



Harmonization of EU NAP architectures and first layout of potential NAP federation

Milestone 2.9: Annex A National Access Point Reference Architecture

Document history

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0.8	31.1.24	NAPCORE T2.3	Document ready for CAT review
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2 Introduction

Several Delegated Regulations supplementing the ITS Directive aim to foster the accessibility of mobility data via National Access Points in the EU. They set obligations for

- the provision of road-safety related traffic information (SRTI),
- the provision of information services for safe and secure parking places for trucks (SSTP),
- the provision of real-time traffic information services (RTTI) and
- the provision of multimodal travel information services (MMTIS).

3 Target Group and Usage Hints

Who can profit from the use the NAP Reference Architecture?

The NAP Reference Architecture focusses on the viewpoint of

- Authorities responsible for the NAP and
- Operators of the NAP.

To understand what a NAP does, the NAP Reference Architecture can also be used by

- Transport Operators and Mobility Service Providers owning mobility data and information services mentioned in the Delegated Regulations
- Entities who want to obtain mobility data and information services mentioned in the Delegated Regulations

When and how should the NAP Reference Architecture be used?

NAP authorities and operators:

- The NAP Reference Architecture can support within the planning process of setting up a new NAP. It illustrates the obligatory functionalities of a NAP.
- Organisational implications and technical specifications are shown in a generic way.
- The NAP Reference Architecture can support within the process of further developing an existing NAP and aligning it with other NAPs.

Transport Operators, Mobility Service Providers and entities interested in obtaining mobility data and information services:

- Before using a NAP, the NAP Reference Architecture can
 - give insights into what a NAP is intended to do,
 - point to organisational implications and
 - show technical specifications in a generic way.

4 Contents of the Reference Architecture

4.1 Motivation Layer

The Motivation Layer illustrates the idea of a NAP. Vision, mission statement, a concise description of the NAP service and the intended added value are shown.

TO BE ADDED in M2.11

4.2 User Needs

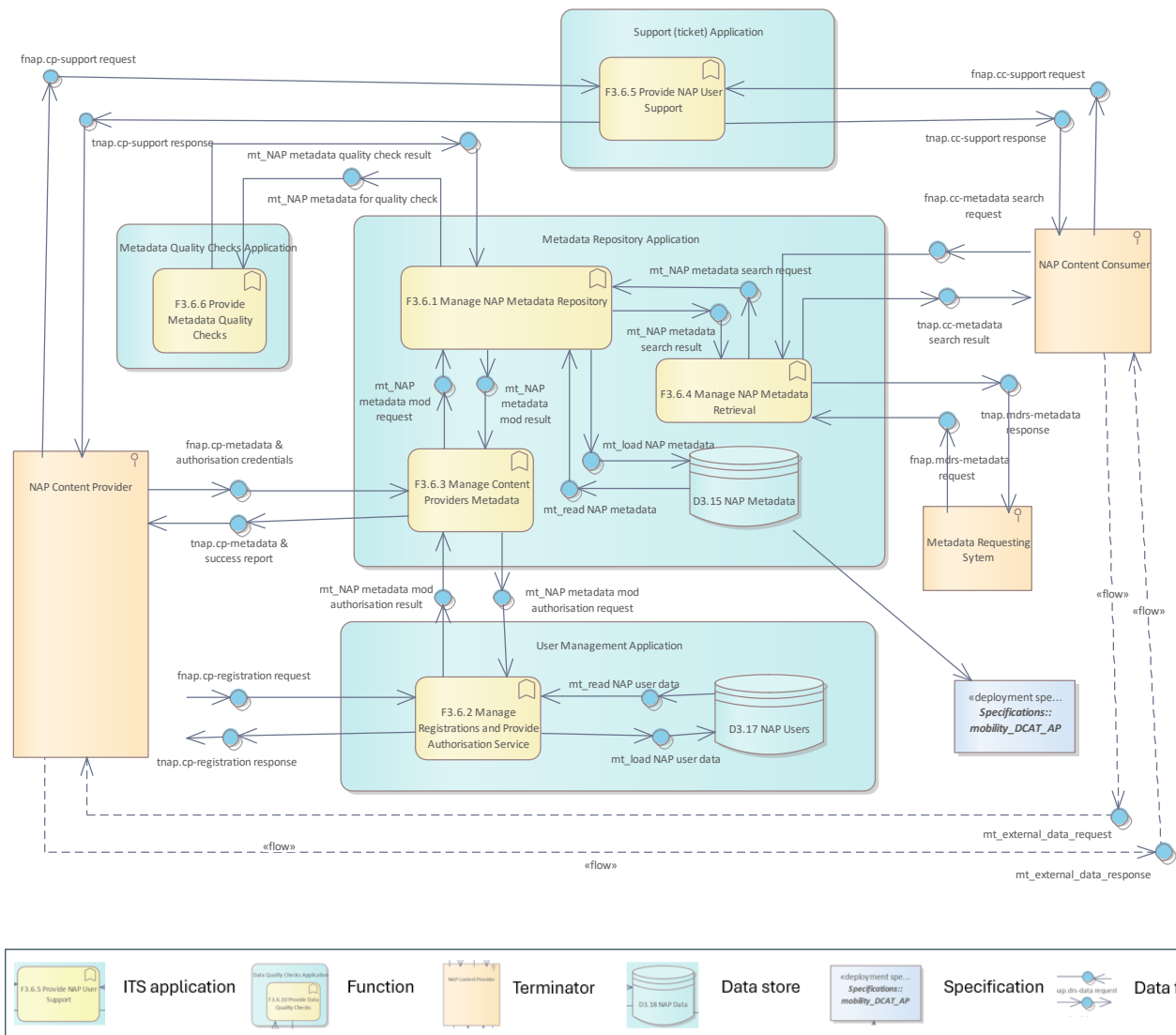
User Need for NAP are defined in the subgroup 6.5.1 “National Access Point (NAP)”

No	Description
6.5.1.1	The service shall make sources of static and dynamic urban and inter-urban road and traffic information accessible to authorised users, e.g. Information Service Providers (ISPs) and Broadcasters, who can then distribute it to their end-users.
6.5.1.2	The service shall provide a discovery service of static and dynamic urban and inter-urban road and traffic information for authorised users, e.g. Information Service Providers (ISPs) and Broadcasters.
6.5.1.3	The service shall provide all the information available from it in the form of meta-data, with pointers (links) to where the actual data can be found.
6.5.1.4	The service shall be able to validate the identity of a Data Provider for a National Access Point (NAP).
6.5.1.5	The service shall be able to permit a validated Data Provider to update its meta-data links directly.
6.5.1.6	The service shall provide a search interface in the native language of the area covered and, at least, English.
6.5.1.7	The service shall provide Information Management tools for the operator.
6.5.1.8	The service shall provide information using "open" standard communication protocols.

TO BE UPDATED in M2.11

4.3 Functional View - Metadata Directory

02 NAP Functional View - Metadata Directory
02 NAP Functional View
7.0.7
P. Bureš



4.3.1 Functions

4.3.1.1 F3.6.1 Manage NAP Metadata Repository

GUID: {FC985F0E-26B3-41e8-847E-A71AA3290132}

This Function shall be capable of providing the following facilities:

- (1) The ability to manage the store of Metadata.
- (2) The ability to ensure that all data sent to the store is stored in a coherent and logical manner.
- (3) The ability to read, edit, update and erase data from the store as and when requested.
- (4) The ability to enable Metadata to be created in advance of their publication on the NAP so it could be checked before its publication.
- (5) The ability to carry out its activities in such a way that they do not interfere with one another, and that the integrity of the data being stored and read is preserved.
- (6) This function manages all data mentioned in the mobilityDCAT-AP (<https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html>) and other relevant information (e.g. quality info, possible data comments etc.)

4.3.1.2 F3.6.2 Manage Registrations and Provide Authorisation Service

GUID: {B032435E-6A52-4920-97B0-C13BB3E8BFC7}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process a request from an entity that wants to become new NAP User.
- (2) The ability to check the new NAP User in (1) above to include electronic identification, verification that the requesting entity exists based on information included in the request and agree with terms of the NAP User (different for NAP Content Provider and NAP Content Consumer)
- (3) The ability to load information about the entity submitting the request in (1) above into the NAP Users data store, if the identification, verification, and acceptance in (2) above is successful.
- (4) The ability to provide authorisation credentials to the requesting entity.
- (5) The ability to send a rejection notice (including the reason for rejection) to the entity that submitted the request in (1) above if the identification, verification, and acceptance in (2) and (3) above was not successful.
- (6) The ability to check the authorisation of an entity which sends its credentials to the NAP functions and to response to those functions if the authorisation check has been successful.
- (7) The ability to process the information provided in an unsuccessful request for the update of NAP User data so that a suitable response can be sent to the entity that made the request and future unsuccessful update requests monitored.
- (8) The ability to register multiple user accounts within a NAP User account, i.e. users' organization.
- (9) The ability to register multiple machine accounts within a NAP User account, i.e. users' organization, for consuming or providing content from / to the NAP. The machine accounts stand for Data Requesting Systems and Data Supplying System.
- (10) The ability to organize user and machine account registered under one NAP User into organization, where user accounts have different rights to access the NAP Users data store, i.e. view, modify, add, and delete records.
- (11) The ability to remove electronic identity of the NAP User from the NAP Users data store based on reception of a request from a NAP User.
- (12) The ability to register the as one or both NAP Content Provider and NAP Content Consumer with different rights / responsibilities to perform tasks assigned to provider or consumer in the NAP via Functions Manage Content Providers Metadata and Manage NAP Metadata Retrieval.
- (13) Ability to provide registered NAP User data upon its successful authorization
- (14) Ability to log in events connected with NAP User Activity to the NAP User data store

NOTE: one physical user can be part of more NAP Users but under the different electronic identity.

modified: 11.01.2024

4.3.1.3 F3.6.3 Manage Content Providers Metadata

GUID: {B623B347-AA95-44be-9043-55050E3CFC41}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process request to upload new or updated metadata from a NAP Content Provider.
- (2) The ability to forward the authorisation credentials of the NAP Content Provider to the Function Manage NAP User Registrations and to receive a result about the authorised registration of the NAP Content Provider from the Function Manage NAP User Registrations.
- (3) The ability to perform basic and consistency checks on filled in metadata (e.g. the data are filled in expected manner and are structurally complete)
- (4) The ability to send the metadata included in the request in (1) above to the Function Manage NAP Metadata Repository for loading into the data store if the checks in (2) above were successful.
- (5) The ability to send a "failure" response to the entity that made the request in (1) above if the checks in (2) and (3) above were unsuccessful or a "success" response if the checks were successful.

(6) Ability to provide metadata created by the NAP Content Provider and data created by the NAP, i.e. quality records and NAP User event log to the NAP Content Provider.

(7) Ability to record NAP Content Provider Activity into the NAP Users data store.

(8) Ability to update, amend or delete existing metadata records.

NOTE: the ability to browse, search and view metadata is in the functionality F3.6.4 Manage Metadata Retrieval. It is assumed that NAP Content Provider is also logged in as NAP Content Consumer.

modified: 11.01.2024

4.3.1.4 F3.6.4 Manage NAP Metadata Retrieval

GUID: {D9EFBB62-DD12-4dd1-A835-DF560A82A1AD}

This Function shall be capable of providing the following facilities:

(1) The ability to provide a query form or comparable search interface to define keywords or refine demands in different available metadata elements.

(2) The ability to receive and process requests from NAP Content Consumers to be provided with NAP metadata.

(3) The ability to process the request in (1) above so that all suitable search results to the request are retrieved from the Data Store NAP Metadata.

(4) The ability to format the NAP metadata search results obtained in (3) above and send it to the entity that made the request in (2) above or to display them in an overview results page.

(5) Ability to provide metadata at the NAP including data created by the NAP, i.e. quality records.

(6) Ability to provide all or parts of metadata stored in the NAP Metadata store in a machine-readable format for reasons of harvesting the metadata by Metadata Requesting System (machine to machine access).

(7) The ability to provide all relevant metadata without NAP Content Consumer registration

NOTE: It is assumed that NAP Content Provider could perform all the task of the NAP Content Consumer.

modified: 11.01.2024

4.3.1.5 F3.6.5 Provide NAP User Support

GUID: {0CFE2A7A-AD32-4068-BDC5-AF0F18B6D99B}

This Function shall be capable of providing the following facilities:

(1) The ability to receive and process support requests from any existing or potential NAP Content Provider or NAP Content Consumer.

(2) The ability to respond to user support requests adequately at least in a form of first-level support.

(3) The ability to consult other NAP roles for issues which cannot be responded with the own knowledge.

(4) The ability to manage issues and log the issue resolution for later use by NAP Users or by an Auditing entity

NOTE: this could be done via a ticketing system

modified: 11.01.2024

4.3.1.6 F3.6.6 Provide Metadata Quality Checks

GUID: {15BFF38A-05D9-4775-84C9-6604B0EEA3C6}

This function shall be capable of providing the following facilities:

(1) The ability to perform metadata quality checks based on prespecified rules and procedures (including appropriate time frequencies). The checks follow the MQA and InQMS methodology, at minimum it is an availability of the urls provided in metadata.

(2) The ability to retrieve data to be checked from the NAP Metadata store.

(3) The ability to disseminate and store the outcomes of data quality checks to the NAP Metadata store.

(4) Ability to perform the checks based on metadata events (data insert, data update) in the NAP Metadata store

modified: 04.01.2024

4.3.2 Data Flows

4.3.2.1 fnap.cc-metadata_search_request

GUID: {DCE578B8-265B-47f6-906D-8C4E9593F623}

It consists of inputs from the NAP Content Consumer containing data objects that provide a request for information about accessible traffic, travel data and any other relevant information which are described with metadata in the store of NAP Metadata. The request shall contain keywords or any refining demand in at least one metadata element.

modified: 04.01.2024

4.3.2.2 fnap.cc-support_request

GUID: {16D06C97-2C77-4307-B304-766A1D613BE8}

It consists of inputs from the NAP Content Consumer containing data objects that provide a request for support describing an issue the NAP User have and to which the NAP Operator shall respond. The data objects are used by functionality in the Manage Traffic Functional Area.

modified: 04.01.2024

4.3.2.3 fnap.cp-metadata_&_authorisation_credentials

GUID: {00BDD6C9-80B2-4dee-90C4-810AB30E51F8}

It consists of inputs from the NAP Content Provider containing data objects that provide new or updated metadata to be loaded into the store of NAP metadata. The required and optional elements of metadata can be found in a metadata catalogue: <https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html> .

Besides the metadata itself the request must contain the authorisation credentials of the entity that is providing it, so that this can be checked to ensure that it is a registered entity.

modified: 04.01.2024

4.3.2.4 fnap.cp-registration_request

GUID: {4C018359-5E45-494d-B61F-93B909FE1F63}

It consists of inputs from the NAP Content Provider containing data objects that provide a registration request of and information about a potential NAP Content Provider which wants to register or a request with credentials of registered NAP Content Provider for retrieval of its data upon a successful authorisation. (Details of the information about the NAP Content Provider will be found in the description of the store of NAP Users).

The registration request contains relevant information about the entity to be registered under NAP Content Provider account, including identity information, licence terms approval, users, machines, and organization information.

modified: 04.01.2024

4.3.2.5 fnap.cp-support_request

GUID: {D597AA27-D232-49ad-8A7F-D4F246F9E217}

It consists of inputs from the NAP Content Provider containing data objects that provide a request for support describing an issue the NAP User have and to which the NAP Operator shall respond. The data objects are used by functionality in the Manage Traffic Functional Area.

modified: 04.01.2024

4.3.2.6 mt_NAP_metadata_mod_authorisation_request

GUID: {8CF116B5-F004-4ade-992F-224F911F17FB}

It contains data objects that provide credentials of a NAP Content Provider to be checked against the data stored in NAP Users data store to authorize the claimant to modify metadata records in the store of NAP Metadata.

modified: 04.01.2024

4.3.2.7 mt_NAP_metadata_mod_authorisation_result

GUID: {BEA016F1-B13A-4ae8-951E-7F0A26FD3888}

It contains data objects that provide information about the validity of the authorisation credentials of a NAP Content Provider that authorize the claimant to modify metadata records in the store of NAP Metadata.

modified: 04.01.2024

4.3.2.8 mt_load_NAP_metadata

GUID: {9099D7FF-5046-4a5a-ADF5-F891BAA1B934}

It contains data objects that provide either new metadata to be loaded into the store of NAP Metadata, or a request for metadata to be retrieved. The metadata that is to be loaded into the store shall give information about the contents which are made accessible by the NAP Content Provider. The required and optional elements of metadata can be found in a mobilityDCAT-AP <https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html>.

Apart from data specified by the above said catalogue other data are managed by the load function these are data quality records and NAP User event log.

modified: 04.01.2024

4.3.2.9 mt_load_NAP_user_data

GUID: {6FE0CAF2-D55F-4f13-B39A-6D819C3E9C75}

It contains data objects that provide either new data to be loaded into the store of NAP Users, or a request for data objects to be retrieved. The data objects that are to be loaded into the store will include information about a previously unregistered NAP User or modifying, extending, deleting previously registered NAP User.

modified: 04.01.2024

4.3.2.10 mt_NAP_metadata_search_result

GUID: {A17E620E-AAD9-4f53-8D90-E75C36E9CF0D}

It contains data objects that provide metadata items which have been retrieved from the store of NAP Metadata following a previous search request. A request identifier must be included so that it can be related to a particular request (there may be multiple requests being made from the same source) and returned to the requestor.

modified: 04.01.2024

4.3.2.11 mt_NAP_metadata_mod_request

GUID: {8B43A86E-ED30-493c-9B56-4D3EB3EB391B}

It contains data objects that provide either new metadata or updates to data that has been previously loaded into the store of NAP Metadata or a request for data objects to be retrieved. The updated data objects that are to be loaded into the store includes information that is being made accessible by the NAP Content Provider. The required and optional elements of metadata can be found in a metadata catalogue: <https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html>

modified: 04.01.2024

4.3.2.12 mt_NAP_metadata_search_request

GUID: {4624DD5D-01B5-414a-AE0A-50169378736B}

It contains data objects that provide a request from the NAP Content Consumer for information about traffic, travel data and any other relevant information which are described with metadata in the store of NAP Metadata. The request shall contain keywords or any refining demand in at least one metadata element together with a request identifier.

modified: 04.01.2024

4.3.2.13 mt_read_NAP_metadata

GUID: {2A5ABAB8-048B-412c-AC03-A6DBD3D5DBB3}

It contains data objects that provide metadata that has been retrieved from the store of NAP Metadata following a request. The metadata that has been read from the store gives information about the contents which are made accessible by the NAP

Content Provider. The required and optional elements of metadata can be found in a metadata catalogue: <https://mobilitydcap.github.io/mobilityDCAT-AP/releases/index.html>

Apart from data specified by the above said catalogue other data are managed by the read function these are data quality records and NAP User event log.

modified: 04.01.2024

4.3.2.14 mt_read_NAP_user_data

GUID: {7E763AED-E934-47b4-BF12-7ED1C864E575}

It contains data objects that provide data that has been read from the store of NAP Users, following a previous request for data to be retrieved. The data that is to be read from the store will be information about a registered NAP User, or a "no data" found response. (Details of the type of information about the NAP Users that is available will be found in the description of the store of their data).

modified: 04.01.2024

4.3.2.15 mt_NAP_metadata_mod_result

GUID: {D1E1FC81-8318-433d-8628-B81EF2B0B4AB}

It contains data objects that provide information about the success of loading the newly provided or updated NAP Content Provider metadata into the store of NAP Metadata or provide data objects containing the NAP Content Provider metadata. All information stored in the NAP Metadata store about the authorised NAP Content Provider may be retrieved this way.

modified: 04.01.2024

4.3.2.16 tnap.cc-metadata_search_result

GUID: {63E13C50-8801-4e2b-BA9D-170CDE8BD53D}

It contains outputs to the NAP Content Consumer that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are items of NAP metadata which have been retrieved from the store of NAP metadata following a previous search request.

modified: 04.01.2024

4.3.2.17 tnap.cc-support_response

GUID: {72CEA537-E1D0-4568-A93D-9343F41193CC}

It contains outputs to the NAP Content Consumer that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the responses to previous requests for support, i.e. information about handling and resolving the issue.

modified: 04.01.2024

4.3.2.18 tnap.cp-registration_response

GUID: {43BA5834-14FF-41d8-89AB-BD55A7C65F2E}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response ("acceptance" or "rejection") to a previous registration request from a NAP Content Provider. In case of a successful registration, it includes credentials for the Content Provider to prove its authorisation to access NAP functionality that needs authorisation. Also based on the successful request it contains data of the registered NAP Content Provider

modified: 04.01.2024

4.3.2.19 tnap.cp-metadata_&_success_report

GUID: {B3154461-F9DC-4afd-8D5F-F44985AF55EC}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response to a previous request to create, update delete Content Provider related metadata in the store of NAP Metadata. The response can be either "successful" or "failed", which must be accompanied by a reason for the "failure". In case of invalid authorisation credentials, the Content Provider should be invited to (newly)

register through the Manage NAP User Registrations function. Also based on the successful request it contains data objects from the NAP Metadata store related to that NAP Content Provider.

modified: 04.01.2024

4.3.2.20 tnap.cp-support_response

GUID: {396E64F8-C99F-4e67-9ABE-3D0BF49B608F}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the responses to previous requests for support. i.e. information about handling and resolving the issue.

modified: 04.01.2024

4.3.2.21 fnap.mdrs-metadata_request

GUID: {1F8479D1-6CEC-42fd-8CD2-79F9AD3334A4}

It consists of inputs from the Metadata Requesting System containing data objects that provide request for retrieval of information stored in NAP Metadata store as DCAT-AP records. The request shall contain keywords or any refining demand in at least one metadata element.

modified: 04.01.2024

4.3.2.22 mt_NAP_metadata_for_quality_check

GUID: {EB72DA4A-A638-4946-B10F-21C536686F6C}

It contains data objects with the metadata information that has been retrieved from the store of NAP Metadata following a scheduled or triggered event. The data object also contains quality information that is to be updated after the quality check of the retrieved metadata content.

modified: 04.01.2024

4.3.2.23 mt_NAP_metadata_quality_check_result

GUID: {01233765-5DC4-4cf9-879E-4DC6961C9611}

It contains data objects created by Provide Metadata Quality Checks after checking quality of metadata that has been retrieved from the store of NAP Metadata following a scheduled or triggered event. The data is timestamp and success of failure (with number of errors found, level of service achieved) of the checks and overall aggregated summary. The checks follow the MQA and InQMS methodology, at minimum it is an availability of the urls provided in metadata.

modified: 04.01.2024

4.3.2.24 tnap.mdrs-metadata_response

GUID: {CA529868-7C49-48f9-AD5E-F796011DFDF5}

It contains outputs to the Metadata Requesting System that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are items of NAP Metadata which have been retrieved from the store of NAP Metadata following a previous request. Data are formatted as DCAT-AP records compliant with mobilityDCAT-AP.

modified: 04.01.2024

4.3.2.25 mt_external_data_request

GUID: {57094788-46D4-44bd-BEC6-50F84B787146}

This data flow manifest that the traffic or travel data owned by Content Provider are retrieved by Content Consumer outside of the system.

It contains identification of the Content Consumer, possibly signed licence terms and identification of data to be retrieved.

modified: 04.01.2024

4.3.2.26 mt_external_data_response

GUID: {91290012-4B70-4d58-BC5E-E548FBB78289}

This data flow manifest that the traffic or travel data owned by Content Provider are retrieved by Content Consumer outside of the system.

It contains requested data sent by Content Provider

modified: 04.01.2024

4.3.3 Data Stores

4.3.3.1 D3.15 NAP Metadata

GUID: {7A7B38A3-E097-4a2f-AEB6-7C204435B35E}

This Data Store shall be used within the Manage Traffic Functional Area. It shall contain information objects that provide metadata about traffic, travel data and any other relevant information. The required and optional elements of metadata have been harmonised and can be found in a metadata catalogue: <https://mobilitydcap.github.io/mobilityDCAT-AP/releases/index.html>.

Metadata is structured in the data store to:

- (1) describe data provider, where each data provider may list multiple of
- (2) data sets or services and each of such can be provided by more than one way by specifying its
- (3) distribution parameters.

The content and the structure are governed by the mobilityDCAT-AP.

Further on the data store also contains:

- (4) log of events with respect of metadata creation, update and
- (5) quality information per data set.

modified: 03.01.2024

4.3.3.2 D3.17 NAP Users

GUID: {DEABFE3A-CF27-4232-83E9-D03599E58AC3}

This Data Store shall be used within the Manage Traffic Functional Area. It shall contain information objects that provide details of NAP Users, i.e. NAP Content Providers and NAP Content Consumers (for Data Platform NAP type) . The Data Store contains private information used by NAP Users to access the NAP, to provide agreement on terms and conditions. Public metadata about traffic and travel information and other related information are stored in NAP Metadata store (D3.15).

For Content Providers the data store contains following data objects:

- (1) organization with name (1.1), postal address (1.2), website (1.3), agreement on licence terms (1.4), unique identifier assigned to organization (1.5), name and contact details of a responsible person to act as a contact (1.6).
- (2) user account(s) with name (2.1), email (2.2), credentials (2.3), user type (2.4).
- *(3) machine account with url (3.1), connection type (3.2), credentials (3.3).

For Content Consumers the data store contains following data objects:

- *(1) organization with name (1.1), postal address (1.2), website (1.3), agreement on licence terms (1.4), unique identifier assigned to organization (1.5), name and contact details of a responsible person to act as a contact (1.6).
- *(2) user account(s) with name (2.1), email (2.2), credentials (2.3), user type (2.4).
- *(3) machine account with url (3.1), connection type (3.2), credentials (3.3).

* Optional data object for Data Platform NAP type and even there it is optional provided the data is not openly accessible.

Additionally, for both:

- (4) Event information (log in, log out, change of data)

modified: 03.01.2024

4.3.4 Terminators

4.3.4.1 NAP Content Consumer

GUID: {A8478CF0-37A0-4638-BECC-CBB89B7519C6}

This Generic Terminator Role Content Consumer shall represent any interested entity in traffic, travel data. The NAP Content Consumer can find available metadata via the NAP. Therefore, Function F3.6.4 Manage NAP Metadata Retrieval offers an interface (typically a graphical user interface freely accessible via the Internet) to search the metadata in D3.15 NAP Metadata.

The NAP Content Consumer also can, in case of Data Platform NAP type retrieve data directly from the NAP, via Manage NAP Data Retrieval function. In some cases, especially when the data are pushed to the Content Consumer systems and / or authorisation is necessary the Content Provider must register at the NAP to obtain credentials and / or to set up a machine account to which data are pushed.

Key issue: Request high quality services; provide feedback about relevant content.

Area of responsibility: Be compliant to the agreement with content provider

Tasks: Receive content

Mnemonic: nap.cc

modified: 11.01.2024

4.3.4.2 NAP Content Provider

GUID: {48698837-F8BB-4dca-BBDB-736CF23C778C}

This Generic Terminator Role Content Provider shall represent any provider of traffic, travel data.

The Content Provider describes this data with metadata on the NAP (to be stored in D3.15 NAP Metadata). The Content Provider must be registered in the NAP, the NAP Content Provider electronic identity, proof of real-world identity and authorization credentials are kept in D3.17 NAP Users. The Content Provider information is encompassing one or more user accounts and machine accounts, (for Data Platform NAP type), licence agreements and other relevant data based on the provider complexity. The Content Provider is always linked with at least one user account that also stands for the organization.

In case of Data Platform NAP type the Content Provider also uploads / make data available for retrieval by the NAP.

Content Providers are for example public and private road operators, road authorities, service providers, transport authorities, transport operators, infrastructure managers, transport on-demand service providers.

Obligations to make data content accessible via the NAP is stipulated in the ITS Directive 2010/40/EU and its revised version (EU) 2023/2661 and complementary Delegated Regulations 885/2013, 886/2013, 2015/962, 2017/1926, 2022/670 and 2023/1804,

Key issue: Provide and publish content (to which he has the legal rights to publish); collect content.

Area of responsibility: Provide timely and accurate traffic and travel data.

Tasks: Provide content relevant to the ITS domain and according to contracts with the NAP and content consumers. provide information for issuing electronic identity, proving of real-world identity, issuing authentication credentials to prove themselves as trusted and registered NAP Content provider.

Mnemonic: nap.cp

modified: 03.01.2024

4.3.4.3 Metadata Requesting System

GUID: {DEB4AC48-7332-4f57-99D5-79169FCA6F1F}

This Generic Terminator Role Metadata Requesting System shall represent any interested entity in traffic, travel metadata dissemination. The Metadata Requesting System can request information stored in NAP Metadata store in standardized format (DCAT-AP) in order to incorporate said data into its own information services (i.e. metadata harvesting). Therefore, Function F3.6.4 Manage NAP Metadata Retrieval offers a data distribution interface for machine-to-machine data retrieval.

Key issue: Request metadata stored at NAP.

Area of responsibility: Be compliant to the agreement with NAP operator

Tasks: Receive information about the content, i.e. metadata

Mnemonic: nap.mdrs

modified: 11.01.2024

4.3.5 Applications

4.3.5.1 Metadata Quality Checks Application

GUID: {B9BC9F94-BAF8-465C-A024-66944F4C302E}

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

modified: 03.01.2024

4.3.5.2 Metadata Repository Application

GUID: {4C1A7740-ADB9-4654-9703-57AC92DD6D54}

This application represents an application that contains a NAP Metadata store and interfaces to handle metadata.

It shall contain an interface which enables NAP Content Providers to upload, update or delete metadata and informs about the success or failure of that interaction.

It shall contain another interface which is able to process metadata search requests to enable NAP Content Consumers to retrieve metadata.

modified: 03.01.2024

4.3.5.3 Support (ticket) Application

GUID: {02101F2C-788B-49ea-8C0D-AD3B498E1E53}

This application shall provide functions to process requests for support, reported issues by NAP Users, (Content Providers, Content Consumers). The handling of the support is performed by NAP Operator.

modified: 03.01.2024

4.3.5.4 User Management Application

GUID: {83B61A0E-1086-4216-B72F-38DA9E185D9B}

This application represents an application that handles User Registrations (i.e. NAP Content Providers and NAP Content Consumers).

It shall contain a NAP Users data store and an interface to Manage NAP User Registrations and Provide Authorisation Service. It shall also be able to verify NAP Content Providers to authorise the usage of the NAP Metadata store.

modified: 11.01.2024

4.3.6 Specifications

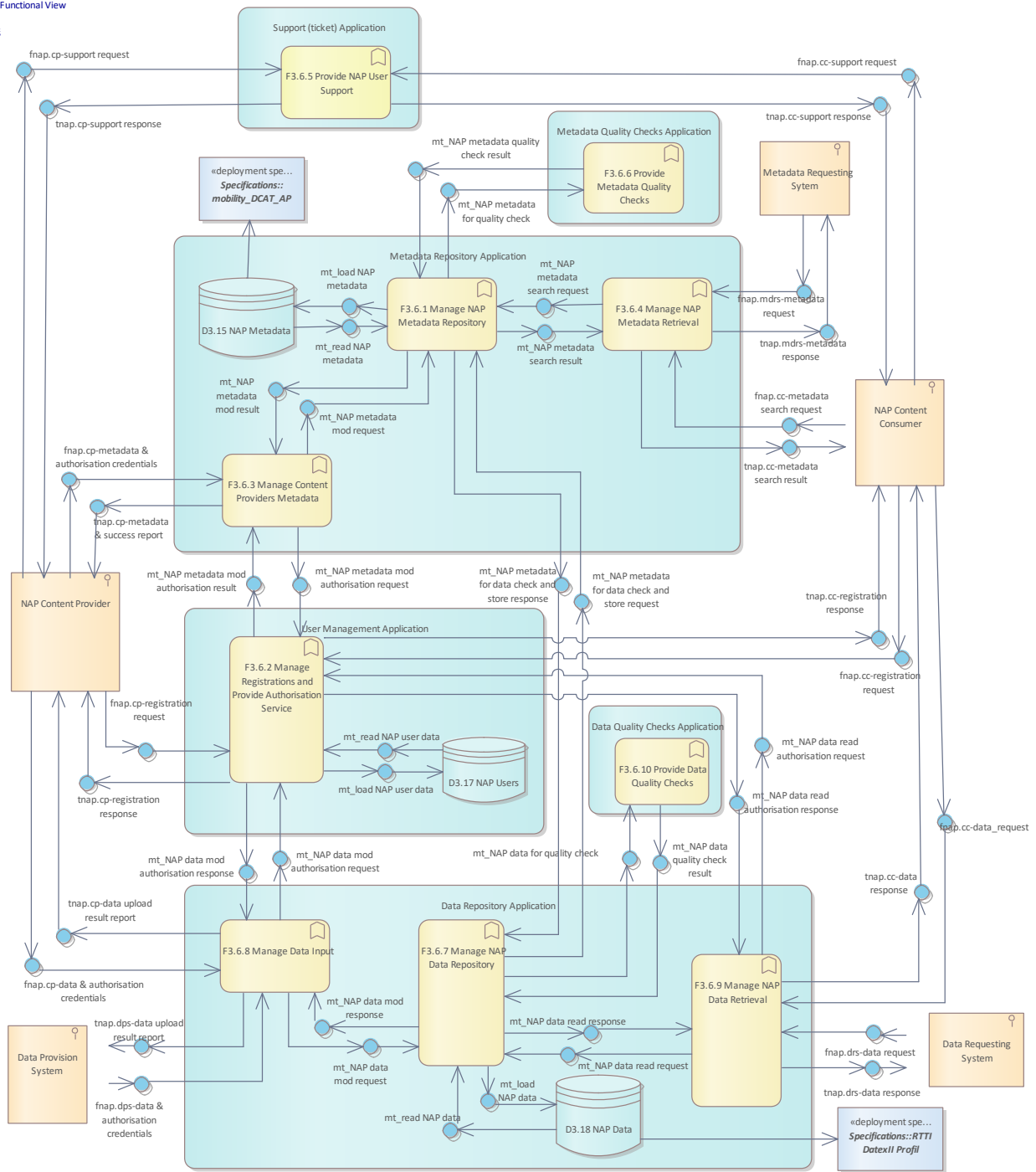
4.3.6.1 mobility_DCAT_AP

GUID: {E2577D77-AFB9-46e3-818C-9764DC209E14}

modified: 10.10.2023

4.4 Functional View – Data Platform

02 NAP Functional View - Data Platform
02 NAP Functional View
7.0.7
P. Bures



4.4.1 Functions

4.4.1.1 F3.6.1 Manage NAP Metadata Repository

GUID: {FC985F0E-26B3-41e8-847E-A71AA3290132}

This Function shall be capable of providing the following facilities:

- (1) The ability to manage the store of Metadata.
- (2) The ability to ensure that all data sent to the store is stored in a coherent and logical manner.
- (3) The ability to read, edit, update and erase data from the store as and when requested.

(4) The ability to enable Metadata to be created in advance of their publication on the NAP so it could be checked before its publication.

(5) The ability to carry out its activities in such a way that they do not interfere with one another, and that the integrity of the data being stored and read is preserved.

(6) This function manages all data mentioned in the mobilityDCAT-AP (<https://mobilitydcap.github.io/mobilityDCAT-AP/releases/index.html>) and other relevant information (e.g. quality info, possible data comments etc.)

modified: 11.01.2024

4.4.1.2 F3.6.2 Manage Registrations and Provide Authorisation Service

GUID: {B032435E-6A52-4920-97B0-C13BB3E8BFC7}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process a request from an entity that wants to become new NAP User.
- (2) The ability to check the new NAP User in (1) above to include electronic identification, verification that the requesting entity exists based on information included in the request and agree with terms of the NAP User (different for NAP Content Provider and NAP Content Consumer)
- (3) The ability to load information about the entity submitting the request in (1) above into the NAP Users data store, if the identification, verification, and acceptance in (2) above is successful.
- (4) The ability to provide authorisation credentials to the requesting entity.
- (5) The ability to send a rejection notice (including the reason for rejection) to the entity that submitted the request in (1) above if the identification, verification, and acceptance in (2) and (3) above was not successful.
- (6) The ability to check the authorisation of an entity which sends its credentials to the NAP functions and to response to those functions if the authorisation check has been successful.
- (7) The ability to process the information provided in an unsuccessful request for the update of NAP User data so that a suitable response can be sent to the entity that made the request and future unsuccessful update requests monitored.
- (8) The ability to register multiple user accounts within a NAP User account, i.e. users' organization.
- (9) The ability to register multiple machine accounts within a NAP User account, i.e. users' organization, for consuming or providing content from / to the NAP. The machine accounts stand for Data Requesting Systems and Data Supplying System.
- (10) The ability to organize user and machine account registered under one NAP User into organization, where user accounts have different rights to access the NAP Users data store, i.e. view, modify, add, and delete records.
- (11) The ability to remove electronic identity of the NAP User from the NAP Users data store based on reception of a request from a NAP User.
- (12) The ability to register the as one or both NAP Content Provider and NAP Content Consumer with different rights / responsibilities to perform tasks assigned to provider or consumer in the NAP via Functions Manage Content Providers Metadata and Manage NAP Metadata Retrieval.
- (13) Ability to provide registered NAP User data upon its successful authorization
- (14) Ability to log in events connected with NAP User Activity to the NAP User data store

NOTE: one physical user can be part of more NAP Users but under the different electronic identity.

modified: 11.01.2024

4.4.1.3 F3.6.3 Manage Content Providers Metadata

GUID: {B623B347-AA95-44be-9043-55050E3CFC41}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process request to upload new or updated metadata from a NAP Content Provider.
- (2) The ability to forward the authorisation credentials of the NAP Content Provider to the Function Manage NAP User Registrations and to receive a result about the authorised registration of the NAP Content Provider from the Function Manage NAP User Registrations.

- (3) The ability to perform basic and consistency checks on filled in metadata (e.g. the data are filled in expected manner and are structurally complete)
- (4) The ability to send the metadata included in the request in (1) above to the Function Manage NAP Metadata Repository for loading into the data store if the checks in (2) above were successful.
- (5) The ability to send a "failure" response to the entity that made the request in (1) above if the checks in (2) and (3) above were unsuccessful or a "success" response if the checks were successful.
- (6) Ability to provide metadata created by the NAP Content Provider and data created by the NAP, i.e. quality records and NAP User event log to the NAP Content Provider.
- (7) Ability to record NAP Content Provider Activity into the NAP Users data store.
- (8) Ability to update, amend or delete existing metadata records.

NOTE: the ability to browse, search and view metadata is in the functionality F3.6.4 Manage Metadata Retrieval. It is assumed that NAP Content Provider is also logged in as NAP Content Consumer.

modified: 11.01.2024

4.4.1.4 F3.6.4 Manage NAP Metadata Retrieval

GUID: {D9EFBB62-DD12-4dd1-A835-DF560A82A1AD}

This Function shall be capable of providing the following facilities:

- (1) The ability to provide a query form or comparable search interface to define keywords or refine demands in different available metadata elements.
- (2) The ability to receive and process requests from NAP Content Consumers to be provided with NAP metadata.
- (3) The ability to process the request in (1) above so that all suitable search results to the request are retrieved from the Data Store NAP Metadata.
- (4) The ability to format the NAP metadata search results obtained in (3) above and send it to the entity that made the request in (2) above or to display them in an overview results page.
- (5) Ability to provide metadata at the NAP including data created by the NAP, i.e. quality records.
- (6) Ability to provide all or parts of metadata stored in the NAP Metadata store in a machine-readable format for reasons of harvesting the metadata by Metadata Requesting System (machine to machine access).
- (7) The ability to provide all relevant metadata without NAP Content Consumer registration

NOTE: It is assumed that NAP Content Provider could perform all the task of the NAP Content Consumer.

modified: 11.01.2024

4.4.1.5 F3.6.5 Provide NAP User Support

GUID: {0CFE2A7A-AD32-4068-BDC5-AF0F18B6D99B}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process support requests from any existing or potential NAP Content Provider or NAP Content Consumer.
- (2) The ability to respond to user support requests adequately at least in a form of first-level support.
- (3) The ability to consult other NAP roles for issues which cannot be responded with the own knowledge.
- (4) The ability to manage issues and log the issue resolution for later use by NAP Users or by an Auditing entity

NOTE: this could be done via a ticketing system

modified: 11.01.2024

4.4.1.6 F3.6.10 Provide Data Quality Checks

GUID: {D01EFD87-A3E1-4216-81D9-855530ECE1B9}

This Function shall be capable of providing the following facilities:

- (1) The ability to provide periodical and initial checking of published data quality based on prespecified rules and procedures (including appropriate time frequencies). Main tests performed are schema validation and availability of provided data against the metadata information.
- (2) The ability to retrieve data to be checked from the NAP Data store.
- (3) The ability to disseminate and store the outcomes of data quality checks to the NAP Data store.
- (4) The function shall be capable to request metadata from NAP Metadata store, by invoking the functionality of Manage NAP Data Repository for data validation purposes
- (5) Ability to perform the checks based on data events (data insert, data update) in the NAP Data store

modified: 11.01.2024

4.4.1.7 F3.6.6 Provide Metadata Quality Checks

GUID: {15BFF38A-05D9-4775-84C9-6604B0EEA3C6}

This function shall be capable of providing the following facilities:

- (1) The ability to perform metadata quality checks based on prespecified rules and procedures (including appropriate time frequencies). The checks follow the MQA and InQMS methodology, at minimum it is an availability of the urls provided in metadata.
- (2) The ability to retrieve data to be checked from the NAP Metadata store.
- (3) The ability to disseminate and store the outcomes of data quality checks to the NAP Metadata store.
- (4) Ability to perform the checks based on metadata events (data insert, data update) in the NAP Metadata store

modified: 04.01.2024

4.4.1.8 F3.6.7 Manage NAP Data Repository

GUID: {57AEF510-D710-4920-9CCE-96BE708F6AAC}

This Function shall be capable of providing the following facilities:

- (1) The ability to manage the store of traffic and travel data.
- (2) The ability to ensure that all data sent to the store is stored in a coherent and logical manner.
- (3) The ability to read, create and overwrite data from the store as and when requested.
- (4) The ability to hide data in the NAP Data store so it could be checked before it is made available.
- (5) The ability to carry out its activities in such a way that they do not interfere with one another, and that the integrity of the data being stored and read is preserved.
- (6) Ability to send request for Metadata from F3.6.1 Manage NAP Metadata Repository and provide this data to connected functionality,
- (7) Ability to store data event logs

modified: 11.01.2024

4.4.1.9 F3.6.8 Manage Data Input

GUID: {5B4F357F-A164-4a3f-8909-C370F4C0615F}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process traffic and travel data in different message types from NAP Content Provider or Data Provision System.
- (2) The ability to forward the authorisation credentials of the NAP Content Provider or of the Data Provision System to the Function Manage Registrations and Provide Authorisation Service and to receive a result about the authorised access.
- (3) The ability to perform basic checks on filled in information about data access (for automatic data retrieval by NAP) or checks of data format and expected size of the NAP Content Provider manually uploaded data.

- (4) The ability to send the data included in the request in (1) above to the Function Manage NAP Data Repository for loading into the data store if the checks in (2) and (3) above were successful.
- (5) The ability to send a “failure” response to the entity that made the request in (1) above if the checks in (2) and (3) above were unsuccessful or a “success” response if the checks were successful.
- (6) Ability to provide all data created by the NAP Content Provider and also data created by the NAP, i.e. quality records and data event log.
- (7) Ability to record NAP Content Provider activity into the NAP Data store.

modified: 11.01.2024

4.4.1.10 F3.6.9 Manage NAP Data Retrieval

GUID: {A3764B72-97E2-400c-81B8-C945964F9E0D}

This Function shall be capable of providing the following facilities:

- (1) The ability to receive and process request for data retrieval from a NAP Content Consumer or Data Requesting System.
- (2) The ability to forward the authorisation credentials of the NAP Content Consumer or Data Requesting System to the Function Manage NAP User Registrations and Provide Authorisation Service and to receive a result about the authorisation of the said entities.
- (3) The ability to send the request in (1) above to the Function Manage NAP Data Repository for retrieving data identified in the request from the NAP Data store if the checks in (2) above were successful.
- (4) The ability to send a "failure" response to the entity that made the request in (1) above if the checks in (2) above were unsuccessful or a “success” response with the retrieved data if the checks were successful to the requesting entity.
- (5) Ability to provide data retrieved from the NAP Data store to the NAP Content Consumer or Data Requesting System in a way which is requested.
- (6) Ability to record NAP User Activity into the NAP Users data store.
- (7) Requested data are either traffic or travel information or its support information stored in the NAP Data store (e.g. quality information, last update time) or both.

modified: 11.01.2024

4.4.2 Data Flows

4.4.2.1 fnap.cc-metadata_search_request

GUID: {DCE578B8-265B-47f6-906D-8C4E9593F623}

It consists of inputs from the NAP Content Consumer containing data objects that provide a request for information about accessible traffic, travel data and any other relevant information which are described with metadata in the store of NAP Metadata. The request shall contain keywords or any refining demand in at least one metadata element.

modified: 04.01.2024

4.4.2.2 fnap.cc-support_request

GUID: {16D06C97-2C77-4307-B304-766A1D613BE8}

It consists of inputs from the NAP Content Consumer containing data objects that provide a request for support describing an issue the NAP User have and to which the NAP Operator shall respond. The data objects are used by functionality in the Manage Traffic Functional Area.

modified: 04.01.2024

4.4.2.3 fnap.cp-metadata_&_authorisation_credentials

GUID: {00BDD6C9-80B2-4dee-90C4-810AB30E51F8}

It consists of inputs from the NAP Content Provider containing data objects that provide new or updated metadata to be loaded into the store of NAP metadata. The required and optional elements of metadata can be found in a metadata catalogue: <https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html> .

Besides the metadata itself the request must contain the authorisation credentials of the entity that is providing it, so that this can be checked to ensure that it is a registered entity.

4.4.2.4 fnap.cp-registration_request

GUID: {4C018359-5E45-494d-B61F-93B909FE1F63}

It consists of inputs from the NAP Content Provider containing data objects that provide a registration request of and information about a potential NAP Content Provider which wants to register or a request with credentials of registered NAP Content Provider for retrieval of its data upon a successful authorisation. (Details of the information about the NAP Content Provider will be found in the description of the store of NAP Users).

The registration request contains relevant information about the entity to be registered under NAP Content Provider account, including identity information, licence terms approval, users, machines, and organization information.

modified: 04.01.2024

4.4.2.5 fnap.cp-support_request

GUID: {D597AA27-D232-49ad-8A7F-D4F246F9E217}

It consists of inputs from the NAP Content Provider containing data objects that provide a request for support describing an issue the NAP User have and to which the NAP Operator shall respond. The data objects are used by functionality in the Manage Traffic Functional Area.

modified: 04.01.2024

4.4.2.6 mt_NAP_metadata_mod_authorisation_request

GUID: {8CF116B5-F004-4ade-992F-224F911F17FB}

It contains data objects that provide credentials of a NAP Content Provider to be checked against the data stored in NAP Users data store to authorize the claimant to modify metadata records in the store of NAP Metadata.

modified: 04.01.2024

4.4.2.7 mt_NAP_metadata_mod_authorisation_result

GUID: {BEA016F1-B13A-4ae8-951E-7F0A26FD3888}

It contains data objects that provide information about the validity of the authorisation credentials of a NAP Content Provider that authorize the claimant to modify metadata records in the store of NAP Metadata.

modified: 04.01.2024

4.4.2.8 mt_load_NAP_metadata

GUID: {9099D7FF-5046-4a5a-ADF5-F891BAA1B934}

It contains data objects that provide either new metadata to be loaded into the store of NAP Metadata, or a request for metadata to be retrieved. The metadata that is to be loaded into the store shall give information about the contents which are made accessible by the NAP Content Provider. The required and optional elements of metadata can be found in a mobilityDCAT-AP <https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html>.

Apart from data specified by the above said catalogue other data are managed by the load function these are data quality records and NAP User event log.

modified: 04.01.2024

4.4.2.9 mt_load_NAP_user_data

GUID: {6FE0CAF2-D55F-4f13-B39A-6D819C3E9C75}

It contains data objects that provide either new data to be loaded into the store of NAP Users, or a request for data objects to be retrieved. The data objects that are to be loaded into the store will include information about a previously unregistered NAP User or modifying, extending, deleting previously registered NAP User.

modified: 04.01.2024

4.4.2.10 mt_NAP_metadata_search_result

GUID: {A17E620E-AAD9-4f53-8D90-E75C36E9CF0D}

It contains data objects that provide metadata items which have been retrieved from the store of NAP Metadata following a previous search request. A request identifier must be included so that it can be related to a particular request (there may be multiple requests being made from the same source) and returned to the requestor.

modified: 04.01.2024

4.4.2.11 mt_NAP_metadata_mod_request

GUID: {8B43A86E-ED30-493c-9B56-4D3EB3EB391B}

It contains data objects that provide either new metadata or updates to data that has been previously loaded into the store of NAP Metadata or a request for data objects to be retrieved. The updated data objects that are to be loaded into the store includes information that is being made accessible by the NAP Content Provider. The required and optional elements of metadata can be found in a metadata catalogue: <https://mobilitydcap.github.io/mobilityDCAT-AP/releases/index.html>

modified: 04.01.2024

4.4.2.12 mt_NAP_metadata_search_request

GUID: {4624DD5D-01B5-414a-AE0A-50169378736B}

It contains data objects that provide a request from the NAP Content Consumer for information about traffic, travel data and any other relevant information which are described with metadata in the store of NAP Metadata. The request shall contain keywords or any refining demand in at least one metadata element together with a request identifier.

modified: 04.01.2024

4.4.2.13 mt_read_NAP_metadata

GUID: {2A5ABAB8-048B-412c-AC03-A6DBD3D5DBB3}

It contains data objects that provide metadata that has been retrieved from the store of NAP Metadata following a request. The metadata that has been read from the store gives information about the contents which are made accessible by the NAP Content Provider. The required and optional elements of metadata can be found in a metadata catalogue: <https://mobilitydcap.github.io/mobilityDCAT-AP/releases/index.html>

Apart from data specified by the above said catalogue other data are managed by the read function these are data quality records and NAP User event log.

modified: 04.01.2024

4.4.2.14 mt_read_NAP_user_data

GUID: {7E763AED-E934-47b4-BF12-7ED1C864E575}

It contains data objects that provide data that has been read from the store of NAP Users, following a previous request for data to be retrieved. The data that is to be read from the store will be information about a registered NAP User, or a "no data" found response. (Details of the type of information about the NAP Users that is available will be found in the description of the store of their data).

modified: 04.01.2024

4.4.2.15 mt_NAP_metadata_mod_result

GUID: {D1E1FC81-8318-433d-8628-B81EF2B0B4AB}

It contains data objects that provide information about the success of loading the newly provided or updated NAP Content Provider metadata into the store of NAP Metadata or provide data objects containing the NAP Content Provider metadata. All information stored in the NAP Metadata store about the authorised NAP Content Provider may be retrieved this way.

modified: 04.01.2024

4.4.2.16 tnap.cc-metadata_search_result

GUID: {63E13C50-8801-4e2b-BA9D-170CDE8BD53D}

It contains outputs to the NAP Content Consumer that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are items of NAP metadata which have been retrieved from the store of NAP metadata following a previous search request.

modified: 04.01.2024

4.4.2.17 tnap.cc-support_response

GUID: {72CEA537-E1D0-4568-A93D-9343F41193CC}

It contains outputs to the NAP Content Consumer that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the responses to previous requests for support, i.e. information about handling and resolving the issue.

modified: 04.01.2024

4.4.2.18 tnap.cp-registration_response

GUID: {43BA5834-14FF-41d8-89AB-BD55A7C65F2E}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response (“acceptance” or “rejection”) to a previous registration request from a NAP Content Provider. In case of a successful registration, it includes credentials for the Content Provider to prove its authorisation to access NAP functionality that needs authorisation. Also based on the successful request it contains data of the registered NAP Content Provider

modified: 04.01.2024

4.4.2.19 tnap.cp-metadata_&_success_report

GUID: {B3154461-F9DC-4afd-8D5F-F44985AF55EC}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response to a previous request to create, update delete Content Provider related metadata in the store of NAP Metadata. The response can be either “successful” or “failed”, which must be accompanied by a reason for the “failure”. In case of invalid authorisation credentials, the Content Provider should be invited to (newly) register through the Manage NAP User Registrations function. Also based on the successful request it contains data objects from the NAP Metadata store related to that NAP Content Provider.

modified: 04.01.2024

4.4.2.20 tnap.cp-support_response

GUID: {396E64F8-C99F-4e67-9ABE-3D0BF49B608F}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the responses to previous requests for support. i.e. information about handling and resolving the issue.

modified: 04.01.2024

4.4.2.21 fnap.cc-registration_request

GUID: {7777AD14-8D53-466c-9949-22CFAB635676}

It consists of inputs from the NAP Content Consumer containing data objects that provide a registration request of and information about a potential NAP Content Consumer which wants to register or a request with credentials of registered NAP Content Consumer for retrieval of its data upon a successful authorisation. (Details of the information about the NAP Content Consumer will be found in the description of the store of NAP Users).

The registration request contains relevant information about the entity to be registered under NAP Content Consumer account, including identity information, licence terms approval, users, machines, and organization information.

modified: 04.01.2024

4.4.2.22 fnap.dps-data_&_authorisation_credentials

GUID: {8EC048EF-B06E-497b-A29E-EFB18412560E}

It consists of inputs from the Data Provision System containing data objects that provide new or updated traffic or travel data to be loaded into the store of NAP Data store.

Besides the data itself the request must contain the authorisation credentials of the entity that is providing it, so that this can be checked to ensure that it is a registered entity.

modified: 04.01.2024

4.4.2.23 fnap.drs-data_request

GUID: {A57EDCA4-5B76-4808-9C68-5DDF06E70C93}

It consists of inputs from the Data Requesting System containing data objects that provide request for retrieval of traffic or travel data stored in NAP Data store. Besides the identification of data to be retrieved the request must contain the authorisation credentials of the entity that is providing it, so that this can be checked to ensure that it is a registered entity with right to access the data.

modified: 04.01.2024

4.4.2.24 fnap.mdrs-metadata_request

GUID: {1F8479D1-6CEC-42fd-8CD2-79F9AD3334A4}

It consists of inputs from the Metadata Requesting System containing data objects that provide request for retrieval of information stored in NAP Metadata store as DCAT-AP records. The request shall contain keywords or any refining demand in at least one metadata element.

modified: 04.01.2024

4.4.2.25 mt_load_NAP_data

GUID: {38D2C47E-7C5D-4d8d-B7B5-05AFC34DF3CA}

It contains data objects that provide either new data to be loaded into the store of NAP Data, or a request for data to be retrieved. The data that is to be loaded into the store consist of traffic or travel information (static or dynamic) which are made accessible by the NAP Content Provider. The required data objects are further elaborated in NAP Data store.

Apart from real data content the information object loaded to data store shall contain data quality records and NAP Data event logs, Identification of the data and access information.

modified: 04.01.2024

4.4.2.26 mt_NAP_data_for_quality_check

GUID: {12DD5935-707F-445e-B70C-4401AE81022C}

It contains data objects with the traffic or travel information that has been retrieved from the store of NAP Data following a scheduled or triggered event. The data object also contains quality information that is to be updated after the quality check of the retrieved data content.

modified: 04.01.2024

4.4.2.27 mt_NAP_data_mod_authorisation_request

GUID: {E20BF73E-7630-4235-9E13-54B7C5C78E46}

It contains data objects that provide credentials of a NAP Content Provider or Data Providing System to be checked against the data stored in NAP Users data store to authorize the claimant to insert data records in the store of NAP Data.

modified: 04.01.2024

4.4.2.28 mt_NAP_data_mod_authorisation_response

GUID: {310CD8FD-F1FA-4b44-A502-9A7D061FD2BE}

It contains data objects that provide information about the validity of the authorisation credentials of a NAP Content Provider or Data Providing System that authorize the claimant to modify / insert data records in the store of NAP Data.

modified: 04.01.2024

4.4.2.29 mt_NAP_data_mod_response

GUID: {E340D2D2-B614-4c5f-BA76-FBD43E68CF5E}

It contains data objects that provide information about the success of loading the newly provided or updated NAP Content Provider data into the store of NAP Data or provide data objects containing the NAP Data metadata (e.g. events associated with data access, quality information)

modified: 04.01.2024

4.4.2.30 mt_NAP_data_quality_check_result

GUID: {8AE74C5A-125D-4ce5-ABD4-89818AAE054B}

It contains data objects created by Provide Data Quality Checks after checking quality of data that has been retrieved from the store of NAP Data following a scheduled or triggered event. The data is timestamp and success of failure (with number of errors found) of the checks and aggregated information i.e. average of the characteristic per time period.

modified: 04.01.2024

4.4.2.31 mt_NAP_data_read_authorisation_request

GUID: {D487FAFF-4F5B-4520-BC53-427580A77997}

It contains data objects that provide credentials of a NAP Content Consumer or Data Requesting System to be checked against the data stored in NAP Users data store to authorize the claimant to read data records from the store of NAP Data.

modified: 04.01.2024

4.4.2.32 mt_NAP_data_read_authorisation_response

GUID: {C050FEDE-4276-4730-8B5C-0F605084BE69}

It contains data objects that provide information about the validity of the authorisation credentials of a NAP Content Consumer or Data Requesting System that authorize the claimant to read data records from the store of NAP Data.

modified: 04.01.2024

4.4.2.33 mt_NAP_metadata_for_data_check_and_store_request

GUID: {A65597A1-4E9A-40cc-9665-4640823B199F}

It contains data objects that provide a request from Manage NAP Data Repository functionality for set of metadata related to NAP Data to be checked/stored/updated. The request shall contain keywords or any refining demand in at least one metadata element together with a request identifier.

modified: 11.01.2024

4.4.2.34 mt_NAP_metadata_for_data_check_and_store_response

GUID: {2FD69798-3950-48ea-B7F0-F52F39470F34}

It contains data objects that provide items of NAP metadata which have been retrieved from the store of NAP Metadata following a previous request.

modified: 11.01.2024

4.4.2.35 mt_NAP_metadata_for_quality_check

GUID: {EB72DA4A-A638-4946-B10F-21C536686F6C}

It contains data objects with the metadata information that has been retrieved from the store of NAP Metadata following a scheduled or triggered event. The data object also contains quality information that is to be updated after the quality check of the retrieved metadata content.

modified: 04.01.2024

4.4.2.36 mt_NAP_metadata_quality_check_result

GUID: {01233765-5DC4-4cf9-879E-4DC6961C9611}

It contains data objects created by Provide Metadata Quality Checks after checking quality of metadata that has been retrieved from the store of NAP Metadata following a scheduled or triggered event. The data is timestamp and success of failure (with number of errors found, level of service achieved) of the checks and overall aggregated summary. The checks follow the MQA and InQMS methodology, at minimum it is an availability of the urls provided in metadata.

modified: 04.01.2024

4.4.2.37 mt_read_NAP_data

GUID: {30332204-58C2-432d-A2FE-1801EA8E123F}

It contains data objects that provide data that has been retrieved from the store of NAP Data following a request. The data that has been read from the store contains the traffic or travel information content together with its metadata which are made accessible to authorised NAP Functionality.

The required data objects are further elaborated in NAP Data store.

Apart from real data content the information object retrieved from data store may contain data quality records and NAP Data event logs, Identification of the data and access information.

modified: 04.01.2024

4.4.2.38 tnap.cc-registration_response

GUID: {60E6A67C-C9D0-464b-900F-9F28DC71E886}

It contains outputs to the NAP Content Consumer that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response (“acceptance” or “rejection”) to a previous registration request from a NAP Content Consumer. In case of a successful registration, it includes credentials for the Content Consumer to prove its authorisation to access NAP functionality that needs authorisation. Also based on the successful request it contains data of the registered NAP Content Consumer

modified: 04.01.2024

4.4.2.39 tnap.cp-data_upload_result_report

GUID: {A6E68B7A-7C94-474f-B168-C2A98537BC37}

It contains outputs to the NAP Content Provider that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response to a previous request for newly provided or updated traffic or travel data to be loaded into the store of NAP Data. The response can be either “successful” or “failed”, which must be accompanied by a reason for the “failure”. In case of invalid authorisation credentials, the Content Provider should be invited to (newly) register through the Manage NAP User Registrations and Provide Authorisation Service function.

modified: 11.01.2024

4.4.2.40 tnap.dps-data_upload_result_report

GUID: {FBD65825-894B-415a-AE17-8AD14FDF8F08}

It contains outputs to the Data Provision System that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response to a previous request to upload data. The response can be either “successful” or “failed”, which must be accompanied by a reason for the “failure” i.e. invalid authorisation credentials.

modified: 04.01.2024

4.4.2.41 tnap.drs-data_response

GUID: {53ED8069-70B8-44ac-85D7-ED06B5283424}

It contains outputs to the Data Requesting System that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response to a previous request to retrieve data. The response can be either “successful” or “failed”, which must be accompanied by a reason for the “failure” i.e. invalid authorisation credentials. Also based on the successful request it contains data objects representing traffic or travel data from the NAP Data store related to that request.

modified: 04.01.2024

4.4.2.42 tnap.mdrs-metadata_response

GUID: {CA529868-7C49-48f9-AD5E-F796011DFDF5}

It contains outputs to the Metadata Requesting System that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are items of NAP Metadata which have been retrieved from the store of NAP Metadata following a previous request. Data are formatted as DCAT-AP records compliant with mobilityDCAT-AP.

modified: 04.01.2024

4.4.2.43 fnap.cc-data_request

GUID: {AFB3FDE3-5682-463a-A966-CEF77741C6A9}

It consists of inputs from the NAP Content Consumer containing data objects that provide request for retrieval of traffic or travel data stored in NAP Data store. Besides the identification of data to be retrieved the request must contain the authorisation credentials of the entity that is providing it, so that this can be checked to ensure that it is a registered entity with right to access the data.

modified: 04.01.2024

4.4.2.44 fnap.cp-data_&_authorisation_credentials

GUID: {60297FF0-CD09-4e8d-8221-0B0FF35E3239}

It consists of inputs from the NAP Content Provider containing data objects that provide new or updated traffic or travel data to be loaded into the store of NAP Data store.

Besides the data itself the request must contain the authorisation credentials of the entity that is providing it, so that this can be checked to ensure that it is a registered entity.

modified: 04.01.2024

4.4.2.45 mt_NAP_data_mod_request

GUID: {B7FC7C2F-C1AA-4bf8-82D4-0EA2370C6BC9}

It contains data objects that provide either new data or updates to data that has been previously loaded into the store of NAP Data or a request for data objects to be retrieved. The updated data objects that are to be loaded into the store includes traffic or travel data objects and supporting metadata allowing linking the data object to information stored in NAP Metadata store and accessibility information by the NAP Content Consumers.

modified: 04.01.2024

4.4.2.46 mt_NAP_data_read_request

GUID: {50A2D529-AAC6-4908-919C-7838C607386A}

It contains a request for identified data objects to be retrieved from the NAP Data store together with requestor identification. The data objects that are to be retrieved include traffic or travel data objects and supporting metadata information related to the identified data including last update timestamp and quality information.

modified: 04.01.2024

4.4.2.47 mt_NAP_data_read_response

GUID: {3D6B17A5-0D0F-4944-9E8F-FB446B82FF2F}

It contains data objects with traffic or travel information from the store of NAP Data following a previous request to retrieve data and last update timestamp and quality information.

modified: 04.01.2024

4.4.2.48 tnap.cc-data_response

GUID: {F7412343-95F0-4611-8149-58EA48466E80}

It contains outputs to the NAP Content Consumer that have been created from data objects provided by functionality in the Manage Traffic Functional Area that are the response to a previous request to retrieve data. The response can be either “successful” or “failed”, which must be accompanied by a reason for the “failure” i.e. invalid authorisation credentials.

Also based on the successful request it contains data objects representing traffic or travel data from the NAP Data store related to that request and last update timestamp and quality information.

modified: 04.01.2024

4.4.3 Data Stores

4.4.3.1 D3.15 NAP Metadata

GUID: {7A7B38A3-E097-4a2f-AEB6-7C204435B35E}

This Data Store shall be used within the Manage Traffic Functional Area. It shall contain information objects that provide metadata about traffic, travel data and any other relevant information. The required and optional elements of metadata have been harmonised and can be found in a metadata catalogue: <https://mobilitydcat-ap.github.io/mobilityDCAT-AP/releases/index.html>.

Metadata is structured in the data store to:

- (1) describe data provider, where each data provider may list multiple of
- (2) data sets or services and each of such can be provided by more than one way by specifying its
- (3) distribution parameters.

The content and the structure are governed by the mobilityDCAT-AP.

Further on the data store also contains:

- (4) log of events with respect of metadata creation, update and
- (5) quality information per data set.

modified: 03.01.2024

4.4.3.2 D3.17 NAP Users

GUID: {DEABFE3A-CF27-4232-83E9-D03599E58AC3}

This Data Store shall be used within the Manage Traffic Functional Area. It shall contain information objects that provide details of NAP Users, i.e. NAP Content Providers and NAP Content Consumers (for Data Platform NAP type) . The Data Store contains private information used by NAP Users to access the NAP, to provide agreement on terms and conditions. Public metadata about traffic and travel information and other related information are stored in NAP Metadata store (D3.15).

For Content Providers the data store contains following data objects:

- (1) organization with name (1.1), postal address (1.2), website (1.3), agreement on licence terms (1.4), unique identifier assigned to organization (1.5), name and contact details of a responsible person to act as a contact (1.6).
- (2) user account(s) with name (2.1), email (2.2), credentials (2.3), user type (2.4).
- *(3) machine account with url (3.1), connection type (3.2), credentials (3.3).

For Content Consumers the data store contains following data objects:

- *(1) organization with name (1.1), postal address (1.2), website (1.3), agreement on licence terms (1.4), unique identifier assigned to organization (1.5), name and contact details of a responsible person to act as a contact (1.6).
- *(2) user account(s) with name (2.1), email (2.2), credentials (2.3), user type (2.4).
- *(3) machine account with url (3.1), connection type (3.2), credentials (3.3).
- * Optional data object for Data Platform NAP type and even there it is optional provided the data is not openly accessible.

Additionally, for both:

- (4) Event information (log in, log out, change of data)

modified: 03.01.2024

4.4.3.3 D3.18 NAP Data

GUID: {B1156E38-B7ED-4dcd-BD87-C003C660A85A}

This Data Store shall be used within the Manage Traffic Functional Area. It shall contain information objects that provide traffic and travel data.

Each information object in the Store shall contain the following data objects:

- (1) actual stored traffic or travel related data that is considered as a compact and comprehensive data content
- (2) data quality information
- (3) relation of the data content to the metadata elements, allowing to identify data distribution
- (4) access credentials to stored content identifying the information object creator and updater and its readers
- (5) last update time information
- (6) size of the object

Data content to be stored in the data store is given mainly by the obligations to make certain data content accessible via the NAP. The obligation together with a list of data is stipulated in the ITS Directive 2010/40/EU and its revised version (EU) 2023/2661 and complementary Delegated Regulations 885/2013, 886/2013, 2015/962, 2017/1926, 2022/670 and 2023/1804,

modified: 03.01.2024

4.4.4 Terminators

4.4.4.1 NAP Content Consumer

GUID: {A8478CF0-37A0-4638-BECC-CBB89B7519C6}

This Generic Terminator Role Content Consumer shall represent any interested entity in traffic, travel data. The NAP Content Consumer can find available metadata via the NAP. Therefore, Function F3.6.4 Manage NAP Metadata Retrieval offers an interface (typically a graphical user interface freely accessible via the Internet) to search the metadata in D3.15 NAP Metadata.

The NAP Content Consumer also can, in case of Data Platform NAP type retrieve data directly from the NAP, via Manage NAP Data Retrieval function. In some cases, especially when the data are pushed to the Content Consumer systems and / or authorisation is necessary the Content Provider must register at the NAP to obtain credentials and / or to set up a machine account to which data are pushed.

Key issue: Request high quality services; provide feedback about relevant content.

Area of responsibility: Be compliant to the agreement with content provider

Tasks: Receive content

Mnemonic: nap.cc

modified: 11.01.2024

4.4.4.2 NAP Content Provider

GUID: {48698837-F8BB-4dca-BBDB-736CF23C778C}

This Generic Terminator Role Content Provider shall represent any provider of traffic, travel data.

The Content Provider describes this data with metadata on the NAP (to be stored in D3.15 NAP Metadata). The Content Provider must be registered in the NAP, the NAP Content Provider electronic identity, proof of real-world identity and authorization credentials are kept in D3.17 NAP Users. The Content Provider information is encompassing one or more user accounts and machine accounts, (for Data Platform NAP type), licence agreements and other relevant data based on the provider complexity. The Content Provider is always linked with at least one user account that also stands for the organization.

In case of Data Platform NAP type the Content Provider also uploads / make data available for retrieval by the NAP.

Content Providers are for example public and private road operators, road authorities, service providers, transport authorities, transport operators, infrastructure managers, transport on-demand service providers.

Obligations to make data content accessible via the NAP is stipulated in the ITS Directive 2010/40/EU and its revised version (EU) 2023/2661 and complementary Delegated Regulations 885/2013, 886/2013, 2015/962, 2017/1926, 2022/670 and 2023/1804,

Key issue: Provide and publish content (to which he has the legal rights to publish); collect content.

Area of responsibility: Provide timely and accurate traffic and travel data.

Tasks: Provide content relevant to the ITS domain and according to contracts with the NAP and content consumers. provide information for issuing electronic identity, proving of real-world identity, issuing authentication credentials to prove themselves as trusted and registered NAP Content provider.

Mnemonic: nap.cp

modified: 03.01.2024

4.4.4.3 Data Provision System

GUID: {13412496-2C40-428C-B961-F0F374D991C8}

This Generic Terminator Role Data Provision System shall represent system of any interested entity in traffic, travel data provision. The Data Provision System can upload traffic and travel data to the NAP Data store. Therefore, Function F3.6.8 Manage Data Input offers a data interface for machine-to-machine data upload.

Data Provision System requires authorisation to access the NAP Functionality. It must use credentials obtained by Content Provider. When registering the Content Provider will obtain credentials and / or to set up a machine account from which data are retrieved.

Key issue: Upload data to the NAP.

Area of responsibility: Be compliant to the agreement with NAP Operator

Tasks: Create and upload content

Mnemonic: nap.dps

modified: 11.01.2024

4.4.4.4 Data Requesting System

GUID: {6CBF0F02-2909-4086-A608-C5EA1E42A9F6}

This Generic Terminator Role Data Requesting System shall represent any interested entity in traffic, travel data. The Data Requesting System can request traffic and travel data available in the NAP Data store. Therefore, Function F3.6.9 Manage NAP Data Retrieval offers a data distribution interface for machine-to-machine data retrieval.

In some cases, especially when the data are pushed to the Content Consumer systems and / or authorisation is necessary the Data Requesting System must use credentials obtained by Content Consumer. When registering the Content Consumer will obtain credentials and / or to set up a machine account to which data are pushed.

Key issue: Request data stored at NAP.

Area of responsibility: Be compliant to the agreement with content provider

Tasks: Receive content

Mnemonic: nap.drs

modified: 11.01.2024

4.4.4.5 Metadata Requesting System

GUID: {DEB4AC48-7332-4F57-99D5-79169FCA6F1F}

This Generic Terminator Role Metadata Requesting System shall represent any interested entity in traffic, travel metadata dissemination. The Metadata Requesting System can request information stored in NAP Metadata store in standardized format (DCAT-AP) in order to incorporate said data into its own information services (i.e. metadata harvesting). Therefore, Function F3.6.4 Manage NAP Metadata Retrieval offers a data distribution interface for machine-to-machine data retrieval.

Key issue: Request metadata stored at NAP.

Area of responsibility: Be compliant to the agreement with NAP operator

Tasks: Receive information about the content, i.e. metadata

Mnemonic: nap.mdrs

4.4.5 Applications

4.4.5.1 Data Quality Checks Application

GUID: {2E455170-A8C4-4ffc-BF75-1D058FC191B2}

This application shall enable 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.

modified: 03.01.2024

4.4.5.2 Data Repository Application

GUID: {919C23BB-5FFF-4300-A416-F084AB9FE538}

This application shall enable and support the Data Exchange between NAP Content Providers and NAP Content Consumers by providing a Data input interface to receive data, a database to store last received data object (i.e. any update overwrites stored data object), and a Data Provision Interface function to transmit traffic and travel data to the NAP Content Consumers.

modified: 03.01.2024

4.4.5.3 Metadata Quality Checks Application

GUID: {B9BC9F94-BAF8-465c-A024-66944F4C302E}

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

modified: 03.01.2024

4.4.5.4 Metadata Repository Application

GUID: {4C1A7740-ADB9-4654-9703-57AC92DD6D54}

This application represents an application that contains a NAP Metadata store and interfaces to handle metadata.

It shall contain an interface which enables NAP Content Providers to upload, update or delete metadata and informs about the success or failure of that interaction.

It shall contain another interface which is able to process metadata search requests to enable NAP Content Consumers to retrieve metadata.

modified: 03.01.2024

4.4.5.5 Support (ticket) Application

GUID: {02101F2C-788B-49ea-8C0D-AD3B498E1E53}

This application shall provide functions to process requests for support, reported issues by NAP Users, (Content Providers, Content Consumers). The handling of the support is performed by NAP Operator.

modified: 03.01.2024

4.4.5.6 User Management Application

GUID: {83B61A0E-1086-4216-B72F-38DA9E185D9B}

This application represents an application that handles User Registrations (i.e. NAP Content Providers and NAP Content Consumers).

It shall contain a NAP Users data store and an interface to Manage NAP User Registrations and Provide Authorisation Service. It shall also be able to verify NAP Content Providers to authorise the usage of the NAP Metadata store.

modified: 11.01.2024

4.4.6 Specifications

4.4.6.1 mobility_DCAT_AP

GUID: {E2577D77-AFB9-46e3-818C-9764DC209E14}

modified: 10.10.2023

4.4.6.2 RTTI DatexII Profil

GUID: {0284859D-C83B-423b-909A-05291C3F0B08}

modified: 10.10.2023

4.5 Physical View

The relationship of the NAP content provider and the NAP content consumer to the NAP is described via physical data flows with corresponding interfaces and components.

TO BE ADDED in M2.11

4.6 Organisational View

The organisational view describes the relationships between the individual roles and actors that are necessary for a NAP. It also describes the agreements that should be made between the roles.

TO BE ADDED in M2.11

4.7 Communications View

The structure of the Communication view is the same as the Physical view. In addition, the required information objects are described for the Functional Data Flows.

TO BE ADDED in M2.11

4.8 Security View

The structure of the Security view is yet to be determined with WG4.1

TO BE ADDED in M2.11