

IATA WEBINAR

ONE Record Insights

Episode 4

This session will start shortly

**The ONE Record API:
An overview of the key features**

Henk Mulder

Head, Digital Cargo
IATA

Andra Blaj

Developer, ONE Record
IATA



ONE Record Insights

Episode 4

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Your hosts today



Henk Mulder
Head, Digital Cargo
IATA



Andra Blaj
Developer, ONE Record
IATA

ONE Record Insights

IATA

WEBINAR

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)

ONE Record Insights

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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

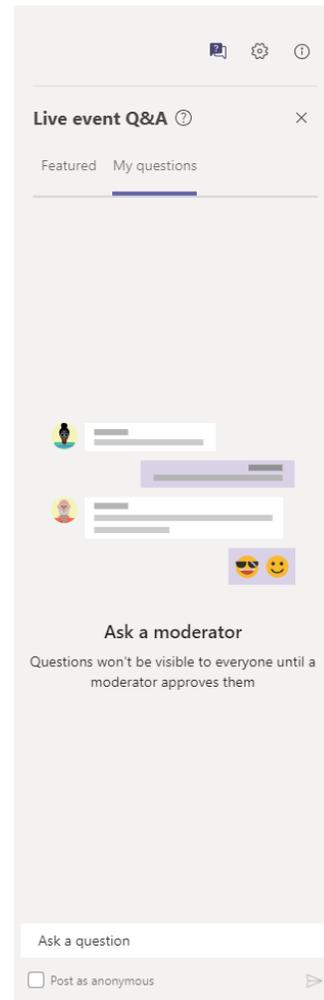
Part 8



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:

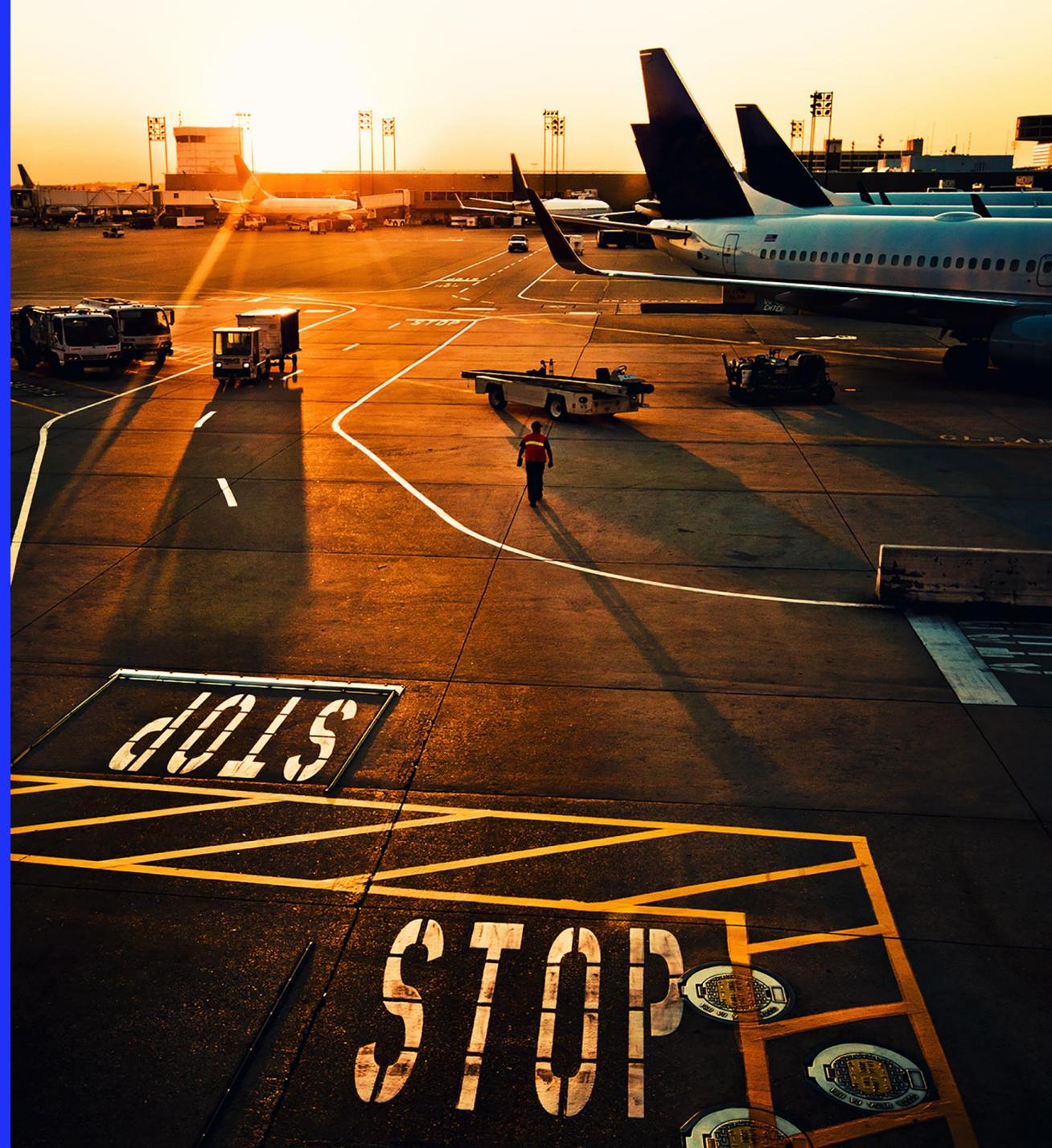
www.iata.org/one-record



ONE Record Insights

Part 1

Context

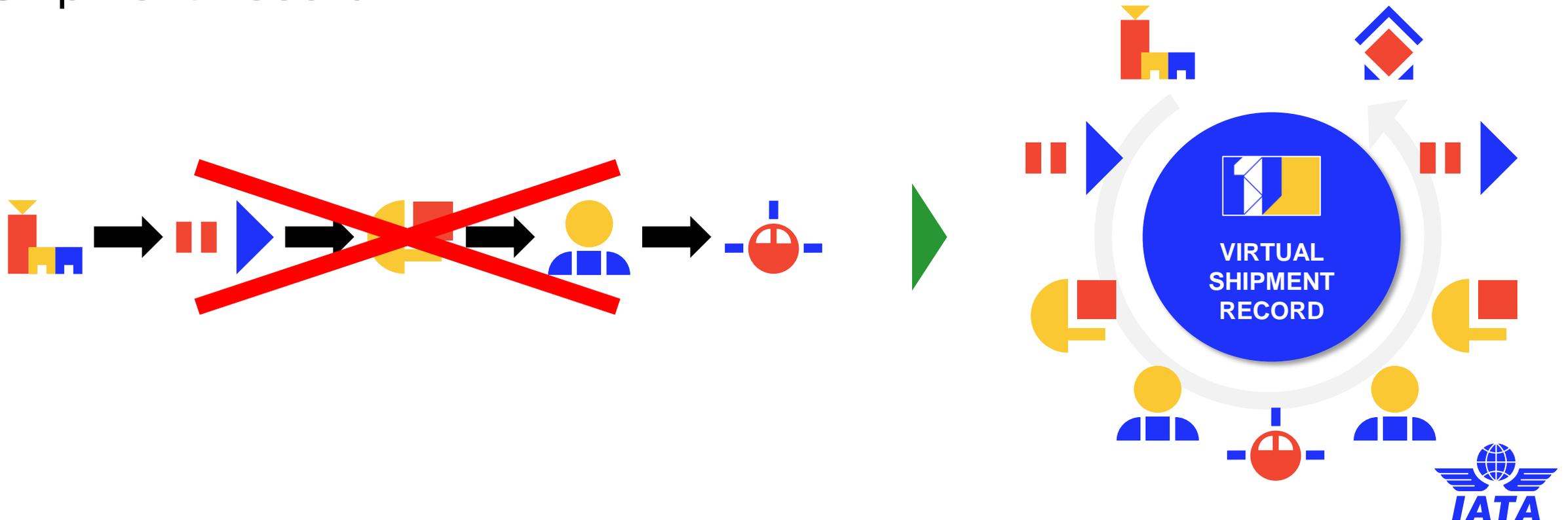


ONE Record Concept

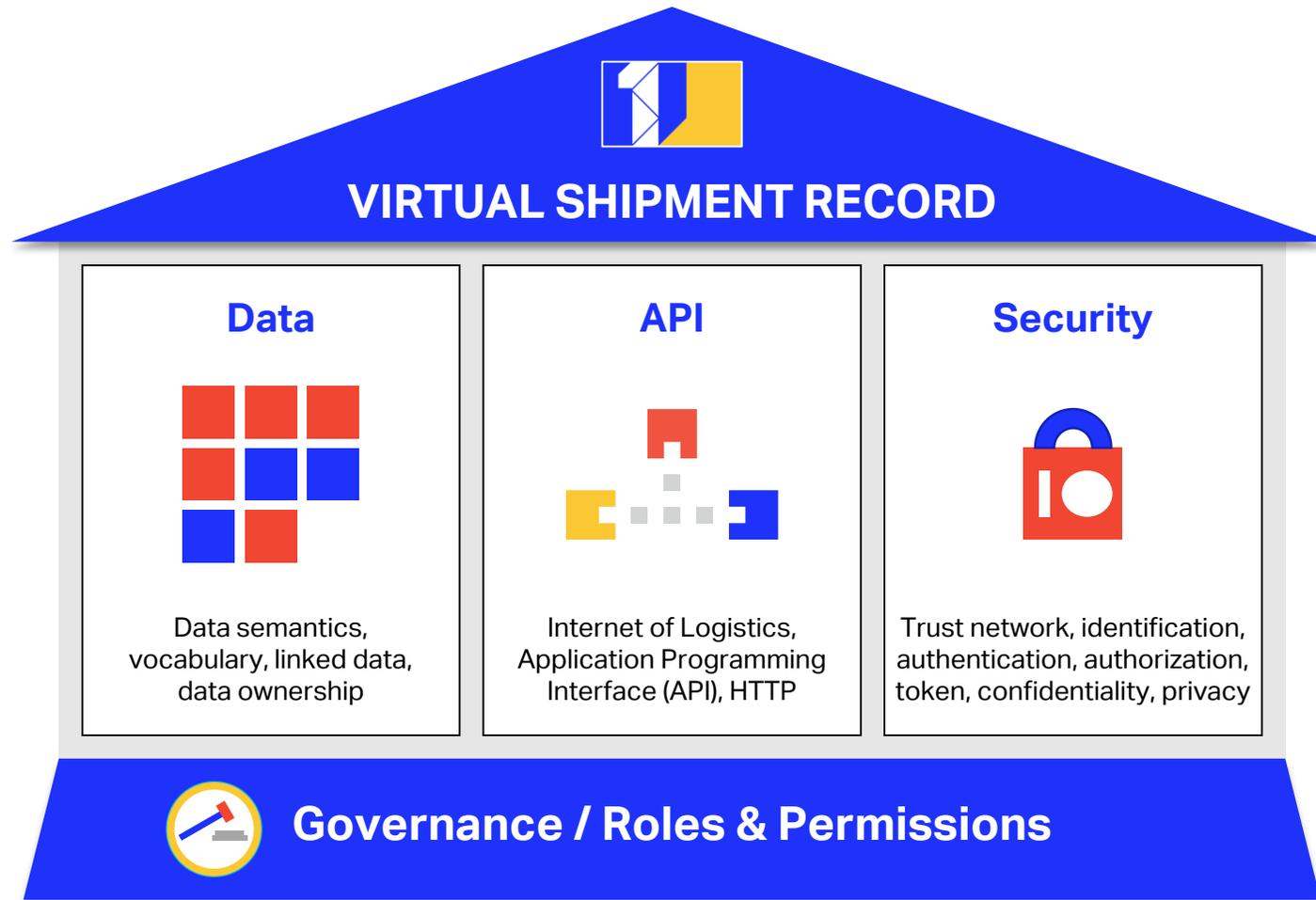


ONE Record concept

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



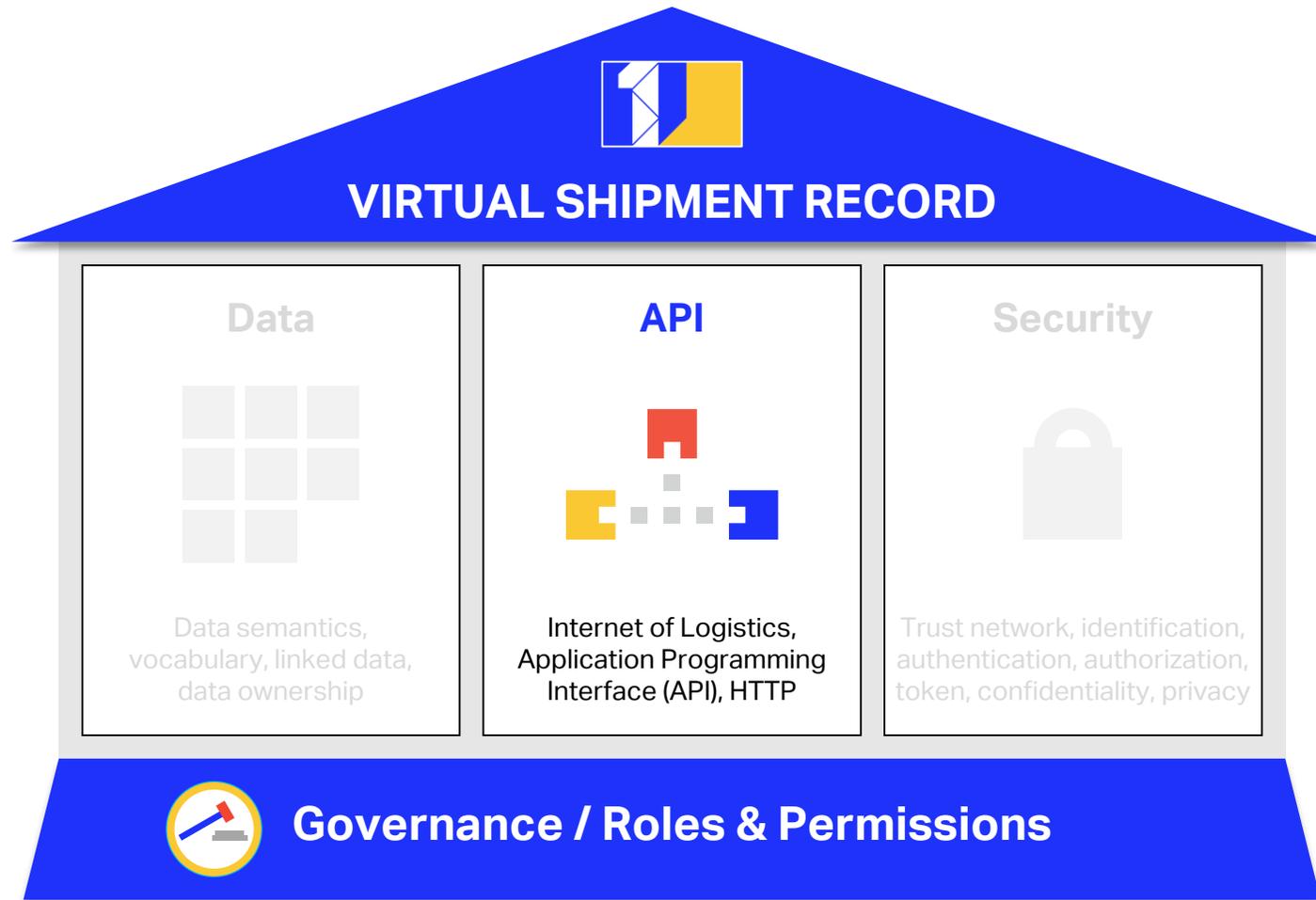
ONE Record concept



The ONE Record concept is based on 3 pillars enabling to define:

WHAT, HOW, with WHOM data can be shared

ONE Record concept

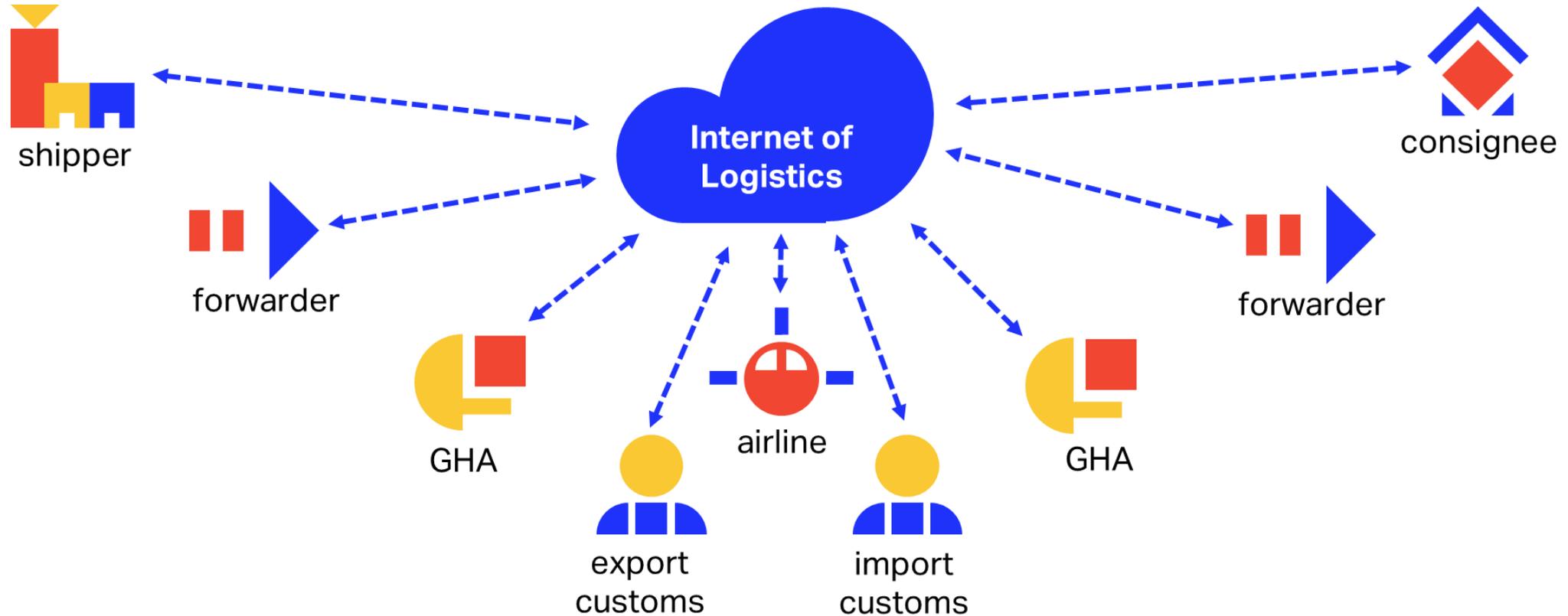


The ONE Record concept is based on 3 pillars enabling to define: **WHAT, HOW, with WHOM** data can be shared

What is the Internet of Logistics?



How does the Internet of Logistics work?

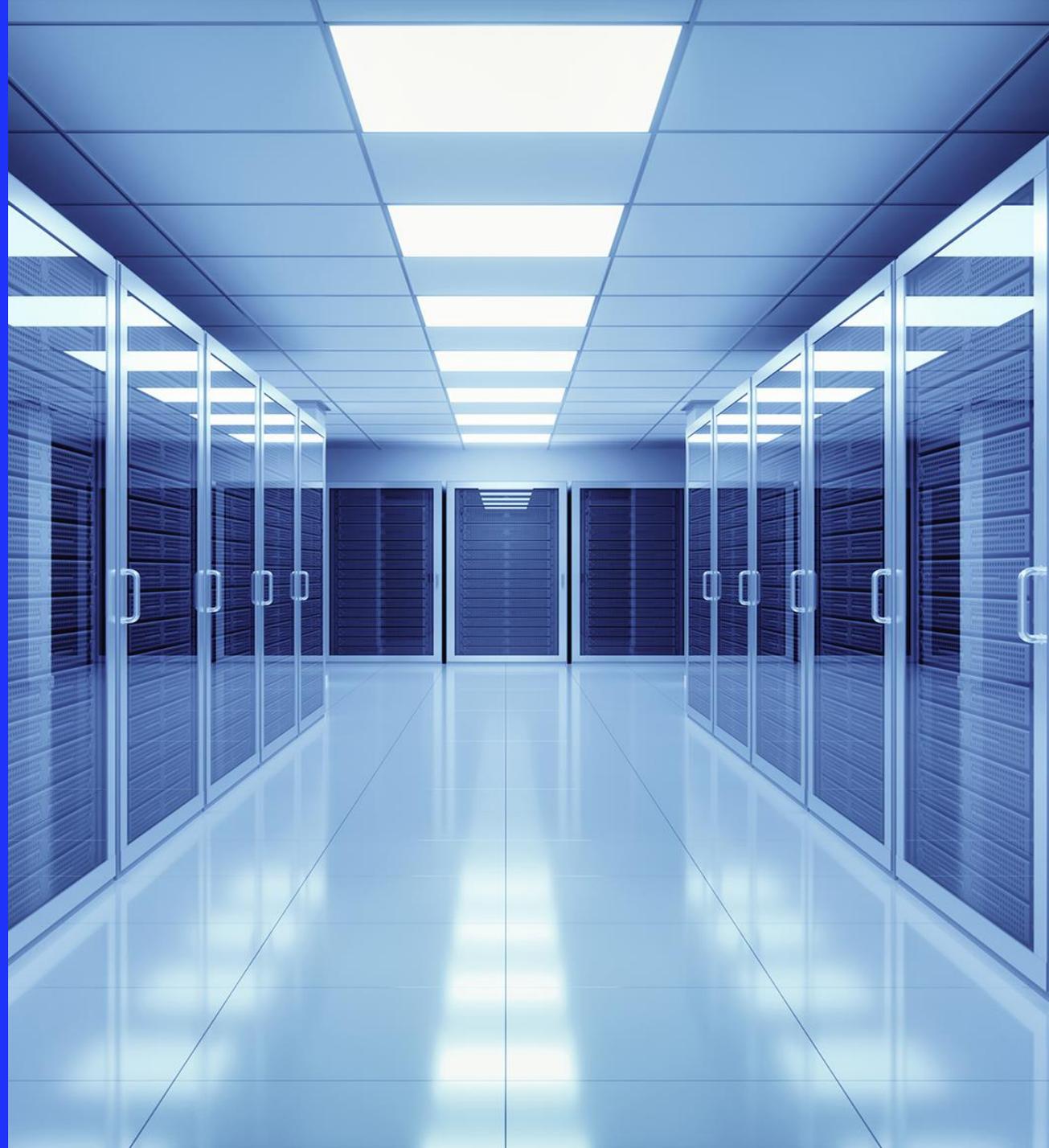


Internet of Logistics (IoL) - contains ONE Record Servers and Clients representing all types of stakeholders from the supply chain and it is governed by the ONE Record API and Security specifications.

What is an API?



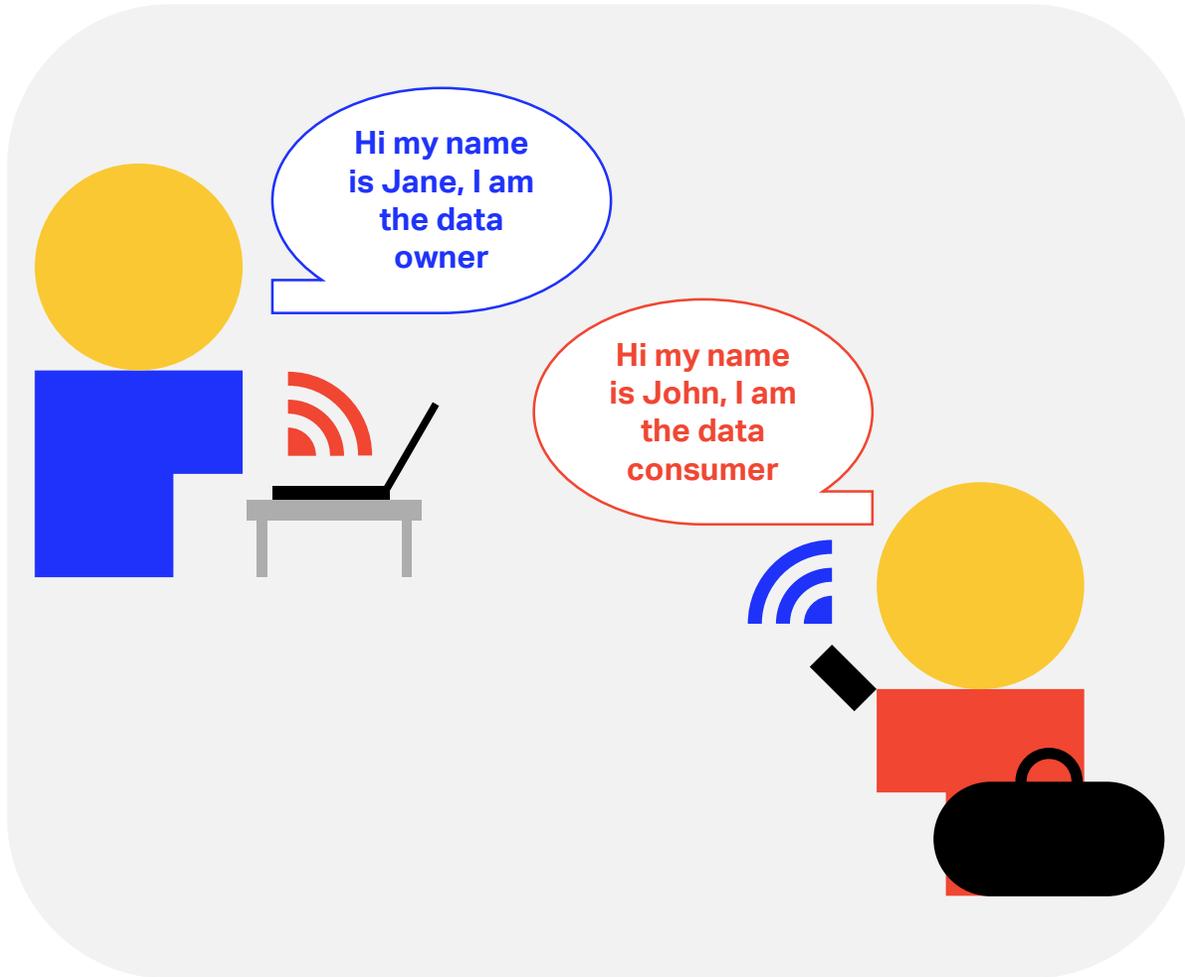
“An **API** is a computing interface which defines interactions between multiple software intermediaries. It defines the **kinds of calls or requests** that can be made, **how** to make them, the **data formats** that should be used and the **conventions** to follow.”



**What are the features of
the ONE Record API?**



Introducing John & Jane, IoT partners



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?

7
How can we automate data notifications?

8
How can I send events related to data?

3
How do I raise a change request?

4
How do I update the data?

9
How can I define to whom I give data access?

10
How can I take a snapshot of the data?

5
How can I save the history of the data?

6
How do I give data access to my partners?

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

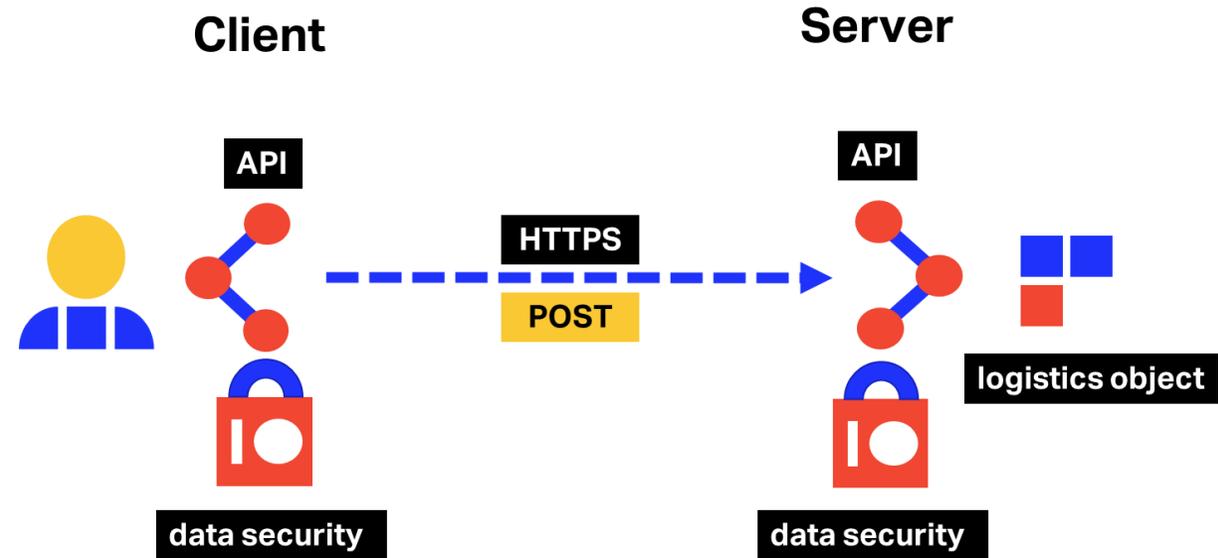
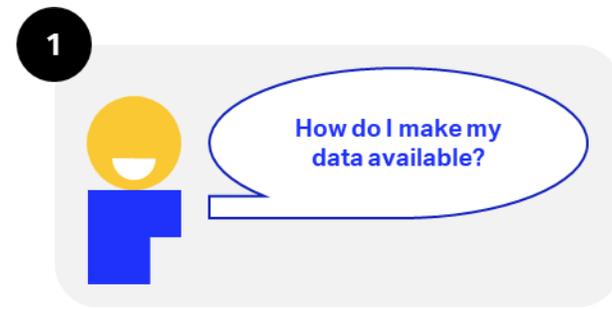
ONE Record API basics



How do I make my data available?

Publishing data with POST

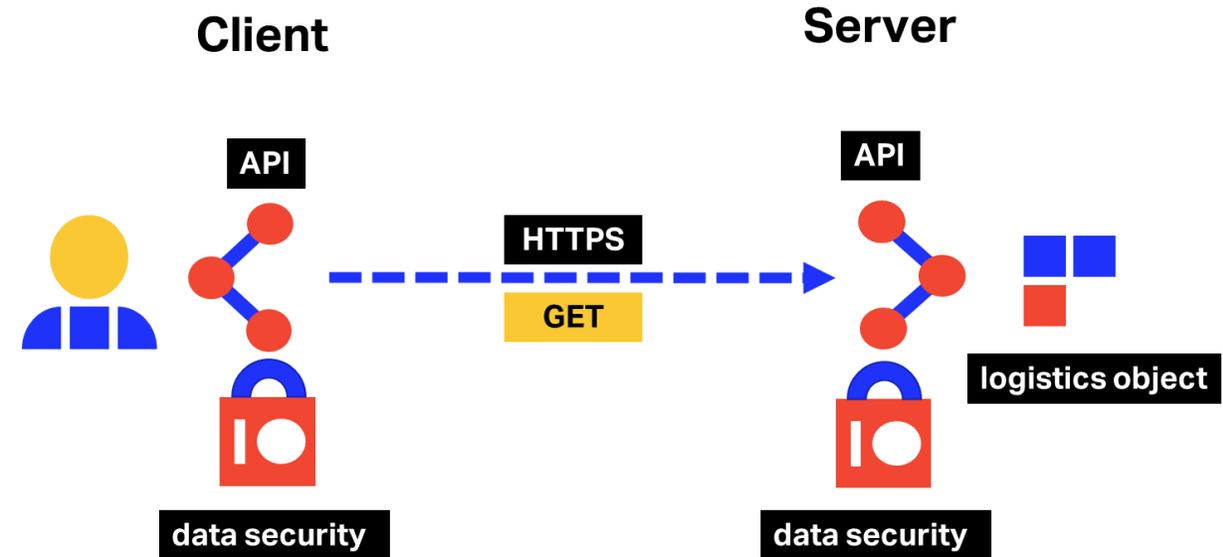
When creating a new [Logistics Object \(LO\)](#) on a ONE Record Server, you need to do a HTTPS POST request. The data for the LO should be included in the request body and provided that you are authenticated and authorized, the server will accept the request and [create](#) a new LO. This operation 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.

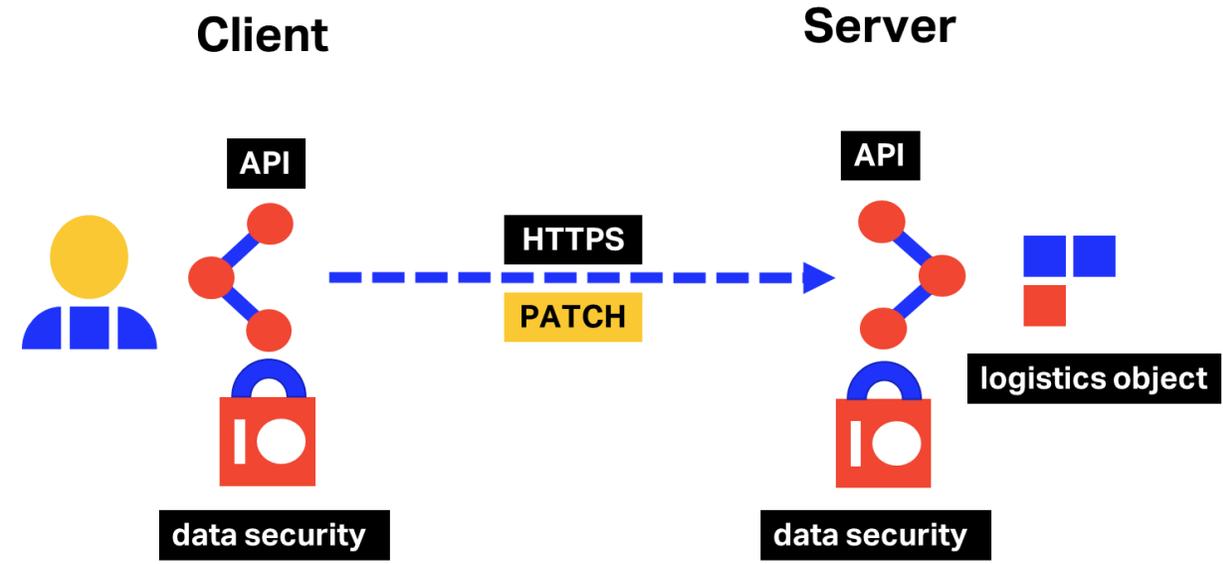
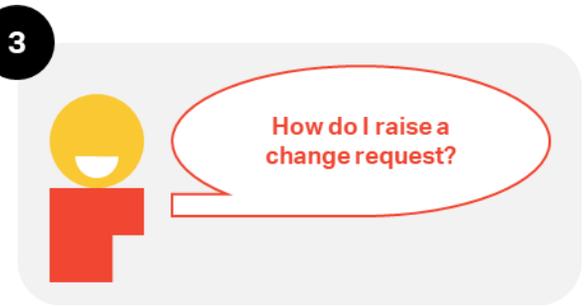


How do I raise a change request?

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**).

3



For more information, read the [ONE Record PATCH Insight](#).

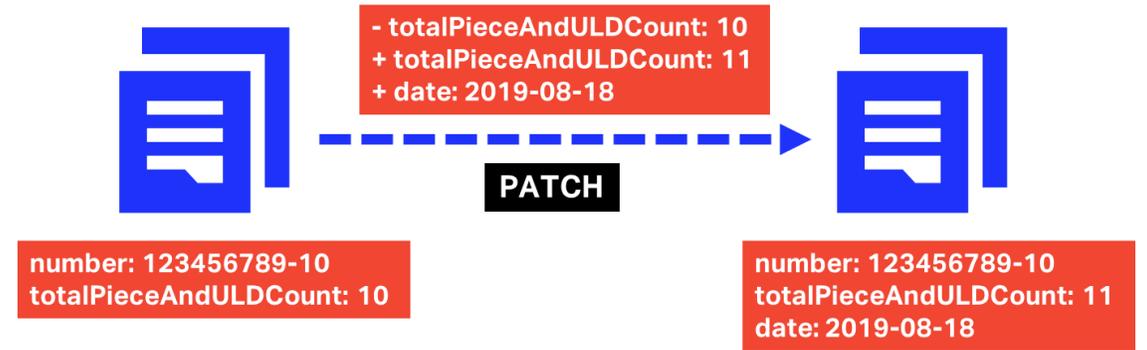


How do I update the data?

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 in ONE Record

```
1 {
2   "operations":[
3     {
4       "op":"del",
5       "p":"https://onerecord.iata.org/Waybill#totalPieceAndULDCount",
6       "o":{
7         "value":"10",
8         "datatype":"https://www.w3.org/2001/XMLSchema#decimal"
9       }
10    },
11    {
12      "op":"add",
13      "p":"https://onerecord.iata.org/Waybill#totalPieceAndULDCount",
14      "o":{
15        "value":"11",
16        "datatype":"https://www.w3.org/2001/XMLSchema#decimal"
17      }
18    },
19    {
20      "op":"add",
21      "p":" https://onerecord.iata.org/Waybill#date",
22      "o":{
23        "value":"2019-08-18",
24        "datatype":"http://www.w3.org/2001/XMLSchema#date"
25      }
26    }
27  ]
28 }
29
```

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.



How can I save the history of the data?

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
```

5



How can I save the history of the data?

```
"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



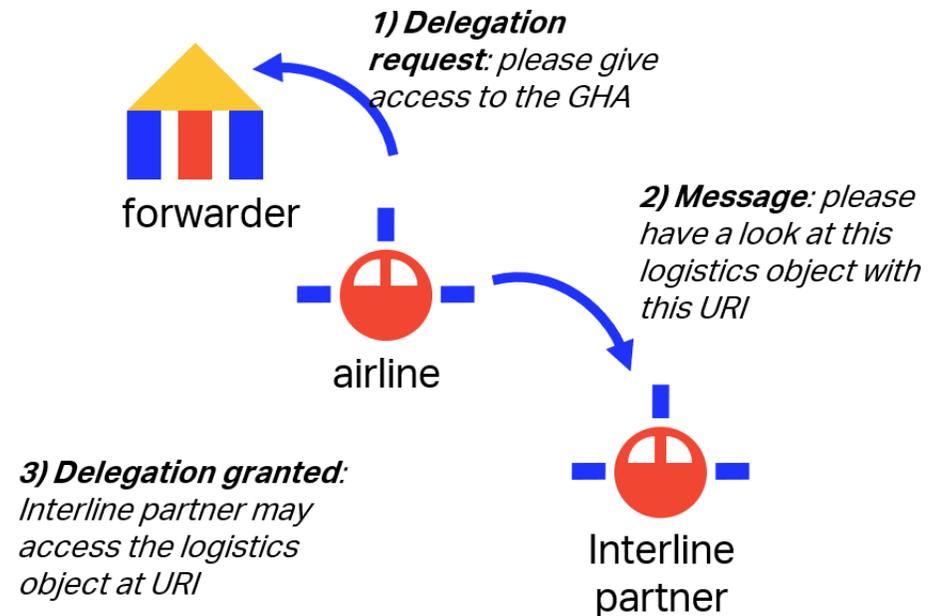
How do I give data access to my partners?

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.

6

How do I give data access to my partners?



For more information, read the [Access Delegation Insight](#).



How do I give data access to my partners?

Chains of Trust

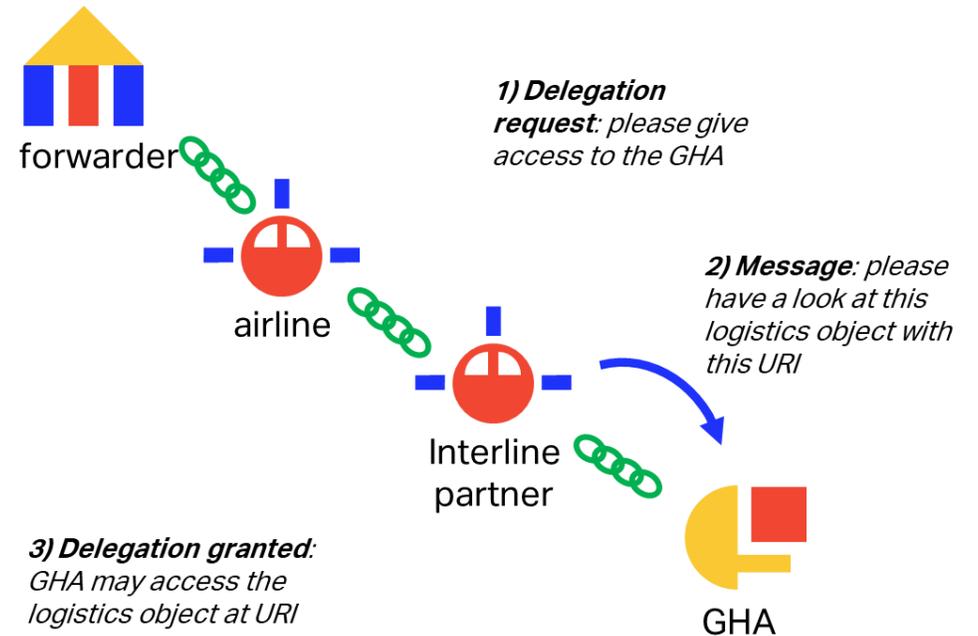
Chains of trust are based on **business partnerships** and **trust** in the transport chain. It ensures that the company who has shared a logistics object on a server, always knows who may access this and at any time, it can revoke all or part of the chain of trust.

6

How do I give data access to my partners?



 = Chain of Trust



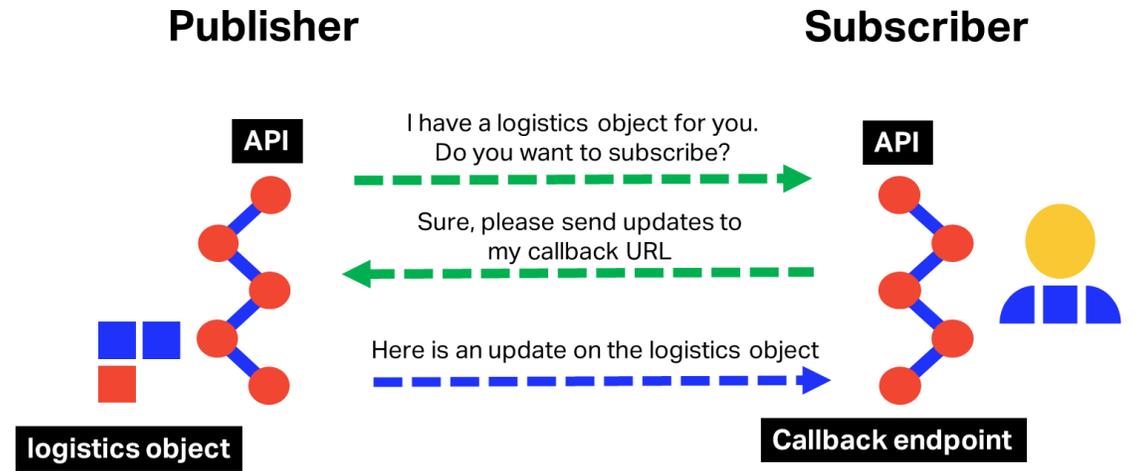
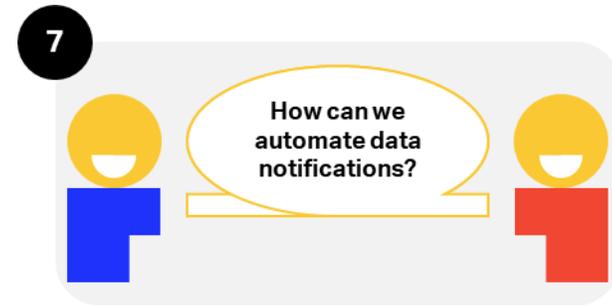
For more information, read the [Access Delegation Insight](#).



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.



ONE Record Insights

Part 4

Handling Events



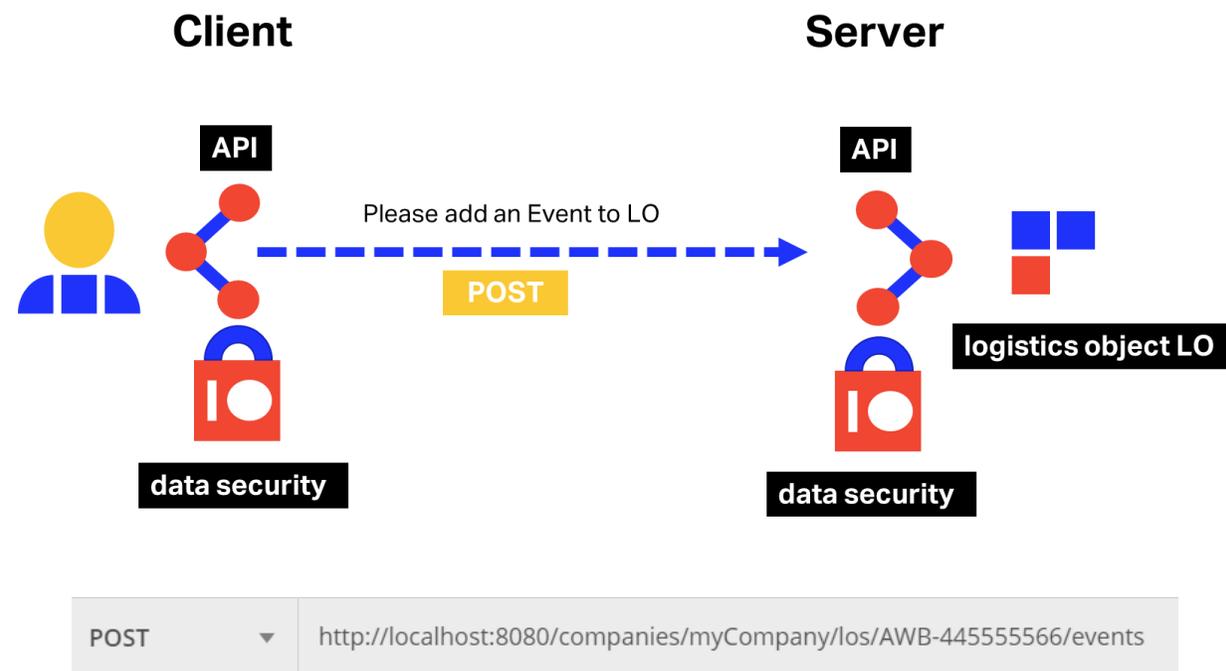
How can I send events related to data?

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.

8

How can I send events related to data?



ONE Record 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?



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.

9



How can I define to whom I give data access?



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



ONE Record Insights

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

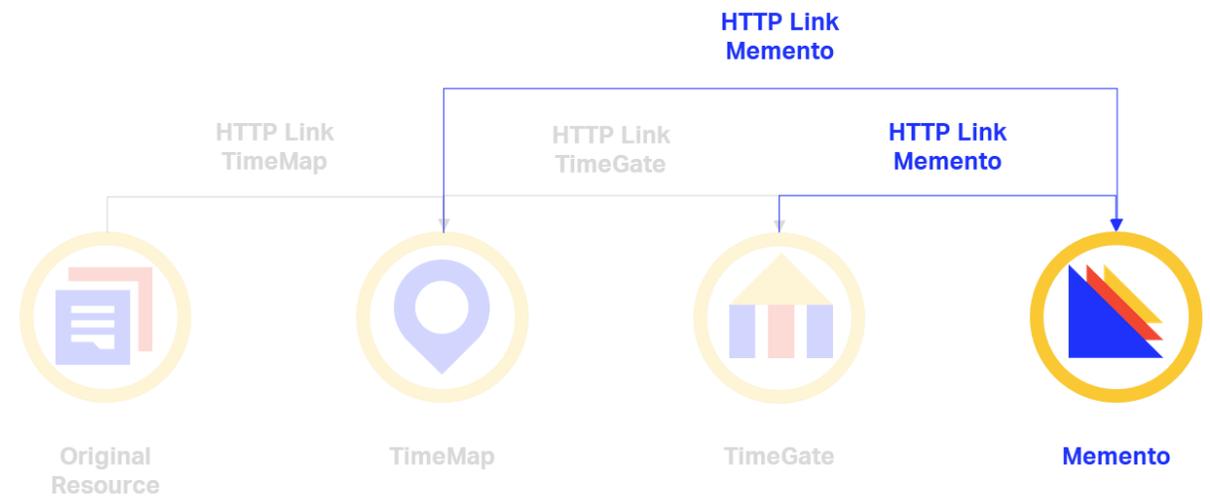
More information about the [Memento Protocol](#).

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.

10



How can I retrieve a version of data at a certain moment in time?

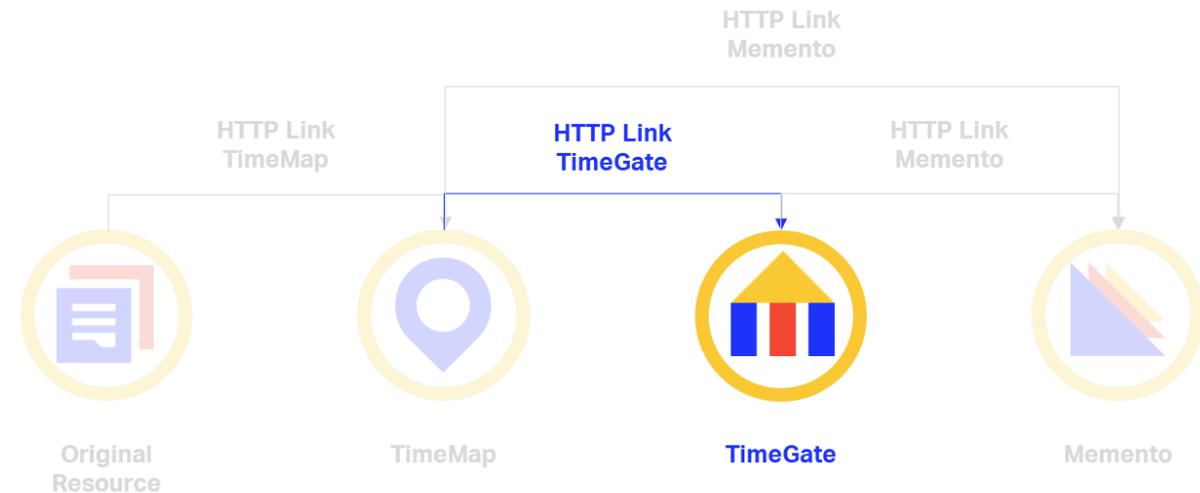
TimeGate

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.

11



How can I retrieve a version of data at a certain moment in time?

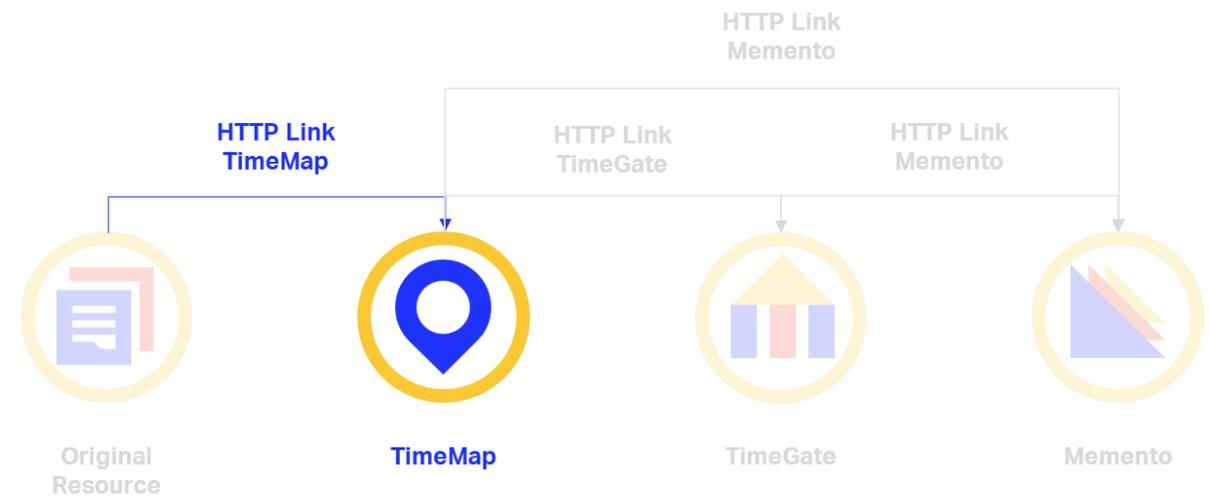


How can I see all the existing version of the data?

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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ONE Record Insights

Part 7

Demo



ONE Record Insights

Bonus

**Would you like to
know more?**



ONE Record API specifications



ONE Record API & Security **specifications document**

Ontology of the API models

JSON-LD examples & **Postman** collection

ONE Record Server ^{1.0.0}

[Base URL: localhost:8080/]

<http://localhost:8080/v2/api-docs>

ONE Record Server autogenerated Swagger API documentation.

[IATA ONE Record - Website](#)

[Send email to IATA ONE Record](#)

[MIT License](#)

companies-resource Companies Resource >

delegation-resource Delegation Resource >

logistics-objects-resource Logistics Objects Resource >

notification-resource Notification Resource >

ssl-client-authentication-test-resource Ssl Client Authentication Test Resource >

Models >

<https://github.com/IATA-Cargo/one-record-server-java>

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>

Advance your ONE Record knowledge & skills

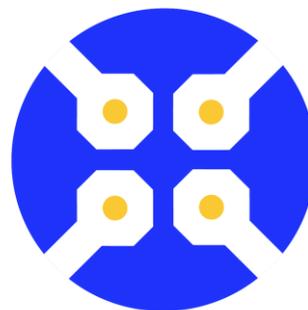
Three great events to mark in your calendars



IATA WEBINAR

**ONE Record
Insights**

Series of 6 webinars, every Tuesday from
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HACKATHON

11-13 September

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Part 8

Save the date

ONE Record Webinar
From June 23 to July 28
Every Tuesday 11:00-12:30

Hackathon
11-13 September

Digital Cargo Conference 2020
Week of 14-18 September



Q&A

Thank You

More info

www.iata.org/one-record

