DigiDrop of transport documents

JSON formatted transport documents

basic data infrastructure

Topsector Logistiek

Colophon

DigiDrop of transport documents

JSON formatted transport documents such as eCMR as payload for signed (non-repudiation) JWS in DigiDrop transactions

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1 JSON format as signed payload in a JWS

The Digidrop concept provides exchange of information in the popular JavaScript Object Notation (JSON) format, as payload in a JWS token.

The JWS format creates non-repudiation of the content: the content becomes a formal statement on behalf of an identifiable party.

- The content of formal statement cannot be denied or modified without detection.
- The identity of party that has sent the statement is verifiable.

Many (paper) documents are in use in road transport: such as the transport order (CMR) for commercial purposes and other documents to prove compliance with regulations (such as safety, Accord européen relatif au transport international de marchandises Dangereuses par Route (ADR), customs).

The JSON format is well suited to convert the paper documents to electronic versions: the JSON formatted information is designed to be the payload of the JWS.

The electronic version of the transport order (eCMR) has been used as an example of a payload in JSON.

2 UNCEFACT and OTM

There are multiple standards that specify the data to be used in an eCMR.

Two standards have been evaluated:

- OTM (Open Trip Model);
- UNCEFACT eCMR.

Both standards are expressed in JSON format. OTM is more compact than UNCEFACT: UNCEFACT supports the standardization of all data of an eCMR, including edge cases.

For the purpose of this document it appeared to be more interesting to investigate the more complex UNCEFACT version.

3 Example of eCMR JSON payload for JWS

The example below shows a UNCEFACT eCMR (in JSON format). The size of the payload is limited and easy to embed into a signed JWS.


```
{
   "specifiedConsignment": [
      {
         "consignee": {
            "name": [
               {
                  "content": "Retail Ltd"
               }
            ],
            "postalTradeAddress": {
               "streetName": [
                  {
                     "content": "Retailweg 5"
                  }
               ],
               "cityName": [
                  {
                     "content": "Rotterdam"
                  }
               ],
               "countryName": [
                  {
                     "content": "Netherlands"
                  }
               ]
            }
         },
         "consignor": {
            "name": [
               {
                  "content": "Unifood Ltd"
               }
            ],
            "postalTradeAddress": {
               "streetName": [
                  {
                     "content": "Handelsweg 5"
                  }
               ],
               "cityName": [
                  {
                     "content": "Amsterdam"
                  }
               ],
               "countryName": [
                  {
                     "content": "Netherlands"
                  }
               ]
            }
         },
         "carrier": {
            "name": [
               {
                  "content": "Carrier Ltd"
               }
            ],
            "postalTradeAddress": {
               "streetName": [
                  {
                     "content": "Handelsweg 5"
                  }
```

```
        ],
        "cityName": [
          {
            "content": "Amsterdam"
          }
        ],
        "countryName": [
          {
            "content": "Netherlands"
          }
        ]
      }
    },
    "connectingCarrier": [
      {
        "name": [
          {
            "content": "Transploft Ltd"
          }
        ],
        "postalTradeAddress": {
          "streetName": [
            {
              "content": "Handelsweg 24"
            }
          ],
          "cityName": [
            {
              "content": "Amersfoort"
            }
          ],
          "countryName": [
            {
              "content": "Netherlands"
            }
          ]
        }
      }
    ],
    "carrierAcceptanceLogisticsLocation": {
      "name": [
        {
          "content": "Unifood Ltd"
        }
      ],
      "postalTradeAddress": {
        "streetName": [
          {
            "content": "Warehouseweg 25"
          }
        ],
        "cityName": [
          {
            "content": "Aalsmeer"
          }
        ],
        "countryName": [
          {
            "content": "Netherlands"
          }
        ]
      }
    },
    "consigneeReceiptLogisticsLocation": {
      "name": [
        {
          "content": "Retailer B"
```

```
            }
          ],
          "postalTradeAddress": {
            "streetName": [
              {
                "content": "Market Road 10"
              }
            ],
            "cityName": [
              {
                "content": "Berlin"
              }
            ],
            "countryName": [
              {
                "content": "Germany"
              }
            ]
          }
        },
        "includedConsignmentItem": [
          {
            "sequenceNumeric": {
              "content": "0"
            },
            "grossWeight": [
              {
                "content": "52.3",
                "unitCode": "KGM"
              }
            ],
            "natureIdCargo": [
              {
                "id": [
                  {
                    "content": "Bananen"
                  }
                ]
              }
            ]
          }
        ],
        "pickUpEvent": {
          "actualOccurrenceDateTime": "2025-04-01 10:00:00"
        },
        "deliveryEvent": {
          "actualOccurrenceDateTime": "2025-04-02 14:00:00",
          "applicableNote": [
            {
              "content": [
                {
                  "content": "2 dozen beschimmeld"
                }
              ]
            }
          ]
        }
      }
    ]
}
```

4 References

OTM
https://otm5.opentripmodel.org/#section/Open-Trip-Model

UNCEFACT eCMR
https://unece.org/trade/documents/2024/12/standards/ecmr-d24a

https://service.unece.org/trade/uncefact/publication/Transport-Logistics/eCMR/HTML/001.htm

https://github.com/uncefact/spec-JSONschema/blob/main/JSONschema2020-12/library/BuyShip-Pay/D23B/UNECE-eCMR.json

JWS in DigiDrop
https://content.bdinetwork.org/wp-content/uploads/sites/2/2025/02/20250130_TSL_BDI-JWS-as-digital-proof.pdf

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