



# European Supplementary dataHub (E-SOH)

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World Meteorological Organization

Organisation météorologique mondiale

# Project objectives

## User Requirements

**User Requirements** – Within the meteorological community – Improvements needed in forecasting of fog and convective events

### Priority observation types for E-SOH

1. Sub-hourly resolution observations from stations operated by EUMETNET *Members* that are normally only made available hourly (or less frequently).
2. Sub-hourly resolution observations from stations operated by EUMETNET *Members* that are not normally made available
3. Rain-gauge observations, from gauges operated by EUMETNET Members
4. Rain-gauge observations, from gauges operationally operated by 3<sup>rd</sup> parties who currently make their data available to one or more EUMETNET Member, but aren't normally published
5. Real-time observations from personal weather stations (PWS) in a way that is consistent with other land surface observation
6. Single unified view of supplementary observations, that is easily accessible and findable, is easily integrated into downstream systems and can be re-used (i.e., following FAIR principles). Access to data across international borders is simplified.



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# Project objective

## Vision

With European co-operation and collaboration, E-SOH will deliver the first component of a Federated European Meteorological Data Infrastructure, that is sustainable and meets the technical requirements and standards of international bodies.

### E-SOH in a wide Context

- E-SOH will develop World leading capability.
- First pilot project of **FDCM**
- Demonstration project of **WIS 2.0**.
- Will exploit **Cloud** and where appropriate EWC.
- Enabler for Members to meeting their open data obligations (e.g., **Resolution 42, HVD**)

### Federation

- Mix of hosts to deliver the overall Service. Initially, mostly centralised
- Sub-hourly obs, eventually delivered by Members.
- 3<sup>rd</sup> party, PWS, etc. centralised more likely.
- Standards-based approach will allow a federated model
- Recognise Members will follow national IT strategies.

### Approach

- Start small and build
- Open!
- Share and re-use
- Platform agnostic (within reason)
- Sustainable, continuous development and lifecycle managed
- Minimise Members duplication of effort

# Project team – Work Package 0 - Vision

A Task Team established by EUMETNET to develop the vision of E-SOH, clarify the requirements and create the Invitation to Tender

Stuart Matthews (Met Office, EMN Obs-CA), Gé Verver (KNMI, HVD ET), Michael Schick (EUMETSAT, EWC),  
Rowan Smith (Met Office), Sarah O'Reilly (Met Éireann), Umberto Modigliani (ECMWF, EWC),  
Willie McCairns (ECOMET), Wim Som de Cerff (KNMI), Jacqueline Sugier (Met Office, EMN Obs-CA),  
Gérard Plangger (Meteo Swiss), Rémy Giraud and Frédéric Guillaud (Météo-France)

Task Team ended on 31 August 2021



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# Project team

Design, Development and Operations teams to be confirmed

- Invitation to Tender will be issued within the next 2 weeks
  - Approval given on 9 September 2021
- Open to All EUMETNET Members, plus ECMWF and EUMETSAT as hosts of EWC
- Initially Three Work Packages related to sub-hourly surface observations
  - WP1 – Design,
  - WP2 – Build,
  - WP3 – Operate
- Sub-hourly observations from EUMETNET Members networks only.
  - Other observation types will be considered later and under separate projects



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# Project plan (WP1, 2 and 3)

	2021 Q4	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024	2025	2026...
	o n d	j f m	a m j	j a s	o n d	j f m	a m J	j a s	o n d	Jan-Dec	Jan-Dec	...
<i>ITT and Business Case</i>	1											
<i>Establish Development Team</i>				2		Development						
<i>Design (WP1)</i>					3							
<i>Build (WP2)</i>						Development				4		
<i>Operate (WP3)</i>										5		
<i>Operational</i>											Operations	

<b>Legend:</b>	<span style="display:inline-block; width:15px; height:15px; background-color:lightgrey; border:1px solid black;"></span> No started	<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span> Development	<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span> Operations
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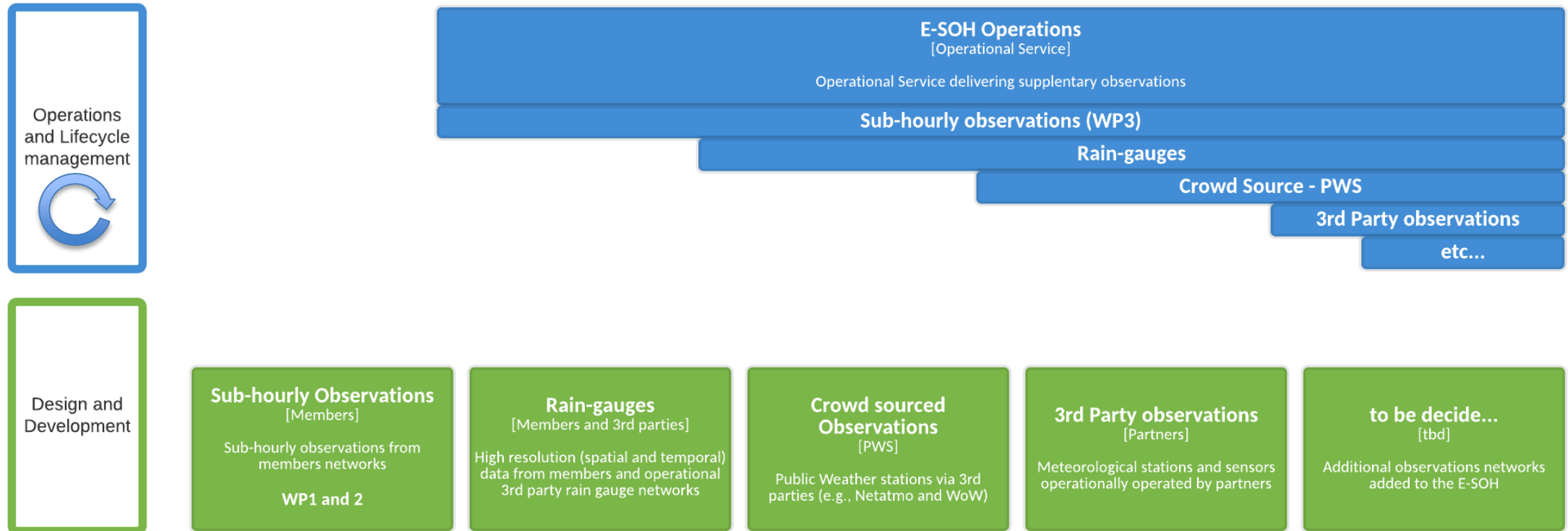
1. Tender response – 14<sup>th</sup> January 2022
2. Business case presented to EUMETNET Assembly 28 – May 2022
3. Design phase complete and approved by the Project Board - January 2023.
4. Development of first release of E-SOH complete and operational service starts - December 2023.
5. Report on Lessons Learnt and operational costs of maintaining E-SOH in the long term (at least next 5 years) - Spring 2025.



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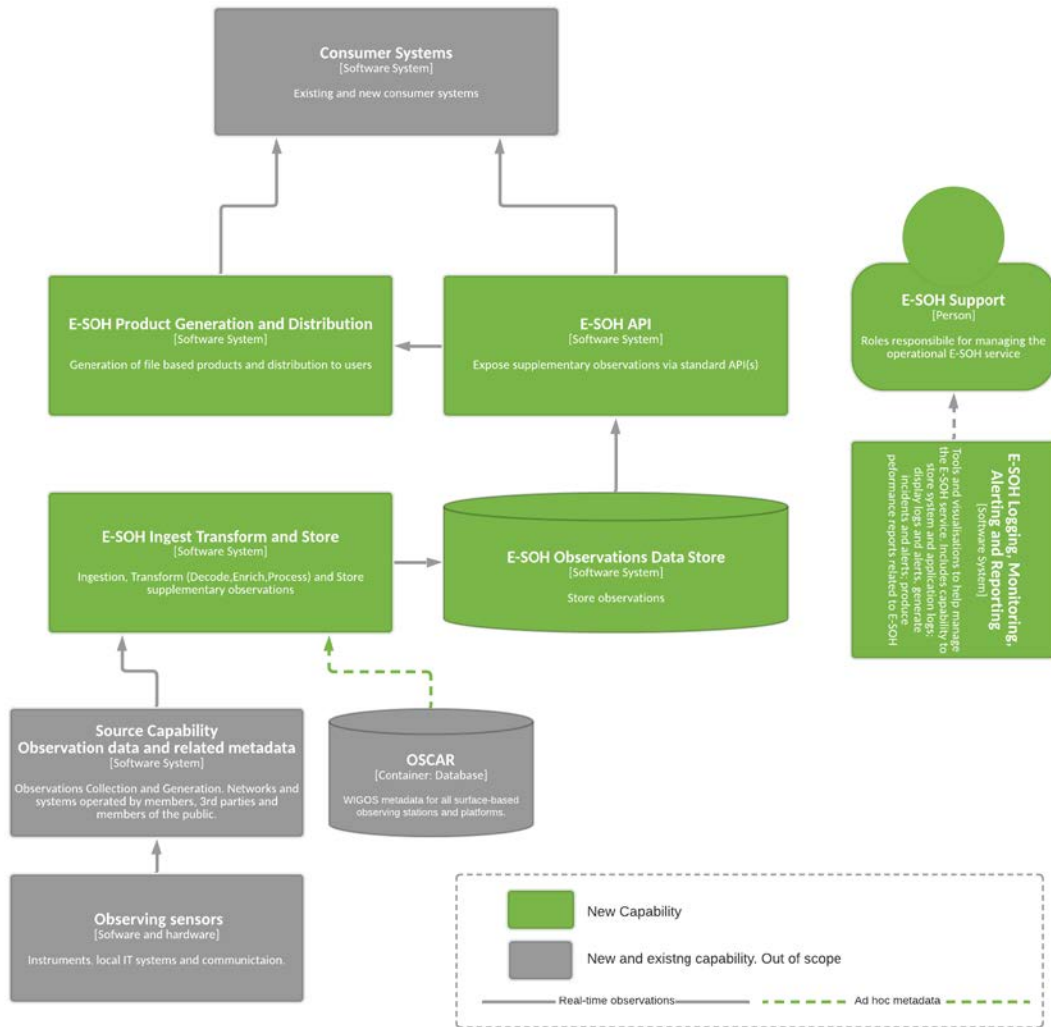
# E-SOH Ambition

No time timeframe yet and priority may change

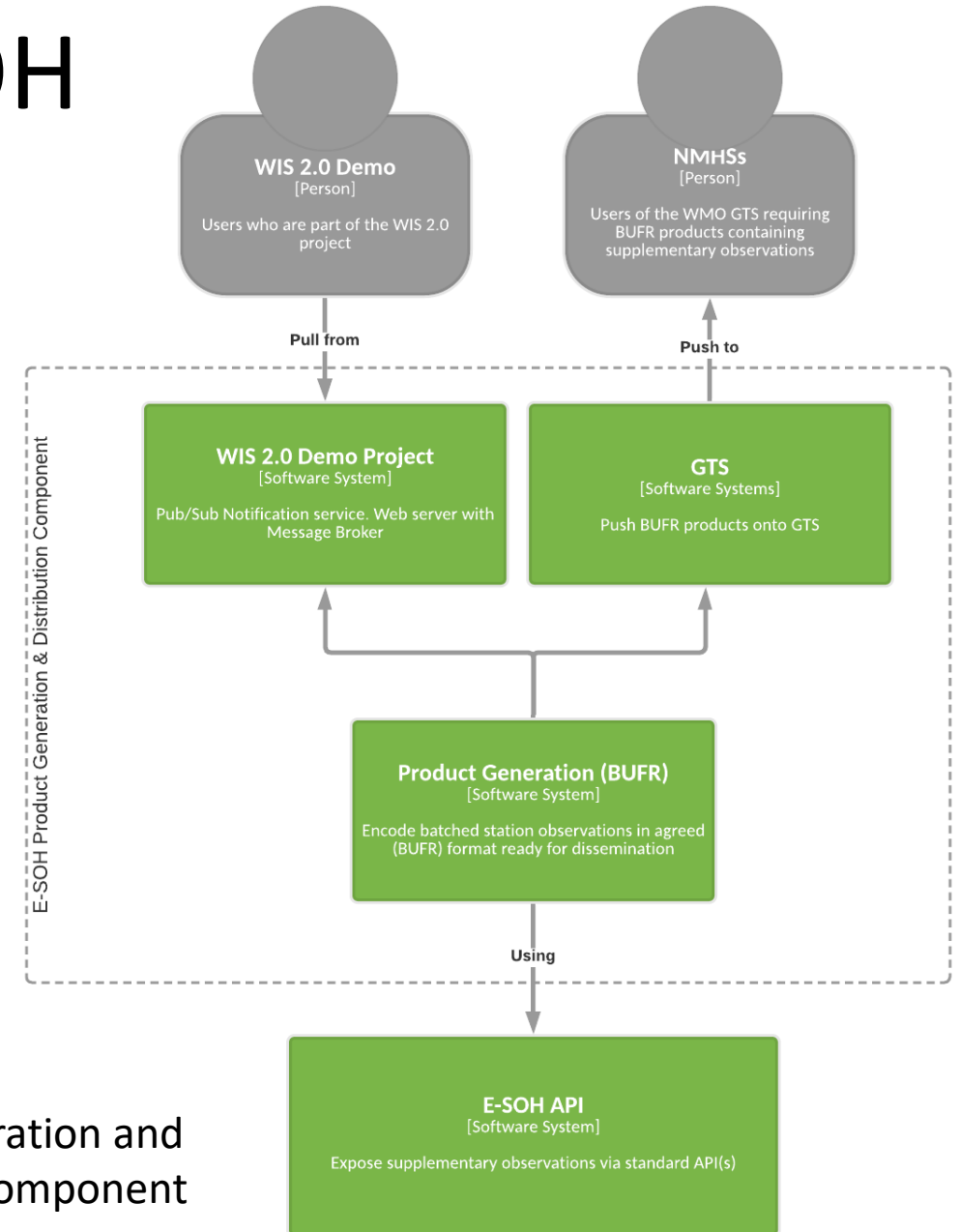


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# High level components of E-SOH



E-SOH: Component diagram, Stuart Matthews 08-09-2021

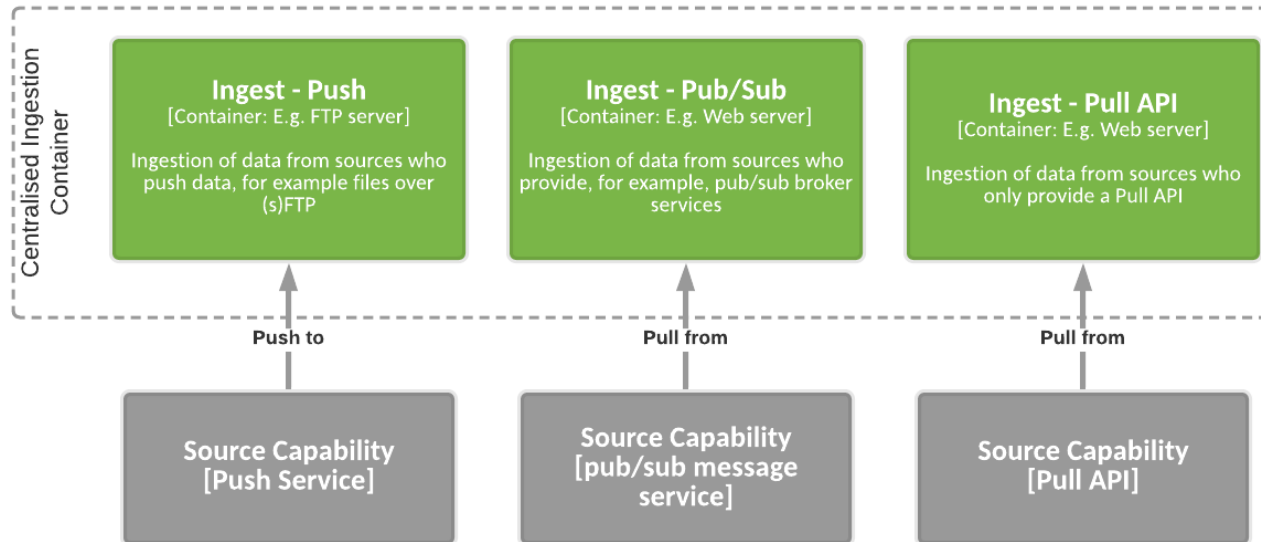


## Product Generation and Distribution Component



# Input patterns to E-SOH

Not directly from the instrument, but via a 'central' capability (e.g., NC or a 3<sup>rd</sup> party centralised capability)



Expectations on data producers...

- Consistent delivery format and protocol, but not necessarily following any official standards.
- Minimal latency ~1 minute
- If possible... automated quality controlled, with quality indicator

Ingestion Patterns into E-SOH

1. Traditional FTP server with the capability of receiving files **pushed** by the source.
2. Consume from Sources that provide data through a publish-subscribe (**pub/sub**) message pattern
3. Consume from an API that only offers a 'Pull' service.

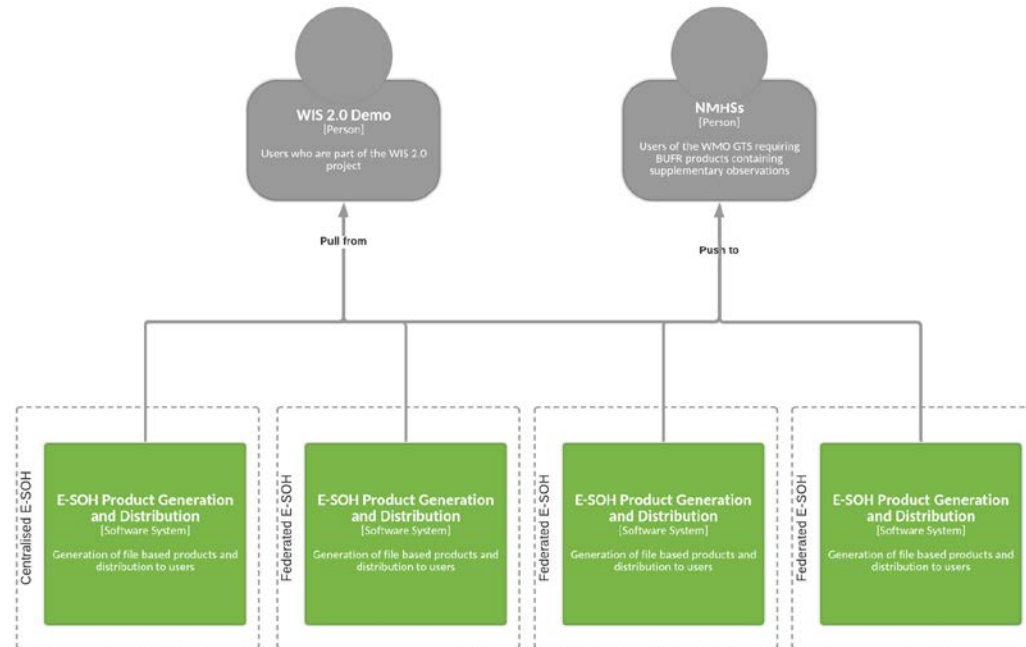


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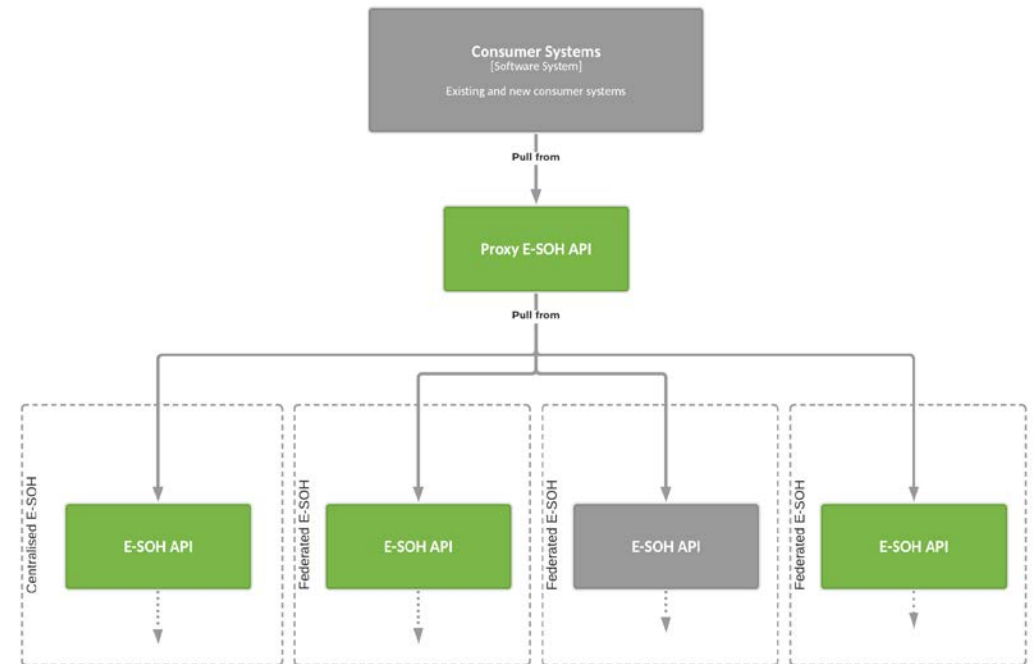
# Centralised and Federated

(Data distribution)

GTS and WIS 2.0



Proxy E-SOH API



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Some uncertainty about the technical solution for the 'Proxy' API

# WIS 2 Principles in the project

**Principle 1.** Web technologies and leverages industry best practices and open standards.

Open standards are a key part of the of the E-SOH principles.

**Principle 2.** Uniform Resource Locators (URL) to identify resources.

URL Access to data mandatory requirement

**Principle 3.** use of public telecommunications networks (i.e., the Internet) when publishing digital resources.

Mandatory requirement

**Principle 6.** will add open standard messaging protocols that use the publish-subscribe message pattern to the list of data exchange mechanisms approved for use within WIS and GTS.

Open standards and alignment with WIS are a mandatory requirement

# WIS 2 Principles in the project

**Principle 7.** all services that provide real-time distribution of messages (containing data or notifications about data availability) to cache/store the messages for a minimum of 24-hours, and allow users to request cached messages for download.

Real-time, with absolute minimum delay, is a key mandatory requirement. A minimum 24 hours cache is also a mandatory requirement.

**Principle 8.** adopt direct data-exchange between provider and consumer.

Users will be access data directly either through pub/sub capability or API.

**Principle 9.** phase out use of routing tables and bulletin headers.

We do not intend to use routing tables and bulletin headers beyond the first E-SOH data type (sub-hourly surface observations).



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# Project data standards

- BUFR to be exchanged on GTS and WIS 2.0
- Conversion to BUFR using ecCodes
- Format for API access to be decided, GeoJSON currently proposed.
  - Standards need to be developed



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# Project metadata standards

To be confirmed



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# Data discovery

Yes, but detailed design not developed yet



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# Data exchange

- Exchange through GTS and WIS 2.0 protocols
- API query access
  - Suggested OGC EDR API developed but there might be requirements from European Union for a different approach.



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# Input to WIS2

- Ongoing discussion about ‘openness’ of the solution
  - Strong preference for Open Source, but this might limit potential to re-use existing capability
- Platform agnostic (within reason) solution proposed.
- Cloud first principle with EWC considered as a host for centralised capability
  - NMHSs free to follow national strategy including public cloud (e.g. AWS)



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WEATHER CLIMATE WATER

TEMPS CLIMAT EAU



Thank you  
Merci

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