Demonstration of the Global Discovery Catalogue, Global Broker and Global Cache

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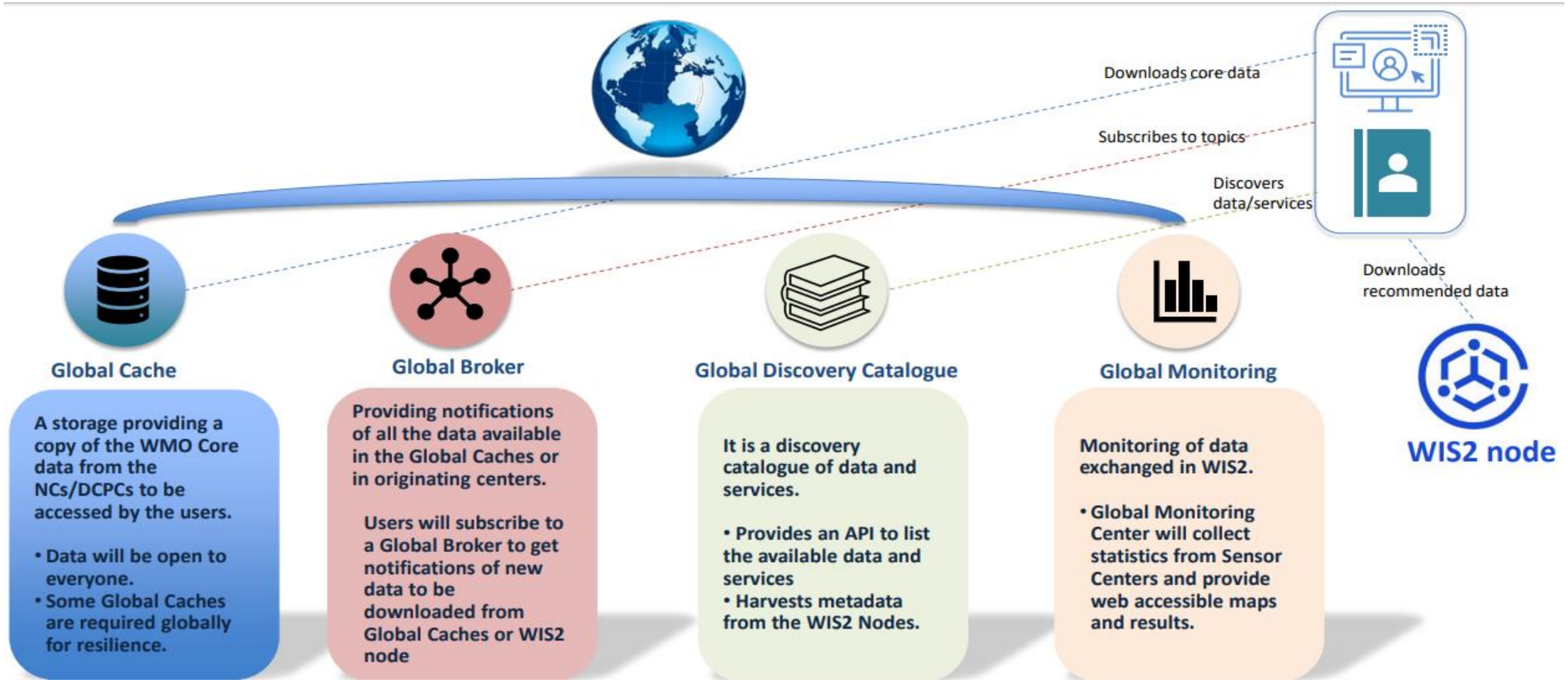
Overview

- Architecture of WIS2.0
- Demonstration of Global Discovery Catalogue
- Demonstration of Global Broker
- Demonstration of Global Cache

Architecture of WIS2.0



How to search the GDC to find datasets

How to subscribe/publish to notifications about the availability of new data

How to download data from WIS2

Demonstration of Global Discovery Catalogue

The Global Discovery Catalogue(GDC) provides data consumers with a mechanism for discovering and searching for datasets of interest as well as learning how to interact with and find out more information about those datasets.

WIS2.0 - Large library

The WIS metadata describes: What data resources can be obtained from where and under what conditions, for whom

Metadata - Index cards

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Demonstration of Global Discovery Catalogue

The primary purpose of WCMP is to describe datasets. While WCMP can describe any resource (datasets, APIs and data reduction services, processes, analytics, etc.), the key component for international data exchange is data. Services and APIs operating on resources may be represented as part of their own metadata or associated through WCMP links.

Property	Requirement	Property	Requirement
id	required	additionalExtents.temporal	optional
type	required	properties.contacts	required
conformsTo	required	properties.version	optional
properties.type	required	properties.externalIds	optional
properties.title	required	properties.created	required
properties.description	required	properties.updated	optional
properties.keywords	optional	properties.status	optional
properties.themes	required	properties.wmo:dataPolicy	conditional
geometry	required	properties.rights	optional
time	required	links	required
additionalExtents.spatial	optional	.....	.....

Demonstration of Global Discovery Catalogue

urn:wmo:md:cn-cma:data.core.weather.surface-based-observations


```
    "contacts": [{
        "addresses": [{
            "deliveryPoint": [
                "46 Zhongguancun Nandajie"
            ],
            "city": "Beijing",
            "administrativeArea": "Beijing",
            "postalCode": "100 081",
            "country": "China"
        }],
        "roles": [
            "host"
        ],
        "organization": "China Meteorological Administration (CMA)",
        "hoursOfService": "0700h - 1500h UTC",
        "contactInstructions": "email",
        "phones": [{
            "value": "+8601068409329"
        }],
        "emails": [{
            "value": "giscadmin@cma.gov.cn"
        }],
        "links": [{
            "rel": "canonical",
            "type": "text/html",
            "href": "https://www.cma.gov.cn/"
        }]
    }],
    "keywords": [
        "surface weather",
        "observations"
    ],
    "wmo:dataPolicy": "core",
    "wmo:topicHierarchy": "origin/a/wis2/cn-cma/data/core/weather/surface-based-observations/synop",
    "id": "urn:wmo:md:cn-cma:data.core.weather.surface-based-observations",
    "centre-id": "cn-cma"
},
"time": {
    "interval": [
        "2021-11-29",
        ".."
    ],
    "resolution": "PT1H"
},
"links": [{
        "href": "mqtts://everyone:everyone@gb.wis.cma.cn:8883",
        "type": "application/geo+json",
        "name": "origin/a/wis2/cn-cma/data/core/weather/surface-based-observations/synop",
        "rel": "items",
        "channel": "cache/a/wis2/cn-cma/data/core/weather/surface-based-observations/synop",
        "title": "Notifications from China Meteorological Administration, Global Broker Service (cn-cma-global-broker)"
    },
    {
        "href": "mqtts://everyone:everyone@globalbroker.meteo.fr:8883",
```


The **links** property describes URLs and APIs for accessing the dataset or for subscribing to dataset notifications.

Links are the primary mechanism for interacting with the data, and provide an "actionable" workflow to enhance and improve the user experience with "less clicks" for subscriptions and downloads

- Href: The link destination or target, or URL

  mqtts://everyone:everyone@gb.wis.cma.cn:8883
  mqtts://everyone:everyone@globalbroker.meteo.fr:8883
  mqtts://everyone:everyone@globalbroker.inmet.gov.br:8883
  mqtts://everyone:everyone@wis2globalbroker.nws.noaa.gov:8883

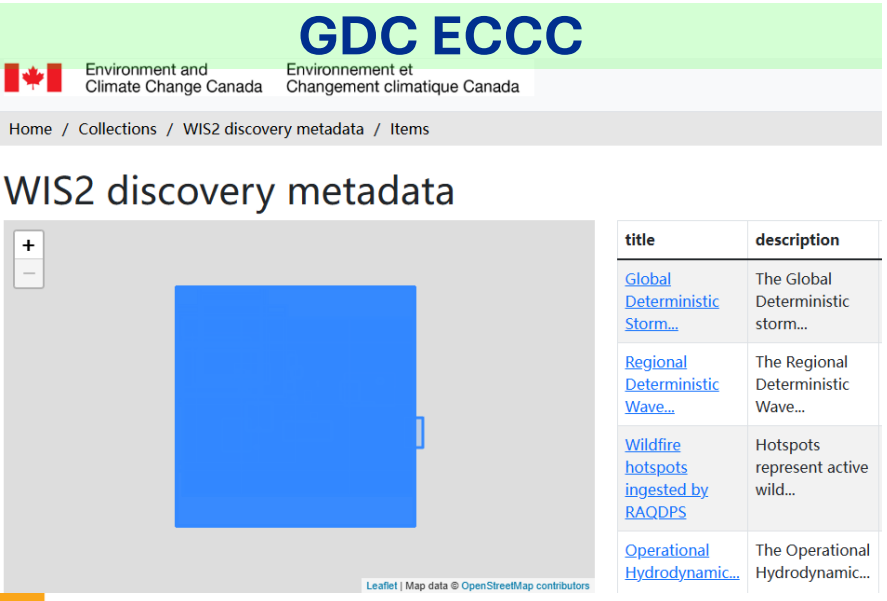
- Channel: For data made available via MQTT, the topic to which a user may subscribe for notifications and access

  cache/a/wis2/cn-cma/data/core/weather/surface-based-observations/synop

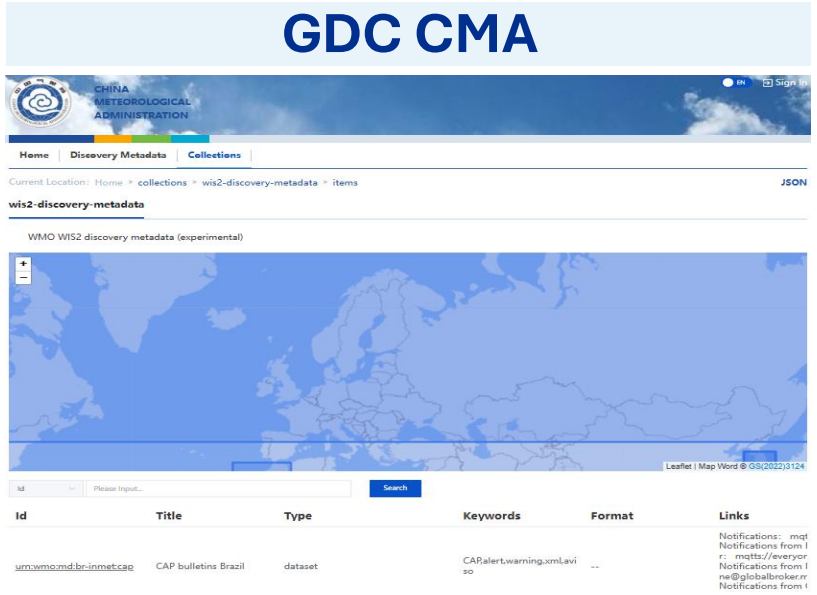
Demonstration of Global Discovery Catalogue

The first step to using data published via WIS2 is to determine which dataset or datasets contain the data that are needed. To do this, a data consumer may browse discovery metadata provided by the Global Discovery Catalogue.

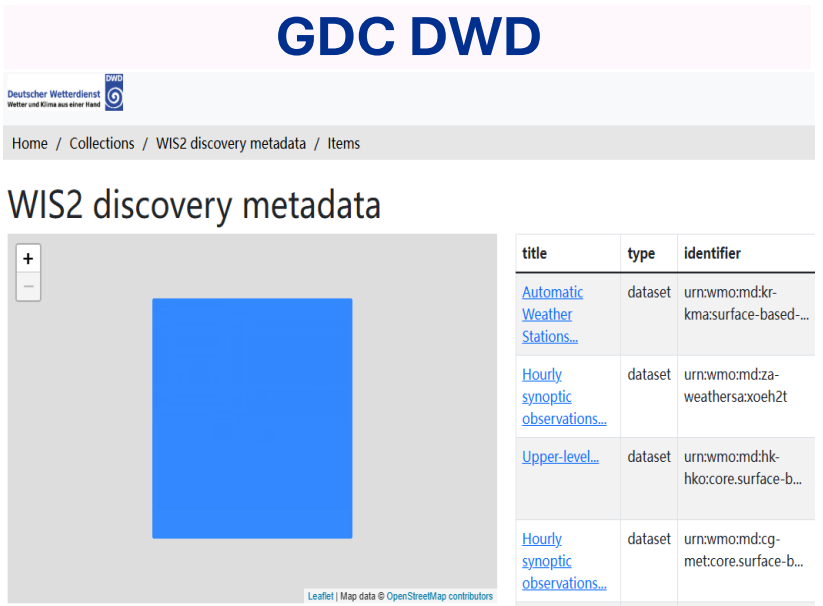
GDC ECCC



GDC CMA



GDC DWD



GDC ECCC *https://wis2-gdc.weather.gc.ca/collections/wis2-discovery-metadata/items*
GDC CMA *https://gdc.wis.cma.cn/collections/wis2-discovery-metadata/items*
GDC DWD *https://wis2.dwd.de/gdc/collections/wis2-discovery-metadata/items*

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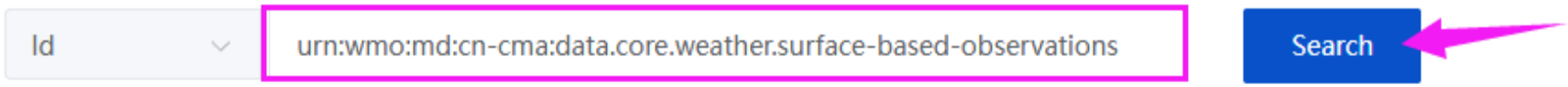
Demonstration of Global Discovery Catalogue

urn:wmo:md:cn-cma:data.core.weather.surface-based-observations

1. Check the metadata through the portal.

Step1: Enter “urn:wmo:md:cn-cma:data.core.weather.surface-based-observations” into the textbox.



Id	Title	Type	Keywords	Format	Links
urn:wmo:md:cn-cma:data.core.weather.surface-based-observations	ISMN SYNOP reports - China ; available from BABJ(PEKING (BEIJING)) at 00,06,12,18 .	dataset	surface weather,observations	--	Notifications: mqtts://everyone:everyone@wis2node.wis.cma.cn:8883

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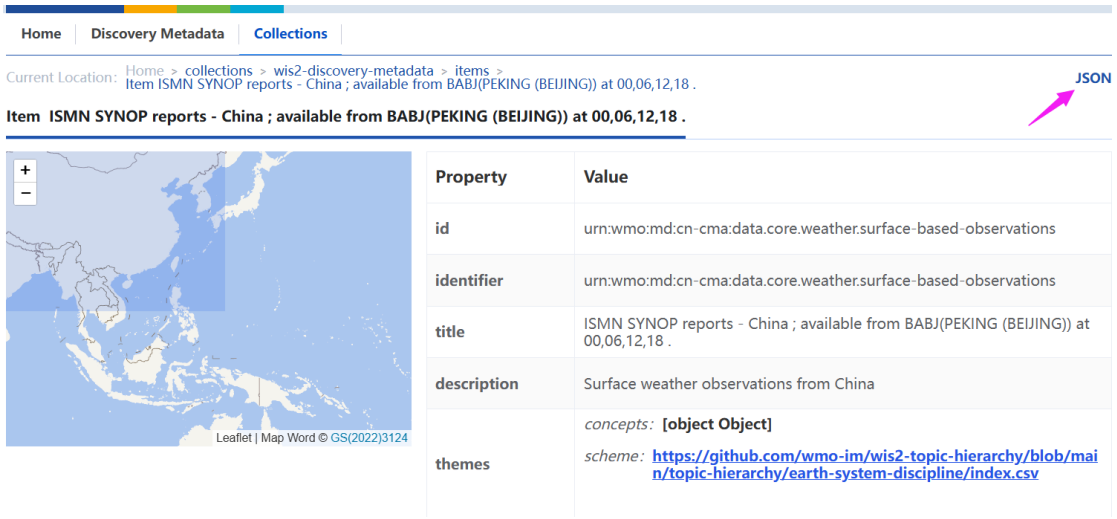
Step2: You can view the metadata information online and also access the metadata in JSON format.




```
{
  "id": "urn:wmo:md:cn-cma:data.core.weather.surface-based-observations",
  "conformsTo": [
    "http://wis.wmo.int/spec/wcmp/2/conf/core",
    "http://www.opengis.net/spec/ogcapi-records-1/1.0/req/record-core"
  ],
  "type": "Feature",
  "geometry": {
    "type": "Polygon",
    "coordinates": [
      [
        [73.66, 3.86],
        [73.66, 53.55],
        [135.05, 53.55],
        [135.05, 3.86],
        [73.66, 3.86]
      ]
    ]
  },
  "properties": {
    "identifier": "urn:wmo:md:cn-cma:data.core.weather.surface-based-observations",
    "title": "ISMN SYNOP reports - China ; available from BABJ(PEKING (BEIJING)) at 00,06,12,18 .",
    "description": "Surface weather observations from China",
    "themes": [
      {
        "concepts": [
          {
            "id": "weatherObservations"
          }
        ],
        "scheme": "https://github.com/wmo-im/wis2-topic-hierarchy/blob/main/topic-hierarchy/earth-system-discipline/index.csv"
      }
    ],
    "type": "dataset",
    "created": "2024-01-17T00:00:00Z",
    "updated": "2025-08-18T01:00:04Z",
    "contacts": [
      {
        "addresses": [
          {
```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Demonstration of Global Discovery Catalogue

urn:wmo:md:cn-cma:data.core.weather.surface-based-observations

2. Get the metadata through the OGC API.

1. Get "urn:wmo:md:cn-cma:data.core.weather.surface-based-observations" from GDC CMA:
https://gdc.wis.cma.cn/collections/wis2-discovery-metadata/items/urn:wmo:md:cn-cma:data.core.weather.surface-based-observations?f=json

2. Get 100 metadata records from GDC CMA:
https://gdc.wis.cma.cn/collections/wis2-discovery-metadata/items?f=json&limit=100

3. Get metadata records within a certain geographical range
https://gdc.wis.cma.cn/collections/wis2-discovery-metadata/items?bbox=73.66,4,135.08,53.52&f=json

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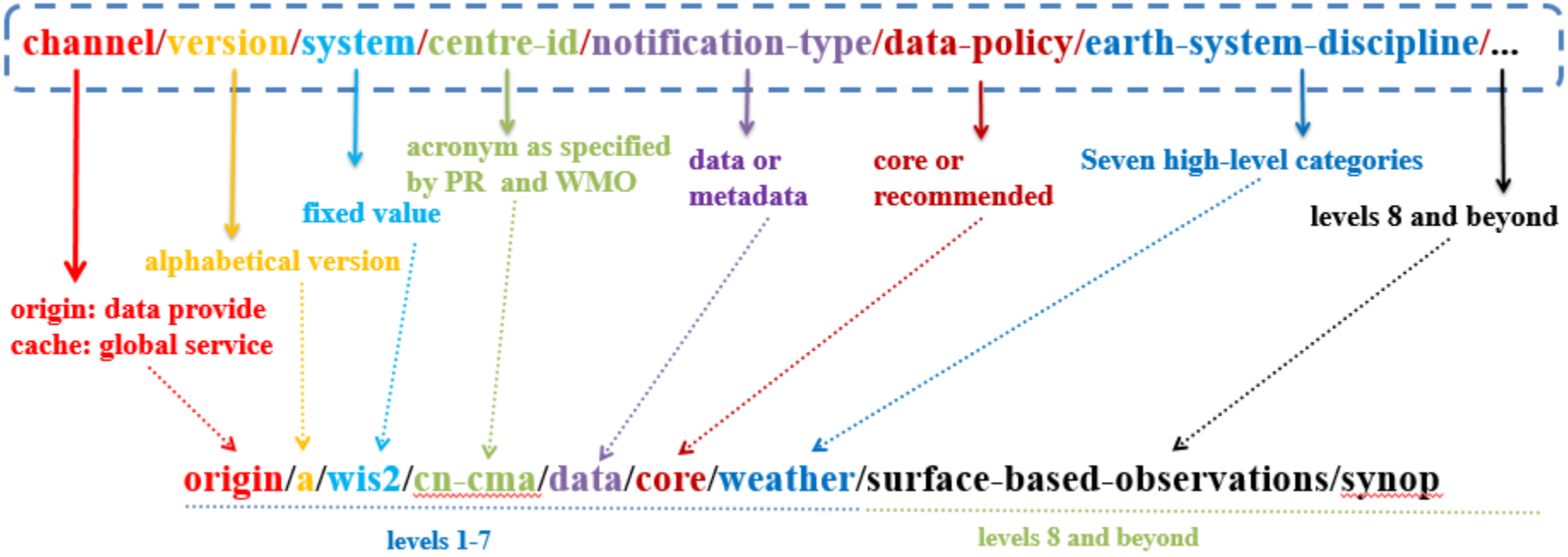
Demonstration of Global Broker

The Global Broker provides MQTT(S) Broker that re-publishes data notifications of all WIS2 Nodes. Users of WIS 2.0 will be able to access data in real-time by subscribing to a Global Broker and receiving notifications when new data is available for download from a Global Cache or the data provider WIS2 Node

The WIS2 Topic Hierarchy (WTH) is composed of primary topics (levels 1–7) and sub-discipline specific topics (levels 8 and beyond



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Demonstration of Global Broker

WIS2 Notification Message (WNM) is an extension of the OGC API - Features standard and shall be encoded in GeoJSON

Property	Requirement	Property	Requirement
id	required	properties.datetime	optional
type	required	properties.start_datetime	optional
version	required	properties.end_datetime	optional
geometry	required	properties.cache	optional
properties.pubtime	required	properties.integrity	optional
properties.data_id	required	properties.content	optional
properties.metadata_id	optional	links	required
properties.producer	optional	… …	… …

Demonstration of Global Broker

Id:6ce38020-9a50-4f0b-97ab-7a67a33e505e
Data_id:cn-cma:data.core.weather.surface-based-observations/WIGOS_0-20000-0-57265_20250907T000000


```
{
    "id": "6ce38020-9a50-4f0b-97ab-7a67a33e505e",
    "type": "Feature",
    "conformsTo": ["http://wis.wmo.int/spec/wnm/1/conf/core"],
    "geometry": {
        "coordinates": [111.73, 32.43, 129],
        "type": "Point"
    },
    "properties": {
        "data_id": "cn-cma:data.core.weather.surface-based-observations/WIGOS_0-20000-0-57265_20250907T000000",
        "datetime": "2025-09-07T00:00:00Z",
        "pubtime": "2025-09-07T00:16:03Z",
        "integrity": {
            "method": "sha512",
            "value ": "VOKJkkRX + cNk / SoBQBT8tBydcCpGKosfc8s + 9 MzBceNR95DlrKV / TxwPwcRTlQp6YB99999s9DDB1bCFxQubg == "
        },
        "metadata_id ": "urn:wmo:md:cn-cma:data.core.weather.surface-based-observations ",
        "gts ": {
            "ttaaii ": "ISMN02 ",
            "cccc": "BABJ"
        },
        "content": {
            "encoding": "base64",
            "value": "QlVGUgAA+gQAABYAACYAAAAAAAIAIAAHGQHAAAAAAALAAABgMGWx1AAAMOABOIAAANTcyNjUAAAAAAAAAAAAAAAHKEpiCnpCKlp6qAAAAAAAAAAAAAAAAAP(
            "size": 250
        },
        "wigos_station_identifier": "0-20000-0-57265"
    },
    "links": [{
        "rel": "canonical",
        "type": "application/bufr",
        "href": "https://wis2node.wis.cma.cn/data/2025-09-07/wis/urn:wmo:md:cn-cma:data.core.weather.surface-based-observations/WIGOS_0-2000(
        "length ": 250
    }, {
        "rel ": "via ",
        "type ": "text / html ",
        "href ": "https: //oscar.wmo.int/surface/#/search/station/stationReportDetails/0-20000-0-57265"
    }],
    "generated_by": "wis2box 1.0.0rc1"
}
```


The **links** array property consists of one or more objects **providing URLs to access data**.

https://wis2node.wis.cma.cn/data/2025-09-07/wis/urn:wmo:md:cn-cma:data.core.weather.surface-based-observations/WIGOS_0-20000-0-57265_20250907T000000.bufr4

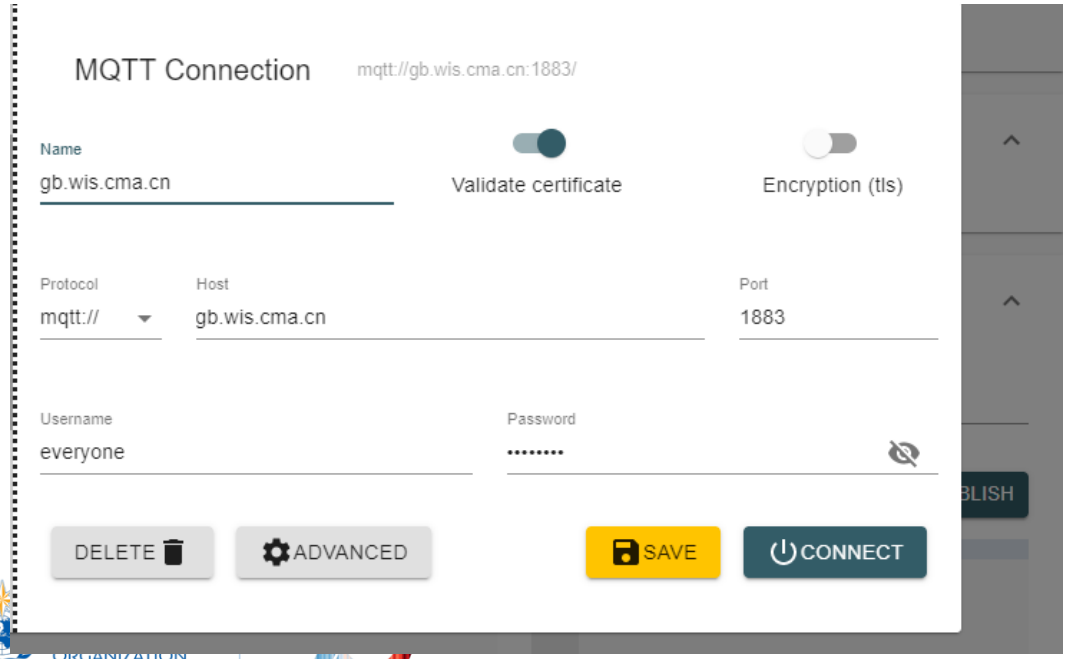
Demonstration of Global Broker

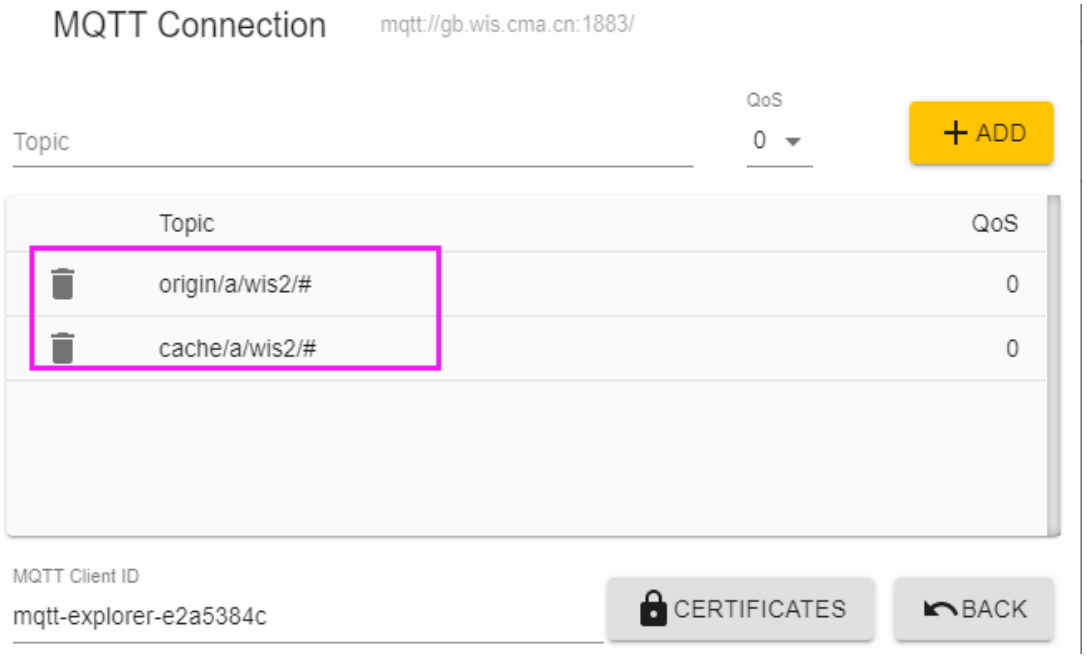
1. Subscribe by MQTT-TOOL.

Step1: Use MQTT-TOOL(MQTT-Explorer) to subscribe Global Broker.

Broker of GB CMA: *mqtt://everyone:everyone@gb.wis.cma.cn:1883*

Topic Hierachy: *origin/a/wis2/#*

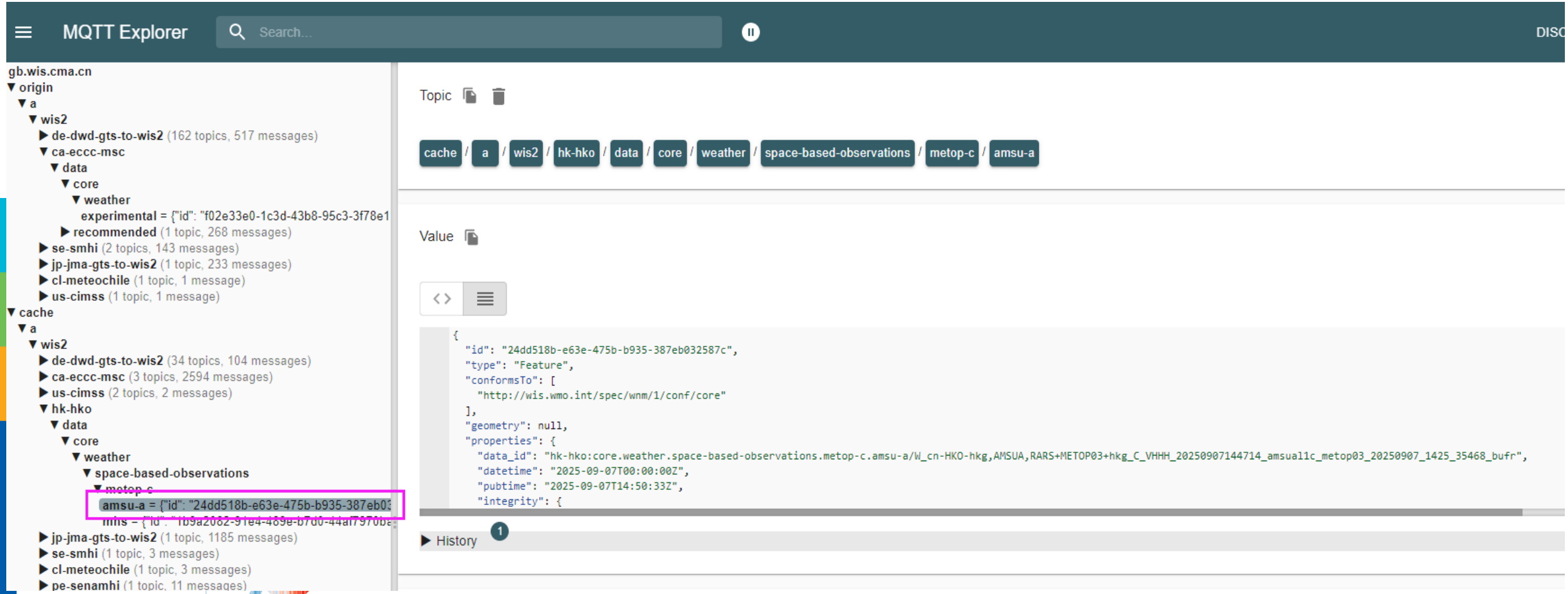




Demonstration of Global Broker

1. Subscribe by MQTT-TOOL.

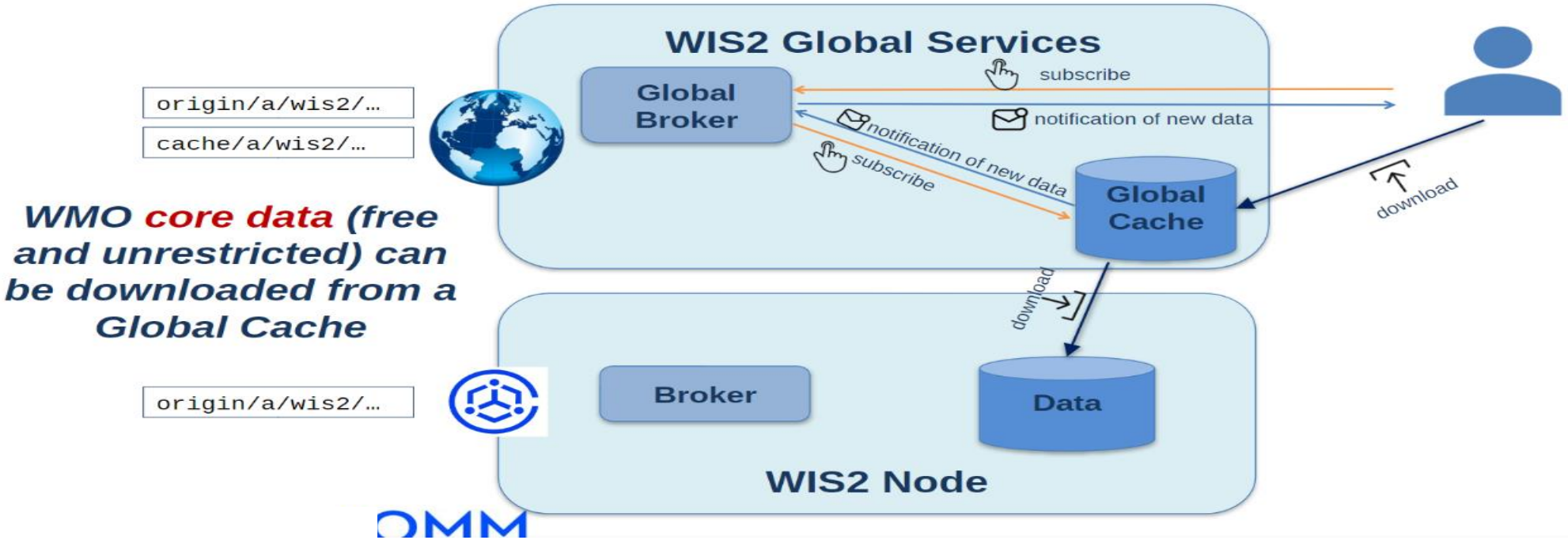
Step2: Check the messages that need attention.



Demonstration of Global Cache

The Global Cache provides HTTP(S) server where core data (as defined in WMO Resolution 1) can be downloaded from

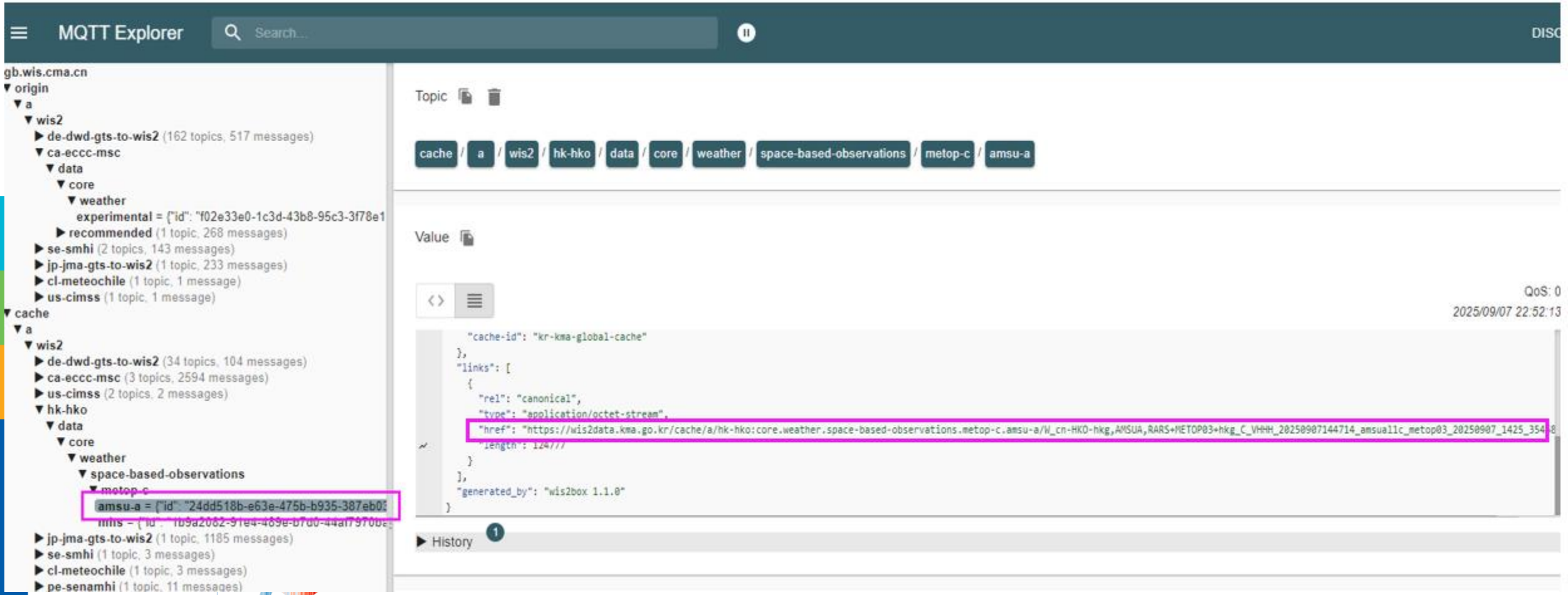
A discovery metadata record or notification message may provide more than one download links. The preferred link will be identified as “canonical” (link relation: “rel”: “canonical”) and provides a URL where one can directly download a data object.



Demonstration of Global Cache

1. Subscribe by MQTT-TOOL.

Download data from Global Cache.



Thank you

Merci

Gracias

شكرا

谢谢

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