WIS2 overview and status

15th Observation Coordination Group (OCG-15)
WIS2.0 workshop

Hassan Haddouch / WIS 2.0 Manager

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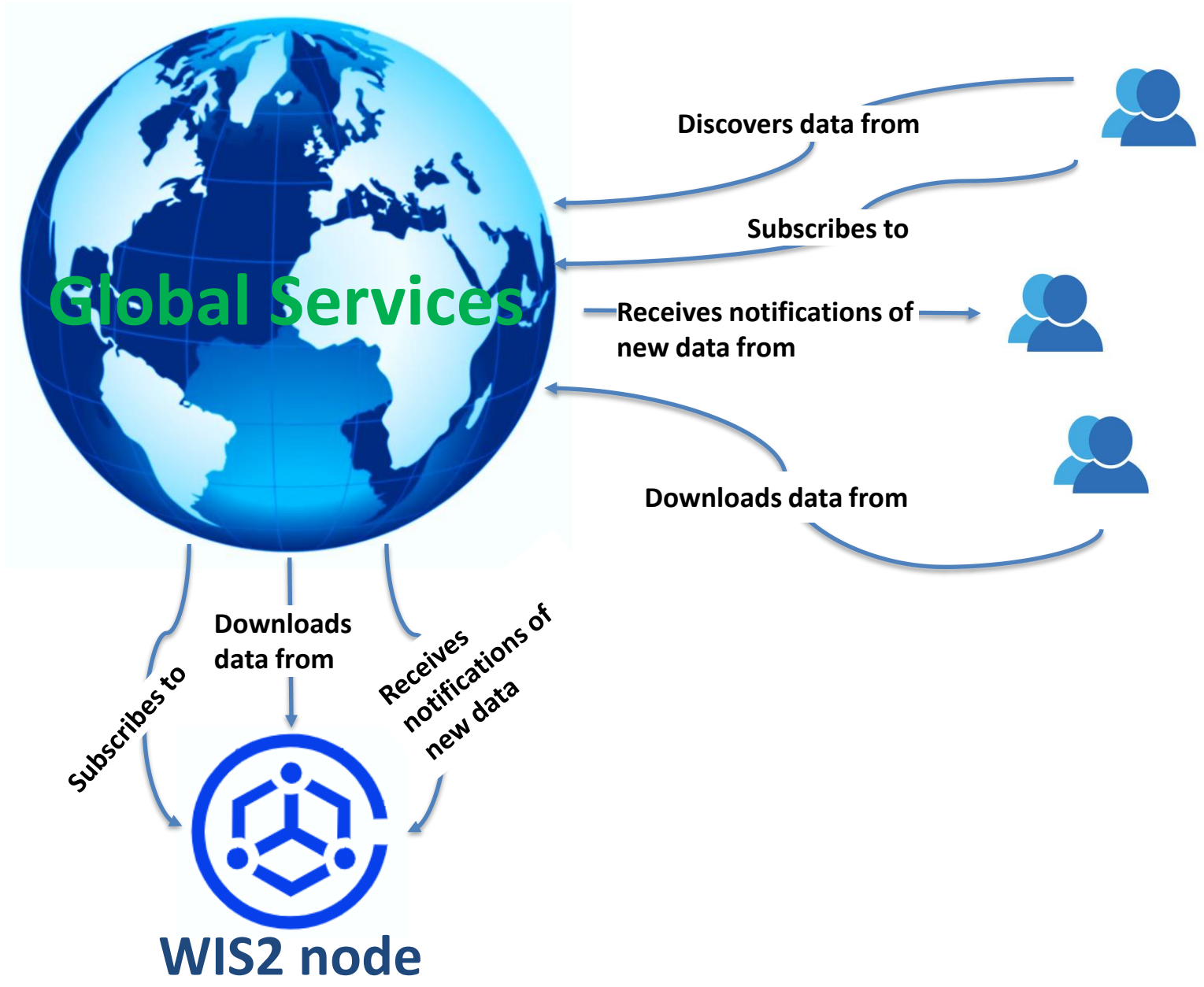
WIS Architecture



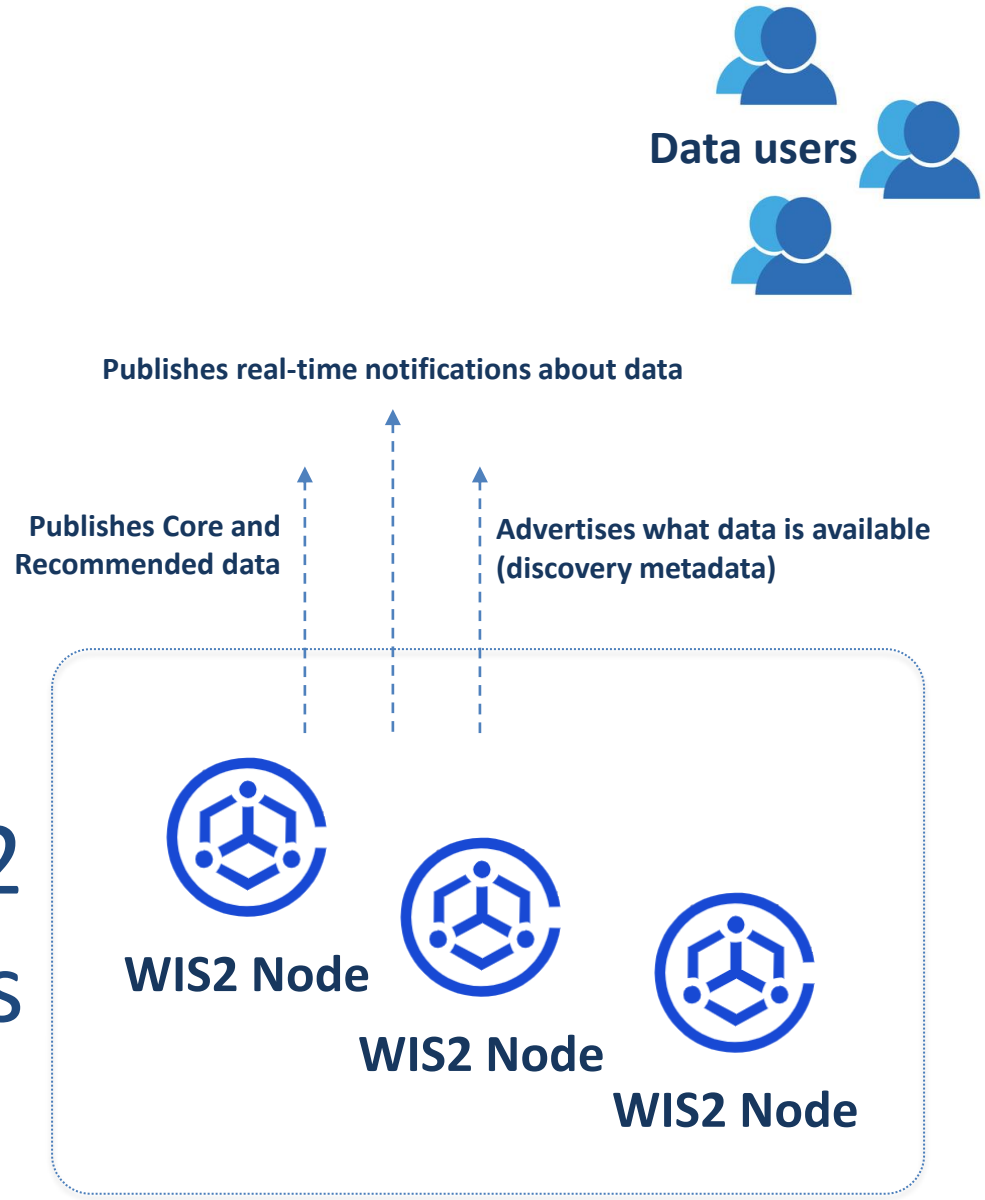
WMO OMM

WIS2 Components: WIS2 Nodes

- Each WMO Member shall implement at least one WIS2 Node to share data in WIS2
- A WIS2 Node replaces the GTS Message Switching System
- Data and metadata are shared using a WIS2 Node
- A WIS2 Node shares data via an HTTPS service and sends notifications to MQTT subscribers

WMO OMM

WIS2 Nodes



WIS2 Components: Global Services

Global Services

Global Monitoring

Global Discovery Catalogue

Provides an API to discover datasets and services

Global Broker

Sends notifications of new data to be downloaded from Global Caches or WIS2 nodes

Global Cache

Provides users HTTP download of core data cached from WIS2 nodes

Discovers datasets

Subscribes to topics

Downloads core data

Data users

Downloads recommended data

Downloads recommended data

Downloads recommended data

WIS2 node

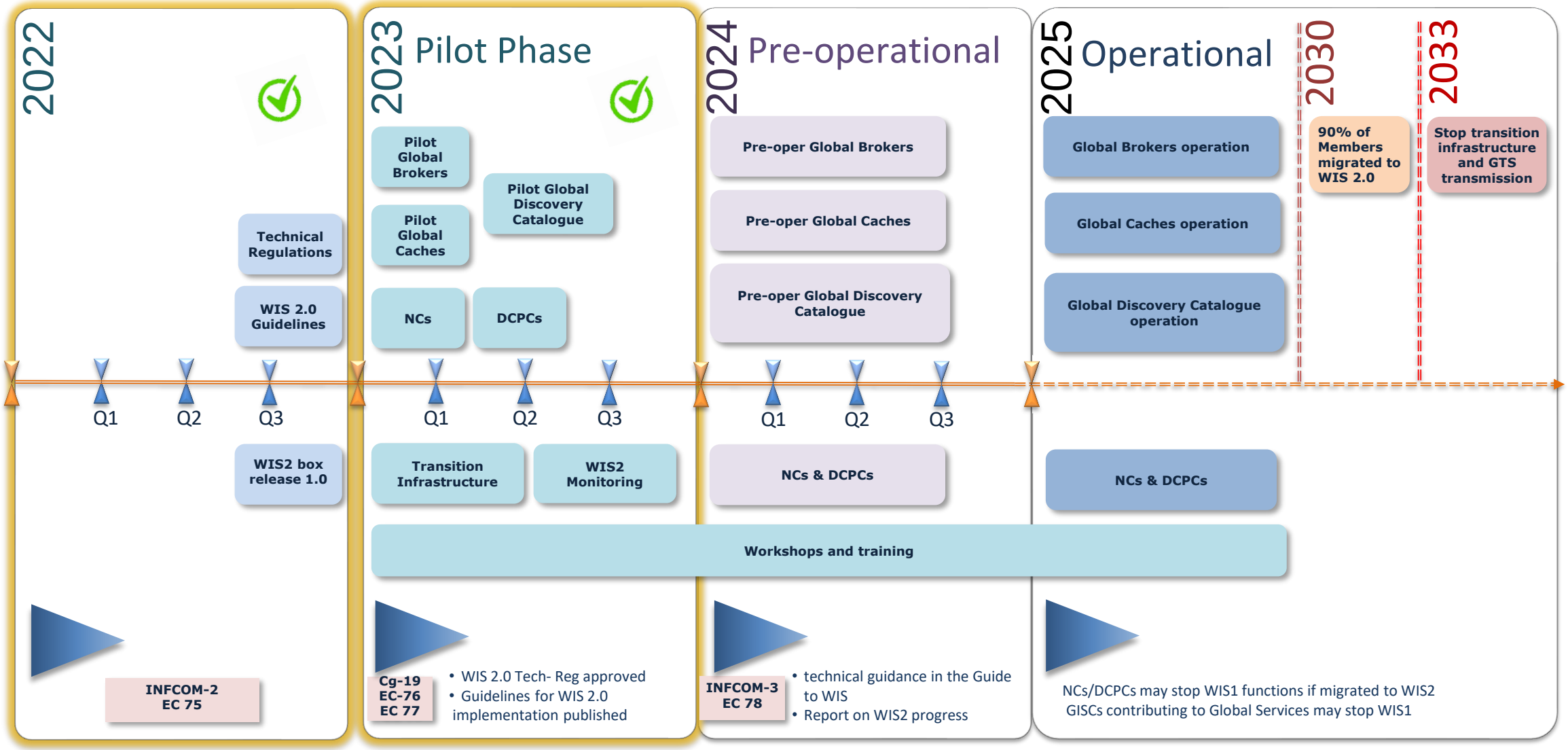
WIS2 node

WIS2 node

Scale to highly-available, global data sharing

WMO OMM

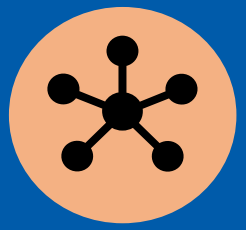
WIS2 progress: Pilot Phase complete



WMO OMM

WIS2 Global Service instances

Global Broker



Brazil
France
China
USA

Global Discovery Catalogue

Canada
China
Korea

Global Cache

China
Germany
Japan
Korea
USA/UK

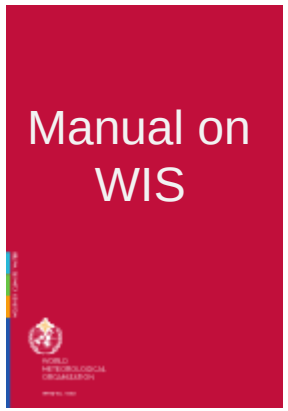
Global Monitoring

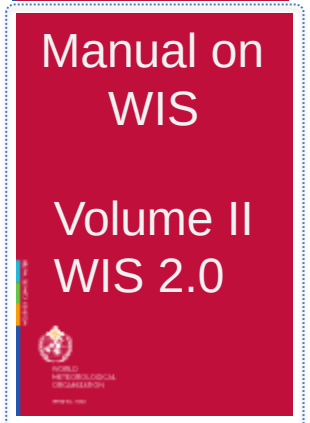
China
Morocco

WORLD METEOROLOGICAL ORGANIZATION

WIS2 regulatory material

June 2023 Cg-19





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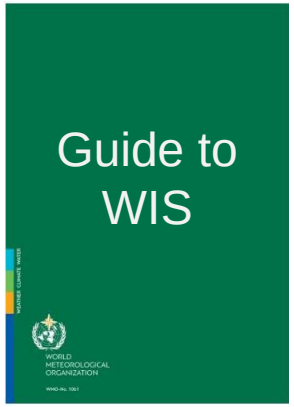
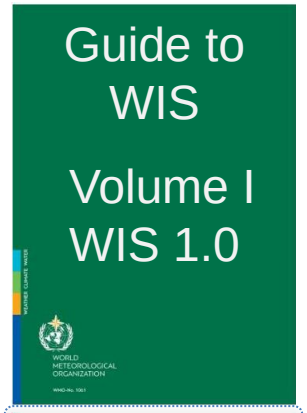
AMENDMENTS TO THE MANUAL ON THE WMO INFORMATION SYSTEM

[Manual on WIS Volume II
WMO Information System 2.0]

April 2024 INFCOM-3





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UPDATE OF THE GUIDE TO THE WMO INFORMATION SYSTEM

ON
OM WIS 1.0
AND GTS TO WIS
2.0, INCLUDING
CAPACITY
DEVELOPMENT

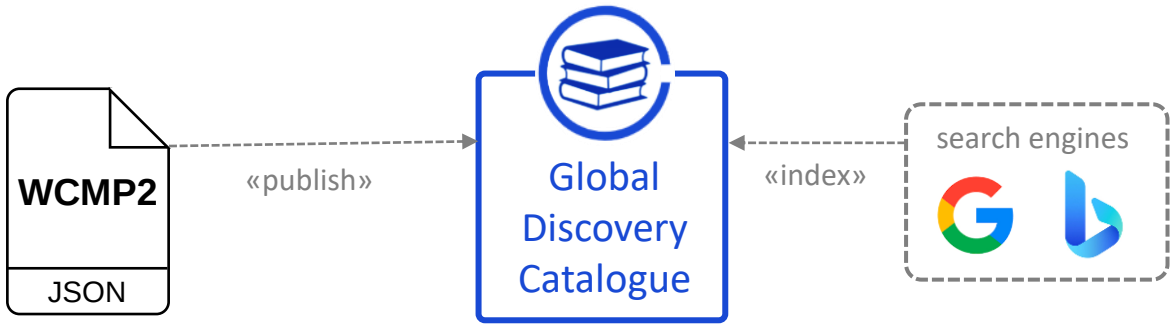
All documents have been endorsed by INFCOM 3 (April 2024)

WMO OMM

WMO Core Metadata Profile 2.0 (WCMP2)

The new standard for WIS Metadata

- WCMP2 is an extension of the International Standard OGC API - Records
- Discovery metadata describes a given dataset or collection
- Aligning with the WIS 2.0 Principles, discovery metadata will be published to the Global Discovery Catalogue



Guide to WIS (WMO No. 1061), Vol II, §1.3.2 How to provide discovery metadata to WIS2 [draft]

Manual on WIS (WMO No. 1060), Vol II, Appendix F: WMO Core Metadata Profile 2 [draft]

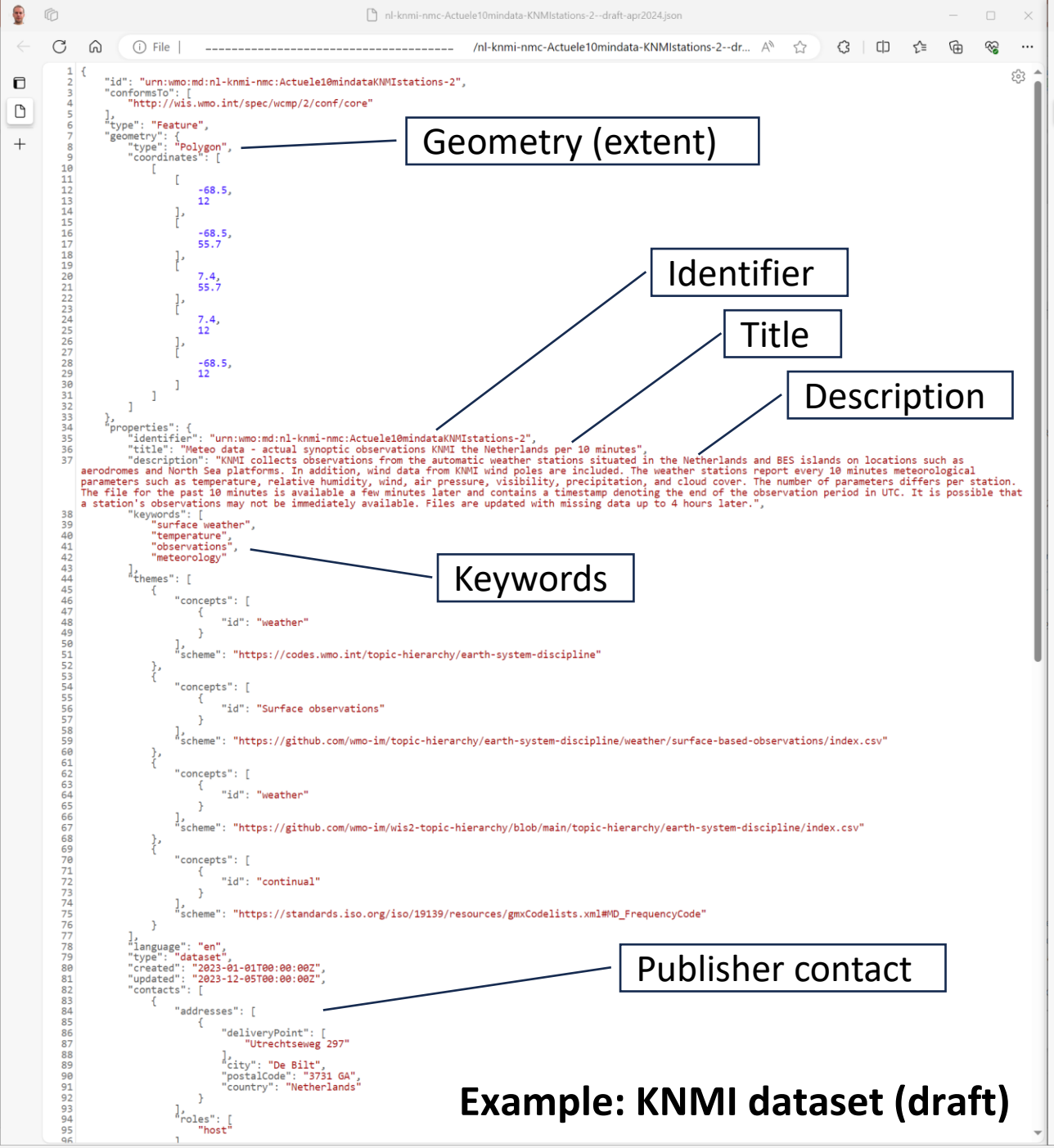
Description of the Dataset
Identifier
Title
Description
Keywords
Geometry (extent)
Time (extent)

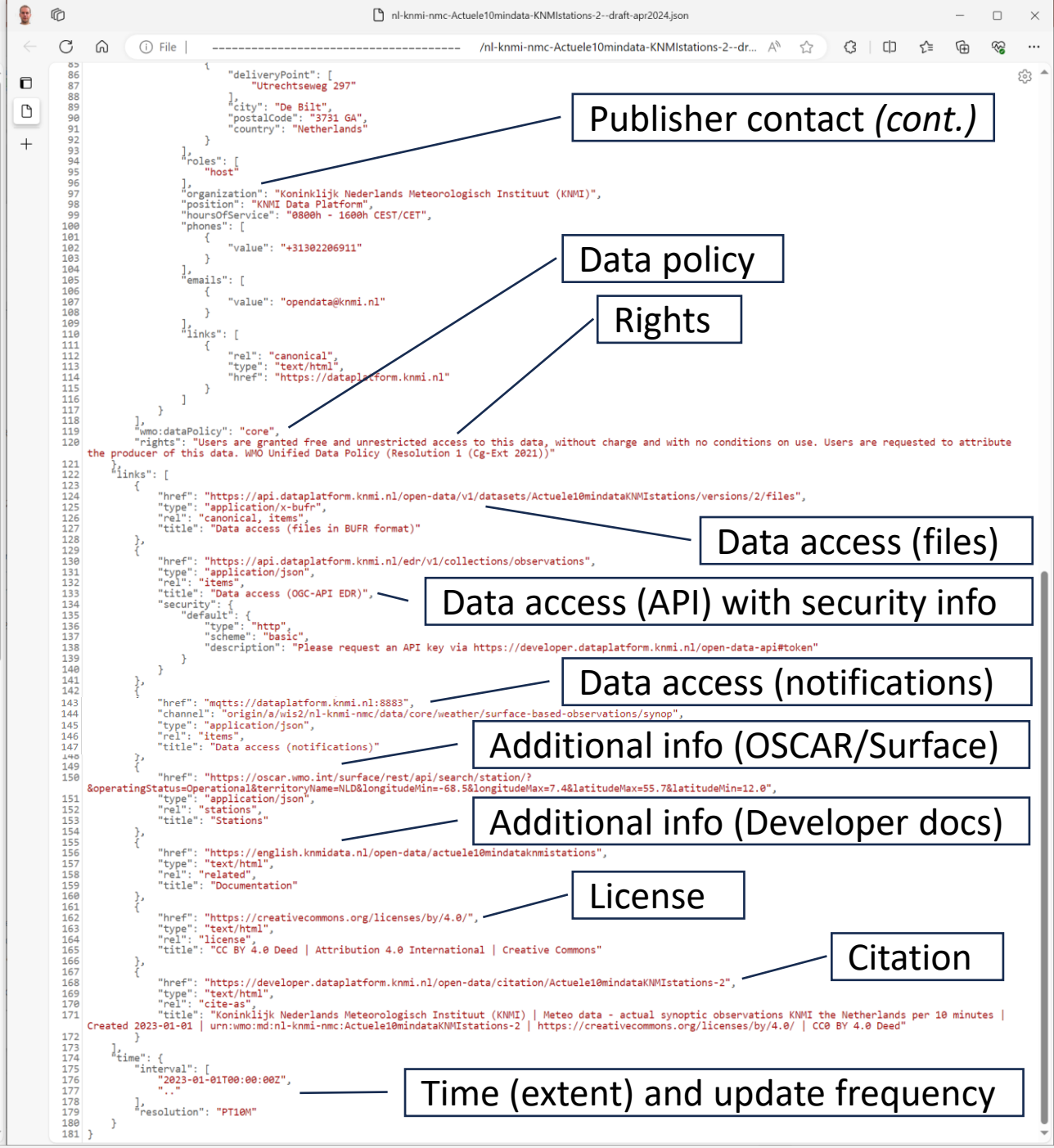
Who to contact
Publisher contact

How to access
Data access (files)
Data access (API)
Data access (notifications)

Conditions of use
Data policy
Rights
License

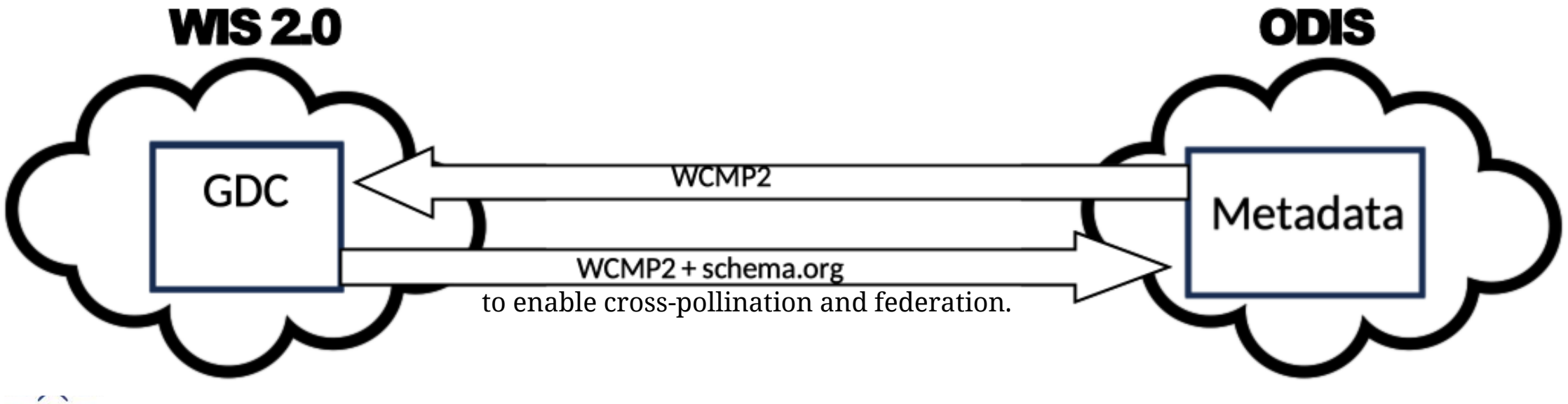
How to attribute
Citation


Geometry (extent)
Identifier
Title
Description
Keywords
Publisher contact
Example: KNMI dataset (draft)


Publisher contact (cont.)
Data policy
Rights
Data access (files)
Data access (API) with security info
Data access (notifications)
Additional info (OSCAR/Surface)
Additional info (Developer docs)
License
Citation
Time (extent) and update frequency

WIS2 / ODIS Integration

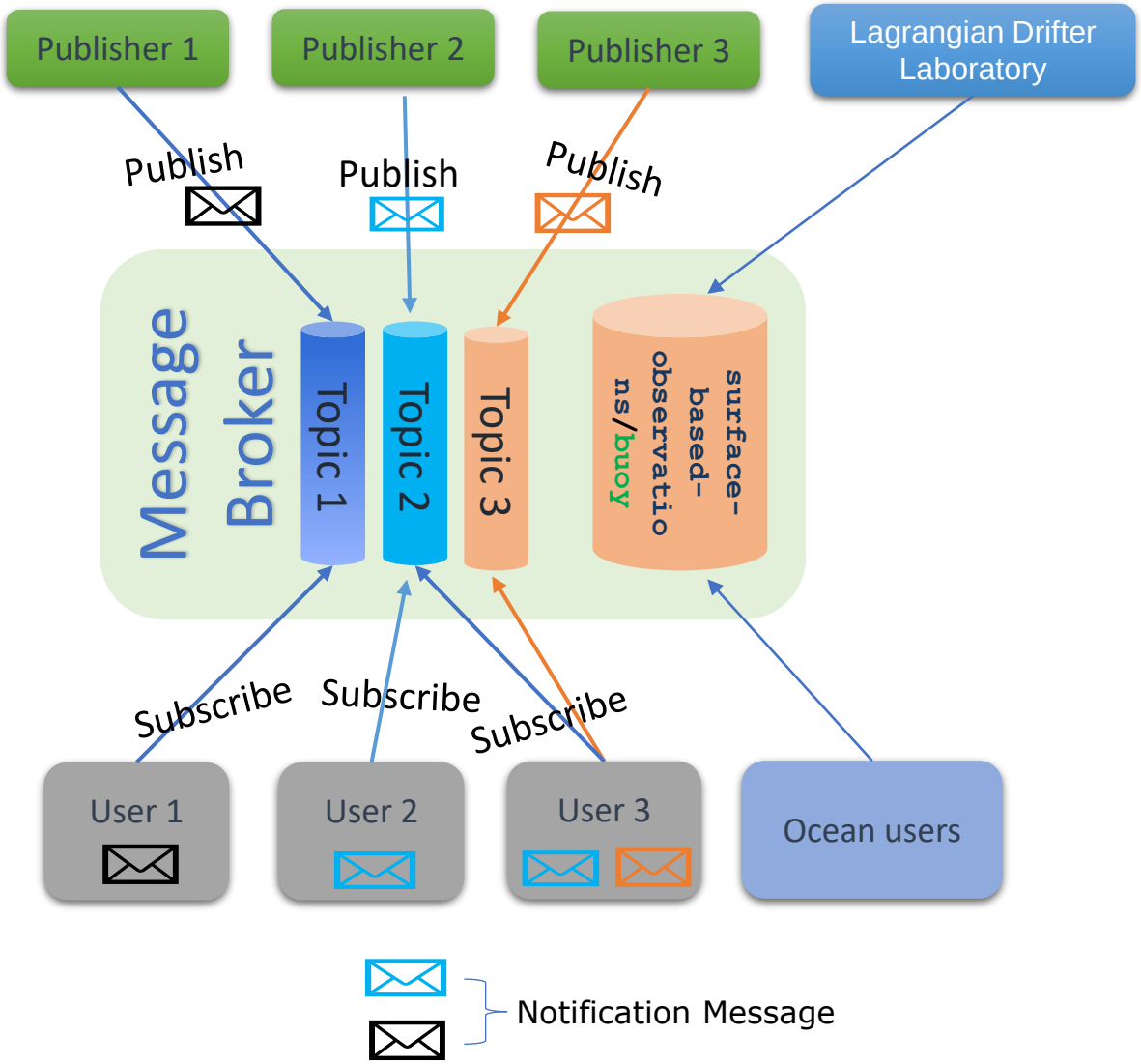
- The WIS2 principles enable lowering the barrier to weather/climate/water data for WMO members. Lowering the barrier is driven by **international standards** for data discovery, access, and visualization
- WIS2 and ODIS, data and metadata exchange is realized using Web architectural principles and approaches



Topic Hierarchy and Notification Message

WIS2 Topic Hierarchy – *"Backbone" of the notification architecture where the messages will be available*

WIS2 Notification Message – *Format of the Notification Messages*



WIS 2.0 topic hierarchy

Level	Name	Description
1	**channel**	Location of where the data originates from (data providers [origin] or global services [cache])
2	**version**	Alphabetical version of the topic hierarchy (currently a)
3	**system**	Fixed value of wis2 for **WIS2**
4	**centre-id**	Acronym as specified by member and endorsed by the PR of the country and by WMO
5	**resource-type**	WIS2 resources types (data, metadata, report [from monitoring activities])
6	**data-policy**	Data policy as defined by the WMO Unified Data Policy. Notifications for **core** and **recommended** data are available by subscription to Global Brokers. recommended data are downloaded from the original NC/DCPC and may require authentication/authorisation
7	**earth-system-discipline**	As per Annex 1 of resolution 1 Cg-Ext-2021 ('atmospheric-composition', 'climate', 'cryosphere', 'hydrology', 'ocean', 'space-weather', or 'weather')
8	**earth-system-discipline-category**	As proposed by domain experts and further approved by INFCOM

Example:

origin/a/wis2/ca-eccc-msc/data/core/weather/ surface-based-observations/synop

cache/a/wis2/int-ecmwf/data/core/weather/prediction/forecast/medium-range/deterministic/global

WIS2 for domains

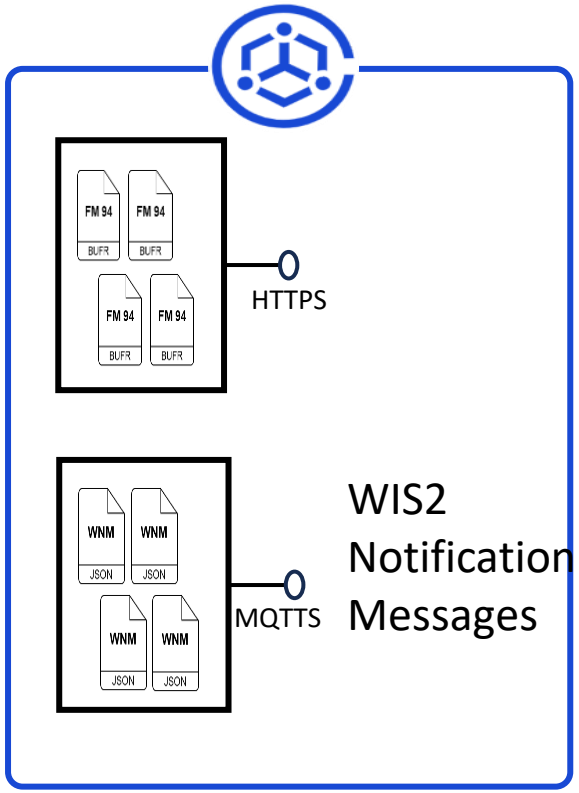
For each Earth domain, the experts from the domain, with the support of the WIS2 team should:

- Further define the Topic Hierarchy, allowing client-side filtering.
  - It must be noted that the Topic Hierarchy is not meant to provide a full description of the data
- Develop the WCMP2 compliant metadata description
  - Each data provider will then have the responsibility to create and then publish the metadata records
  - After 01/01/2025, no data will be published on WIS2, without having a metadata record

WIS2 Node implementation

❑ A WIS2 Node, for publishing data, will need the following software components:

1. **A HTTPS server (NGINX, Apache,…) hosting the data**
2. **A MQTT broker (Mosquitto, EMQX, VerneMQ, HiveMQ,…)**
   - Both tools are ready-to-use solute ons.
   - Some are opensource,
   - other are commercial software
3. **A « glue » to prepare the WIS2 Notification Message to be published on the MQTT broker when new data is available**



❑ As opposed to the GTS, WIS2 is not a closed club (*)

All approved data sources can publish and get data from WIS2 directly

(*) : Data publishers on WIS2 have to be endorsed by the Permanent Representative (or equivalent) to be allowed to make their data available

WIS2 node implementation: options

Infrastructure

- On-premise 31
- Public cloud (AWS, Azure, Google,...) 17
- Private cloud (EWC/GISC-Casablanca) 6

Software

- Open source (wis2box) 45
- Commercial (IBL …) 2
- Custom 7

Operation

- NMHS 38
- Regional, sub-regional 15
- Private company (Synoptic …) 1

Support

- Level 0 = No support 13
- Level 1 = Generic answers 16
- Level 2 = Bespoke suggestions 18
- Level 3 = Technical intervention 7

From 2025 onward (start of the operational phase) :

- For installation and support on the software (whatever the solution used), and if needed, WIS Centres will rely on the HMEI
- For day-to-day support, the GISCs will support the WIS Centres in their area of responsibility.

WIS2 contact

- For any question related to WIS2 contact us in:

  wis-support@wmo.int

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Thank you.

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