

International Data Exchange and the transition to WMO's WIS 2.0



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INTRODUCTION

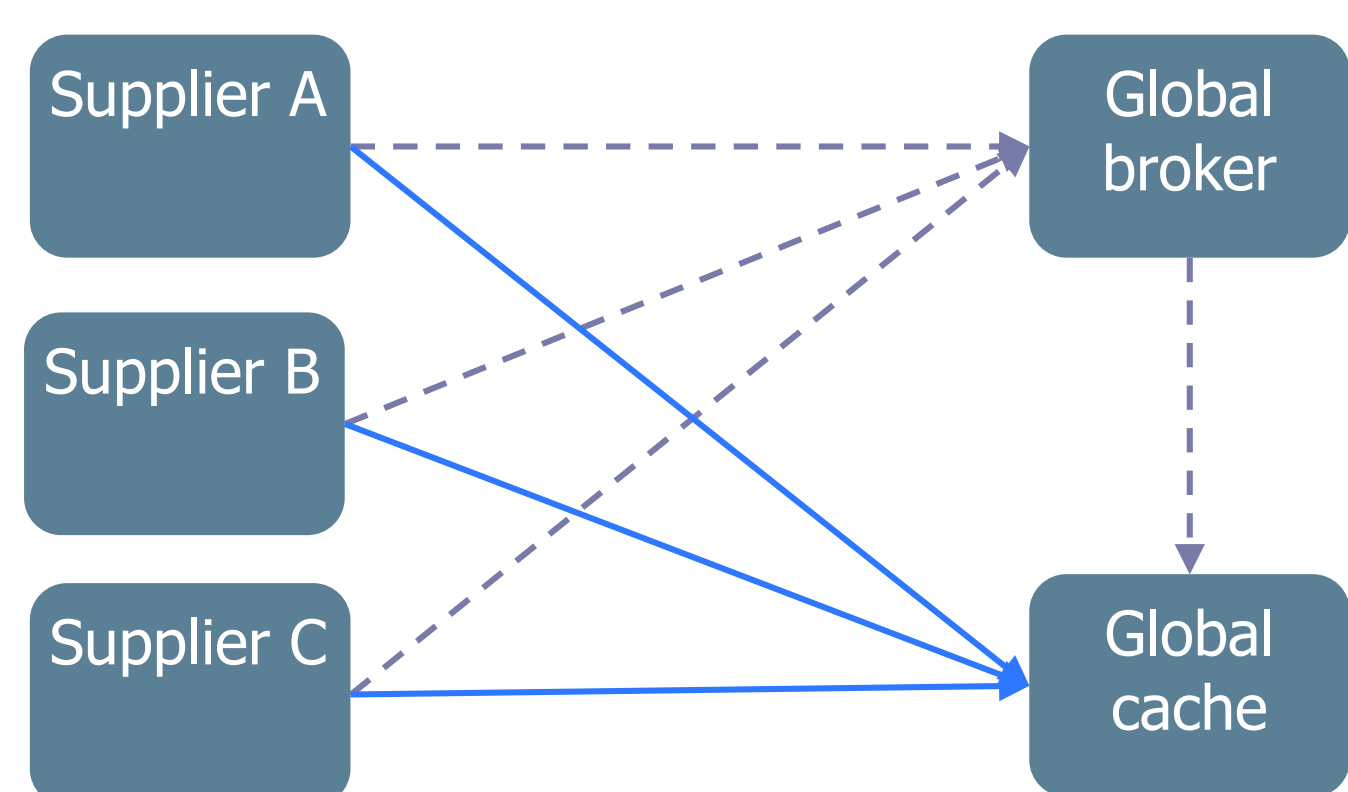
During the coming years, the WMO Information System 2.0 (WIS 2.0) will replace the Global Telecommunication System (GTS) as WMO's global infrastructure for data exchange. WIS 2.0 brings a new approach for request and receiving data (pub/sub), and strives to use open software and public internet connectivity.

The result will be simplified access to data for consumers and simplified provision of data for suppliers. WIS 2.0 will enable us to share more data, more easily – adding value to the data and offering improved opportunities for user applications.

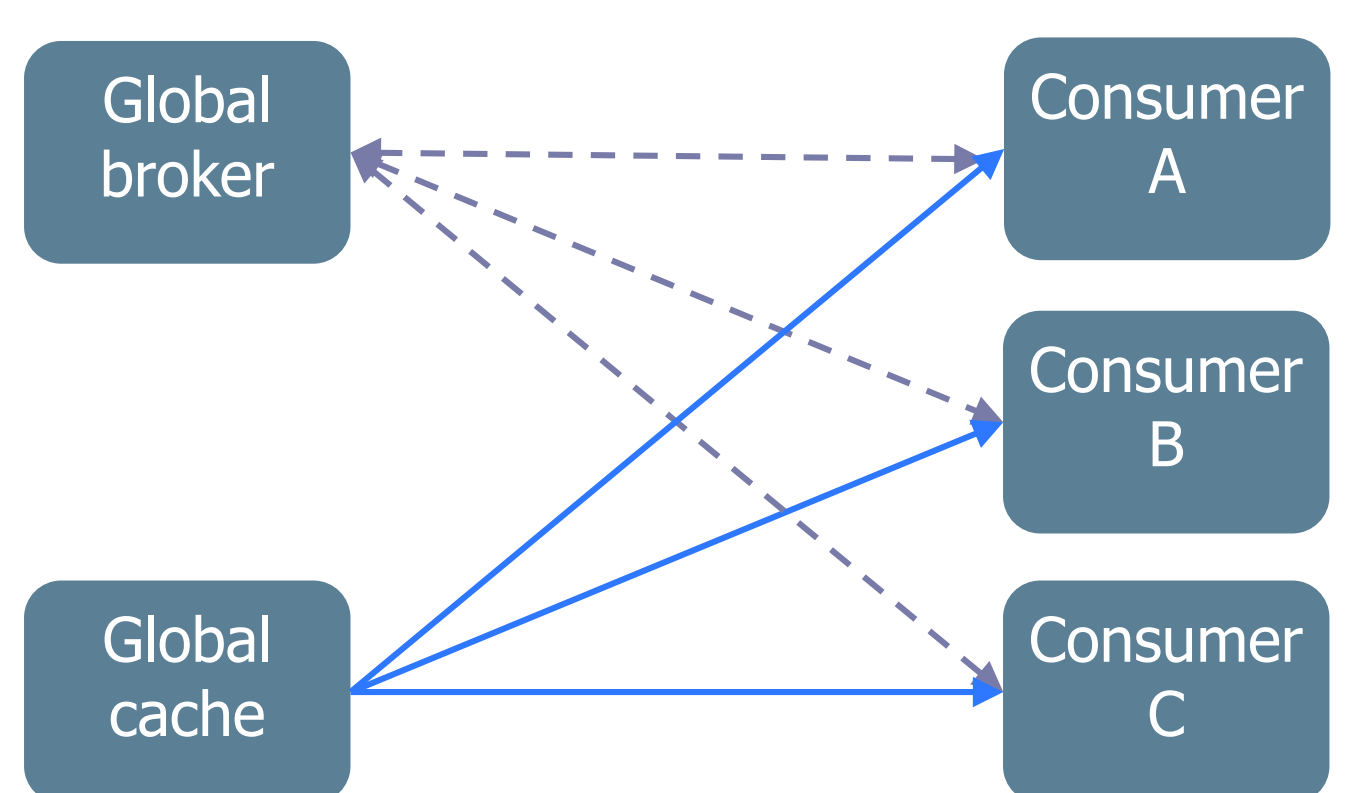
Technical highlights

- Use of existing web standards, service and APIs to ease adoption (e.g pub/sub messaging, MQTT protocol, FTP and SFTP, HTTP and HTTPS)
- Data exchange via the internet – no need to maintain dedicated circuits
- Use of common formats which widely adopted and understood in their target user community (netCDF, HDF, etc) in addition to GRIB and BUFR
- Retirement of GTS – no need for message switching, abbreviated bulletin headers and maintenance of routing tables

Simple architecture: Illustrated here for core (essential) data, which will be available from a global cache. A similar mechanism will deliver recommended (additional) data directly from suppliers to consumers.



Suppliers' perspective:
 Suppliers inform global broker of data availability
 Global broker informs global cache of data availability
 Global cache collects and caches the data from the suppliers



Consumers' perspective:
 Consumers request notification of data availability from global broker
 Global broker informs consumers of data availability
 Consumers collect data from the global cache

Distribution of direct broadcast *full resolution* hyperspectral sounder data

Demonstration starting in Q3 2022 was big step forward sharing DBNet data

NOAA/CIMSS – data provider and WIS 2.0 local node

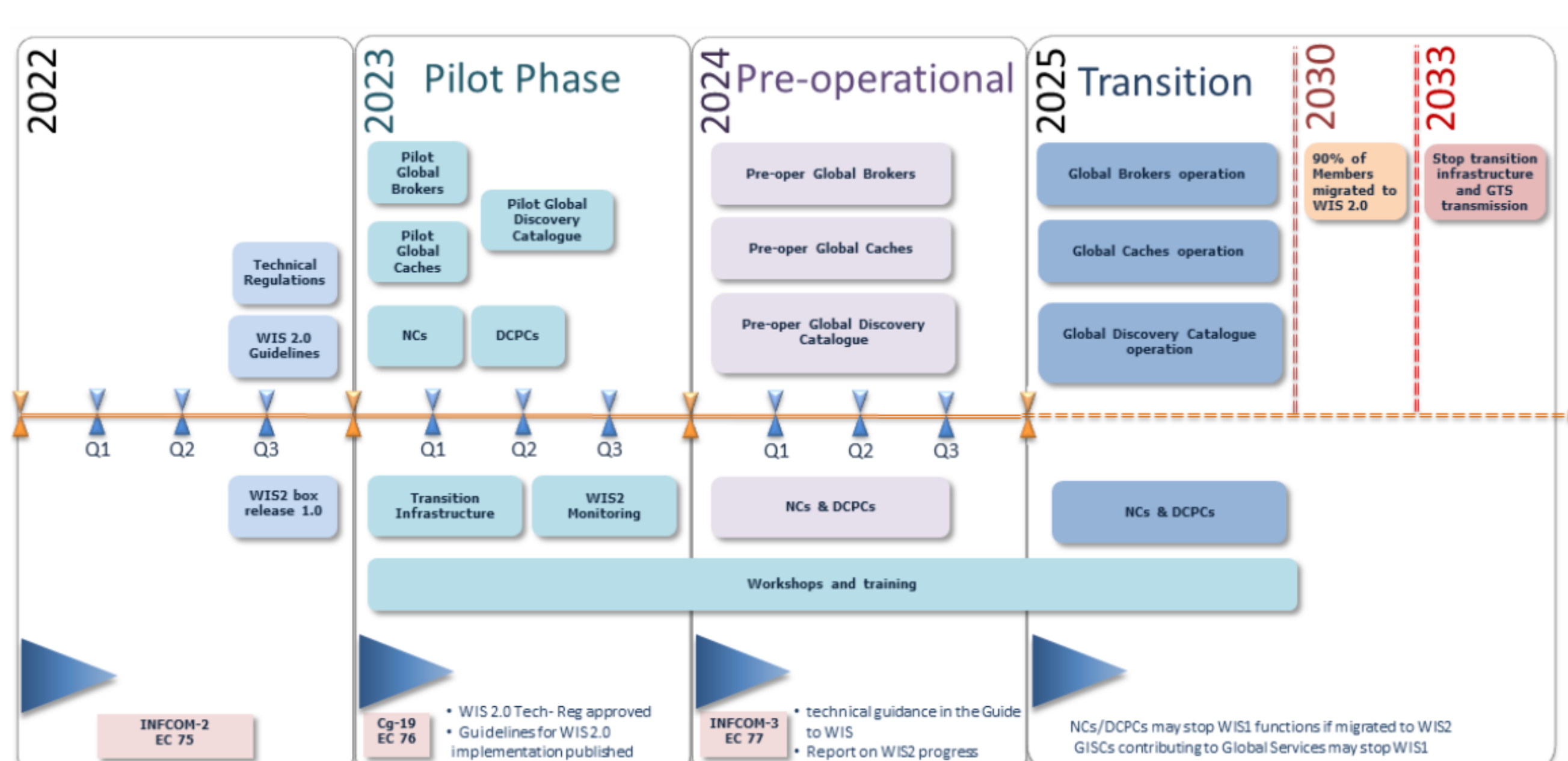
DWD – broker

EUMETSAT – intermediary and dummy consumer

Direct broadcast hyperspectral data (S-NPP/NOAA-21 CrIS, Metop-B/C IASI) are very valuable for NWP, but very big

Since the start of DBNet, data have had to have reduced spectral resolution in order to fit on GTS – ~90% of data thrown away!

Early WIS 2.0 implementations were successfully used to share full spectral resolution data from USA DBNet stations. Implementation took ~1 week; the timeliness of the data is less than 2 minutes from completion of reception to availability at consumer.



WORLD METEOROLOGICAL ORGANIZATION

WIS 2.0

WMO DATA SHARING IN THE 21ST CENTURY

to enable
WMO Unified Data Policy
 and support
WMO Global Basic Observing Network



Key requirements are very simple:

- Internet connection
- Local MQTT broker to be able to publish, subscribe to and receive notification messages (e.g Eclipse Mosquitto or RabbitMQ)
- Data publishing capability (e.g. httpd server) (for *supplier*)
- Metadata editing and publishing function (for *supplier*)
- Data download capability (for *consumer*)

Data are organised by hierarchical topics, and can be subscribed to using wild cards to simply selection (+ for single substitution, # for all levels below):

`origin/a/wis2/xxf/eumetsat/data/core/weather/space-based-observations/satellite4nowcasting/+/ImageL1-5`
`origin/a/wis2/usa/cimss/data/core/weather/space-based-observations/satellite4nwp/#`

Reference information

- [1] WMO Information System 2.0 Strategy (https://library.wmo.int/index.php?lvl=notice_display&id=20422#.ZAXrYT3MKUK)
- [2] Draft Guidance on Technical Specifications of WIS 2.0 (https://community.wmo.int/en/WIS2_Technical_Specification_Guidance)