

National Health Services Directory

FHIR Data Model (R4) - Inbound

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1 Introduction

The National Health Services Directory (NHSD), managed by Healthdirect Australia, is a secure government data asset that aggregates health services and practitioner information from a range of reliable data sources and publishes this data through Application Programming Interfaces (APIs) and publicly available search tools.

The NHSD has adopted the HL7 Fast Healthcare Interoperability Resources (FHIR) Standard and developed a FHIR compliant API, designed to enable clinical systems to integrate NHSD data to facilitate sending of health information electronically, such as referrals and discharge summaries.

The NHSD FHIR API is a service created and operated by Healthdirect Australia to provide integration partners with accurate, up to date health services information in the HL7 FHIR format. More information about the NHSD FHIR API is available at <https://build.fhir.nhsd.healthdirect.org.au/ingestion/index.html>

Access to the NHSD FHIR API is available via a licence agreement with Healthdirect Australia. For further information regarding access to the NHSD FHIR API, please visit the NHSD website: <https://about.healthdirect.gov.au/using-the-nhsd>

This document provides simplified, summary information about the NHSD FHIR Data Model, including each FHIR Resource (Organization, Healthcare Service, Location, Practitioner, Practitioner Role and Endpoint) and the data attributes within these. For more detailed information, please visit the [NHSD FHIR API Implementation Guide](#) website or contact the NHSD Team at nhsd@healthdirect.org.au

2 Data Model

The diagram below shows the entity relationship from the perspective of the Healthcare Service Resource and is followed with a description of each element.

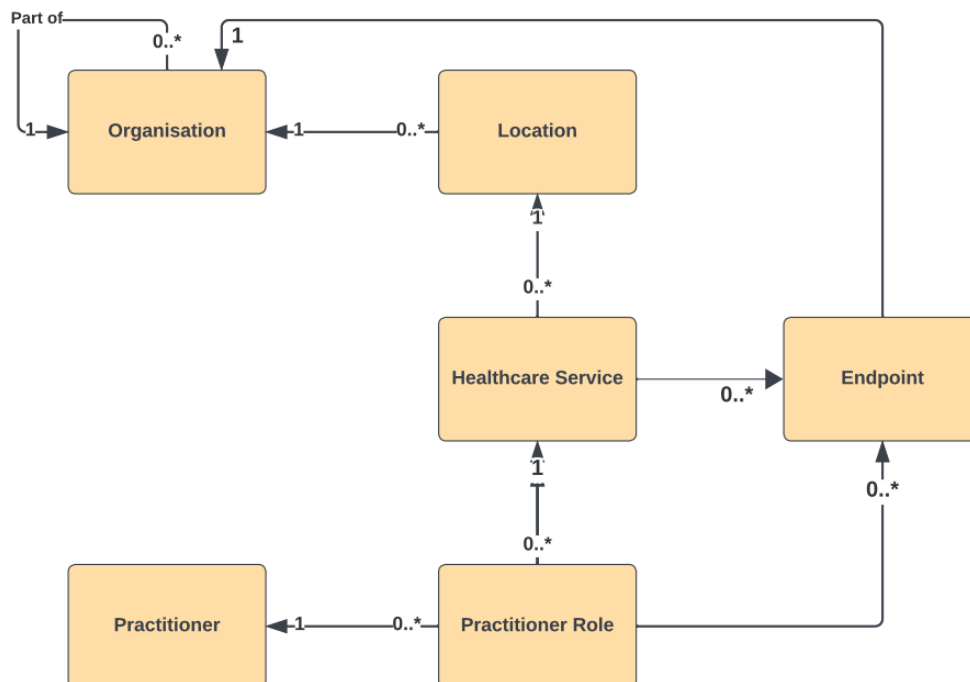


Figure 1 : NHSD FHIR Entity Data model

3 Organisation

<https://build.fhir.nhsd.healthdirect.org.au/ingestion/StructureDefinition-nhsd-organisation.html>

An organisation is an entity that delivers one or more Healthcare Services and can include multiple practitioners who provide multiple healthcare services. It can be represented by a single practice or by an institution, agency or an association. Ideally an organisation is registered with an authority such as the Australian Business Register, Government agency or peak body (trade association, an association of industries or groups with allied interests).

The NHSD data model and FHIR API supports multi-level organisation structures, which may be required for more complex organisations, such as hospitals.

Element	Card.	Type	Description
id	1..1	string	Logical id of this artifact
meta	1..1	meta	Metadata of the organisation, including last updated time
identifier	1..*	Identifier	Organisation specific identifiers
identifier:abn	0..1	AUAustralianBusinessNumber	Australian Business Number (ABN)
identifier:rid	0..1	NHSDResourceIdentifier	NHSD Resource Identifier
active	1..1	boolean	Status of the organisation
name	0..1	string	Name of the organisation (mandatory attribute for service providing Organisations but optional for higher tiers)
alias	0..*	string	Alternate names for the Organisation
partOf	0..1	reference	Reference to the parent Organisation
contact	0..*	BackboneElement	Contacts for the Organisation

4 Location

<https://build.fhir.nhsd.healthdirect.org.au/ingestion/StructureDefinition-nhsd-location.html>

The NHSD Location provides address information for Healthcare Service. The Location also provides context for the type of address (through physicalType) where a Healthcare Service is provided as Home services (the service comes to your home) or Virtual services (e.g. Phone, Website, Videoconference).

Element	Card.	Type	Description
id	1..1	string	Logical id of this artifact
meta	1..1	meta	Metadata of the location, including last updated time
identifier	0..*	identifier	NHSD entry Location identifiers
identifier:rid	0..1	NHSDResourceIdentifier	NHSD Resource Identifier
extension	0..*	extension	Provides additional information applicable to the location nhsd-amenity -> Physical features within or in close proximity of the location URL: http://fhir.nhsd.com.au/StructureDefinition/nhsd-amenity
status	1..1	code	Status of the location
name	0..1	string	Name of the location
type	1..1	CodeableConcept	Type of location [Physical/Mobile/Virtual]
address	0..1	NHSDAddress	Physical Address of the location where the Healthcare Service is provided(Mandatory for Physical location type but optional for Mobile & Virtual location type)
position	0..1	backbone element	The geographic location
managingOrganization	1..1	Reference(NHSD Organisation)	This is a reference to service providing Organization (same as the organisation reference in the connected healthcare service resource)

5 Healthcare Service

<https://build.fhir.nhsd.healthdirect.org.au/ingestion/StructureDefinition-nhsd-healthcareservice.html>

NHSD Provider directory entry for a healthcare service or category of services delivered at a location by an organisation. In a provider directory this allows the association of endpoints with the healthcare service and thus a channel for delivery to that service.

Element	Card.	Type	Description
id	1..1	string	Logical id of this artifact
meta	1..1	meta	Metadata of the healthcare service, including last updated time
contained	0..*	NHSDServiceCoverageArea	Contained inline nhsd-service-coverage-area resource
extension	0..*	extension	Provides additional information applicable to the Healthcare service
nhsd-booking-provider	0..*	(Complex)	Information about Booking Providers for a Healthcare Service URL: http://fhir.nhsd.com.au/StructureDefinition/nhsd-booking-provider
nhsd-referral-information-for-consumer	0..1	markdown	Referral instructions and information for consumers (Public) URL: http://fhir.nhsd.com.au/StructureDefinition/nhsd-referral-information-for-consumer
nhsd-referral-information-for-provider	0..1	markdown	Referral instructions and information for providers (Practitioners) URL: http://fhir.nhsd.com.au/StructureDefinition/nhsd-referral-information-for-provider
nhsd-timezone	0..1	CodeableConcept	Information about time zone for a Healthcare Service. NHSD supports ONLY ONE time zone per service URL: http://fhir.nhsd.com.au/StructureDefinition/nhsd-timezone Binding: Australian States and Territories timezones (required)

nhsd-postal-address	0..1	NHSDAddress	Information about Postal Address for a Healthcare Service
identifier	1..*	identifier	Identifiers for the healthcare service, including NHSD resource identifier (rid)
identifier:rid	0..1	NHSDResourceIdentifier	NHSD Resource Identifier
active	1..1	boolean	Status of the healthcare service
providedBy	1..1	reference (NHSD Organisation)	Reference to the Organization resource that provides the service
type	1..1	CodeableConcept	Service classification based on SNOMED CT-AU
program	0..*	CodeableConcept	Programs that the healthcare service is part of
eligibilites	0..*	CodeableConcept	Eligibilities to access the healthcare service
appointmentRequired	0..1	boolean	Specifies if an appointment is required to visit the healthcare service
location	1..1	reference(NHSD Location)	Reference to Location where the healthcare service is provided
comment	0..1	string	A short description of the service, which may include additional information not covered elsewhere
telecom	1..*	ContactPoint	Contact details for the healthcare service
coverageArea	0..*	reference (NHSD Service Coverage Area)	Reference to the list of 'contained' Location resources defining the coverage area of virtual/home visit type of Healthcare Services
characteristic	0..*	CodeableConcept	A grouped set of attributes including funding source, referral information, service offerings

communication	0..*	CodeableConcept	The language that this service is offered in Binding: https://healthterminologies.gov.au/fhir/ValueSet/common-languages-australia-2 (required)
serviceProvisionCode	0..1	CodeableConcept	It reflects the type of billing options, a Healthcare Service offers. NHSD supports ONLY ONE billing option per service Binding: Service Provision Conditions Australian Concepts (required)
availableTime	0..*	BackboneElement	Opening times on Standard week days/Public Holidays/Adhoc dates for the healthcare service
notAvailable	0..*	BackboneElement	Closed days on Public Holidays/Adhoc dates for a healthcare service
endPoint	0..*	Reference(AU PD Secure Messaging Endpoint), Reference(Endpoint)	Technical endpoints for this healthcare service, including secure messaging endpoints

6 Practitioner

<https://build.fhir.nhsd.healthdirect.org.au/ingestion/StructureDefinition-nhsd-practitioner.html>

NHSD Provider directory entry for a Practitioner. In a provider directory this provides details of an individual person delivering health related services.

Element	Card.	Type	Description
id	1..1	string	Logical id of this artifact
meta	1..1	meta	Metadata of the practitioner, including last updated time
identifier	1..*	identifier	Identifiers for the practitioner, eg AHPRA registration number

identifier:ahpraregistrationnumber	0..1	AUAHPRARegistrationNumber	Australian Health Practitioner Regulation Agency (AHPRA) Registration Number
identifier:rid	0..1	NHSDResourceIdentifier	NHSD Resource Identifier
active	1..1	boolean	Status of the practitioner
name	1..1	HumanName	The practitioner name
communication	0..*	CodeableConcept	Language/s the practitioner can use in patient communication

7 Practitioner Role

<https://build.fhir.nhsd.healthdirect.org.au/ingestion/StructureDefinition-nhsd-practitionerrole.html>

NHSD Provider directory entry for a Practitioner Role describes a practitioner in a role for a Healthcare Service

Element	Card.	Type	Description
id	1..1	string	Logical id of this artifact
meta	1..1	meta	Metadata of the practitioner role, including last updated time
identifier	0..*	identifier	Identifiers for the practitioner role, eg Medicare Provider Number
identifier:medicareprovidernumber	0..1	AUMedicareProviderNumber	Medicare Provider Number
identifier:rid	0..1	NHSDResourceIdentifier	NHSD Resource Identifier
active	1..1	boolean	Status of the practitioner role
practitioner	1..1	Reference(NHSD Practitioner)	Reference to the Practitioner
organization	1..1	Reference(NHSD Organisation)	Reference to the Organisation
location	1..1	Reference(NHSD Location)	Reference to the Location
healthcareService	1..1	Reference(NHSD HealthcareService)	Reference to the Healthcare service

endPoint	0..*	Reference(AU PD Secure Messaging Endpoint), Reference(Endpoint)	Technical endpoints for this practitioner role, including secure messaging endpoints
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8 Endpoint

<https://build.fhir.nhsd.healthdirect.org.au/ingestion/StructureDefinition-nhsd-endpoint.html>

NHSD Provider directory entry for Endpoint describes a secure messaging endpoint detail for Healthcare Service/Practitioner Role.

Element	Card	Type	Description
id	1..1	string	Logical id of this artefact
meta	1..1	meta	Metadata of the endpoint, including last updated time
organization	1..1	reference	Reference to the Organization
identifier	1..*	identifier	Identifiers for the endpoint including smd/target
identifier:rid	0..1	NHSDResourceIdentifier	NHSD Resource Identifier
name	0..1	string	Name for the endpoint
au-receivingFacility	0..1	(complex)	Identifies the receiving application among multiple identical instances of the application running on behalf of different organizations.
au-receivingApplication	0..1	(complex)	Identifies the receiving application among all other applications within the network enterprise. The network enterprise consists of all those applications that participate in the exchange of HL7 messages within the enterprise.
encryption-certificate-pem-x509	0..*	string	An X.509 certificate binds an identity to a public key using a digital signature.
address	1..1	uri	URL address of the endpoint.

connectionType	1..1	coding	Endpoint connection type defined via - https://hl7.org.au/fhir/pd/pd2/CodeSystem-smd-interfaces.html
payloadType	1..*	CodeableConcept	Endpoint payload type defined via codes - http://hl7.org.au/fhir/CodeSystem/endpoint-payload-type
payloadMimeType	0..*	code	Endpoint payload Mime Type
contact	0..*	ContactPoint	Endpoint operators contact information
header	0..*	string	Header text
status	1..1	code	Secure messaging endpoint activation status.

9 FHIR payload samples

The data included are for example purposes only.

Organisation

```
{
  "resourceType": "Organization",
  "id": "<org-resource-id>",
  "meta":
  {
    "lastUpdated": "2024-02-07T04:36:05.075Z"
  },
  "identifier":
  [
    {
      "system": "http://fhir.nhsd.com.au/CodeSystem/nhsdIdentifiers#rid",
      "value": "<nhsd-org-id>"
    },
    {
      "system": "http://hl7.org.au/id/abn",
      "value": "<abn-number>"
    }
  ],
  "active": true,
  "name": "<name-of-practise-OR-legal-entity-name>",
  "telecom":
  [
    {
      "system": "phone",
      "value": "<phone-number>"
    },
    {
      "system": "email",
      "value": "<email-address>"
    }
  ]
}
```

```

    }
  ],
  "address":
  [
    {
      "extension":
      [
        {
          "url": "http://hl7.org.au/fhir/StructureDefinition/address-identifier",
          "valueIdentifier":
          {
            "system": "http://hl7.org.au/id/gnafidentifier",
            "value": "<GNAF-ID>"
          }
        },
        {
          "url": "http://fhir.nhsd.com.au/StructureDefinition/nhsd-address-line",
          "extension":
          [
            {
              "url": "line1",
              "valueString": "<building-name>"
            },
            {
              "url": "line2",
              "valueString": "<unit/suite/level>"
            },
            {
              "url": "line3",
              "valueString": "<street-number/street-name/street-type>"
            }
          ]
        }
      ]
    },
    {
      "use": "work",
      "type": "postal",
      "line":
      [
        "<building-name>",
        "<unit/suite/level>",
        "<street-number/street-name/street-type>"
      ],
      "city": "SYDNEY",
      "state": "NSW",
      "postalCode": "2000",
      "country": "AU"
    }
  ]
}

```

Location

```

{
  "resourceType": "Location",
  "id": "<loc-resource-id>",
  "meta":
  {
    "lastUpdated": "2024-02-07T04:44:02.785Z"
  },
  "extension":
  [
    {
      "url": "http://fhir.nhsd.com.au/StructureDefinition/nhsd-amenity",
      "valueCodeableConcept":
      {
        "coding":
        [
          {
            "system": "http://fhir.nhsd.com.au/CodeSystem/rc-facility",
            "code": "lowSensorySpace",
            "display": "Low Sensory Space"
          }
        ]
      }
    }
  ],
  "identifier":
  [
    {
      "system": "http://fhir.nhsd.com.au/CodeSystem/nhsdIdentifiers#rid",
      "value": "<nhsd-loc-id>"
    }
  ],
  "status": "active",
  "address":
  {
    "extension":
    [
      {
        "url": "http://hl7.org.au/fhir/StructureDefinition/address-identifier",
        "valueIdentifier":
        {
          "system": "http://hl7.org.au/id/gnafidentifier",
          "value": "<GNAF-ID>"
        }
      },
      {
        "url": "http://fhir.nhsd.com.au/StructureDefinition/nhsd-address-line",
        "extension":
        [
          {
            "url": "line1",
            "valueString": "<building-name>"
          },
          {
            "url": "line2",

```

```

        "valueString": "<unit/suite/level>"
      },
      {
        "url": "line3",
        "valueString": "<street-number/street-name/street-type>"
      }
    ]
  },
  "use": "work",
  "type": "postal",
  "line":
  [
    "<building-name>",
    "<unit/suite/level>",
    "<street-number/street-name/street-type>"
  ],
  "city": "SYDNEY",
  "state": "NSW",
  "postalCode": "2000",
  "country": "AU"
},
"managingOrganization":
{
  "reference": "Organization/<org-resource-id>"
}
}

```

Healthcare Service

```

{
  "resourceType": "HealthcareService",
  "id": "<hcs-resource-id>",
  "meta":
  {
    "lastUpdated": "2024-02-07T05:16:15.817Z"
  },
  "extension":
  [
    {
      "url": "http://fhir.nhsd.com.au/StructureDefinition/nhsd-postal-address",
      "valueAddress":
      {
        "extension":
        [
          {
            "url": "http://hl7.org.au/fhir/StructureDefinition/address-identifier",
            "valueIdentifier":
            {
              "system": "http://hl7.org.au/id/gnafidentifier",
              "value": "<GNAF-ID>"
            }
          }
        ],
        "url": "http://fhir.nhsd.com.au/StructureDefinition/nhsd-address-line",
        "extension":

```

```

    [
      {
        "url": "line1",
        "valueString": "<building-name>"
      },
      {
        "url": "line2",
        "valueString": "<unit/suite/level>"
      },
      {
        "url": "line3",
        "valueString": "<street-number/street-name/street-type>"
      }
    ]
  },
  "use": "work",
  "type": "postal",
  "line":
  [
    "<building-name>",
    "<unit/suite/level>",
    "<street-number/street-name/street-type>"
  ],
  "city": "SYDNEY",
  "state": "NSW",
  "postalCode": "2000",
  "country": "AU"
}
],
"identifier":
[
  {
    "system": "http://fhir.nhsd.com.au/CodeSystem/nhsdIdentifiers#rid",
    "value": "<nhsd-service-id>"
  }
],
"active": true,
"providedBy":
{
  "reference": "Organization/<org-resource-id>"
},
"type":
[
  {
    "extension":
    [
      {
        "url": "http://hl7.org/fhir/StructureDefinition/iso21090-preferred",
        "valueBoolean": true
      }
    ]
  }
],
"coding":
[

```

```

    {
      "system": "http://snomed.info/sct",
      "code": "788007007",
      "display": "General practice service"
    }
  ],
},
{
  "coding":
  [
    {
      "system": "http://snomed.info/sct",
      "code": "224891009",
      "display": "Healthcare services"
    }
  ]
},
],
"location":
[
  {
    "reference": "Location/<loc-resource-id>"
  }
],
"telecom":
[
  {
    "system": "phone",
    "value": "<phone-number>"
  },
  {
    "system": "email",
    "value": "<email-address>"
  }
],
"serviceProvisionCode":
[
  {
    "coding":
    [
      {
        "system": "http://terminology.hl7.org.au/CodeSystem/service-provision-conditions",
        "code": "NFE",
        "display": "No Fee"
      }
    ]
  }
],
"availableTime":
[
  {
    "daysOfWeek":
    [
      "mon",
      "tue",

```

```

    "wed",
    "thu",
    "fri"
  ],
  "allDay": false,
  "availableStartTime": "08:00:00",
  "availableEndTime": "18:00:00"
},
{
  "daysOfWeek":
  [
    "sat",
    "sun"
  ],
  "allDay": false,
  "availableStartTime": "09:00:00",
  "availableEndTime": "15:00:00"
}
],
"notAvailable":
[
  {
    "during":
    {
      "start": "2023-02-01",
      "end": "2023-02-01"
    }
  },
  {
    "extension":
    [
      {
        "url": "http://fhir.nhsd.com.au/StructureDefinition/nhsd-availability-reason",
        "valueCodeableConcept":
        {
          "coding":
          [
            {
              "system": "http://fhir.nhsd.com.au/CodeSystem/nationalHolidays",
              "code": "australia_day"
            }
          ]
        }
      }
    ]
  },
  {
    "during":
    {
      "start": "2025-01-26",
      "end": "2025-01-26"
    }
  }
]
}
]
}

```

Practitioner

```

{
  "resourceType": "Practitioner",
  "id": "<prac-resource-id>",
  "meta":
  {
    "lastUpdated": "2024-02-08T02:33:40.970Z"
  },
  "identifier":
  [
    {
      "system": "http://fhir.nhsd.com.au/CodeSystem/nhsdIdentifiers#rid",
      "value": "<nhsd-practitioner-id>"
    },
    {
      "system": "http://hl7.org.au/id/ahpra-registration-number",
      "value": "<ahpra-registration-number>"
    }
  ],
  "active": true,
  "name":
  [
    {
      "family": "<family-name>",
      "given":
      [
        "<first-name>",
        "<middle-name>"
      ]
    }
  ]
}

```

Practitioner Role

```

{
  "resourceType": "PractitionerRole",
  "id": "<prac-role-resource-id>",
  "meta":
  {
    "lastUpdated": "2024-02-08T02:35:24.435Z"
  },
  "identifier":
  [
    {
      "system": "http://fhir.nhsd.com.au/CodeSystem/nhsdIdentifiers#rid",
      "value": "<nhsd-practitioner-relation-id>"
    },
    {
      "system": "http://ns.electronichealth.net.au/id/medicare-provider-number",
      "value": "<medicare-provider-number>"
    }
  ],
  "active": true,
  "practitioner":
  {
    "reference": "Practitioner/<prac-resource-id>"
  }
}

```

```

},
"organization":
{
  "reference": "Organization/<org-resource-id>"
},
"code":
[
  {
    "coding":
    [
      {
        "system": "http://snomed.info/sct",
        "code": "450044741000087104",
        "display": "Acupuncturist"
      }
    ]
  }
],
"location":
[
  {
    "reference": "Location/<loc-resource-id>"
  }
],
"healthcareService":
[
  {
    "reference": "HealthcareService/<hcs-resource-id>"
  }
]
}

```

Endpoint

```

{
  "resourceType": "Endpoint",
  "id": "<ep-resource-id>",
  "meta":
  {
    "lastUpdated": "2024-03-01T00:00:00.001Z"
  },
  "extension":
  [
    {
      "url": "http://hl7.org.au/fhir/StructureDefinition/au-receivingfacility",
      "extension":
      [
        {
          "url": "namespace-id",
          "valueString": "<namespace-id>"
        },
        {
          "url": "universal-id",
          "valueString": "<universal-id>"
        }
      ]
    }
  ]
}

```

```

        "url": "universal-id-type",
        "valueString": "<universal-id-type>"
      }
    ]
  },
  {
    "url": "http://hl7.org.au/fhir/StructureDefinition/au-receivingapplication",
    "extension": [
      {
        "url": "namespace-id",
        "valueString": "<namespace-id>"
      },
      {
        "url": "universal-id",
        "valueString": "<universal-id>"
      },
      {
        "url": "universal-id-type",
        "valueString": "<universal-id-type>"
      }
    ]
  },
  {
    "url": "http://hl7.org.au/fhir/StructureDefinition/encryption-certificate-pem-x509",
    "valueString": "<encryption-certificate>"
  }
],
"identifier": [
  {
    "system": "http://ns.electronichealth.net.au/smd/target",
    "value": "<sm-ep-id>"
  },
  {
    "system": "http://fhir.nhsd.com.au/CodeSystem/nhsdIdentifiers#rid",
    "value": "<nhsd-ep-id>"
  }
],
"status": "ACTIVE",
"connectionType": [
  {
    "system": "http://hl7.org.au/fhir/CodeSystem/smd-interfaces",
    "code": "http://ns.electronichealth.net.au/smd/intf/SealedMessageDelivery/TLS/2010",
    "display": "Sealed Message Delivery"
  },
  {
    "name": "<ep-name>",
    "managingOrganization": [
      {
        "reference": "<org-resource-id>"
      }
    ],
    "contact": [
      {
        "system": "email",

```

```

    "value": "<email-address>"
  }
],
"payloadMimeType":
[
  "application/hl7-v2"
],
"payloadType":
[
  {
    "coding":
    [
      {
        "system": "http://hl7.org.au/fhir/CodeSystem/endpoint-payload-type",
        "code": "http://ns.hl7.org.au/hl7v2/profiles/HL7AU-OO-REF-SIMPLIFIED-201706",
        "display": "Simplified Profile for HL7 V2.4 REF message"
      }
    ]
  },
  {
    "coding":
    [
      {
        "system": "http://hl7.org.au/fhir/CodeSystem/endpoint-payload-type",
        "code": "http://ns.electronichealth.net.au/ack/sc/deliver/hl7Ack/2012",
        "display": "HL7 V2 Acknowledgment"
      }
    ]
  }
]
},
"headers":
[
  "<header_1>",
  "<header_2>"
],
"address": "<address-url>"
}

```