NAP Reference Architecture

This report defines one of the Views of the NAP Reference Architecture

10.02.2025

# NAP Physical View

The Physical View Depicts the system from a system engineer’s point of view. This view is used to describe the arrangement of physical elements, such as system elements and their connections that provide the solution for a product, service, or enterprise. It is intended to satisfy logical architecture elements and system requirements.

The View contains **Subsystems** with **Modules**. **Physical data flows**, grouping functional data flows passing between subsystems or modules.

The Physical View is always based on a particular Functional View. The Physical View consists of Sub-systems and, optionally, Modules and Physical Data Flows between them.

The Physical View is elaborated with respect of minimum functionality of two NAP types: **Metadata Directory** and **Data Platform.**

Those types are presented via TWO diagrams, each leveraging functionality of respective type.



Figure: NAP Physical View - Metadata Directory

## Selected terms and definitions

**Sub-systems**: High-level units that may include multiple Modules, but can also have none if simple. Each geographic location has its own Sub-system.

**Modules**: Computer programs within Sub-systems that perform ITS functions and communicate via ITS interfaces. They can be replicated wholly or partly across locations.

**Physical Data Flows**: Communication channels in ITS, either Internal (linking Sub-systems/Modules) or External (connecting to Terminators/Actors). They're based on a pre-checked Functional View.

**Terminators**: External entities not modelled within the FRAME Architecture, such as different vehicle types or traveller roles

**Metadata directory:** The data portal that contains descriptions of the data and services important for their identification, assessment, and subscription by consumer, i.e., metadata. It provides facilities to authenticate data provider and functionality to insert a metadata records. The NAP provides search and discovery services of the hosted records to end users and via machine readable content to other portals. The NAP is not directly involved in the data exchange between data providers and data consumers.



Figure: NAP Physical View - Data Platform

## Selected terms and definitions

**Data platform**: The data portal that contains descriptions of the data and services important for their identification, assessment, and subscription by consumer, i.e., metadata, together with the data and/or services themselves. It provides facilities to authenticate data provider, and optionally, data consumer and functionality to insert a data and metadata records to NAP internal database. The NAP provides search and discovery services of the hosted records to end users and via machine readable content to other portals and distribution interfaces for data dissemination. The NAP is an intermediary between data provider and consumer, the data however remain in the ownership of the data provider.

**EA GUID** Enterprise Architect unique identifier, uniquely identifying the object within the model.

## Sub-Systems

This chapter defines Subsystems for **both NAP types**, Metadata Directory and Data Platform.

### Data Platform NAP

*Date Modified: 14.01.2025 1:09:44, GUID: {E5881292-2F25-4bc1-8840-23C9D1CC23A4}*

The Data Platform NAP sub system represents the hardware/software implementation of the ITS Service. It consists of modules performing data and metadata quality checks, hosting data and metadata, user data, and credentials, allowing the creation and retrieval of metadata records as well as real data from the internal database and user support.

### Metadata Directory NAP

*Date Modified: 14.01.2025 1:09:23, GUID: {1B971F1C-E2FC-46e2-97A3-CCB248436727}*

The Metadata Directory NAP sub system represents the hardware/software implementation of the ITS Service. It consists of modules performing metadata quality checks, hosting metadata, user data, and credentials, allowing the creation and retrieval of metadata records from the internal database as well as user support.

## Modules

This chapter defines modules for **both NAP types**, Metadata Directory and Data Platform.

### Data Management Module

*Date Modified: 14.01.2025 0:59:55, GUID: {919C23BB-5FFF-4300-A416-F084AB9FE538}*

This Module handles traffic and transport data input (upload, update, or deletion) from NAP content providers and its retrieval by NAP content users. It uses the NAP Data store to store all data and related information.

### Data Quality Checks Module

*Date Modified: 14.01.2025 1:00:20, GUID: {2E455170-A8C4-4ffc-BF75-1D058FC191B2}*

This Module enables and support the periodical and initial checking of published data quality. Main tests performed are schema validation and availability of provided data against the metadata information. The results of the check are stored in NAP Data store.

### Metadata Management Module

*Date Modified: 14.01.2025 0:59:24, GUID: {4C1A7740-ADB9-4654-9703-57AC92DD6D54}*

This Module handles metadata input (upload, update, or deletion) from NAP content providers and its retrieval by NAP content users. It uses the NAP Metadata store to store all metadata and related information.

### Metadata Quality Check Module

*Date Modified: 14.01.2025 1:00:56, GUID: {B9BC9F94-BAF8-465c-A024-66944F4C302E}*

This Module periodically and initially checks the quality of provided metadata. The main tests performed are the availability of provided links and structural and contextual soundness based on predefined criteria. The results of the check are stored in the NAP Metadata store.

### Support (ticket) Module

*Date Modified: 14.01.2025 1:01:22, GUID: {02101F2C-788B-49ea-8C0D-AD3B498E1E53}*

This Module handles and allows the processing of requests for support and reported issues by NAP Users, (Content Providers and Content Consumers).

### User Management Module

*Date Modified: 14.01.2025 1:01:47, GUID: {83B61A0E-1086-4216-B72F-38DA9E185D9B}*

This Module handles user (NAP Content Providers and NAP Content Consumers) registrations and authorizations. It stores all relevant user information along with credentials in NAP Users data store.

## Physical Dataflows

This chapter defines physical data flows for **both NAP types**, Metadata Directory and Data Platform.

### PDF Content Consumer Authorization and Registration

*Date Modified: 14.01.2025 1:02:56, GUID: {96C4145B-D427-423c-8272-54CE77DBDE7F}*

This Physical Data Flow facilitates information exchange between NAP Content Consumer and User Management Module. This exchange concerns Content Consumers data objects for registration requests and credentials for data retrieval upon authorization. The registration request contains entity information, license terms approval, and organization details. Outputs include responses to registration requests and credentials for accessing NAP functionality.

### PDF Data from Content Provider

*Date Modified: 14.01.2025 1:03:06, GUID: {1F6F7D4C-BAFE-43db-AF7B-C8043CC6E31F}*

This Physical Data Flow facilitates information exchange between Data Management Module and Content Provider. This exchange concerns inputs from the NAP Content Provider with new or updated data objects, requiring authorisation credentials.

### PDF Data from Data Provision System

*Date Modified: 14.01.2025 1:03:31, GUID: {1DE55835-B3EB-461f-BAF4-61B9F635EDBD}*

This Physical Data Flow facilitates information exchange between Data Management Module and Data Provision System. This exchange concerns inputs from the Data Provision System with new or updated data objects, requiring authorisation credentials.

### PDF Data Quality Check

*Date Modified: 14.01.2025 1:05:31, GUID: {1587F034-1363-447d-8BFA-2234BA04649C}*

This Physical Data Flow facilitates information exchange between Data Quality Check and Data Management modules. This exchange concerns data retrieved from the NAP Data store after scheduled or triggered events. The data object includes updated quality information, time stamps, success or failure status, error counts, service levels, and an aggregated summary.

### PDF Data to Content Consumer

*Date Modified: 14.01.2025 1:03:58, GUID: {B82B3A07-B464-4905-B517-04B74942E5AA}*

This Physical Data Flow facilitates information exchange between Data Management Module and Content Consumer. This exchange concerns requests from the NAP Content Consumer for data content and responses with data if the authorisation is successful.

### PDF Data to Data Requesting System

*Date Modified: 14.01.2025 1:04:13, GUID: {F785EA75-B3BD-4be6-9374-06DC89A98B73}*

This Physical Data Flow facilitates information exchange between Data Requesting System and NAP Data Management Module. This exchange concerns requests from the Data Requesting System for data content and responses with data if the authorisation is successful.

### PDF Metadata and Data Management

*Date Modified: 14.01.2025 1:05:54, GUID: {8DE1FAAE-FC95-48f3-B1BD-F0F67A00B135}*

This Physical Data Flow facilitates information exchange between Metadata Management and Data Management modules. This exchange concerns metadata retrieval/check/update with regards data stored in the Data Store.

### PDF Metadata and User Management

*Date Modified: 14.01.2025 1:04:56, GUID: {252899F7-3651-40d5-A2A6-1A59A8185657}*

This Physical Data Flow facilitates information exchange between Metadata Management and User Management modules. This exchange concerns request for authorisation of Content Provider to access and change data in Metadata Management Module.

### PDF Metadata from Content Provider

*Date Modified: 14.01.2025 1:06:12, GUID: {48F2D92D-8E82-4032-B932-CD8D2CB855B0}*

This Physical Data Flow facilitates information exchange between Metadata Management Module and Content Provider. This exchange concerns inputs from the NAP Content Provider with new or updated metadata objects, requiring authorisation credentials.

### PDF Metadata from Metadata Provision System

*Date Modified: 10.02.2025 12:32:44, GUID: {A75E9CBB-5B13-4249-B1EE-F51C9EC0BD9D}*

This Physical Data Flow facilitates metadata exchange between Metadata Management Module and metadata Provision System. This exchange concerns inputs from the Metadata Provision System with new or updated data objects, requiring authorisation credentials.

### PDF Metadata Quality Check

*Date Modified: 14.01.2025 1:06:35, GUID: {4FB08435-DE36-46a7-B970-3E2B0A3CD452}*

This Physical Data Flow facilitates information exchange between Metadata Quality Check and Metadata Management modules. This exchange concerns metadata retrieved from the NAP Metadata store after scheduled or triggered events. The data object includes updated quality information, time stamps, success or failure status, error counts, service levels, and an aggregated summary.

### PDF Metadata to Content Consumer

*Date Modified: 14.01.2025 1:06:58, GUID: {C25F8BCA-DCD4-4894-956E-40D0218D3ACA}*

This Physical Data Flow facilitates information exchange between NAP Content Consumer and NAP Metadata Management Module. This exchange concerns search requests sent by the NAP Content Consumer and search results returned by the NAP Metadata Management Module.

### PDF Metadata to Requesting System

*Date Modified: 14.01.2025 1:07:14, GUID: {5681386B-AB60-4a6c-B51B-4BD4F745FDD5}*

This Physical Data Flow facilitates information exchange between Metadata Requesting System and NAP Metadata Management Module. This exchange concerns search requests sent by the Metadata Requesting System and search results returned by the NAP Metadata Management Module.

### PDF Support of Content Consumer

*Date Modified: 14.01.2025 1:07:29, GUID: {0B43348A-F713-49fe-A684-A88D53A58D67}*

This Physical Data Flow facilitates information exchange between Support (ticket) Module and Content Consumer. This exchange concerns support requests sent by the Content Consumer and handled by the Support (ticket) Module.

### PDF Support of Content Provider

*Date Modified: 14.01.2025 1:07:46, GUID: {BA985F0C-2C6F-4329-BABC-91890CC23954}*

This Physical Data Flow facilitates information exchange between Support (ticket) Module and Content Provider. This exchange concerns support requests sent by the Content Provider and handled by the Support (ticket) Module.

### PDF User and Data Management

*Date Modified: 14.01.2025 1:08:05, GUID: {5C212D22-87C8-423c-A4EE-D4FACC7598C7}*

This Physical Data Flow facilitates information exchange between User Management and Data Management modules. This exchange concerns credentials of a NAP Content Provider or Data Providing System, which are checked against the NAP Users data store to authorize the claimant to insert or modify data records in the NAP Data store. They also provide information about the validity of these authorization credentials.

### PDF User Management of Content Provider

*Date Modified: 14.01.2025 1:08:23, GUID: {C5A68539-7FA7-4245-9B3A-F55B6668B579}*

This Physical Data Flow facilitates information exchange between Content Provider and User Management Module. This exchange concerns user registration requests.

## Specifications

Specifications and requirements affecting the implementation of the ITS Service and depicted on the diagram are described in a Specifications document.