PANEDA®

Lars-Peder Lundgren, DAB since 1997

DAB HEAD-END SYSTEMS

PANEDA

Owns and operates its own DVB-T2 network in Norway with 100+ transmitters

TV NETWORK

Radio Break-In systems for road tunnels, over 250 tunnels equipped with a Paneda solution

TUNNEL SYSTEMS

Leading supplier of DAB Head-End systems with over 200 systems in operation world-wide

DAB HEAD-END

RESOURCES

- 22 persons

- 6 dedicated developers

- DAB focus

- Hardware and Software

- Up-to-date DAB standard

EXPERTS IN VIRTUALIZATION

PREMIUM REFERENCES

dab+

arqiva

62 Multiplexers (400 Services)

Telstra **ABC SBS**

10 Multiplexers

rtbf.be

8 Multiplexers

towerCast **radiofrance**

25 Multiplexers

BAUER

15 Multiplexers

TOPICS
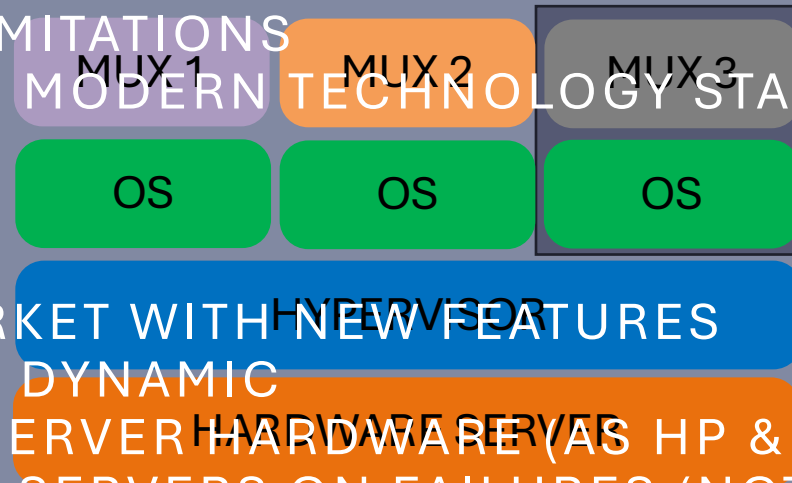
LATEST DEVELOPMENT, virtualization

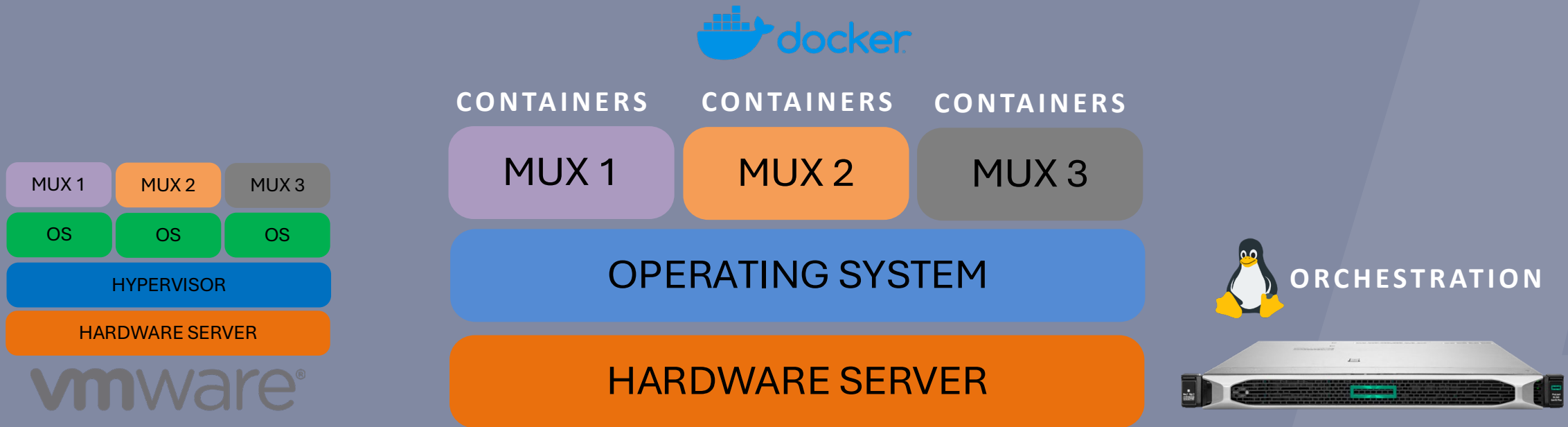LANGUAGE SIGNALLING

API and METADATA

PANEDA

SOFTWARE SOLUTIONS

- OFFERS MORE FEATURES
- MANY MULTIPLEXERS IN THE SAME HW
- NOT HIT BY HW LIMITATIONS
- IT SECURITY WITH MODERN TECHNOLOGY STANDARDS
- COST EFFICIENT
- SCALABLE
- FLEXIBLE
- FAST TIME TO MARKET WITH NEW FEATURES
- DAB STANDARD IS DYNAMIC
- USING GENERIC SERVER HARDWARE (AS HP & DELL)
- EASY TO REPLACE SERVERS ON FAILURES (NOT DEPENDENT ON TYPE OF HW)
- ROBUST AND MOST PROVEN TO WORK OVER YEARS IN OPERATION

MUX 1   MUX 2   MUX 3

OS   OS   OS

HYPERVISOR

HARDWARE SERVER

PANEDA

LATEST DEVELOPMENT

docker

CONTAINERS   CONTAINERS   CONTAINERS

| MUX 1 | MUX 2 | MUX 3 |

OPERATING SYSTEM

HARDWARE SERVER

ORCHESTRATION

MUX 1 | MUX 2 | MUX 3
OS | OS | OS
HYPERVISOR
HARDWARE SERVER

vmware

50% LESS OVERHEAD
SECURITY (ISOLATION)
MAINTENANCE
FLEXIBILITY
SCALABLE
ONE OS ONLY

docker

CONTAINERS

PANEDA

ORCHESTRATION

Paneda Orchestration Service

Version: h-2024-06-19_8705b5de   Logout

Dashboard

MUX-HOST

Muxes

ID (short)	NAME	STATUS	IMAGE	TIME	REACHABLE	CONTAINER CONTROLS
622751e220eb	mux-1a-docker	created	v-h-2024-06-19_8705b5de	Created: 15 days ago Started: 15 days ago Finished: Status: running	Reachable	+ ▶ ■ —
664b5f04d90f	mux-1a-eurodab	created	v-h-2024-05-13_eca06bc6	Created: 15 days ago Started: 15 days ago Finished: 15 days ago Status: exited	Unreachable	+ ▶ ■ —
664b669fd90f	mux-1b-eurodab	created	v-h-2024-05-13_eca06bc6	Created: 15 days ago Started: 15 days ago Finished: 15 days ago Status: exited	Unreachable	+ ▶ ■ —
6673ff1c3582	test	missing		Created: Started: Finished: Status:	Unreachable	+ ▶ ■ —

+

Macvlan Networks

ID (short)	Name	Created	Vlan	Parent	Configs	Types	Tags	Action
7a0aa10875ad	aoip	2 years ago		aoip	Subnet: 10.39.49.0/24 Ip range: 10.39.49.102/32 Gateway: 10.39.49.1	audio	aoip	—
195bfb15696a	edi	2 years ago		edi	Subnet: 10.38.48.0/24 Ip range: 10.38.48.102/32 Gateway: 10.38.48.1	edi	edi	—
b672642fcce8	internal-lan	2 years ago		internal-lan	Subnet: 10.37.47.0/24 Ip range: 10.37.47.102/32 Gateway: 10.37.47.1	mux-sync		—
13d680c2f7b5	paneda-lan	15 days ago		paneda-lan	Subnet: 192.168.10.0/24 Subnet: 172.16.61.0/24 Ip range: 192.168.10.0/24Ip range: 172.16.61.0/24 Gateway: 192.168.10.100 Gateway: 172.16.61.254	management	mgmt	—

ORCHESTRATION

MULTIPLEXER USER INTERFACE

Status

Options

Audio levels (live)

Bandit-classic
bandit-classic/web

dbFS   -2.9   -3
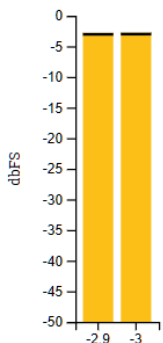
Dansbandskanalen
Dansbandskanalen/web

dbFS   -3.7   -3.7
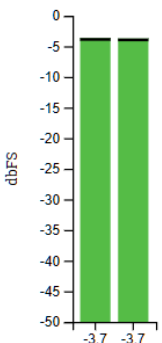
Gamla favoriter
gamla-favoriter/web

dbFS   -4.6   -3.5
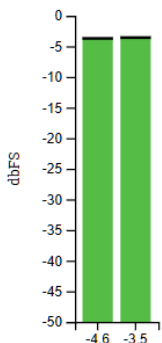
Guldkanalen
guld-kanalen/web

dbFS   -3.2   -3.2
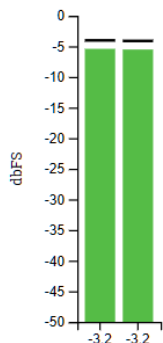
Lugna favoriter
lugna-favoriter/web

dbFS   -2.6   -2.7

Star80
star-80/web

dbFS   -4   -4
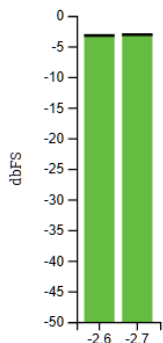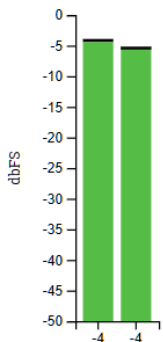
Uti Bôgda
RixFM/RIX WEB

dbFS   -4.2   -4.1
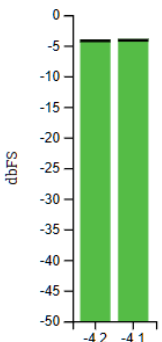
LANGUAGE SUPPORT

NEW DAB STANDARD

ISSUE:

THE SERVICE LABEL CAN BE MAXIMUM 16 CHARACTERS (LONG) AND 8 CHARACTERS (SHORT)

-EBU-LATIN 1 AND UTF IS SUPPORTED TO USE.

-THE PROBLEM IS THAT MANY LANGUAGES USE 2 BYTES PER CHARACTER, WHICH WOULD LIMIT THE LABEL LENGTH TO ONLY 8 (LONG) AND 4 (SHORT)!

-ANOTHER PROBLEM IS THAT IF YOU USE UTF7 YOU WILL DISQUALIFY MANY RECEIVERS!

TS 101 756, annex E.4 with the encoding set to UTF/UCS in the FIG type 2 labels.

The updated standard has overcome the issues, by SUPPORTING **2 labels**, one **standard** label (in EBU Latin1) and another label called **extended** label, which hasn't the length limitation. And uses UTF/UCS.

A receiver that isn't compatible with this standard will read the normal label, and a COMPATIBLE receiver will read the extended label.
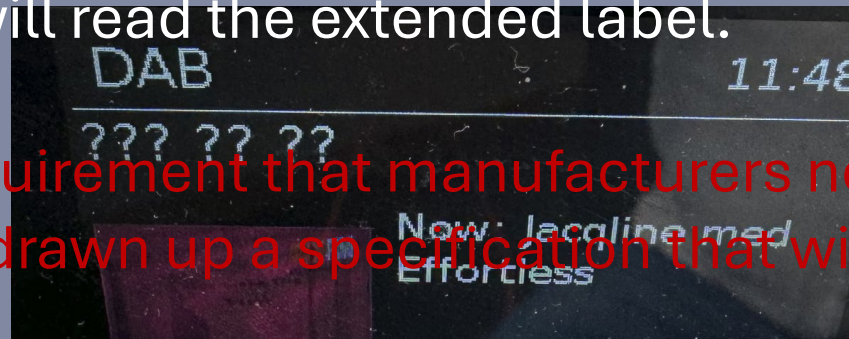
Regardless, this is a requirement that manufacturers need to be aware of. For example, Thailand has drawn up a specification that will apply to imports into Thailand

IMPLEMENTATION

Service label

Type *
Extended label

☑ Standard label

?

Extended label

Encoding *
UCS-2

Long label
วิทยุสดใส

9 / 16

🖱 วิ ทย, สดใส

Short label

Toggle the letters next to the mouse icon 🖱

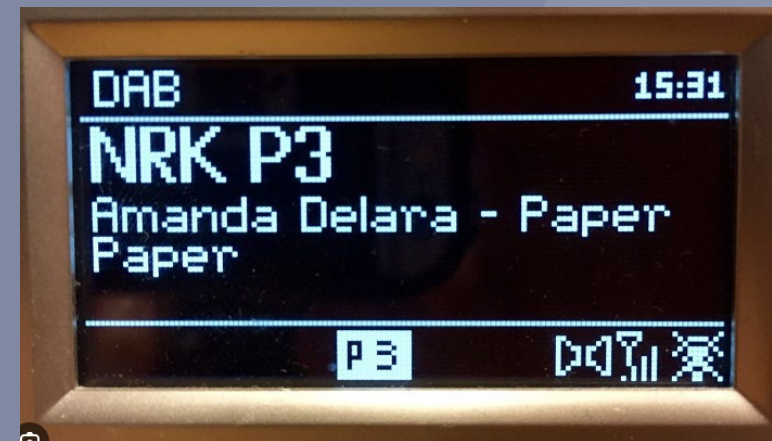**Standard label**

Encoding *
EBU-latin
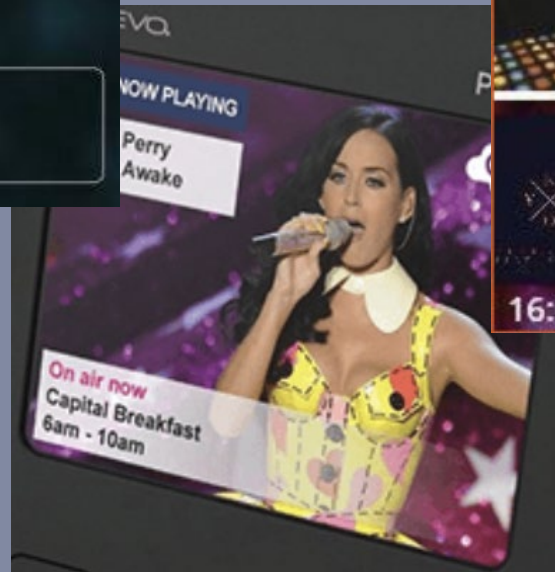
Long label
Radio Bright
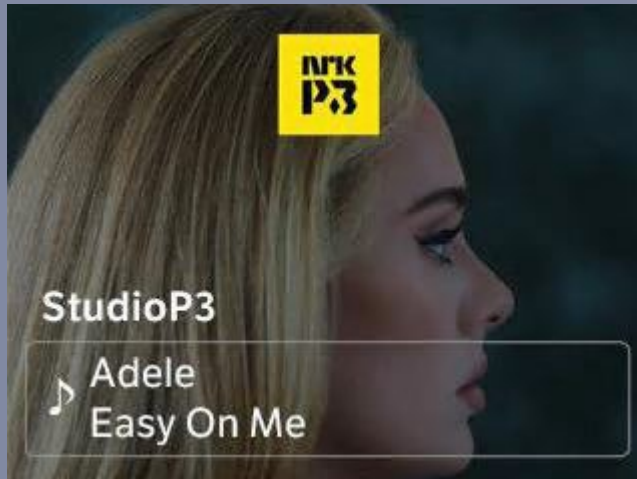
12 / 16

🖱 Radio **Bright**

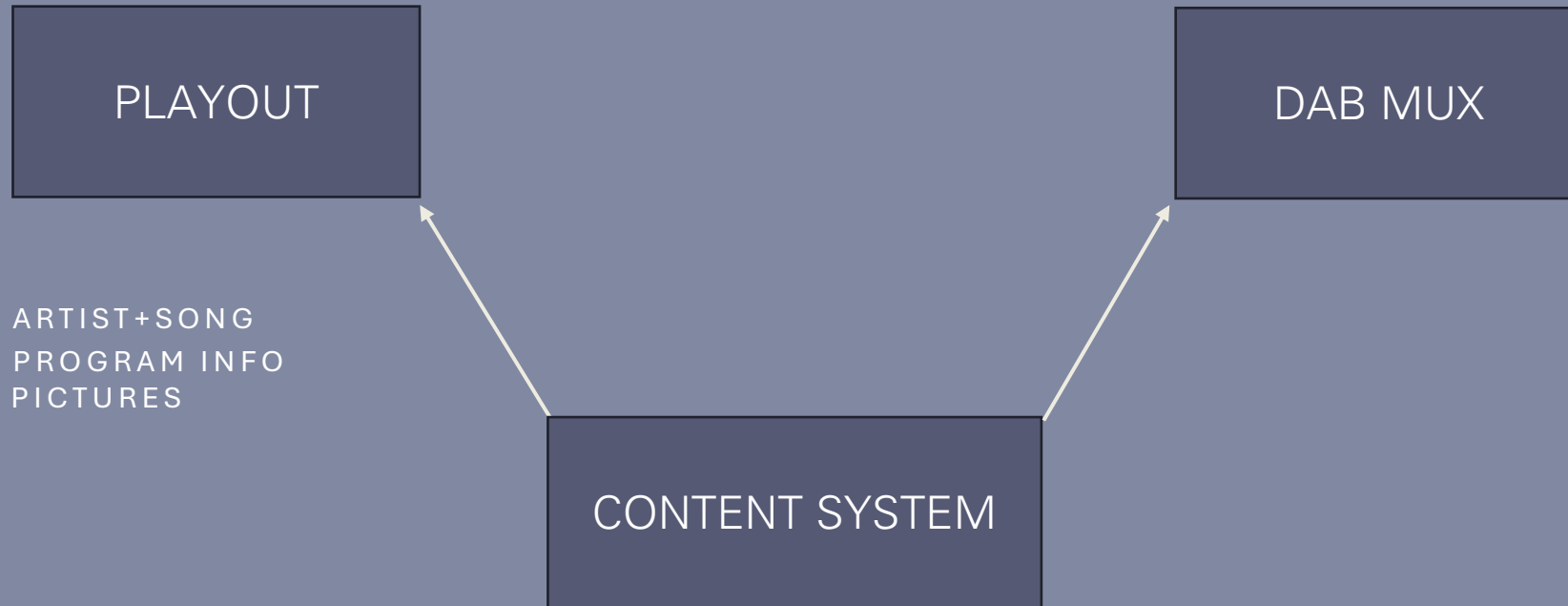Short label
Bright

Toggle the letters next to the mouse icon 🖱

METADATA

IMPROVED USER EXPERIENCE
DLS, DYNAMIC LABEL SEGMENT (TEXT)
SLS, SLIDESHOW (PICTURES)

METADATA INTEGRATION

PLAYOUT → API → DAB MUX

ARTIST+SONG
PROGRAM INFO
PICTURES

PANEDA®

METADATA INTEGRATION

PLAYOUT

DAB MUX

ARTIST+SONG
PROGRAM INFO
PICTURES

CONTENT SYSTEM

METADATA INTEGRATION

PICTURE

ARTIST+SONG

PROGRAM INFO

LIVE EXPORT API

PANEDA

DAB MUX

PLAYOUT SYSTEM

METADATA SYNCHRONISATION

| PLAYOUT | — ARTIST PICTURE → | DAB | — TRANSFER TIME → | RECEIVER |

QUEEN
BOHEMIAN RHAPSODY

STATION LOGO (SPI)

GUI STATION LOGO

PANEDA API

BASED ON OPEN API V3
EASY INTEGRATION
DOCUMENTED
MONITORING API
CTRL API
EVERYTHING

Paneda mux management API (rev.254)

Download OpenAPI specification: Download

- API version information
- API description
- API authentication
- API error handling
- API concepts
- Changelog

TELEMETRY
- States
- SNMP

ORCHESTRATION
- Providers
- Input sources
- SPI Ensembles
- SPI Buckets
- Smart switch
- EDI output
- Mux service
- License
- Ensemble
- Time zone

API version information

- Document revision: `rev.254`
- System version: `master`
- Git commit: `15ea728e`

API versioning strategy

The current strategy is to avoid breaking changes as the API evolves. New functionality will extend the API rather than replacing functionality.

Allowing old clients to continue to operate without changes while providing more features for an updated client.

API description

Use this API to:
- manage and configure a running Paneda headend mux

To create/start/stop/etc the mux. Use the orchestration API.

API authentication

A bearer token is used for API access.

The token can be created using the orchestration API for full machine-machine operation.

Then, the token is used in the Authorization header as: `Authorization: bearer 'token-value'`

The API is using role based authentication (RBAC). The required role(s) that the token must be created with are listed under each API route.

PANEDA API

MSC items

An MSC item is a building block for the MSC layout. Each MSC item defines the content of one subchannel.

There are a number of different categories, use the one appropriate for your use-case.

See the following image of how to identify the MSC item building blocks

OVERVIEW

Navigation sidebar

Search...

Mux inhibited inputs

License

Ensemble

Time zone

Local encoder pool

SERVICE CONFIGURATION

Encoder profiles

MSC items

- GET Retrieve all MSC items
- POST Create new MSC item
- PUT Update a MSC item
- DEL Remove an MSC item

MSC layouts

Active

History
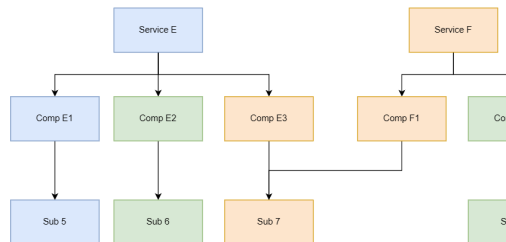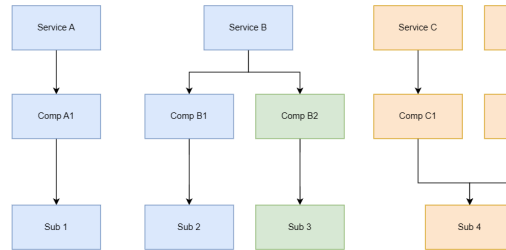
Update override SLS

`PUT` `/providers/{provider}/data/{dataSourceId}/sls/override`

Update the override slideshow content

I.e the SLS data that overrides the default.

Required-scopes: `["uploadPad"]`
Paneda-license-key: `non-licensed`
Cluster-sync: `false`

AUTHORIZATIONS: ›   *APIBearerAuth* or *Cookie based authentication*

PATH PARAMETERS

provider **required**   string (ID) [3 .. 40] characters `^[0-9a-zA-Z_-]*$`
Example: `5ea6fe5f4fa9e7834416ccbd`
The ID of the provider to use

dataSourceId **required**   string (ID) [3 .. 40] characters `^[0-9a-zA-Z_-]*$`
Example: `5ea6fe5f4fa9e7834416ccbd`
The ID of the data source

HEADER PARAMETERS

x-idempotency-key   string [3 .. 80] characters
The idempotency key can be used to assure that the mux processes an item only once.

For instance, if redundant systems produce data for the mux system they can use a shared key so that the first request that arrives is processed. While additional requests using the same key is ignored. This is signaled by sending HTTP status 299 back.

This header is optional. But if used it is up to the user to ensure that the key is unique for new requests and that the key is never reused (other than for duplicated calls of course).

If a call fails (return status other than 2xx) it is necessary to repeat the call using a new idempotency key as the key may already have been "consumed".

API CALL

Request samples

Payload

Content type
application/json

Example
single item

Copy   Expand all   Collapse all

```
{
    "type": "single-item",
    "targetDisplayTime": "2021-09-22T23:20:50.52Z",
    "allowAbortCurrentObject": true,
    "dgControl": "send-all",
  - "content": {
        "image": "ZXXdnZnd1Z2V3Z3dh...2Vnd2Vnd2VnZXdn1Z2VnZWc=",
        "omitTriggerTime": false,
      + "additionalMotParameters": [ … ]
    }
}
```

Response samples

200   299   default

Content type
application/json

Copy   Expand all   Collapse all

```
{
  - "imageProcessingResults": [
      + { … }
    ]
}
```

EXAMPLES

THANK YOU

LARS-PEDER LUNDGREN

www.paneda.no