines
- Millisecond publishing timestamp and transmission timestamp for price correlation analysis
- Ultra-low latency Economic Events
- Intra-data center and geographic redundancy to ensure high levels of resiliency

1.2 CONTENT SOURCES

NFD contains both proprietary and third-party world-class market moving content.

| CONTENT SOURCE | DESCRIPTION |
|---------------------------------|--|
| Economic Events | Ultra-low latency, machine readable economic news from Thomson Reuters journalists around the world. Coverage includes data releases from the US Department of Commerce, US Department of Labor, US Department of Treasury and Treasury Auction Results, USDA Crop Reports, UK Office for National Statistics, Bank of England, Statistics Canada, Eurostat, Reserve Bank of Australia and many others. See Customer Zone for an updated list of indicators. |
| Institute of Supply Management | Embargo delivery of Institute of Supply Management's Manufacturing and Non-Manufacturing ISM Report On Business. |
| Markit PMI | Embargo delivery of Purchasing Managers' Index data produced by Markit for a wide range of countries and regions. |
| Reuters News | With over 150 years of experience, Reuters News boasts over 2,800 journalists in 200 bureaux worldwide. It is seen by one billion people daily and generates over 800,000 alerts and 2.5 million unique stories per year in 21 languages. |
| Select Third Party News Sources | For additional market-moving coverage NFD offers a variety of select third-party sources such as PR Newswire, Business Wire, Marketwire, Globe Newswire, Thomson Reuters ONE, and others. See Customer Zone for an updated list of sources. |
| News Analytics | Author sentiment and relevance on a company or commodity level, along advanced document metadata such as novelty. See Customer Zone for more information on this content set. |

Thomson Reuters's news sources cover the following types of key events:

- Economic releases
- Mergers and acquisitions
- Corporate actions
- Company earnings
- Litigation
- Bankruptcy
- Company management changes

- Regulatory changes and updates
- Geopolitics
- New product and service launches

1.3 CONTENT STRUCTURE AND DELIVERY PLATFORM OVERVIEW

NFD uses an HTTP client interface that allows clients to receive data in real time. While HTTP is typically used for request/response systems, NFD uses Pipelined HTTP to support an efficient, ultra-low latency interface based on the industry standard HTTP 1.1 protocol.

Multicast publication is also available for Economic Events. Please refer to section 3.6 for details.

1.4 HOW TO USE THIS DOCUMENT

Following this introduction, this guide contains two main sections.

1. The first section is a **User Guide**, which contains step-by-step instructions on how to access data from NFD, including NFD server access, security and authentication, requesting data. Use this section if you are an application developer and you need to learn how to work with an NFD server in order to begin subscribing to data. Read this entire section before trying to access the system.
2. The second section is a **Reference Manual**, and drills down into greater detail about news sources, data formats, and metadata. Look in this section to find a complete breakdown of what data is distributed over NFD. The best way to use this section is to look in the Table of Contents for a topic in which you are interested, and then turn directly to the appropriate page.

1.5 TERMINOLOGY

This document will use various terms to refer to data transmitted across NFD. Some terms that may be confusing are defined below.

Message: This is a generic transmission from client to server or vice versa.

News Message: This refers to a generic unit of data transmitted by an NFD server.

News Item: This is a type of news message that contains a news story or headline.

Content Envelope: This type of news message refers to a generic news item or News Analytics message. It is defined as such because for both news items and News Analytics messages, the top-level XML element is a `<ContentEnvelope>`.

1.6 CONTACT INFORMATION

First-level support is available to Thomson Reuters customers 7am to 7pm in each country. Note that second-level support hours are Monday through Friday ex-US market holidays, 8am to 6pm Eastern time.

1.6.1. FOR PRODUCTION CUSTOMERS

Production customers should direct their NFD questions or support issues to one of the following:

- Phone: US customers should call +1 877-814-3571 and choose option 2. Customers from other countries can find their respective Thomson Reuters support numbers at the [Contact Us By Phone](#) link on [Customer Zone](#).
- Electronic: Visit the [“CONTACT US”](#) link in the top left of the page at [Customer Zone](#). In filling out the form, type in “Thomson Reuters Machine Readable News-News Feed Direct” as the product name.

1.6.2. FOR TRIAL CUSTOMERS

Trial customers are assigned a dedicated Presales Technical Engineer to assist with technical questions during the trial. During the trial, all questions should be sent directly to the Presales Technical Engineer.

1.7 SERVICE ALERTS AND NOTIFICATIONS

For product updates, Thomson Reuters strongly recommends that clients sign up for Product Client Notifications (PCNs) and service alerts on their products. For information on signing up for these for News Analytics and MarketPsych Indices, please see the respective user guides on Customer Zone.

To sign up for service alerts on other News Feed Direct content sets, go the Service Alert-Edit Subscriptions page, [here](#). Then check the box at Application -> Financial Information Applications -> Enterprise Information Products -> Thomson Reuters Machine Readable News -> Thomson Reuters Machine Readable News - News Feed Direct. Then click the Update button in the bottom right.

To sign up for PCNs on News Feed Direct, go to the PCN subscription page, [here](#). Check the box at All Products -> Reuters Enterprise Information -> Thomson Reuters Machine Readable News. Toward the bottom, make sure that the box for “All Client impacts”, or at least “For Action” under that, is checked. Then click the **submit** → link in the lower or upper right to confirm your selection.

CHAPTER 2 USER GUIDE

The User Guide component of this manual describes how to connect to an NFD server and how to begin subscribing to news messages. As an application developer who will be working with NFD, you should read this section in order to learn how to interact with the system before developing your application.

2.1 DELIVERY CONFIGURATION

Thomson Reuters provides clients subscribing to NFD services with access to multiple data centers and servers within data centers to ensure both intra-data center and geographic redundancy. Clients subscribing to several feeds should arbitrate messages between sources using the ID tag. For News Items and News Analytics, users may reference the ContentEnvelope/Header/Info/Id tag. Subscribers can use this ID to discard duplicate messages that results from ingesting multiple feeds of identical content.

News Item examples:

```
<Id>20150609-135838000-nL5N0YV2CD-1-2</Id>
```

```
<Id>20150529-155154000-nL5N0YK0S7-2-2</Id>
```

News Analytics examples:

```
<Id>NewsFeedDirect:20140513-070100000-nL1N0NY1PS-1-2</Id>
```

```
<Id>NewsFeedDirect:20140204-201503000-nPnLApKjy7-1-2</Id>
```

For Economic Events, one should refer to the Indicator Id. See the [Economic Events](#) section for more information.

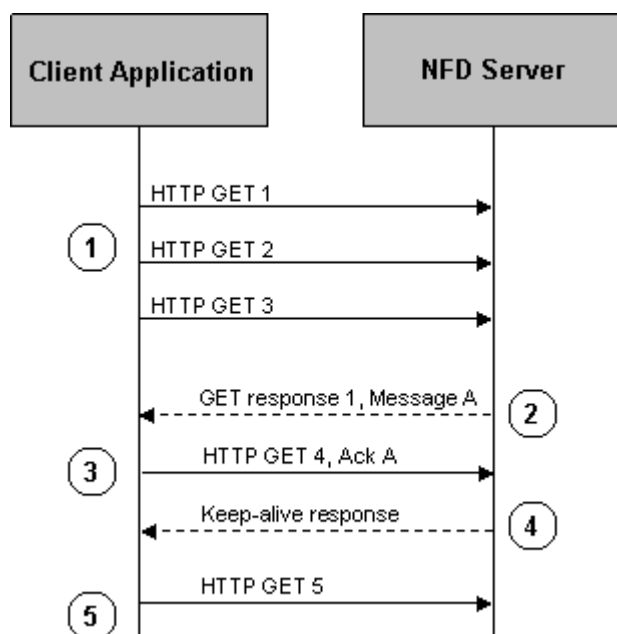
2.2 CONNECTING TO NEWS FEED DIRECT

To connect to a NFD server, the HTTP POST header should appear as follows:

```
POST /login HTTP/1.1
KeepAlive-Interval: <seconds>
Content-Type: text/xml
Host: <ip address>
Content-Length: <content length>
Connection: Keep-Alive
```

The body of the POST should contain the validation SOAP request.

KeepAlive-Interval tells the NFD server how frequently to send keep-alive messages if no other messages are transmitted. See [Keep-Alive Messages](#) below for more details.



2.3 RECEIVING NEWS MESSAGES

NFD uses a specially designed HTTP pipelining protocol to transmit news messages at ultra-low latency. At its most basic level, HTTP is a request/response protocol. A client submits one HTTP GET request and receives one response. The HTTP pipelining protocol extends this. It allows a client to submit multiple GETs and to receive responses as they become available. NFD takes advantage of HTTP pipelining to implement an efficient, ultra-low latency streaming feed of news.

The basic pattern of message exchange between a client application and an NFD server is shown in the following sequence diagram, which presents a sample set of communications between the client and the NFD server.

The client submits a pool of 3 GETs, each ready to be responded to when a news message arrives. One may

configure what size of a pool to maintain. Please see [Maintaining a Pool of Outstanding GETs](#) for details.

The NFD server responds to the first GET when it has data available.

The client submits another GET to top off the pool of outstanding GETs. This example shows an acknowledgement, see [Acknowledgements](#) section below.

A keep-alive response to the second HTTP GET is sent by the NFD server because no news message was transmitted within the keep-alive timeout period. See the [Keep-Alive Messages](#) section for more information.

The client submits another GET to once again top off the pool for a total of three outstanding GETs.

2.3.1. MAINTAINING A POOL OF OUTSTANDING GETS

After connecting, the client must submit a number of HTTP GET requests to an NFD server. Whenever an NFD server has a news message to send to the client it will respond to one of the HTTP GETs with a complete news message – a valid XML document. The client should process the news message and submit another HTTP GET in order to keep a pool of outstanding GET requests ready for subsequent news messages.

A typical GET might look something like the following:

```
GET / HTTP/1.1
Pragma: no-cache
Host: 123.45.67.89
```

2.3.2. RESPONSES FROM GETS

A response, containing a news message will have the following format:

```
HTTP/1.1 200 OK
Cache-Control: no-cache
MsgId: 0
Content-Length: length
payload
```

See the [Acknowledgements](#) section below for a description of the MsgId header.

2.3.3. ACKNOWLEDGEMENTS

One may sign up for either to receive news messages with Direct Delivery or Assured Delivery. For the client code to be flexible enough to use either mode, it should include an acknowledgement in the GETs if the previously received news message has a non-zero MsgId. A GET with an acknowledgement should contain the MsgId of the acknowledged news message in the header:

```
GET / HTTP/1.1
Pragma: no-cache
MsgId: id
Host: 123.45.67.89
```

Assured delivery users should send an acknowledgement to the NFD server within 2 seconds of receipt of a news message. Should the client fail to do this, the NFD server will continue to retransmit the news message every two seconds until it receives an acknowledgement for that news message.

2.3.4. KEEP-ALIVE MESSAGES

If the NFD Server has not sent a news message within the keep-alive period it will send a keep-alive message. This serves two purposes:

- It indicates to the client that everything is functioning properly.
- It provides a response to one of the client's submitted GETs. This limits the period that an HTTP GET will be outstanding. The keep-alive timeout period can be configured at connection in order to ensure that GETs are not outstanding for longer than the timeout period of the client HTTP stack or a proxy if one is used.

If the client does not receive a news message or a keep-alive within a reasonable period, e.g., twice the keep-alive interval, it should assume that there is a problem and so disconnect and reconnect. Conversely, the NFD server will disconnect the client if it does not receive a GET request within 3 times the keep-alive interval and there are no outstanding GETs.

A keep-alive response is represented as an HTTP response of “204 No Content”, as in the following example:

```
HTTP/1.1 204 No Content  
Cache-Control: no-cache
```

The keep-alive interval is specified at connection time in the header of the POST (see the Authentication section above). The minimum value is 3, the maximum is 60, and the default is 5.

Thomson Reuters strongly advises that the keep-alive timeout should be made configurable in client applications.

CHAPTER 3 REFERENCE MANUAL

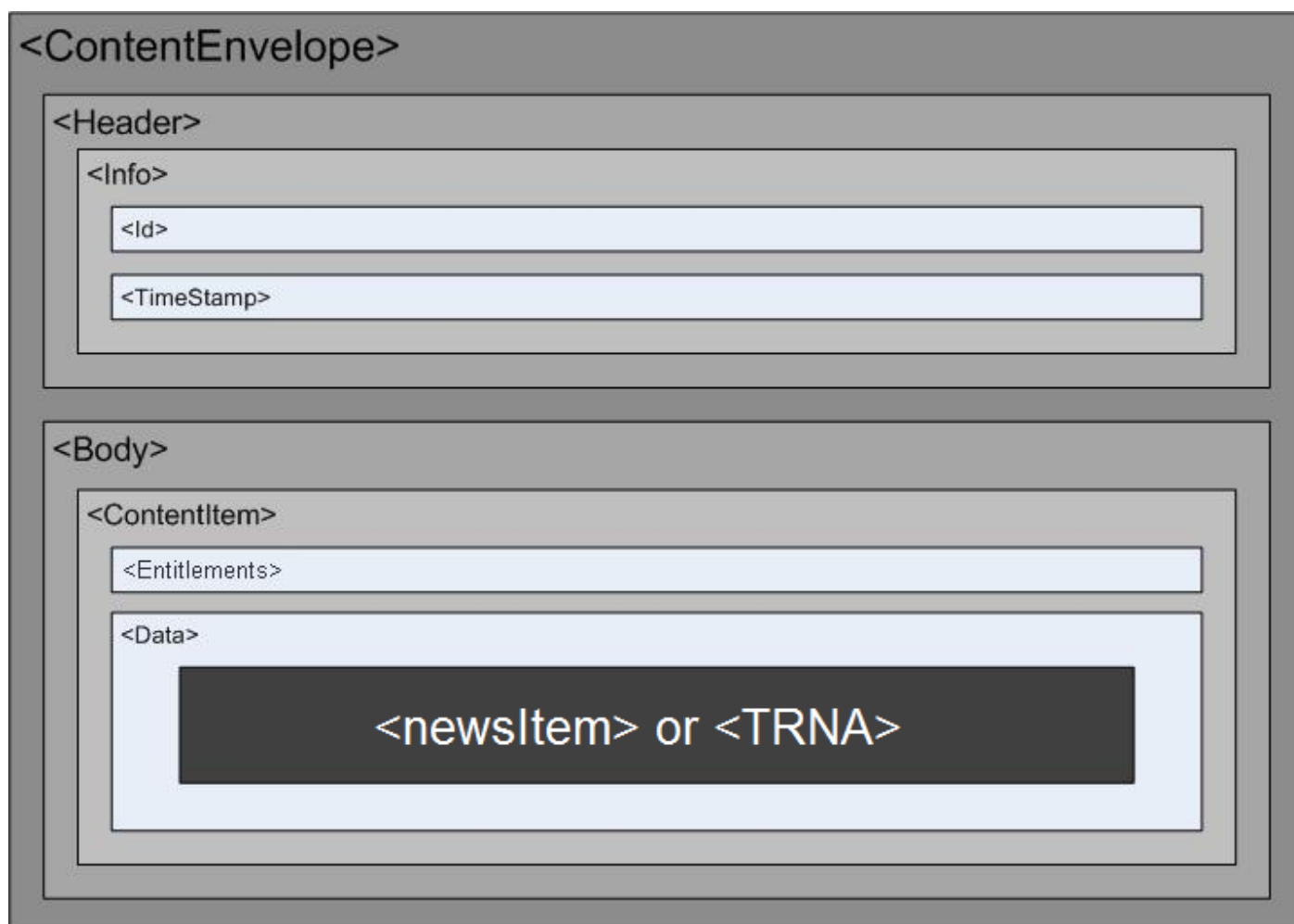
The Reference Manual section of this document is intended for use by application developers who are creating in-house applications to subscribe, process, and analyze data from NFD. If you are new to NFD, and need to learn the basic process of connecting to NFD and receiving data, we recommend that you read the User Manual first, from start to finish, before reading anything in this section.

The best way to use the Reference Manual is to look in the Table of Contents for a topic of interest, and then navigate directly to it in the Reference Manual.

3.1 CONTENT ENVELOPE OVERVIEW

The top-level structure of NFD data for News and News Analytics is the **content envelope**. The content envelope contains all the information required about a particular story or event, including all metadata.

All content envelopes are XML and follow a schema for which the root tag is `<ContentEnvelope>`. News and News Analytics differ structurally at the `ContentEnvelope/Body/Data` level. News-specific data will be stored inside a `<newsItem>` element, while News Analytics-specific data will be stored inside a `<TRNA>` element. The graphic below shows the basic structure of a content envelope.



3.2 CONTENT ENVELOPE STRUCTURE

The figure below illustrates the structure of a content envelope. The table below provides a description of key elements inside the `<ContentEnvelope>`, as well as key attributes that appear in these elements.

| ELEMENT | DESCRIPTION & ATTRIBUTES |
|--------------------------------------|--|
| <code><ContentEnvelope></code> | This is the root element. It contains the following child elements: <ul style="list-style-type: none"> <code><Header></code> <code><Body></code> |
| <code><Header></code> | Contains any required details about the news envelope that pertain to the envelope itself, rather than the news story within. |
| <code><Info></code> | Contains information about the news envelope itself, including: <ul style="list-style-type: none"> <code><Id></code>, which provides a unique ID associated with the news message. <code><TimeStamp></code>, which contains a timestamp applied by Thomson Reuters' normalization and delivery infrastructure. |
| <code><Body></code> | Contains metadata about the news item/News Analytics as well as the news item/company event itself. It contains the <code>contentSet</code> attribute, which is "News" or "TRNA" for news items and News Analytics, respectively. |
| <code><ContentItem></code> | Contains the metadata and data. This element contains the <code><Data></code> child element, described below. |
| <code><Data></code> | This element includes the "payload" of the news item or News Analytics, which is the news and its metadata. The content of this element is covered by a separate schema that varies according to the payload |

3.3 NEWS ITEMS

3.3.1 OVERVIEW

NFD provides real-time news from Reuters and selected third parties, with the same coverage that is available with the News Archive and Real-time News products. For more information on Reuters News content, please refer to the Thomson Reuters News Archive User Guide available [here](#).

The payload of a news item is contained within the `<newsItem>` element. All news items are encoded using a UTF-8 scheme. Every news item in NFD contains several layers of XML elements that provide system data, metadata, and the content of the news story itself.

The block below shows a simple example of a content envelope used to store a news item. Later in this section is a complete description of key fields that may be extracted from the content envelope.

3.3.2 EXAMPLE OF A NEWS ITEM CONTENT ENVELOPE

The below example represents a typical story from Reuters. News items from third-party sources do not differ on tags that hold significant fields. See [News Item Fields](#) section below for more information on significant fields.

```

<ContentEnvelope majVers="1" mi nVers="0.7" pubStyle="Message"
xml ns="http://data.schemas.tfn.thomson.com/Envelope/2008-05-01/"
xml ns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xml ns:news="http://news.schemas.tfn.thomson.com/2008-05-01/">
<Header>
  <Info>
    <Id>20110916-200045000-nASA02TYQ-1-2</Id>
    <TimeStamp>2011-09-16T20:05:01.429Z</TimeStamp>
  </Info>
</Header>
<Body contentSet="News" majVers="1" mi nVers="3.0">
  <ContentItem action="Insert">
    <Entitlements>
      <Product>
        <Code>NS:RTRS</Code>
        <Code>NP:CAN</Code>
        <Code>NP:E</Code>
        <Code>NP:FCA</Code>
        <Code>NP:U</Code>
        <Code>NP:RNP</Code>
        <Code>NP:PCO</Code>
        <Code>NP:PCU</Code>
      </Product>
      <Source>
        <Group>NONE</Group>
      </Source>
    </Entitlements>
    <Data xsi:type="news:NewsDataItem">
      <newsItem standard="NewsML-G2" standardVersion="2.7" conformance="power" guid="20110916-200045000-
nASA02TYQ-1-2" version="1" xml:lang="en" xsi:schemaLocation="http://iptc.org/std/nar/2006-10-01/NAR_1.8-
spec-All-Power_2.xsd http://www.w3.org/1999/xhtml/xhtml1-strict.xsd" xml ns="http://iptc.org/std/nar/2006-
10-01/" xml ns:rtr="http://www.reuters.com/ns/2003/08/content"
xml ns:x="http://www.w3.org/1999/xhtml"><catalogRef href="http://www.iptc.org/std/catalog/catalog.IPTC-G2-
Standards_14.xml" />
      <itemMeta>
        <itemClass qcode="i cls:text" />
        <provider qcode="NS:RTRS" />
        <versionCreated>2011-09-16T20:04:58.001Z</versionCreated>
        <firstCreated>2011-09-16T20:00:45.000Z</firstCreated>
        <pubStatus qcode="stat:usable" />
        <rtr:versionedId guid="20110916-200045000-nASA02TYQ-1-2" />
      </itemMeta>
      <contentMeta>
        <urgency>2</urgency>
        <altId type="idType:USN" rtr:isOriginal="1">nASA02TYQ</altId>
        <language tag="en" />
        <subject qcode="B:202" />
        <subject qcode="N2:RSPC" />
        <subject qcode="B:203" />
        <subject qcode="N2:RCAR" />
        <subject qcode="B:69" />
        <subject qcode="N2:CYCS" />
        <subject qcode="B:98" />
        <subject qcode="N2:SHOP" />
        <subject qcode="BL:54" />
        <subject qcode="N2:RET" />
        <subject qcode="E:1" />
        <subject qcode="N2:BACT" />
        <subject qcode="E:D" />
        <subject qcode="N2:REGS" />
        <subject qcode="G:6J" />
        <subject qcode="N2:US" />
        <subject qcode="G:8W" />
      </contentMeta>
    </Data>
  </ContentItem>
</Body>
</ContentEnvelope>

```

```

    <subject qcode="N2: CA" />
    <subject qcode="M: NY" />
    <subject qcode="N2: BLR" />
    <subject qcode="M: Z" />
    <subject qcode="N2: CMPNY" />
    <subject qcode="R: CTC. TO" />
    <headline>BRIEF- Canadian Tire recalls J1K coded batch of 1000lb Swivel
    Jack&lt;CTC. TO&gt;</headline>
  </contentMeta>
  <contentSet>
    <inlineXML contentType="application/xhtml+xml">
      <xhtml xmlns="http://www.w3.org/1999/xhtml">
        <body>Sept 16 (Reuters) - Canadian Tire Corp Ltd &lt;CTC. TO&gt;;
* Voluntarily recalls j1k coded batch of 1000lb Swivel Jack (product #
040-9035)
* Says only products from the batch with date code j1k are impacted by this
voluntary recall

((Bangalore Equities Newsroom; +91 80 4135 5800; within U.S. +1 646 223 8780))

((For more news, please click here [CTC. TO]))</body>
      </xhtml>
    </inlineXML>
  </contentSet>
</newsItem>
</Data>
</ContentItem>
</Body>
</ContentEnvelope>

```

3.3.3. NEWS ITEM FIELDS

This section will describe key news fields and how they relate to fields of the News Archive.

The subsections below are ordered according to the News Archive field order, not according to the order in which the fields appear in each content envelope.

3.3.3.1. UNIQUE STORY INDEX

The Unique Story Index is a unique index which will always be the same for all news "events" about the same story. This is a simple concatenation of the first publication date and time (See Section 3.3.3.4.) and the PNAC (See 3.3.3.3.).

Example of a Unique Story Index with value 201110916200045nASA02TYQ:

```

<firstCreated>2011-09-16T20:00:45.000Z</firstCreated>
...
<altId type="idType:USN" rtr:isOriginal="1">nASA02TYQ</altId>

```

This is the UNIQUE_STORY_INDEX field in the News Archive.

3.3.3.2. EVENT TYPE

The event type can be used to determine whether the story is an alert, a story, or a deletion. Following are short descriptions of these types:

3.3.3.2.1. ALERT

Alerts are typically used to quickly transmit breaking news information to be followed later by a story take(s). As transmitted to desktops, they have no story body. Nonetheless, the content envelope will repeat the alert text in the tag dedicated to story body. (See 3.3.3.6.) The headline is a short sentence in upper-case. (See 3.3.3.5.) The defining tag of the alert is the `Data/newsItem/contentMeta/urgency` tag taking the value of 1.

Example of an alert:

```
<urgency>1</urgency>
```

3.3.3.2.2. STORY

A story contains headline and story body. It is defined by (a) `Data/newsItem/itemMeta/pubStatus` taking a `qcode` attribute value of "stat:usable" and (b) `Data/newsItem/contentMeta/urgency` tag taking a value greater than 1.

Example of a story with urgency 2:

```
<pubStatus qcode="stat:usable" />
...
<urgency>2</urgency>
```

3.3.3.2.3. DELETION

News items may be deleted when the news system needs to reuse the PNAC (See 3.3.3.3.) for another set of stories. The defining tag of a deletion is the `Data/newsItem/itemMeta/pubStatus` taking a `qcode` attribute value of "stat:canceled".

Example of a deletion:

```
<pubStatus qcode="stat:canceled" />
```

Note that there are no other possible values for `pubStatus@qcode`.

3.3.3.2.4. MAPPING TO NEWS ARCHIVE VALUES

The corresponding field in the News Archive is `EVENT_TYPE`. This can take one of five possible values: `ALERT`, `HEADLINE`, `STORY_TAKE_OVERWRITE`, `STORY_TAKE_APPEND`, and `DELETE`. The NFD alert corresponds to the `ALERT` value and the deletion to the `DELETE` value. The other three `EVENT_TYPE` values are types of stories. They can be differentiated as follows:

- `HEADLINE`: Short summary of the story, containing a headline but no story body. Followed rapidly by a `STORY_TAKE_OVERWRITE` or `STORY_TAKE_APPEND` with the story body. The `HEADLINE` type will **not** be found in NFD.
- `STORY_TAKE_OVERWRITE`: Any story body text received in a previous content envelope for this Unique Story Index (See 3.3.3.1.) is now obsolete and is being replaced by the story body of this content envelope.
- `STORY_TAKE_APPEND`: Append an additional story body onto the end of the previously received story text.

Determining the difference between the `STORY_TAKE_OVERWRITE` and `STORY_TAKE_APPEND` values in NFD requires matching the story body of this to that of a previous version of this story.

3.3.3.3. PNAC: PRIMARY NEWS ACCESS CODE

The Primary News Access Code, or "PNAC" as it is better known, is a Content Identifier that applies to all news messages relating to the same story. Note however that this code is only unique for the life of a story. Once that story is deleted, the PNAC can be reused by a new story that has no relation to the previous story. To guarantee

uniqueness for a particular story chain, one should use the Unique Story Index (See Section 3.3.3.1.). The PNAC is mapped into the `Data/newsItem/contentMeta/altId` tag.

Example of a PNAC with value nASA02TYQ:

```
<altId type="idType:USN" rtr:isOriginal="1">nASA02TYQ</altId>
```

This is the PNAC field in the News Archive.

3.3.3.4. PUBLICATION DATE AND TIME: FIRST AND CURRENT VERSIONS OF THIS STORY

This corresponds to two UTC timestamps that are mapped to the `Data/newsItem/itemMeta` area. The date and time of the **first** version of the news item is mapped into the `<firstCreated>` tag, while the date and time of this version of the news item is mapped into the `<versionCreated>` tag.

Example of a story published at 2011-09-16 20:04:58, with the first version published at 2011-09-16 20:00:45:

```
<versionCreated>2011-09-16T20:04:58.001Z</versionCreated>
```

```
<firstCreated>2011-09-16T20:00:45.000Z</firstCreated>
```

In the News Archive, first publication data and time is the `STORY_DATE_TIME` field and the current one is `TAKE_DATE_TIME`.

3.3.3.5. HEADLINE

The headline or alert text is mapped into the `Data/newsItem/contentMeta/headline` tag.

Headline example:

```
<headline>BRIEF-Canadian Tire recalls J1K coded batch of 1000lb Swivel Jack<CTC.T0></headline>
```

This is the `HEADLINE_ALERT_TEXT` field in the News Archive.

3.3.3.6. STORY BODY

The story body is converted into HTML and mapped into the `Data/newsItem/contentSet/inlineXML/body` tag. Alerts have no story body; their content is entirely stored in the `Data/newsItem/contentMeta/headline` tag. (See Section 3.3.3.5.)

Reuters news story body example:

```
<contentSet>
  <inlineXML contentType="application/xhtml+xml">
    <xhtml xmlns="http://www.w3.org/1999/xhtml">
      <body>Sept 16 (Reuters) - Canadian Tire Corp Ltd <CTC.T0>;
      * Voluntarily recalls j1k coded batch of 1000lb Swivel Jack (product #
      040-9035)
      * Says only products from the batch with date code j1k are impacted by this
      voluntary recall

      ((Bangalore Equities Newsroom; +91 80 4135 5800; within U.S. +1 646 223 8780))

      ((For more news, please click here [CTC.T0]))</body>
    </xhtml>
  </inlineXML>
</contentSet>
```

This field is the concatenation of the News Archive fields `ACCUMULATED_STORY_TEXT` and `TAKE_TEXT`.

3.3.3.7. TOPIC CODES

Topic codes describe the story's subject matter. Each topic code is mapped to the `Data/newsItem/contentMeta/subject` tag to the `qcode` attribute with the "N2:" prefix.

Topic code example:

```
<subject qcode="N2:RSPC" />
```

The News Archive field TOPICS contains a space-delimited list of all topic codes in this content envelope. See [Customer Zone](#) for a reference list of topic codes.

3.3.3.8. INSTRUMENT CODES (RICS)

All financial instruments including currencies, stocks, bonds and physical commodities are assigned a Reuters Instrument Code (RIC) to enable Thomson Reuters desktop product users to navigate between news and prices. Thomson Reuters uses these instrument codes to identify listed companies. Each RIC is mapped to the `Data/newsItem/contentMeta/subject` tag to the `qcode` attribute with the "R:" prefix.

Instrument Code example:

```
<subject qcode="R:CTC.TO" />
```

The News Archive field RELATED_RICS contains a space-delimited list of all RICs in this content envelope.

3.3.3.9. NAMED ITEMS

Named Items, also known as "Recurring Reports", represent routinely recurring stories, such as stock market reports and daily calendars. Although published repeatedly, they may not occur frequently. Each named item is mapped to the `Data/newsItem/itemMeta/instanceOf` tag to the `qcode` attribute with the "NI:" prefix.

Instrument Code example:

```
<instanceOf qcode="NI:TOP/ELN" />
```

The News Archive field NAMED_ITEMS contains a space-delimited list of all named items in this content envelope. See [Customer Zone](#) for a reference list of named items.

3.3.3.10. ATTRIBUTION

The attribution is the source of the news story or alert. This is mapped into the `qcode` attribute of the `Data/newsItem/itemMeta/provider` tag. See [Customer Zone](#) for a reference list of attributions.

Attribution example:

```
<provider qcode="NS:RTRS" />
```

This is the ATTRIBUTION field in the News Archive.

3.3.3.11. LANGUAGE

The language determines the language of the story or alert. It is mapped into the `tag` attribute of the `Data/newsItem/contentMeta/language` tag.

Language example:

```
<language tag="en" />
```

This is the LANGUAGE field in the News Archive.

3.4 ECONOMIC EVENTS

NFD contains macro-economic events delivered at ultra-low latency. The following section describes the payload structure of economic events messages, which is octet stream format not XML.

It is important to note that Thomson Reuters places a great deal of scrutiny on data accuracy and consistency. As a result, clients should pay very close attention to the elements associated with each indicator, and how Thomson Reuters has chosen to cover specific releases. See [Customer Zone](#) for a full list of indicators.

3.4.1. OVERVIEW OF BINARY FORMAT

A binary message consists of the following, in this order:

1. Reserved, null terminated string
2. Binary message type
3. Economics header
4. Economics indicators

All multi-byte values are little-endian (least significant byte first).

3.4.1.1. RESERVED, NULL TERMINATED STRING

This is a short string. One should scan for the null terminator and ignore the bytes that precede it.

3.4.1.2. BINARY MESSAGE TYPE

The one byte binary message type indicates what type of payload is being carried in the subsequent portion of the message. Currently the only supported type is Economics for which the value will be set to 1.

3.4.1.3. ECONOMICS HEADER

This consists of a 32 bit HFLAGS followed by an 8 byte deprecated Timestamp. Timestamps should not be relied upon and therefore should be ignored.

3.4.1.3.1. HFLAGS

This is a 4 byte, little endian value describing the message.

| BIT NUMBER | DESCRIPTION |
|------------|---|
| 0-3 | Economics payload version – currently 0b001 |
| 4-7 | Number of indicators. (0b0000 indicates there are 16 indicators). |
| 8-18 | Reserved for future use. 11 bits. |
| 19-31 | Reserved. |

The 32 bit value containing the HFLAGS should conceptually look like:

```

<-      ID      -> <-#IN-> <-VER->
3 3 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0
1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1
  
```

When viewed in memory as little endian bytes it should look like:

```
<--- LOW ---> <--- LOW MID ---> <--- HI MID ---> <--- HI --->
<- #IN-> <- VER-> <--- RES LOW ---> < ID LO > <RH > <--- ID HI --->
0 0 0 0  3 3  1 1 1 1 1 0 0  2 2 2 2 1  1 1 1  3 3 2 2 2 2 2 2
7 6 5 4  2 1  5 4 3 2 1 0 9 8  3 2 1 0 9  8 7 6  1 0 9 8 7 6 5 4
```

Where:

- #IN = number of indicators
- RES = reserved
- RH = reserved hi

Like all multi-byte values in this payload specification, this 32 bit value is transmitted as little endian over the wire.

3.4.1.3.2. TRANSMISSION TIMESTAMP

The timestamp is an 8 byte field containing the number of 100 nanosecond intervals since Jan 1st 1601. Timestamp is no longer supported.

3.4.1.4. ECONOMIC INDICATORS

The message may contain between 1 and 16 indicators. See HFLAGS above.

| BYTE NUMBER | DESCRIPTION |
|-------------|--|
| 0-1 | Indicator id. These are NFD indicator ids. News Feed Direct provides a mapping from these to Thomson Reuters RICs. Indicator ids are significantly more compact than RICs. |
| 2 | IFLAG. A flag describing the indicator. See below. |
| 3-6 | Actual value. This is an IEEE float. See <i>Actual value correction flag</i> in IFLAGS below. |
| 7-10 | Previous value. The publishing app may choose to always publish this value or may choose to publish this value only if the ultimate supplier of the data has provided a revision to the previous value. In this latter case, if there is no revision this value is set to a NaN with bit pattern 0xffc00000. This is an IEEE float. See <i>Previous value correction flag</i> in IFLAGS below. |
| 11-14 | Estimated value. Estimated value is no longer supported and should be ignored. Value may be set to a NaN with bit pattern 0xffc00000. This is an IEEE float. |

3.4.1.4.1. IFLAGS

The value of the IFLAGS field gives further information about the indicator.

| BIT NUMBER | DESCRIPTION |
|------------|---|
| 0-2 | Qualifier. This 3 bit field will have one of the following values: <ul style="list-style-type: none"> 0 : The indicator is a normal indicator – none of the following conditions apply. 1 : The indicator is suspect. Thomson Reuters suspect the <i>actual value</i>, <i>previous value</i> and/or <i>estimated value</i> provided to them may not be correct. 2 : The indicator values contain the lower bounds of a range 3 : The indicator values contain the upper bounds of a range |

| | |
|-----|--|
| | <p>The use of qualifiers 2 and 3 may be used to pass range values in 2 indicators which will have the same indicator id. One of the indicators will have this qualifier set to 2 and contain the lower values of the range and the other will have this qualifier set to 3 and contain the upper values. If there is a range that is suspect then this value will be set to 1 and the values reported will be the lower end of the range.</p> <p>Values 4 to 7 are reserved</p> |
| 3-5 | Reserved |
| 6 | <p>Actual value correction flag This bit is set if the <i>actual value</i> contains a correction to an erroneous actual value sent a previously transmitted copy of this indicator. When this bit is set:</p> <p><i>Actual value</i> is set to the corrected value.</p> <p><i>Previous value</i> is set to a NaN with bit pattern 0xffc00000 unless the <i>Previous value correction flag</i> is also set.</p> <p><i>Estimated value</i> is set as normal.</p> |
| 7 | <p>Previous value correction flag This bit is set if the <i>previous value</i> contains a correction to an erroneous previous value sent in a previously transmitted copy of the indicator. Note that a correction is different from a revision. A correction is used when there has been a mistake. A revision to a <i>previous value</i> is when the ultimate provider of the data issues a revised number. When this bit is set:</p> <p><i>Actual value</i> is set to a NaN with bit pattern 0xffc00000 unless the <i>Actual value correction flag</i> is also set.</p> <p><i>Previous value</i> is set to the corrected value.</p> <p><i>Estimated value</i> is set as normal.</p> |

3.5 MULTICAST

Customers subscribing to News Feed Direct Economic Events service may opt to receive publications via multicast. In order to receive multicast publications, customers must procure direct circuit connectivity to a NFD switch. Multicast publication will be sent from the same switch port as the unicast feed.

3.5.1. MULTICAST CHANNELS

Entitlements to Economic Event data will be controlled by the extension of multicast channels to customer's switch port interfaces. Available Multicast channels are listed below:

| CHANNEL ENTITLEMENT |
|--|
| Production messages for Global Economic Events. |
| Production messages originating from Department of Labor. |
| Production messages originating from Department of Commerce. |
| Production messages for Markit PMI |
| Production messages for Institute of Supply Management |
| Production messages for LIBOR |
| Production messages for EURIBOR |

3.5.2. PAYLOADS

The format of the multicast message is a *version 4 economic payload*. It is similar to but smaller than the version 1 payload carried in the port 80 TCP message. The reduction in size lowers latency.

Version 4 Economic Payload

Byte 0: Type

```
unsigned char  m_Type;           // See note below (*)
```

Bytes 1 to 4: Header (little endian)

```
unsigned long  m_Version : 4;    // Always 4
unsigned long  m_NumIndicators : 4; // 0x0 means 16 indicators
unsigned long  m_Reserved1 : 11;
unsigned long  m_Reserved2 : 13;
```

From bytes 5 onwards, each indicator has the following format:

```
uint16        m_IndicatorId;    // See note below (**)
unsigned char  m_iFlag_qualifier : 3;
unsigned char  m_iFlag_internal : 3;
unsigned char  m_iFlag_actualValueCorrection : 1;
unsigned char  m_iFlag_previousValueCorrection : 1;
float         m_Value;
float         m_PreviousValue;
```

(*) IMPORTANT: A type of 1 indicates this is a binary econ, as documented above. Other values are reserved for future types. If the type is not 1 then ignore the message.

() IMPORTANT:** If the `m_IndicatorId` has the value 11032 then this is a system message, used for heartbeats or other purposes. The message should be ignored.

3.5.3. HEARTBEATS

News Feed Direct normally sends out heartbeats over production messaging multicast channels once per minute in order to prevent multicast routing timeouts. This heartbeat will be active most of the time, but may be down during tests. The heartbeat has the format of a *System Message* as described in the *Payload* section 3.6.2.

3.5.4. RESILIENCY

As multicast uses UDP it does not guarantee delivery. A reliable delivery mechanism is provided by the existing TCP port 80 mechanism; it is recommended that all customers subscribing to multicast should also listen to the TCP publication for resiliency.

APPENDIX 1 FREQUENTLY ASKED QUESTIONS

1.1 SHOULD I USE THE INTERNET OR DEDICATED LEASED LINES TO CONNECT TO NEWS FEED DIRECT?

Thomson Reuters recommends using dedicated leased lines for higher reliability and the lowest possible latency.

1.2 IF I USE DEDICATED LEASED LINES, HOW MUCH BANDWIDTH IS REQUIRED?

A bandwidth of at least 1 Mbps is recommended. Higher bandwidth will reduce serialization delay, providing a better latency.

1.3 WHY IS IT SO IMPORTANT TO ALWAYS MAINTAIN A POOL OF OUTSTANDING GETS?

If an outstanding GET is not present on the NFD server when a news message is being broadcast, the news message will be dropped from that client's queue. It is very important for client applications to maintain a sufficient pool of outstanding GETs.

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