ONE Record Insights

Episode 4

The ONE Record API:
An overview of the key features

Henk Mulder
Head, Digital Cargo
IATA

Andra Blaj
Developer, ONE Record
IATA

This session will start shortly
ONE Record Insights

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Your hosts today

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ONE Record Insights

Episode 1
ONE Record: One step closer to digital cargo
Tuesday, 23rd June 11:00 – 12:30 (CEST)

Episode 2
The data model: a digital twin of the air cargo industry
Tuesday, 30th June 11:00 – 12:30 (CEST)

Episode 3
Crafting ontologies: from physical freight to machine readable data
Tuesday, 7th July 11:00 – 12:30 (CEST)

Episode 4
The ONE Record API: an overview of the key features
Tuesday, 14th July 11:00 – 12:30 (CEST)

Episode 5
Data security: securing the Internet of Logistics
Tuesday, 21st July 11:00 – 12:30 (CEST)

Episode 6
Pilot testing: engaging with the cargo community
Tuesday, 28th July 11:00 – 12:30 (CEST)
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ONE Record API: an overview of the key features

Part 1: Context
Part 2: ONE Record API basics
Part 3: Pub/Sub & Delegation
Part 4: Handling events
Part 5: Access Control
Part 6: Versioning with Memento Protocol
Part 7: Demo
Part 8: Q&A
How to participate during the meeting?

- You can only hear the presenters
- Your microphones are disabled
- Use the questions box to interact
- Simply enter your questions in the chat box on the right
This meeting is recorded for future use

The entire recording along with questions will be available shortly after this webinar finishes.

Simply click on the link in the invite for the live event to access it.

The presentations shown today will be available for download on our website:

www.iata.org/one-record
ONE Record Concept
ONE Record concept

The essence of the ONE Record is to move from a peer-to-peer messaging model to a data sharing model relying on a Virtual Shipment Record.
The ONE Record concept is based on 3 pillars enabling to define:

WHAT, HOW, with WHOM data can be shared
The ONE Record concept is based on 3 pillars enabling to define:

WHAT, HOW, with WHOM data can be shared.
What is the Internet of Logistics?
How does the Internet of Logistics work?

Internet of Logistics (IOL) - contains ONE Record Servers and Clients representing all types of stakeholders from the supply chain and it is governed by the ONE Record API and Security specifications.
What is an API?
“An API is a computing interface which defines interactions between multiple software intermediaries. It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used and the conventions to follow.”
What are the features of the ONE Record API?
Introducing John & Jane, IoL partners

Hi my name is Jane, I am the data owner.

Hi my name is John, I am the data consumer.

Together we will walk you through the API features.

More information in the ONE Record API Insight.
Let’s hear from Jane & John challenges

Jane & John are going to walk us through the different API features

1. How do I make my data available?
2. How can I access the data?
3. How do I raise a change request?
4. How do I update the data?
5. How can I save the history of the data?
6. How do I give data access to my partners?
7. How can we automate data notifications?
8. How can I send events related to data?
9. How can I define to whom I give data access?
10. How can I take a snapshot of the data?
11. How can I retrieve a version of data at a certain moment in time?
12. How can I see all the existing versions of the data?
ONE Record Insights

Part 2

ONE Record API basics
How do I make my data available?

Publishing data with POST

When creating a new Logistics Object (LO) on a ONE Record Server, you need to do a HTTPS POST request. The data for the LO should be included in the request body and provided that you are authenticated and authorized, the server will accept the request and create a new LO. This operation will be generally performed by the owner of the data, who in most cases owns or at least controls the server.
How can I access the data?

**Reading data with GET**

To read the content of a Logistics Object, you need to perform a HTTPS GET request. The server that you are accessing will check that you are an authenticated and authorized user before it will return you the data. **JSON-LD** (application/ld+json) is the standard response format for the ONE Record API.
How do I raise a change request?

**Change request with PATCH**
Whenever you need to request a change to data in a Logistics Object, you need to use the HTTPS PATCH method. In ONE Record API, the PATCH request represents an array of objects. Each object represents a single operation to be applied to the target Logistics Object (add and/or delete).

For more information, read the ONE Record PATCH Insight.
How do I update the data?

Updating data with PATCH

Only the publisher can change the Logistics Object, where the publisher is the party that creates the Logistics Object on the ONE Record server. The evaluation of a PATCH request occurs as a single event. Operations are sorted and processed as groups of delete and then add operations until all the operations are applied, or the entire PATCH fails.

The example below describes the change to be made – delete the totalPieceAndULDCount of value 10 and add value 11 instead. Also, a new field – date – is added.

For more information, read the ONE Record PATCH Insight.
PATCH Operations

**add**: Add has a simple function, it always adds new sets of statements. If a pre-existing statement exists with similar or the same characteristics, it must not be overwritten. To overwrite, a delete and an add operation must be performed.

**del**: Del always removes sets of statements.

```json
{
  "operations": [
    {
      "op": "del",
      "p": "https://one.record.iata.org/My bill #1 Total PriceAndAllCount",
      "o": {
        "value": "10",
        "datatype": "https://www.w3.org/2001/XMLSchema#decimal"
      }
    },
    {
      "op": "add",
      "p": "https://one.record.iata.org/My bill #1 Total PriceAndAllCount",
      "o": {
        "value": "11",
        "datatype": "https://www.w3.org/2001/XMLSchema#decimal"
      }
    },
    {
      "op": "add",
      "p": "https://one.record.iata.org/My bill #2 date",
      "o": {
        "value": "2010-08-18",
        "datatype": "http://www.w3.org/2001/XMLSchema#date"
      }
    }
  ]
}
```
Audit trail of the changes

An audit trail (history) of all the change requests is stored and can be retrieved at any moment from a dedicated endpoint on the ONE Record API.

```
GET http://localhost:8080/companies/myCompany/los/AWB-445555566/auditTrail
```

```
GET http://localhost:8080/companies/myCompany/los/AWB-445555566/auditTrail
updatedFrom=20200620120500&updatedTo=20200710120500
```

```json
"create": {  
"lo": "initial content of the Logistics Object"
}, 
"logisticsObjectRef": "Logistics Object Id to which the audit trail applies", 
"changeRequests": [  
{"timestamp": "2019-09-17T14:49:13+00:00",  
"companyId": "http://myonerecordserver.com/AIRLINE",  
"changeRequest": {  
"revision": "1",  
"description": "Updated number of total pieces count",  
"operations": [  
{    
"op": "del",    
"p": "http://onerecord.iata.org/Waybill#totalPieceAndULDCount",    
"o": {      
"value": "10",      
"datatype": "https://www.w3.org/2001/XMLSchema#decimal"    }  },  
{    
"op": "add",    
"p": "http://onerecord.iata.org/Waybill#totalPieceAndULDCount",    
"o": {      
"value": "11",      
"datatype": "https://www.w3.org/2001/XMLSchema#decimal"    }  },  
{    
"op": "add",    
"p": "http://onerecord.iata.org/Waybill#date",    
"o": {      
"value": "2019-08-18",      
"datatype": "http://www.w3.org/2001/XMLSchema#date"    }  }  
],  
"status": "ACCEPTED" ]
```
ONE Record Insights

Part 3

Pub/Sub & Delegation
How do I give data access to my partners?

Access Delegation

Typically, the company that has created the data will notify their partner and provide them access details such as the URI of the data. However, that second company may need to share the same data with another company downstream. This can be performed via the access delegation feature.

For more information, read the Access Delegation Insight.
How do I give data access to my partners?

Chains of Trust

Chains of trust are based on business partnerships and trust in the transport chain. It ensures that the company who has shared a logistics object on a server, always knows who may access this and at any time, it can revoke all or part of the chain of trust.

For more information, read the Access Delegation Insight.
How can we automate data notifications?

Automatic data updates through pub/sub

In distributed applications, components of the system often need to provide information to other components as events happen. For example, companies need to be notified when new data becomes available, so they can act accordingly if required.
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Part 4

Handling Events
How can I send events related to data?

Status updates via Events
Status updates in ONE Record can be added to Logistics Objects through Events. By definition, each Logistics Object can be assigned Events.

POST http://localhost:8080/companies/myCompany/los/AWB-445555566/events
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Insights

Part 5

Access Control
What is Web Access Control?
“Web Access Control is a decentralized system for allowing different users and groups various forms of access to resources where users and groups are identified by HTTP URIs.”
How can it be applied to ONE Record?
Access Control Lists

In ONE Record, access to resources can be handled by using Access Control Lists (ACLs) stored in the backend systems of the ONE Record Servers and defined using the Web Access Control standard from W3C. Each Logistics Object resource has a set of Authorization statements describing who has access to that resource and what types (or modes) of access they have.

**How can I define to whom I give data access?**

**Access Control Lists**

In ONE Record, access to resources can be handled by using Access Control Lists (ACLs) stored in the backend systems of the ONE Record Servers and defined using the Web Access Control standard from W3C. Each Logistics Object resource has a set of Authorization statements describing who has access to that resource and what types (or modes) of access they have.

**READ / GET**

Read the contents (including querying it)

**WRITE / POST and PATCH**

Write contents or modify part of it

**CONTROL**

Read and Write
Access Control Lists

ACL Ontology from W3C could be used

Each server decides if it shares the ACL externally

The link to ACL should be returned in the Link header when performing GET Logistics Object
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Part 6

Versioning with Memento
What is Memento Protocol?
The **Memento Protocol** aims to bring time-based access to web resources using common web standards. Essentially, Memento is an attempt to permit users to view any web page as it looked on a given date in the past.
What are the components of the Memento Protocol?
Memento Protocol

Original Resource

Memento

TimeGate

TimeMap

How can I take a snapshot of the data?

**Memento**

A Web resource that is a prior version of the Original Resource, i.e. that encapsulates what the Original Resource was like at some time in the past. In ONE Record, a Memento contains a snapshot of the data at a certain moment in time.
How can I retrieve a version of data at a certain moment in time?

**TimeGate**

A Web resource that “decides” on the basis of a given datetime, which Memento best matches what the Original Resource was like around that given datetime. When negotiating with the TimeGate, the client uses an Accept-Datetime header to express the desired datetime of a prior/archived version of the original resource. The TimeGate responds with the location of a matching version, a Memento.
How can I see all the existing version of the data?

**TimeMap**

A TimeMap is a machine-readable document that lists the Original Resource itself, its TimeGate, and its Mementos as well as associated metadata such as archival datetime for Mementos. TimeMaps are exposed by systems that host prior versions of Original Resources and allow for batch discovery of Mementos.
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Part 7

Demo
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Would you like to know more?

Bonus
ONE Record API specifications

- ONE Record API & Security specifications document
- Ontology of the API models
- JSON-LD examples & Postman collection

ONE Record White Papers

Don’t miss our series of three white papers coming this summer!

ONE Record Data Model
ONE Record API
ONE Record Security

https://www.iata.org/one-record/#tab-2
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From June 23 to July 28
Every Tuesday 11:00-12:30

Hackathon
11-13 September

Q&A

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Week of 14-18 September
Thank You

More info

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