Webservices Subgroup

72nd SMDG Meeting in Hamburg

October 10th, 2018
Agenda

- About / Mission / goals / latest activities
- Data modeling
- API Guidelines
- Use Cases and Processes under discussion
- Looking forward / Next steps
Webservice Standardization by SMDG

Working group members

- Tamme Bohlen, Hapag-Lloyd (chair)
- Ray Schraff, Hyland Software (chair)
- Michael Schröder, Hapag-Lloyd
- Peter Horstkorte, Hapag-Lloyd
- Paul Wauters, PSA Terminal Antwerp
- Stephan Krause, Eurogate Terminals
- Hanane Becha, Traxens
- Mario Scimone, Contship Italia Terminals
- Sönke Witt, HHLA Hamburg Terminals
Webservice Standardization by SMDG – Mission statement

Requirements on standardization

At the SMDG meeting in March 2017 in Genoa it was decided that in addition to the world of UN/Edifact standards, the SMDG would also start to engage in the standardization of web services.

Current level of standardization

- Technical standards already exist, such as REST or SOAP. The SMDG will use them but will not engage in developing them.

- Implementation guides – no standards exist. Each party implements based on their own individual requirements.

- Business level description of Input Request and Output Response - No standard exists. Each party uses their own wording.
Webservice Standardization by SMDG

Missing: A catalog of web services from Business Perspective

- All carriers and shippers presumably have similar operational requirements

Role of the SMDG

- The SMDG intends to publish a catalog of web services for the maritime industry. Users could be Shipper – Forwarder – Carrier – Agent – Terminal – Customs
- For each web service in the catalog there should be the business description, the implementation guide and the technical source
- SMDG to offer the standardized web services in addition to the Edifact MIGs.
Idea: build 1 or 2 early prototypes as soon as possible to get experience and learn from it!
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Existing standards for technical layer

**REST – Representational state transfer**

REST is a simple alternative to WSDL and SOAP. It’s a programming framework (a core set of principles, properties, and constraints) that allows a service requestor to access web resources (a core set of principles, properties, and constraints).

**JSON – JavaScript Object Notation**

It is the most common, language-independent data format used for browser/server communication. It is partly replacing XML. It’s based on JavaScript. It’s a simple data format that uses human-readable text to transmit data objects.

**XSD – XML Schema Definition**

specifies how to describe the elements in an XML document. W3C recommendation.

**SOAP – Simple Object Access Protocol**

SOAP is an XML-based protocol specification for exchanging structured information via web services. SOAP is a W3C standard. In use since version 1.0 in 1999, as successor of RPC.

As an example of what SOAP procedures can do, an application can send a SOAP request to a server that has web services enabled with the parameters for a search. The server then returns a SOAP response (an XML-formatted document with the resulting data).

**WSDL – Webservice Description Language**

WSDL is an XML-based description language independent of transmission protocol, programming language or development platform. The filename extension is .wsdl. Current W3C standard is WSDL 2.0. It provides a machine-readable description of how the service can be called, what parameters it expects, and what data structures it returns.

**W3C = World Wide Web Consortium**

REST is a simple alternative to WSDL and SOAP. It’s a programming framework (a core set of principles, properties, and constraints) that allows a service requestor to access web resources (a core set of principles, properties, and constraints).

We finally agreed to focus on:

- **OpenAPI**

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# Webservice Standardization by SMDG

**Examples – Pilot candidates**

## Real-life use cases for Webservice
required or already existing in the maritime industry

<table>
<thead>
<tr>
<th>Webservice Name:</th>
<th>Get Tare Weight</th>
<th>Send VGM</th>
<th>Obtain schedule connections</th>
<th>Schedule to Terminal</th>
<th>Track + Trace Shipper</th>
<th>Automated container tracking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose:</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Shipper needs container tare weight for VGM calculation</td>
<td>Shipper sends VGM to carrier or terminal and needs immediate reply (accept or reject)</td>
<td>Shipper needs schedule connections between two ports e.g. from SGSIN to NLRTM</td>
<td>Carrier sends vessel schedule to terminal</td>
<td>Shipper needs to know the position of his cargo</td>
<td>The tracking device provider sends the container position to the carrier</td>
<td></td>
</tr>
</tbody>
</table>

| Input request    |                  |          |                             |                      |                      |                             |
| Container number | VGM, container ID, booking number etc | two ports e.g. from SGSIN to NLRTM | Locode and Terminalcode | Booking or B/L or container number | - / - (time triggered) |

| Output response  |                   |          |                             |                      |                      |                             |
| Size type and tare weight, MGW + other cntr master data | Accept or reject with reason | Vessels and voyages with their ETA / ETD and cut-offs | For each voyage: Vessel name + ID, voyage number, ETA+ETD + cut-offs | Tracing status / latest position | Container number, position Lat+Lon |
Latest working group activities

- **26.+27.6.2018 F2F-Meeting @Hapag-Lloyd, Hamburg**
  - GEFEG.fx training by GEFEG
  - Introduction into CCL + MMT (Sue)

- **29.08.2018 F2F-Meeting @Hapag-Lloyd, Hamburg**
  - Pilot candidates revisited
  - SMDG API Design Guideline
  - Where is the additional benefit of web services?
  - How close we want to couple to MMT/CCL?
IMO FAL data model: Loosely coupled data models
Data Modeling Approach Analysis

Heavy Data Modeling

(-) Heavy Upfront Efforts
(-) Slow Start
(-) Close Coupling

Use Case focus

(+) Quick Start
(+) Loose Data Coupling
(+) Less efforts upfront
WCO example use case: Declare Arrival of Goods
SMDG Web Service API Design Guideline

<table>
<thead>
<tr>
<th>Table of Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope and Situation</td>
</tr>
<tr>
<td>Design principles</td>
</tr>
<tr>
<td>Business design and resources management</td>
</tr>
<tr>
<td>Security</td>
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<tr>
<td>Transactional Considerations</td>
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<tr>
<td>Relational to DOD/PORT/COLMINT</td>
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<tr>
<td>Tools and Techniques</td>
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<tr>
<td>Use of XDR/GEONET-XML</td>
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<tr>
<td>SDAP in direct list processors</td>
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<tr>
<td>Glossary</td>
</tr>
<tr>
<td>Technical considerations</td>
</tr>
<tr>
<td>URL patterns</td>
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<tr>
<td>Encoding</td>
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<tr>
<td>SMDG type</td>
</tr>
<tr>
<td>Handling of pre-processed data</td>
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<tr>
<td>Use of SOAP messages</td>
</tr>
<tr>
<td>Use of HTTP request message content</td>
</tr>
<tr>
<td>Error handling</td>
</tr>
<tr>
<td>User interface</td>
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<tr>
<td>Versioning</td>
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<tr>
<td>How to document requirements and ensure content</td>
</tr>
<tr>
<td>Questions and answers</td>
</tr>
<tr>
<td>References</td>
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</tbody>
</table>
Terminal Visit / Berth Scheduling

Weather impact
Tidal restrictions
Engine breakdown
Accumulated Delay

Schedule (IFTSAI)

Gang shortage
Weather impact
Crane breakdown
Prev vessel delayed

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Terminal Visit / Berth Scheduling

Weather impact
Tidal restrictions
Engine breakdown
Accumulated Delay

Tidal restrictions
Local bank holidays
Terminal Congestion
Speed on sea passage
Connected services

Gang shortage
Weather impact
Crane breakdown
Prev vessel delayed

Yard planning
Berth planning
Shift/Gang planning
Crane work programs

Schedule (IFTSAI)
Terminal Visit / Berth Scheduling

- Weather impact
- Tidal restrictions
- Engine breakdown
- Accumulated Delay

- Tidal restrictions
- Local bank holidays
- Terminal Congestion
- Speed on sea passage
- Connected services

- Call Announcement
- Call Update / Cancellation
- Berthing Request
- Operational Event Notification
- Berth Availability
- Berth Confirmation/Refusal
- Operational Event Notification

- Gang shortage
- Weather impact
- Crane breakdown
- Prev vessel delayed

- Yard planning
- Berth planning
- Shift/Gang planning
- Crane work programs
Get Booking Details

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Get Booking Details

- Booking
- GATE IN FULL
- VSL ARRIVAL

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Web service governance

- **Service Discovery**
  - Who provides which services under which URL?

- **Service routing**
  - Which service provider do I need to call for which business object?

- **Authentication / Access control**
Next steps

- **Further work on SMDG Web Service API Guideline**
  - Web Service Governance
  - Security, Testing

- **Build a library of Use Cases**
  - Allow for process variation
  - Align data models

- **Establish a pilot project**
  - Select a specific Use Case
  - Use Case design & documentation
  - Recruit Participants
Thank you
for your attention!