

First-mile data collection and standards

WMO Workshop on Standardization of First-mile Data
Collection from Automatic Observing Platforms

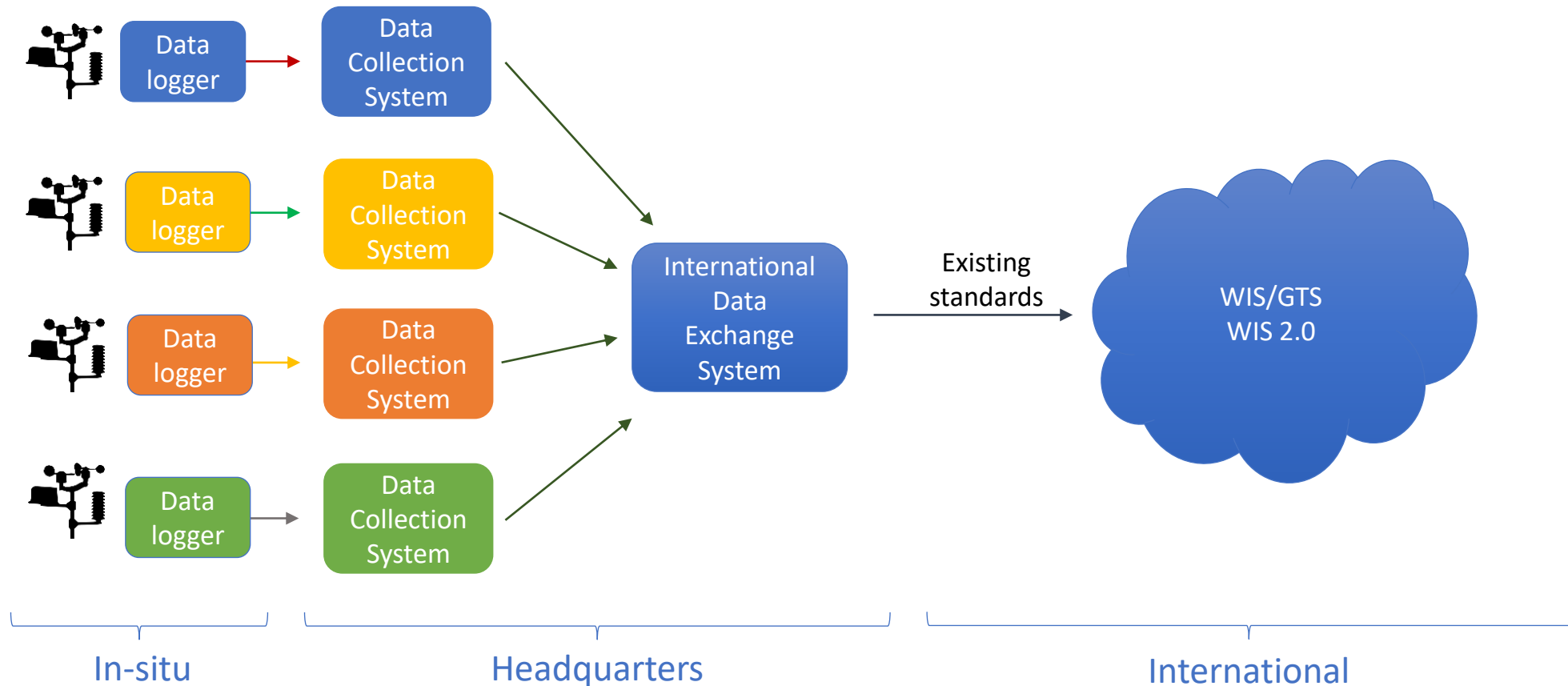
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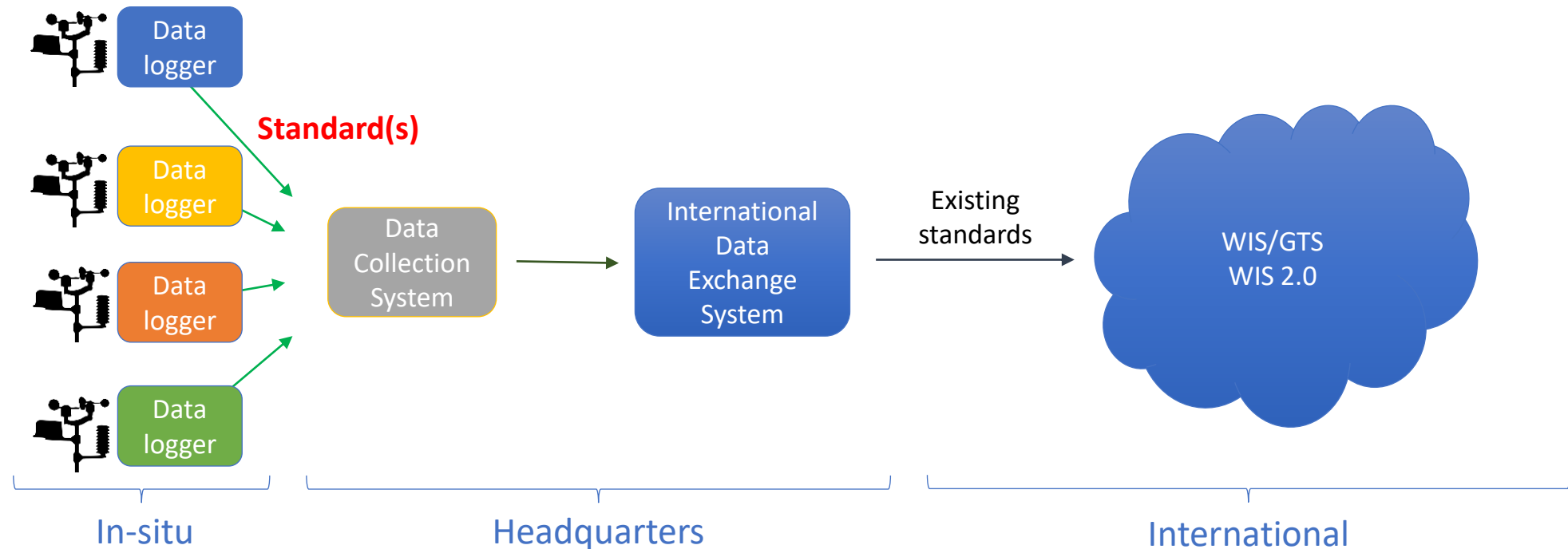
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Introduction

The current situation (and glossary)



How it may* look like...



Depending on the telecom support (5G, LORA, Satellite,...) there might be some differences. The Data Collection System with the required telecom interfaces should be able to ingest all sources.

What is going to be discussed is this “1st Mile” from in-situ to headquarters

Why are we are ?

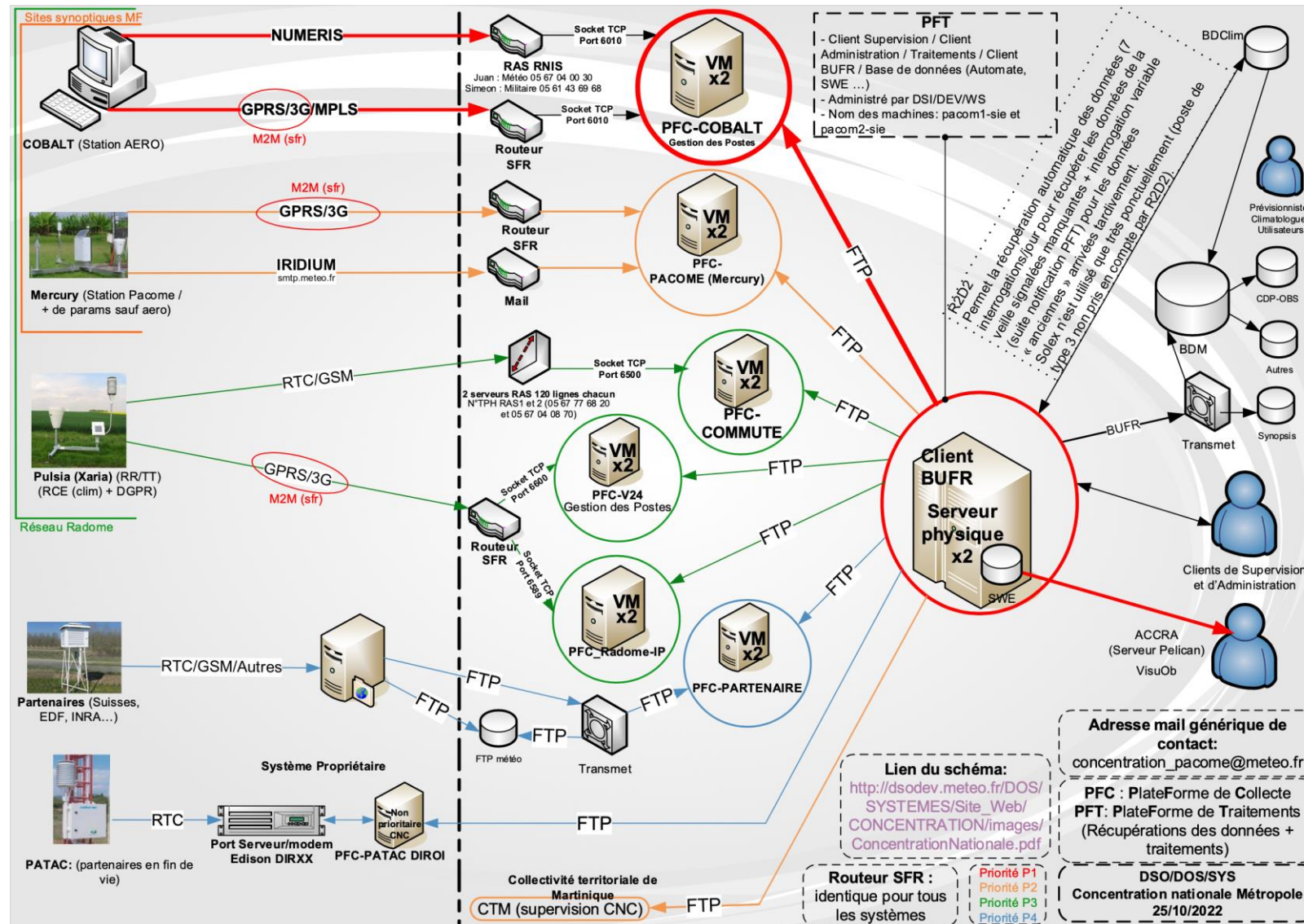
Ten years ago...

- During a WMO event, I had the opportunity to talk with a colleague from Vietnam
- The “shape” of the country is rather particular. Very extended from North to South.
- He shared with me the situation of the forecasters in Ho Chi Min
- To visualize the observations from the entire country, they had in front of them, four different screens, four different PCs, with different UIs. Getting the global view in this context was a real challenge (not to mention the support aspect)
- Why ?

The observing network was the result of contributions from 4 different countries, each one providing an end-to-end solution: the stations, the system to collect the data, the tool to visualize the data



The situation at Météo-France



More recently

- Since June 2022, the GBON Tender Specifications for AWSs is available
- This document is meant to help Members to tender the required equipment for their compliance with GBON
- The concept of standardizing the 1st mile is mentioned in the document e.g. in Chapter 3.2:

285 Standard internal telecommunication/transmission network protocol

The systems should use TCP/IP as standard telecommunication/transmission network protocol for internal interfaces whenever possible. This enables systems to exchange data on the same hardware platform or via LAN/WAN. Exception: interfaces with instruments may not be able to use TCP/IP, but can use another protocol.

- The intent for a standard is here, nevertheless it is not specified.

Standards

Not this...

HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)



WMO is a "factory" of standards

- It is in our collective DNA to make sure that when someone produces something and exchange that information, the person/system receiving this information will be able to understand what it is.
- For this to happen, WMO Members have agreed on using : initially X25 then IP, BUFR, GRIB, defining a file naming convention, GTS Headers,...
- WIS2 goes a step beyond:
 - Selecting standards: HTTP, MQTT, OpenMetrics, OGC API Records,...
 - Enriching those standard to ensure a very deep interoperability
 - Drafting Manual and Guides, providing reference implementation, to ensure that those "surcharged standards" are **consolidated results of science, technology and experience**

Standards and Innovation (1)

- ISO, another factory of standards, published in 2022 a document called “Standards and innovation: What does the research say?”. This report is freely available at <https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100466.pdf>

Standards and Innovation (2)

General functions of standards	Positive impacts on innovation	Negative impacts on innovation
Information	<ul style="list-style-type: none"> ▶ Provide codified knowledge relevant for innovation ▶ Coordinate collaborative innovation activities 	<ul style="list-style-type: none"> ▶ Generate cost for standards screening ▶ Allow unintended knowledge spillovers to competitors by implementation of standards
Variety reduction	<ul style="list-style-type: none"> ▶ Allow exploitation of economies of scale via standards ▶ Support critical mass via standards in emerging technologies and industries ▶ Create incentives for incremental innovation based on standards 	<ul style="list-style-type: none"> ▶ Reduce choice ▶ Support market concentration ▶ Push premature selection of technologies ▶ Limit incentives for radical innovation
Minimum quality	<ul style="list-style-type: none"> ▶ Creating trust in innovative technologies and products at the demand side 	<ul style="list-style-type: none"> ▶ Promote market concentration
Compatibility	<ul style="list-style-type: none"> ▶ Increase variety of system products ▶ Promote positive network externalities ▶ Avoid lock-in into old technologies 	<ul style="list-style-type: none"> ▶ Push monopoly power ▶ Foster lock-in into old technologies in case of strong network externalities
Insurance	<ul style="list-style-type: none"> ▶ Serve as insurance against failure of radical innovation 	<ul style="list-style-type: none"> ▶ Create incentives for incremental instead of radical innovation

Source: Extension of Swann (2000) and Blind (2004, 2016, 2017)

Table 1 – Functions of standards and their effects on innovation

Standards and Innovation (3)

- In the conclusion:

In conclusion, research into the impacts of standards on innovation presents a number of challenges on a theoretical level. For one, it involves considering complex interactions as well as new forms of innovation. But it also requires methodological improvements in order to progress to the next step, i.e. from simply showing correlations to revealing causal relationships. Ultimately, this can only be achieved by gaining access to more precise and representative data on the use of standards, at both national and international levels.

- So, it depends...
- However, considering our particular situation and looking at the negative impacts on the previous slide (monopoly, concentration,...) we can be fairly optimistic to consider that standard here would have a positive impact
- Hopefully, the next two days will demonstrate that we need to work on this and that this work and the upcoming results will bring benefits to our community, WMO Members and HMEI.

So, shall we give it a go ?

Thank you.



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