

Interconnection of GISC Casablanca with NCs in its AoR



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World Meteorological Organization

Organisation météorologique mondiale

Project objectives

The project aims to promote the use of Internet as a support for the exchange of data between GISC of Casablanca and the WIS NCs and DCPCs within its AoR given the difficulties encountered while trying to implement peer-to-peer links or point to point internet VPN

Provide contribution to the definition and implementation of **WIS 2.0**, as a collaborative system of systems using web-architecture and open standards to provide simple, timely and seamless sharing of trusted weather, water and climate data

The project is a **proof of concept** that the rate of data exchanged internationally could be raised significantly in RA I while using web services.

The project will demonstrate that a Cloud based web application dedicated to data collection from NCs will enable each member to share and access in real time and in secure manner the data collected from the national synoptic stations.



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Project team

R. Merrouchi, Y. Darari, E. Ennaji and A. Mellouki (**GISC Casablanca**)

Representatives of NMHs of: **Nigeria, Libya, Republic of Sychelles, RDC, Cameroon, Cabo Verde...**

Bernard Edward GOMEZ (Regional WMO office)



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Project plan

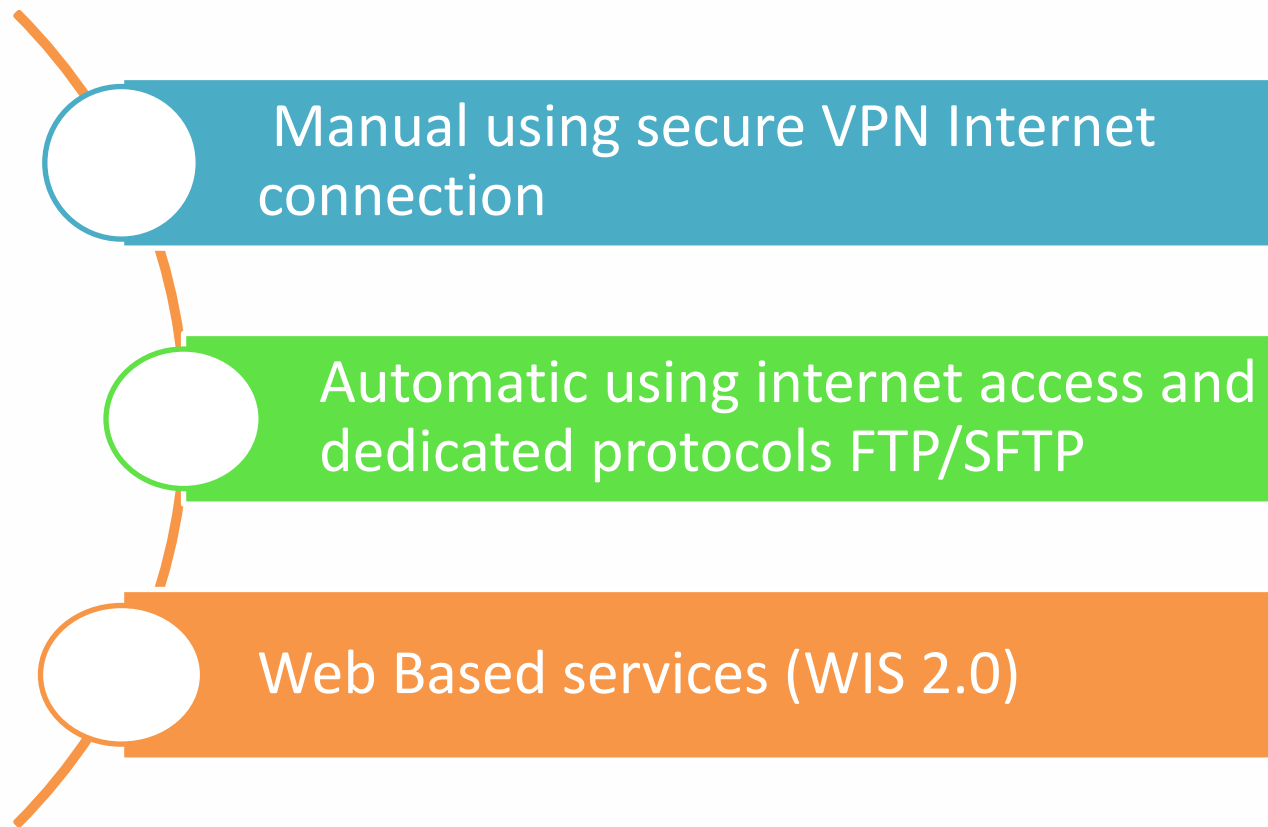
Action	Outcomes	Time Frame
Implementation of a new and complete solution for information system security and computer networking	Material equipment acquired	Achieved in December 2019
Pilot project with Nigerian Met service (NIMET): implementation of machine to machine secure connection using internet	Data from NIMET are well received by GISC Casablanca and disseminated to the GTS	Operational since Marsh 2019
Prepare and share a Survey aiming to collect information on the technical capabilities of WIS NCs in the AoR	Survey established and disseminated	Done, only 30% of NCs had responded the survey (2019)
Establishment of links with WIS National Centers in the AoR of GISC Casablanca	Test of a secure VPN internet connection successfully conducted with Democratic Republic of Congo, Cameroon, Nigeria and Cabo Verde. Machine to machine interconnection successfully established with NIMET (2019), Republic of Seychelles and with Libya (2021)	On going,
Web application development	Web application tested and ready to use in operational mode. A beta version is deployed nationally in operational use (insertion of collective message still missing)	On going



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Project Description

Building telecommunication interfaces NC/GISC Casablanca



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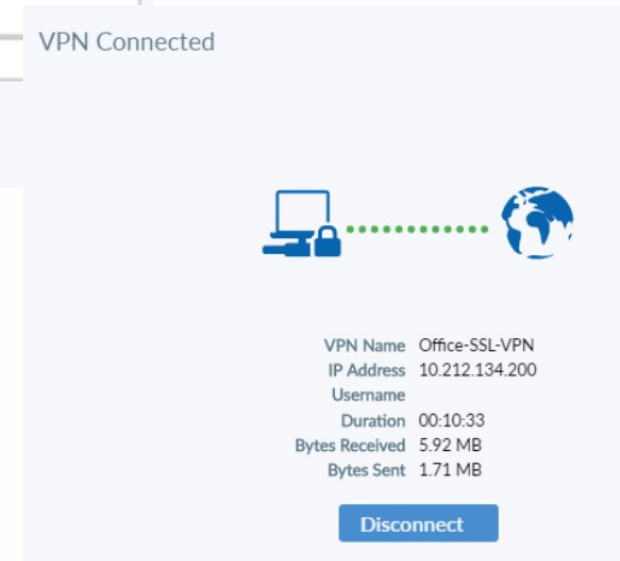
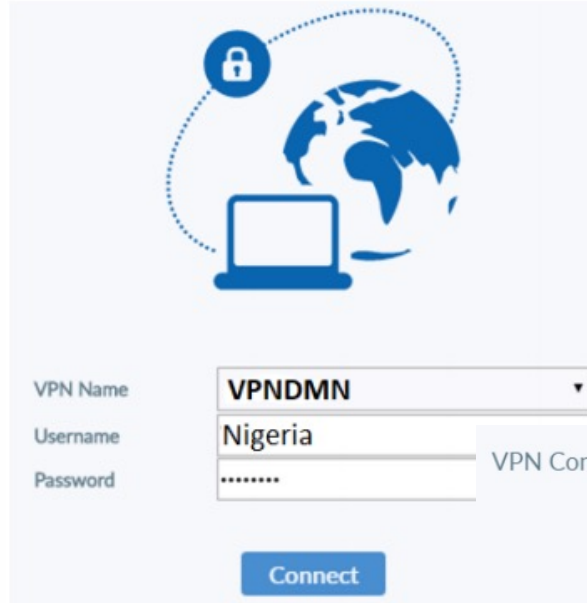
Project Description

Manual using secure VPN Internet connection

A VPN internet secure access using our Firewall client solution have been successfully tested with several countries: **Nigeria, Cameroon, Republic of Cabo Verde, Democratic Republic of the Congo....**

The solution have been used at the national level to allow simultaneous distant access to more than **100 internal** user as an action to face COVID 19.

Once the link is established, the NC shall send its bulletins manually to GISC Casablanca.



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Project Description

Automatic using internet access and dedicated protocols FTP/SFTP

- Machine to machine connection.
- Data and bulletins are automatically transferred from the NC, received at GISC Casablanca and disseminated to the GTS.
- This mode have been successfully applied with **Algeria, Nigeria, Republic of Seychelles** and it is in phase of implementation with **Libya**.

GISC Casablanca

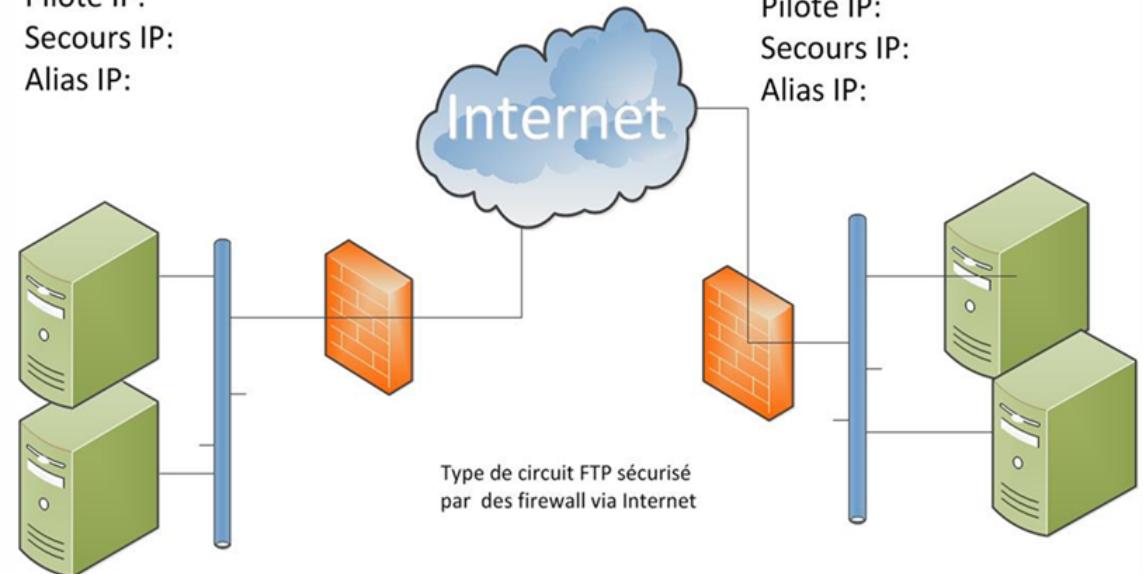
AMSS public IP

Pilote IP:
Secours IP:
Alias IP:

Nigeria

AMSS or any machine with public IP address

Pilote IP:
Secours IP:
Alias IP:



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Project Description

Automatic using internet access and dedicated protocols FTP/SFTP



GISC OF CASABLANCA



Daily report on WMO messages received by Morocco from Nigeria on 22 - 08 - 2021

Id	Message header	Time received	Time sent to GTS
1	SMNI01DNAA220000	2021-08-22 00:08:27	2021-08-22 00:08:39
2	SANI20DNAA220100	2021-08-22 01:12:09	2021-08-22 01:12:14
3	SMNI01DNKN220000	2021-08-22 01:28:06	2021-08-22 01:28:13
4	SMNI01DNMM220000	2021-08-22 01:28:06	2021-08-22 01:28:13
5	SANI20DNAA220200	2021-08-22 02:10:03	2021-08-22 02:10:23
6	SINI20DNMM220300	2021-08-22 03:05:06	2021-08-22 03:05:39
7	SINI20DNAA220400	2021-08-22 04:08:45	2021-08-22 04:09:11
8	SMNI01DNKN220600	2021-08-22 06:06:06	2021-08-22 06:06:10
9	SMNI01DNMM220600	2021-08-22 06:05:07	2021-08-22 06:05:10
10	SMNI01DNAA220600	2021-08-22 06:09:51	2021-08-22 06:10:04
11	SINI20DNAA220900	2021-08-22 09:07:38	2021-08-22 09:08:05
12	SINI20DNMM220900	2021-08-22 09:12:06	2021-08-22 09:12:31
13	SMNI01DNAA221200	2021-08-22 12:13:01	2021-08-22 12:13:19
14	SMNI01DNKN221200	2021-08-22 13:42:10	2021-08-22 13:42:29
15	SMNI01DNMM221200	2021-08-22 13:42:10	2021-08-22 13:42:29
16	SINI20DNMM221500	2021-08-22 15:10:06	2021-08-22 15:10:12
17	SMNI01DNMM221800	2021-08-22 18:07:06	2021-08-22 18:07:09
18	SMNI01DNAA221800	2021-08-22 18:10:36	2021-08-22 18:11:04
19	SMNI01DNKN221800	2021-08-22 18:13:06	2021-08-22 18:13:30
20	SANI20DNAA221900	2021-08-22 19:11:06	2021-08-22 19:11:17
21	SANI20DNAA222000	2021-08-22 20:10:17	2021-08-22 20:10:24
22	SINI20DNMM222100	2021-08-22 21:04:07	2021-08-22 21:04:10
23	SINI20DNAA222100	2021-08-22 21:10:17	2021-08-22 21:10:29
24	SANI20DNAA222300	2021-08-22 23:12:37	2021-08-22 23:13:05



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Project Description

Web Based services (WIS 2.0)

The screenshot displays the GISC-Casablanca web application interface. At the top, there is a blue header with the logo of the Direction Générale de la Météorologie (DGM) and the text "Système Extranet GISC-Casablanca". Below the header, there is a navigation menu with options like "Monitoring", "Vigilances", "Bulletins-Prévision", "Observations-Système", "Cartes Météo", "Chercher utilisateur", and "Publications". The main content area shows a data entry form with fields for "Nouveau", "Synop", "Agadir-Inzg-60250", and "2021-08-22 21:00". There are buttons for "Décodage" and "Transmettre". Below the form, there is a black box containing the message ID "SNMC:40 GMAA 222000.202108222001445" and the message text "AAXX 22204 60250 22958 01308 10216 20190 30115 40148 333 60005". To the right, there is a yellow box containing the decoded message "msg: AAXX 22204 60250 22958 01308 10216 20190 30115 40148 333 60005" and a detailed synoptic observation report for station 60250 (Africa) on 2021-08-22 at 21:00 UTC. The report includes details such as wind data, precipitation data, weather data, base of lowest cloud, visibility, total cloud cover, wind direction and speed, temperature, dewpoint, relative humidity, station level pressure, sea level pressure, and precipitation amount since 1 hour(s).

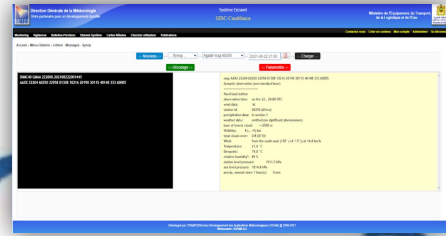


Direct collection of Data using a dedicated Web application and their dissemination to the GTS using the GISC facilities

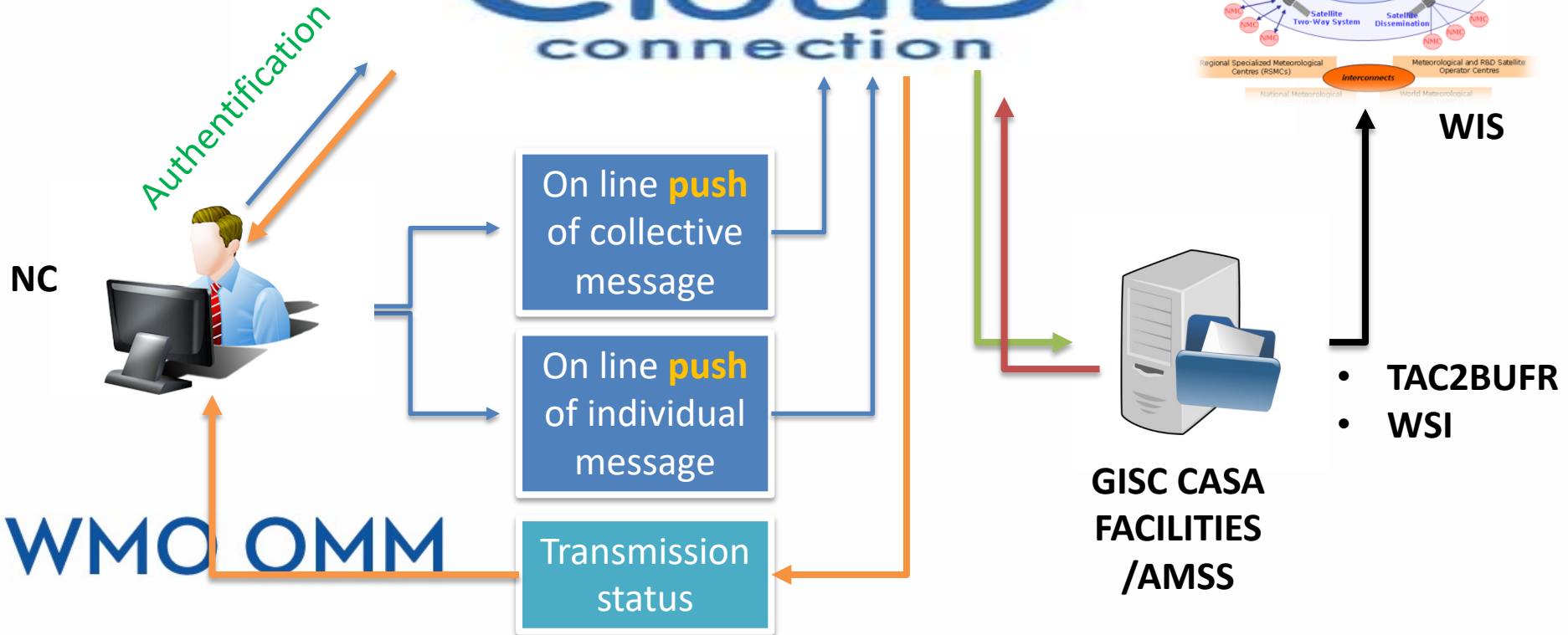
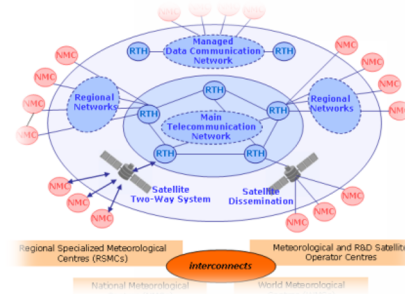


Project Description

Web Based services (WIS 2.0)



Cloud connection



Benefits

- The project is a **proof of concept** that the rate of data exchanged internationally could be raised significantly in RA I while using web services.
- A Cloud based web application dedicated to data collection from NCs will enable each member to share and access in real time and in secure manner the data collected from the national synoptic stations.
- Issues related to the use of Binary codes and of the WIGOS single identifier (WSI) will be addressed.



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WIS 2.0 Principles

- 1** Web technologies, industry best practices and open standards
- 2** Uniform Resource Locators (URL) to identify resources
- 3** Use of public telecommunications networks (i.e., Internet) when publishing digital resources
- 4** Provision of Web service(s) to access or interact with digital resources
- 5** Provide 'data reduction' services via WIS that process 'big data'
- 6** Add open standard messaging protocols that use the publish-subscribe message pattern
- 7** Require all services that provide real-time distribution of messages to cache/store 24H
- 8** Adopt direct data exchange between provider and consumer
- 9** Phase out the use of routing tables and bulletin headers
- 10** Provide a Catalogue containing metadata that describes both data and the service
- 11** Encourages data providers to publish metadata in a way that can be indexed by commercial search engines

WIS 2 Principles in the project

Principle 1: WIS 2.0 adopts Web technologies and leverages industry best practices and open standards

- The WIS interconnection project in RA-I adopts Web technologies and leverages industry best practices and open standards in terms of providing secure links between national centers and GISC Casablanca.



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WIS 2 Principles in the project

Principle 3: WIS 2.0 prioritizes use of public telecommunications networks (i.e., Internet) when publishing digital resources

- The project is prioritizing the use of public telecommunications networks (i.e. Internet) when publishing digital resources. The use of internet appears to be the easiest way not only to ensure the connection but also to facilitate the exchange of any digital resources provided by the national center.



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WIS 2 Principles in the project

Principle 4: WIS 2.0 requires provision of Web service(s) to access or interact with digital resources (e.g., data, information, products) published using WIS

- By establishing a permanent, open and secure links, the machine-actionability is fully supported and thus the national center could be able to access or interact with digital resources with little or no human intervention by using appropriate software solutions.
- Web services allowing the push of individual or collective messages will be offered,
- New APIs could be developed to allow interaction with the web application to be developed.



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WIS 2 Principles in the project

Principle 7: WIS 2.0 will require all services that provide real-time distribution of messages to cache/store the messages for a minimum of 24-hours, and allow users to request cached messages for download

- The project promotes the use of services that provide real-time distribution of messages. The technical capabilities of GISC Casablanca will allow users to request cached messages for download.



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WIS 2 Principles in the project

Principle 10: WIS 2.0 will provide a Catalogue containing metadata that describes both data and the service(s) provided to access that data

Principle 11: WIS 2.0 encourages data providers to publish metadata describing their data [EF1] and Web services in a way that can be indexed by commercial search engines

- The project will allow national centers and DCPCs within the AoR of GISC Casablanca to provide a Catalogue containing metadata that describes both data and the services provided to access that data.
- The project also will support not only harvesting of digital data and metadata resources through the Openwis software in use by GISC Casablanca but also their provision in a way that they could be indexed by commercial search engines.



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Project data standards

The following data standards are **consumed** (e.g., downloaded and decoded from data access services) and/or **produced** (e.g., published to user clients):

- Binary codes

(in addition to other community standards based on JSON, XML and CSV)



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Project metadata standards

The following metadata standards are **consumed** (e.g., harvested from metadata catalogs and inventories) and/or **produced** (e.g., published for discovery):

- ISO 19139 ([WMO Core Metadata Profile version 1.3](#))



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Data discovery

WHOS implements a data discovery function through the **publication of multiple standard data discovery service interfaces**, such as:

- OAI-PMH
- OGC CSW
- OpenSearch



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Data exchange

- The main objective of the project is to promote the international exchange of data collected in Africa.
- Function related to data collection, data processing and data dissemination through WIS are included.



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Thank you
Merci

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