

OrderChangeNotif

Progress Update & Next Steps

CR 067 – Two Facets

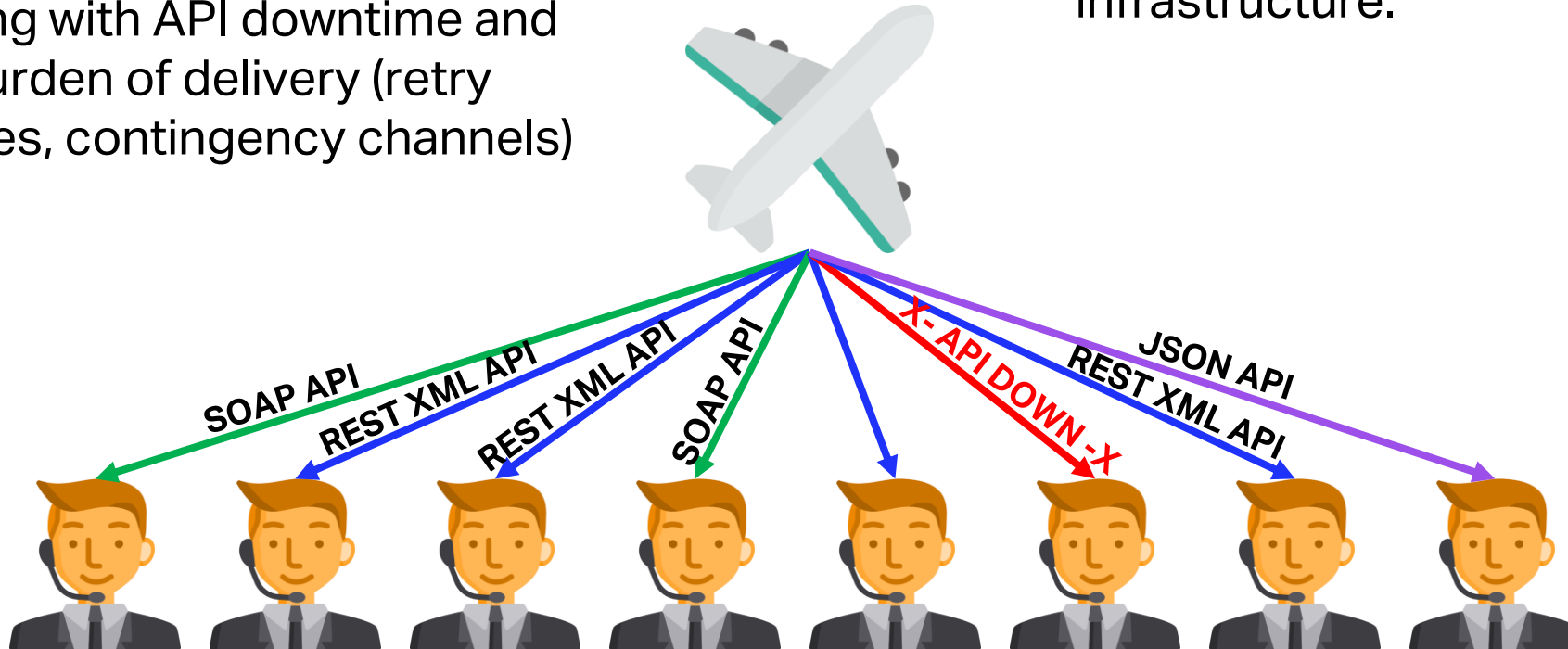
**Asynchronous
Messaging
Protocols**



**Structuring
the Change**

OrderChangeNotif Today

- Managing connections to 100s+ of API different endpoints is impractical & not scalable
- Dealing with API downtime and the burden of delivery (retry policies, contingency channels)
- Significant effort and responsibility for sellers to run their own API endpoints and related services / infrastructure.



Asynchronous Messaging

Delivery mechanisms considered:

- HTTP Long-Polling

Persistence of one HTTP connection per client

- Webhooks

Still requires management of API endpoints

- **Message Queueing**

- STOMP

OSI Layer 7. Text-based.

- MQTT

OSI Layer 4. Optimized for embedded systems.

- **AMQP**

- JMS

Java-specific

- SQS

Proprietary



AMQP Specs & Implementation



Two “competing” versions

- Pre 1.0 (which is de facto a standard)
- Post 1.0 since 2014 (ISO/IEC 19464)

Numerous open source implementations

- Server
 - Apache ActiveMQ (post 1.0)
 - RabbitMQ (pre 1.0)
- Client
 - Every language has an open source AMQP client implementation (post and pre 1.0)
 - Apache Qpid (post 1.0)

And also proprietary solutions & platforms...

AMQP Features

- Fully interoperable
 - Language, client, server...
- Reliable
 - Delivery / Retry-policies:
 - at-most-once
 - at-least-once
 - once-and-only-one
 - with ack...
- Security (authentication)
- Scalable
- Features: <https://www.amqp.org/product/features>



OCN Change Structure

- Purely technical problem area of data synchronization
- 4 x proposals considered so far - still work in progress.
- Considered OCN as a way to execute multiple sequential updates (batch) or as a single update transaction.
- Will include some additional context related to the change, e.g. REA code
- OrderHistory to be aligned with re-design of OCN
- Sticking to principles:
 - Avoid resending something the recipient already knows (RQs by reference rather than by value)
- Order versioning required

XML Segment: IDs & Values

```
<OrderID>XB12345</OrderID>
<OrderVer>1</OrderVer>
<Element1>
  <Element1A>
    <Element1A_ID>E001</Element1A_ID>
    <Element1Aa>111</Element1Aa>
    <Element1Ab>222</Element1Ab>
  </Element1A>
</Element1>
<Element2>
  <Element2_ID>E002</Element2_ID>
  <Element2A>333</Element2A>
  <Element2A>444</Element2A>
  <Element2A>555</Element2A>
</Element2>
<Element3>
  <Element3_ID>E003</Element3_ID>
  <Element3A>
    <Element3Aa>
      <Element3Aai>666</Element3Aai>
      <Element3Aaii>777</Element3Aaii>
      <Element3Aaiii>888</Element3Aaiii>
      <Element3Aaiv>999</Element3Aaiv>
    </Element3Aa>
  </Element3A>
  <Element3B>AAA</Element3B>
  <Element3C>BBB</Element3C>
</Element3>
```

```
<OrderID>XB12345</OrderID>
<OrderVersion>2</OrderVersion>
<ChangeType>Update</ChangeType>
<Delete>
  <Element2>
    <Element2_ID>E002</Element2_ID>
    <Element2A>444</Element2A>
  </Element2>
</Delete>
<Add>
  <Element2>
    <Element2_ID>E002</Element2_ID>
    <Element2A>445</Element2A>
  </Element2>
</Add>
```

IDs for navigation mixed
in with elements/values
to be updated.

IDs need to be hard-coded as
"for navigation purposes only"

XML Segment + Business Context

```
<OrderID>XB12345</OrderID>
<OrderVer>1</OrderVer>
<Element1>
  <Element1A>
    <Element1A_ID>E001</Element1A_ID>
    <Element1Aa>111</Element1Aa>
    <Element1Ab>222</Element1Ab>
  </Element1A>
</Element1>
<Element2>
  <Element2_ID>E002</Element2_ID>
  <Element2A>333</Element2A>
  <Element2A>444</Element2A>
  <Element2A>555</Element2A>
</Element2>
<Element3>
  <Element3_ID>E003</Element3_ID>
  <Element3A>
    <Element3Aa>
      <Element3Aai>666</Element3Aai>
      <Element3Aaii>777</Element3Aaii>
      <Element3Aaiii>888</Element3Aaiii>
      <Element3Aaiv>999</Element3Aaiv>
    </Element3Aa>
  </Element3A>
  <Element3B>AAA</Element3B>
  <Element3C>BBB</Element3C>
</Element3>
```

```
<OrderID>XB12345</OrderID>
<OrderVersion>2</OrderVersion>
<ChangeType>Update</ChangeType>
<Delete>
  <Element2>
    <Element2_ID>E002</Element2_ID>
    <Element2A>333</Element2A>
    <Element2A>444</Element2A>
    <Element2A>555</Element2A>
  </Element2>
</Delete>
<Add>
  <Element2>
    <Element2_ID>E002</Element2_ID>
    <Element2A>333</Element2A>
    <Element2A>445</Element2A>
    <Element2A>555</Element2A>
  </Element2>
</Add>
```

Repeating some information from the Order to provide additional context

"Diff" required



XML Segment + Separate Ref Data

```
<OrderID>XB12345</OrderID>
<OrderVer>1</OrderVer>
<Element1>
  <Element1A>
    <Element1A_ID>E001</Element1A_ID>
    <Element1Aa>111</Element1Aa>
    <Element1Ab>222</Element1Ab>
  </Element1A>
</Element1>
<Element2>
  <Element2_ID>E002</Element2_ID>
  <Element2A>333</Element2A>
  <Element2A>444</Element2A>
  <Element2A>555</Element2A>
</Element2>
<Element3>
  <Element3_ID>E003</Element3_ID>
  <Element3A>
    <Element3Aa>
      <Element3Aai>66</Element3Aai>
      <Element3Aaii>77</Element3Aaii>
      <Element3Aaiii>88</Element3Aaiii>
      <Element3Aaiv>99</Element3Aaiv>
    </Element3Aa>
  </Element3A>
  <Element3B>AAA</Element3B>
  <Element3C>BBB</Element3C>
</Element3>
```

```
<OrderID>XB12345</OrderID>
<OrderVersion>2</OrderVersion>
<ChangeType>Update</ChangeType>
<Delete>
  <Element2>
    <Element2_ID>E002</Element2_ID>
    <Element2A>444</Element2A>
    <Element2A>555</Element2A>
  </Element2>
</Delete>
<Add>
  <Element2>
    <Element2_ID>E002</Element2_ID>
    <Element_RefID>EX1</Element_RefID>
  </Element2>
</Add>
<DataLists>
  <ElementX_ID>EX1<ElementX_ID>
  <ElementX1>445</ElementX1>
</DataLists>
```

Common DataLists (ref data)
for update operations

"Diff" required

Data for additional context
reference and data for
updating mixed together



XPaths with OCN

```
<OrderID>XB12345</OrderID>
```

```
<OrderVer>1</OrderVer>
```

```
<Element1>
```

```
  <Element1A>
```

```
    <Element1A_ID>E001</Element1A_ID>
```

```
    <Element1Aa>111</Element1Aa>
```

```
    <Element1Ab>222</Element1Ab>
```

```
  </Element1A>
```

```
</Element1>
```

```
<Element2>
```

```
  <Element2_ID>E002</Element2_ID>
```

```
  <Element2A>333</Element2A>
```

```
  <Element2A>444</Element2A>
```

```
  <Element2A>555</Element2A>
```

```
</Element2>
```

```
<Element3>
```

```
  <Element3_ID>E003</Element3_ID>
```

```
  <Element3A>
```

```
    <Element3Aa>
```

```
      <Element3Aai>666</Element3Aai>
```

```
      <Element3Aaii>777</Element3Aaii>
```

```
      <Element3Aaiii>888</Element3Aaiii>
```

```
      <Element3Aaiv>999</Element3Aaiv>
```

```
    </Element3Aa>
```

```
  </Element3A>
```

```
  <Element3B>AAA</Element3B>
```

```
  <Element3C>BBB</Element3C>
```

```
</Element3>
```

```
<OrderID>XB12345</OrderID>
```

```
<OrderVersion>2</OrderVersion>
```

```
<ChangeType>Update</ChangeType>
```

```
<Path>/Order/Element2[Element2_ID="E002"]/Element2A[.="444"]</Path>
```

```
<Value>445</Value>
```

Separating the navigation [to where the update needs to take place] from the actual data to be updated

XPath handling already part of the same code libraries used to parse XMLs



XPaths with OCN

```
<OrderID>XB12345</OrderID>
<OrderVer>1</OrderVer>
<Element1>
  <Element1A>
    <Element1A_ID>E001</Element1A_ID>
    <Element1Aa>111</Element1Aa>
    <Element1Ab>222</Element1Ab>
  </Element1A>
</Element1>
<Element2>
  <Element2_ID>E002</Element2_ID>
  <Element2A>333</Element2A>
  <Element2A>444</Element2A>
  <Element2A>555</Element2A>
</Element2>
<Element3>
  <Element3_ID>E003</Element3_ID>
  <Element3A>
    <Element3Aa>
      <Element3Aai>666</Element3Aai>
      <Element3Aaii>777</Element3Aaii>
      <Element3Aaiii>888</Element3Aaiii>
      <Element3Aaiv>999</Element3Aaiv>
    </Element3Aa>
  </Element3A>
  <Element3B>AAA</Element3B>
  <Element3C>BBB</Element3C>
</Element3>
```

Separating the navigation [to where the update needs to take place] from the actual data to be updated

```
<OrderID>XB12345</OrderID>
<OrderVersion>2</OrderVersion>
<ChangeType>Update</ChangeType>
```

```
<Path>/Order/Element2[Element2_ID="E002"]/Element2A[.="444"]</Path>
<Value>445</Value>
```

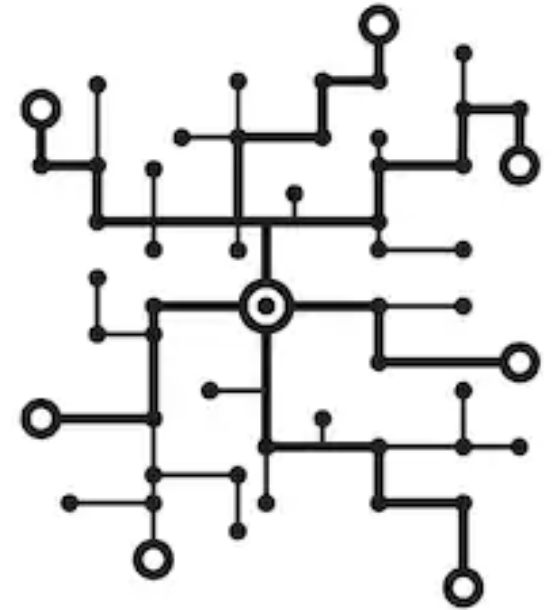
```
<OrderID>XB12345</OrderID>
<OrderVersion>2</OrderVersion>
<ChangeType>Update</ChangeType>
<Path>
  /Order/Element2[Element2_ID="E002"]</Path>
<Value>
  <Element2_ID>E002</Element2_ID>
  <Element2A>333</Element2A>
  <Element2A>445</Element2A>
  <Element2A>555</Element2A>
</Value>
```

Could be used to update any level of the DOM



XPaths with NDC/00

- Used today in:
 - All NDC RS Msgs' Errors (since v1.1.1)
 - Warnings
 - Field Metadata
 - Policies
 - ContentSource
 - Rules Metadata
 - Marketing Messages
 - Payload-wide / element-specific encryption (coming soon)



Thank You

