WIS2 Global Services testing

World Meteorological Organization

Date: 2024-03-31

Version: 2024-03-28

Document location: https://community.wmo.int/wis2-global-services-testing

Standing Committee on Information Management and Technology (SC-IMT)[1]

Commission for Observation, Infrastructure and Information Systems (INFCOM)[2]

Table of Contents

Chapter 1. Abstract

The subject of this Report is the results of testing and experimentation of WIS2 Global Services during the pre-operational phase of WIS2. Global Services testing is coordinated by the WIS2 Architecture and Transition team and provides results and recommendations on testing performance, availability and functionality.

[1] https://community.wmo.int/governance/commission-membership/commission-observation-infrastructures-and-information-systems-infcom/commission-infrastructure-officers/infcom-management-group/standing-committee-information-management-and-technology-sc-imt

[2] https://community.wmo.int/governance/commission-membership/infcom

Chapter 2. Executive Summary

TODO

Chapter 3. Scope

This report presents the testing framework put forth as part of the pre-operational phase of Global Services testing. This report also discussses the results and presents a set of conclusions and recommendations.

Chapter 4. Terms and definitions

This document uses the terms defined in OGC Policy Directive 49, which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this Standard and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the 'ModSpec'. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

4.1. Abbreviated terms

API

Application Programming Interface

GB

Global Broker

GC

Global Cache

GDC

Global Discovery Catalogue

GISC

Global Information System Centre GM: Global Monitor

HTTP

Hypertext Transfer Protocol

HTTPS

Hypertext Transfer Protocol Secure

JSON

JavaScript Object Notation

OGC

Open Geospatial Consortium

MQTT

Message Queuing Telemetry Transport

WCMP2

WMO Core Metadata Profile 2

WIS

WMO Information System

WMO

World Meteorological Organization

WNM

WIS2 Notification Message

WTH

WIS2 Topic Hierarchy

Chapter 5. References

- WMO: WMO Core Metadata Profile (2024) [1]
- WMO: WIS2 Notification Message (2024) [2]
- WMO: WIS2 Topic Hierarchy (2024) [3]
- Draft guidance on technical specifications of WIS2 (2024) [4]
- Draft guidance on transition from GTS to WIS2 (2024) [5]

[1] https://wmo-im.github.io/wcmp2

[2] https://wmo-im.github.io/wis2-notification-message

[3] https://wmo-im.github.io/wis2-topic-hierarchy

[4] https://wmo-im.github.io/wis2-guide/guide/wis2-guide-DRAFT.html

[5] https://wmo-im.github.io/wis2-transition-guide/transition-guide/wis2-transition-guide-DRAFT.html

Chapter 6. High Level Architecture

The focus of testing is to evaluate functionality to ensure all WIS2 components perform as defined by the architecture. Testing is designed to enable core workflows:

- WIS2 Nodes providing data and metadata
- WIS2 Global Brokers subscribing to WIS2 Nodes
- WIS2 Global Caches providing data and metadata for core data and all metadata
- WIS2 Global Discovery Catalogues providing a search API for published discovery metadata
- WIS2 Global Monitors scraping metrics from WIS2 Global Services, and providing metrics/insights on WIS2 performance

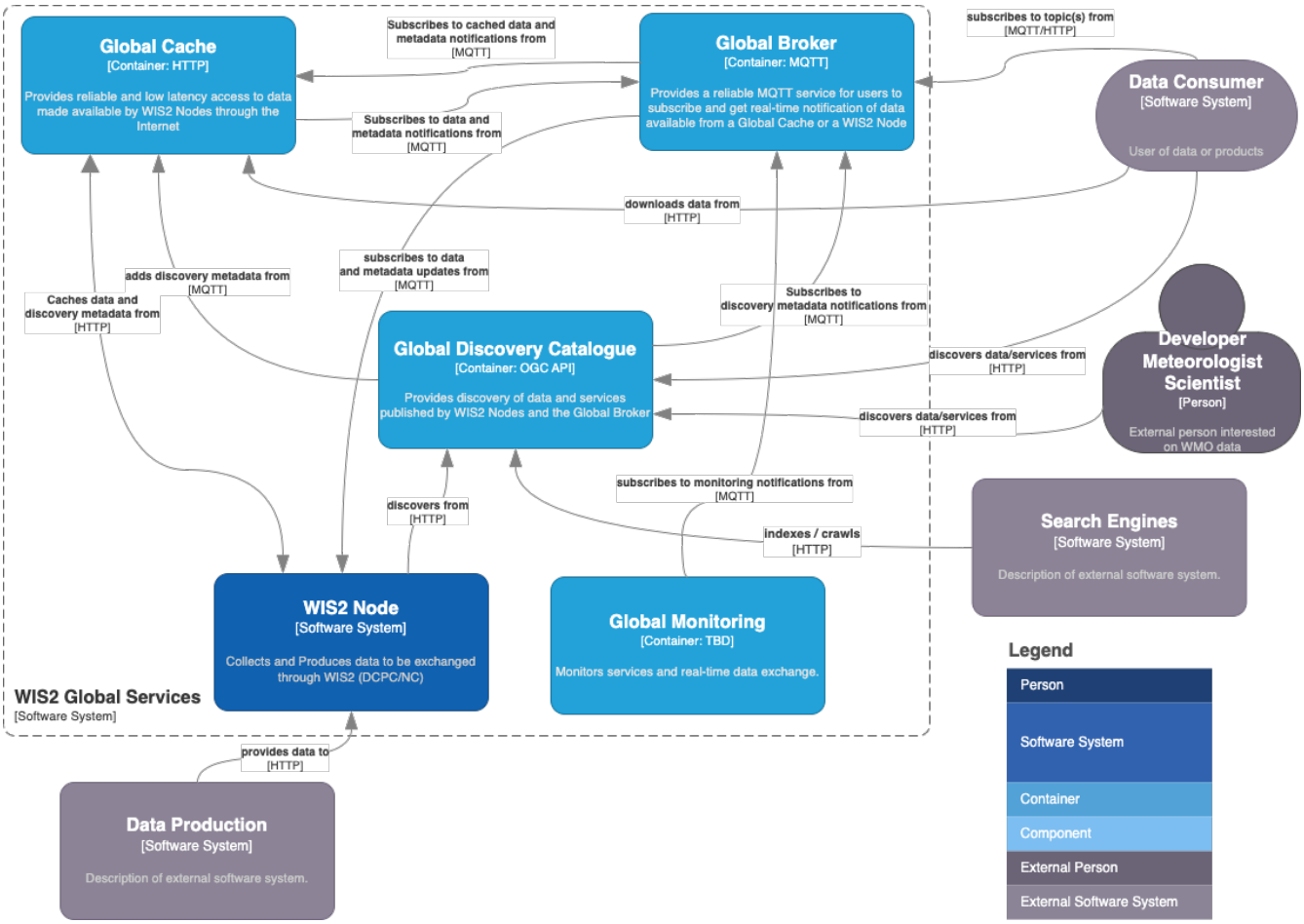

Figure 1. High Level Overview of the WIS2 Architecture

The rest of this section describes the components deployed and standards implemented as part of WIS2.

6.1. WIS2 Specifications

6.1.1. WIS2 Topic Hierarchy (WTH)

WTH defines the structure of the WIS Topic Hierarchy. Topics are utilized by WIS Nodes, Global Broker services, and data/metadata subscribers.

6.1.2. WIS2 Notification Message (WNM)

WNM defines the content, structure, and encoding for the WIS2 Notification Message Encoding. WNMs are provided as MQP payloads by WIS2 nodes, Global Broker services, as well as Replay API services (optional OGC API - Features services for data notifications).

6.1.3. WMO Core Metadata Profile (WCMP2)

WCMP2 defines the content, structure, and encoding for WMO resources. WMO resources include, but are not limited to, data (NWP models, observations, forecasts and warnings, etc.), services/APIs, and processes.

6.2. WIS2 Components

6.2.1. Global Broker

WIS2 incorporates several Global Brokers, ensuring highly resilient distribution of notification messages across the globe.

6.2.2. Global Cache

A Global Cache provides a highly available data server from which a Data Consumer can download Core data, as specified in the WMO Unified Data Policy, Resolution 1 (Cg-Ext(2021)).

6.2.3. Global Discovery Catalogue

A Global Discovery Catalogue enables a data consumer to search and browse descriptions of data published by each WIS2 Node. The data description (i.e., discovery metadata) provides sufficient information to determine the usefulness of data and how one may access it.

6.2.4. Global Monitor

A Global Monitor tracks what data is published by WIS2 Nodes, whether data can be effectively accessed by Data Consumers, and the performance of components in the WIS2 system.

6.3. Testing framework

6.3.1. Data

TODO

6.3.2. Environment

TODO

6.3.3. Performance testing

Ensure WIS2 Global Services are able to operate under various loads.

6.3.4. Functional testing

Ensure WIS2 Global Services operate with one another as expected and meet requirements.

6.4. Tests

6.5. GDC API testing

6.5.1. Type of test

Functional

6.5.2. Purpose

Validate that a GDC API satisfies common user queries

6.5.3. Steps

1. step 1
2. step 2

Chapter 7. Results

Chapter 8. Discussion

TODO

Chapter 9. Conclusions

TODO

Chapter 10. Future work

TODO

Appendix A: Revision History

Date	Release	Author	Primary clauses modified	Description
2024-03-30	0.1	Kralidis	all	initial version

Bibliography

- ab - Apache HTTP server benchmarking tool (2024) [1]

[1] https://httpd.apache.org/docs/2.4/programs/ab.html