



Weather Forecast Improvements at the UK Met Office: Responding to the Big Data Challenge

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Input from Rich Carne, Alex Longden, Derrick Ryall

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Met Office

Weather Information Value Chain

Monitor
&
Observe

Model &
Forecast

Interpret

Produce

Decision
making

Economic
Value



Monitor & Observe

Model & Forecast

Model and observations improvements

March 2016

November 2016

Spring 2017

2017

Autumn 2017

2018-19

Better use of observations

Biggest improvement in a decade

Bigger UK domain

Extend runs to 5 days

Improved forecasts of showers

Global model resolution increase to 10km

New UK hourly nowcasts

New radar network

Precipitation type
Doppler winds
Increased resolution

Run UK ensembles to 5 days

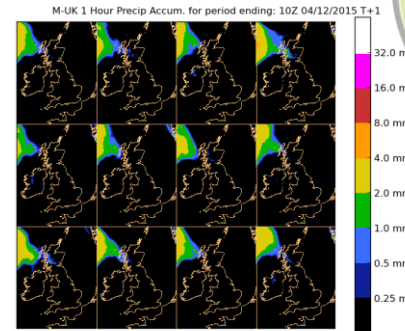
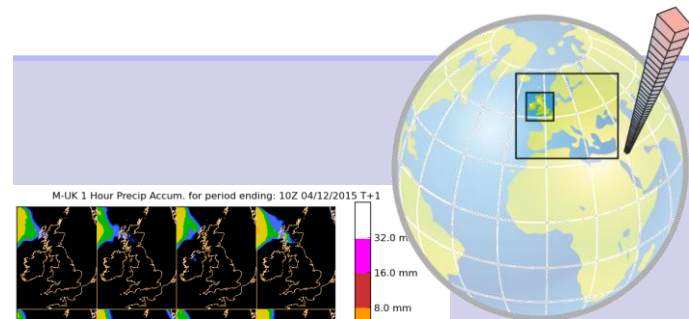
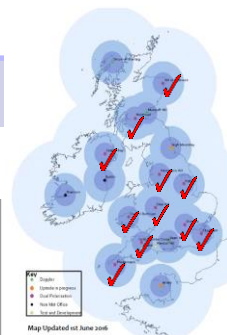
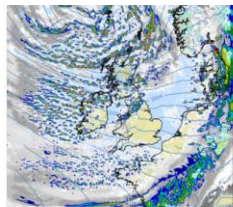
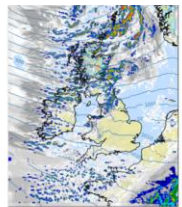
Increased vertical resolution

Couple atmosphere and ocean

Better convection



Improved showers



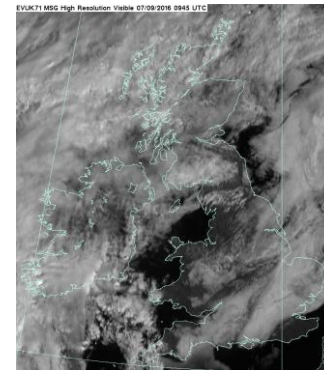
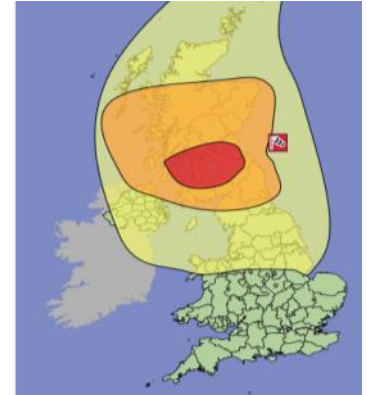
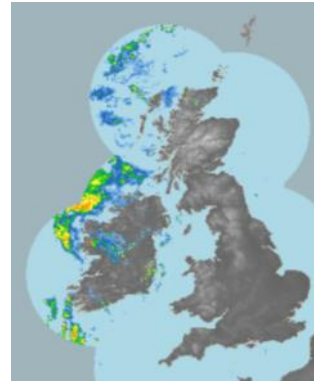
1.2 Pflops

8 Pflops

16 Pflops

Content and services

- Data
 - Gridded forecast data
 - Spot data
 - Observations
- Warnings and Guidance
 - National Severe Weather Warnings
 - Guidance
 - Scripts
- Forecaster/Meteorologist briefings
 - Verbal and web



24/7 support



Services for the Information Economy - INSPIRE



Catalogue



Visualisations



Data downloaded as is



Reuse for interoperability



Remote compute



New ways of working

Met Office Informatics Lab

Analyst friendly
interactive notebooks

Massively scaleable
cloud infrastructure



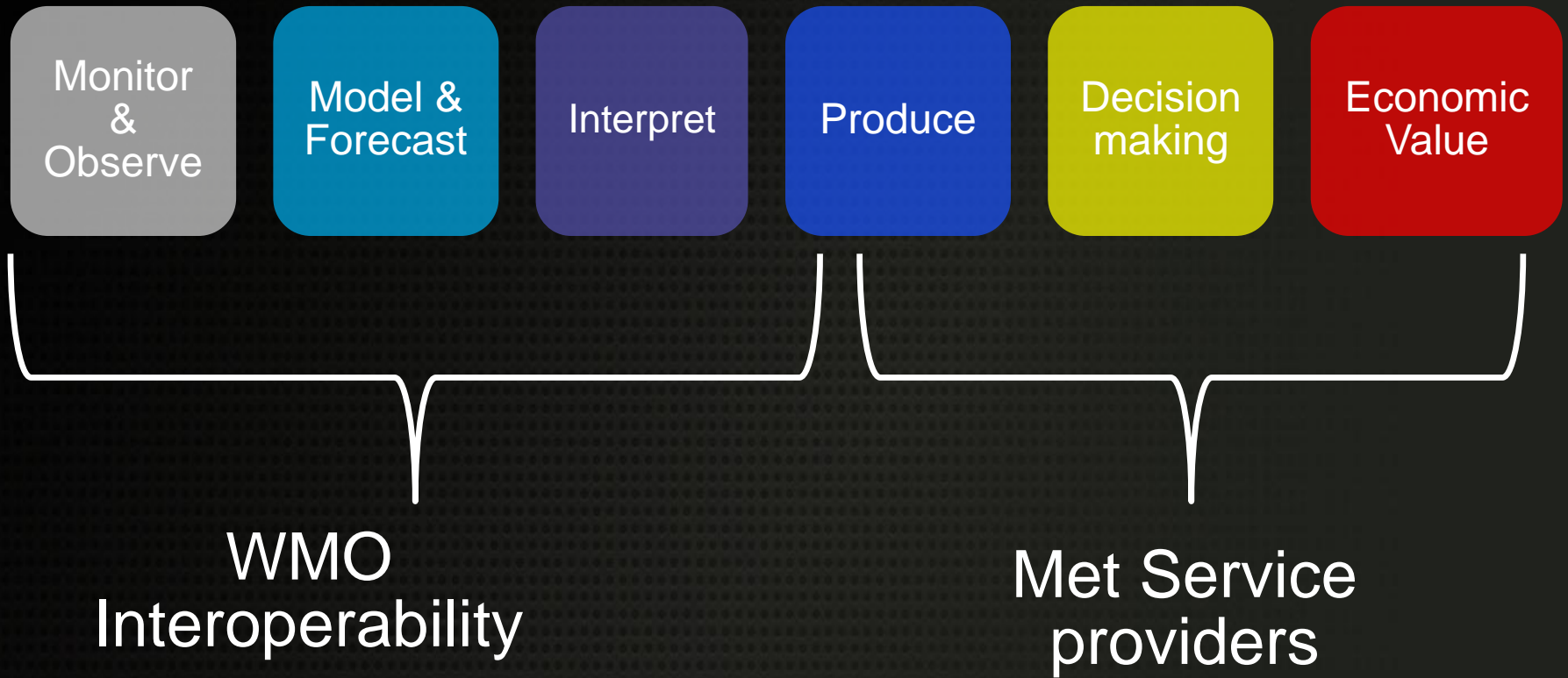
Reproducible, transportable
work environments

Massively parallel data



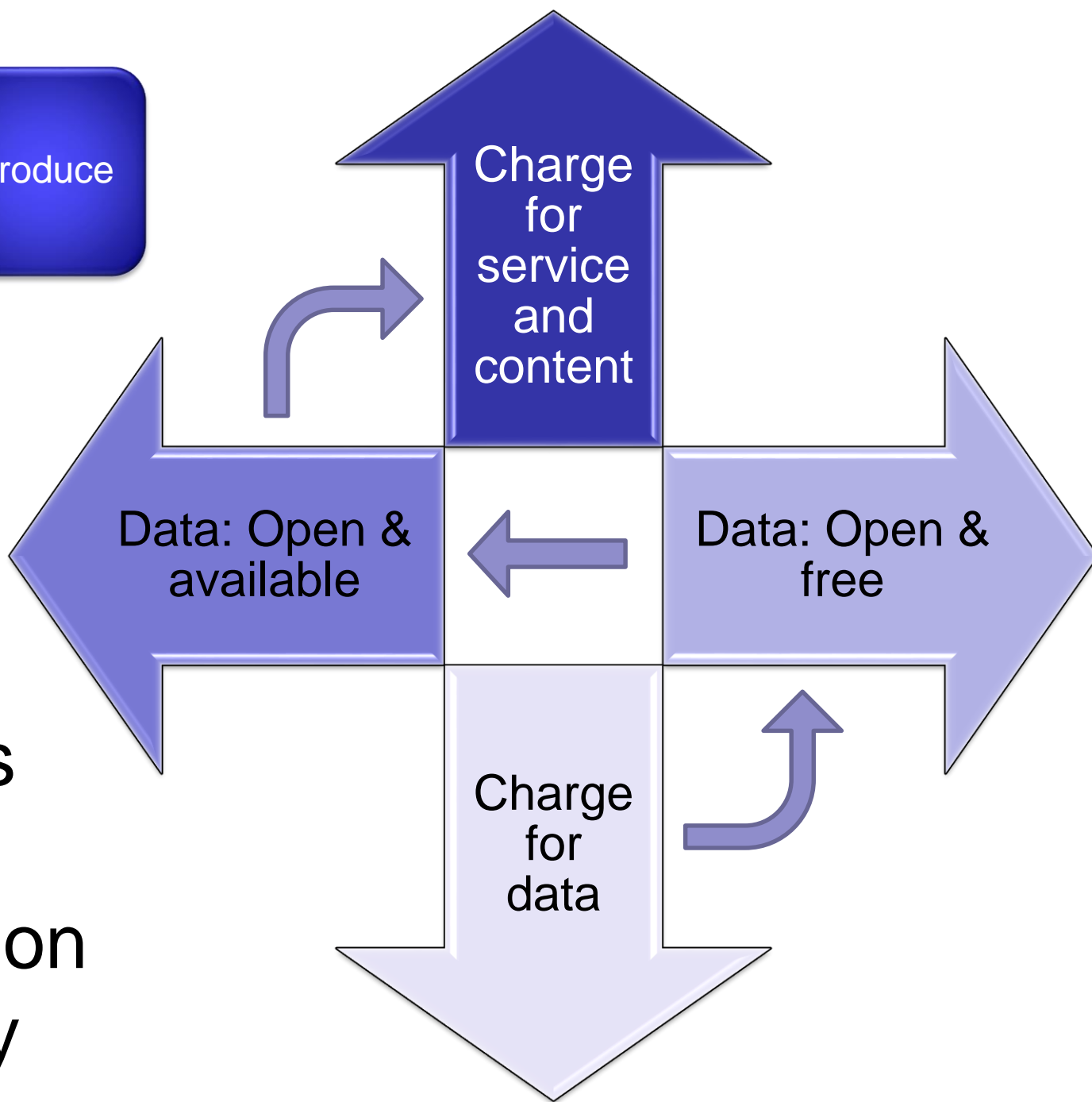
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Weather Information Value Chain





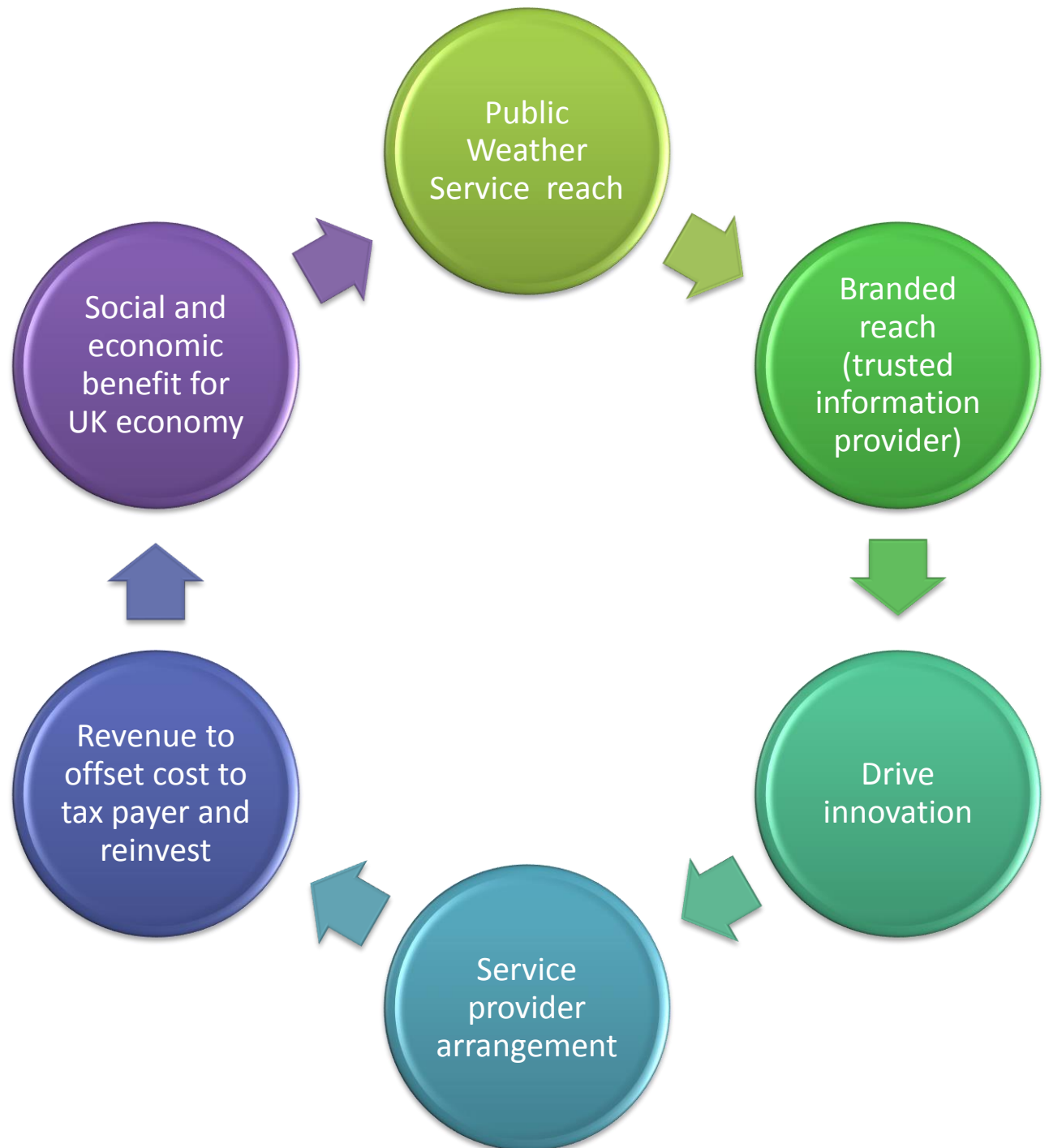
Produce



Changes in the information economy



Met Office drivers





Divergence of information



Weather Forecast Services

Authoritative Warnings

- Google
- Yahoo
- Amazon
- BA



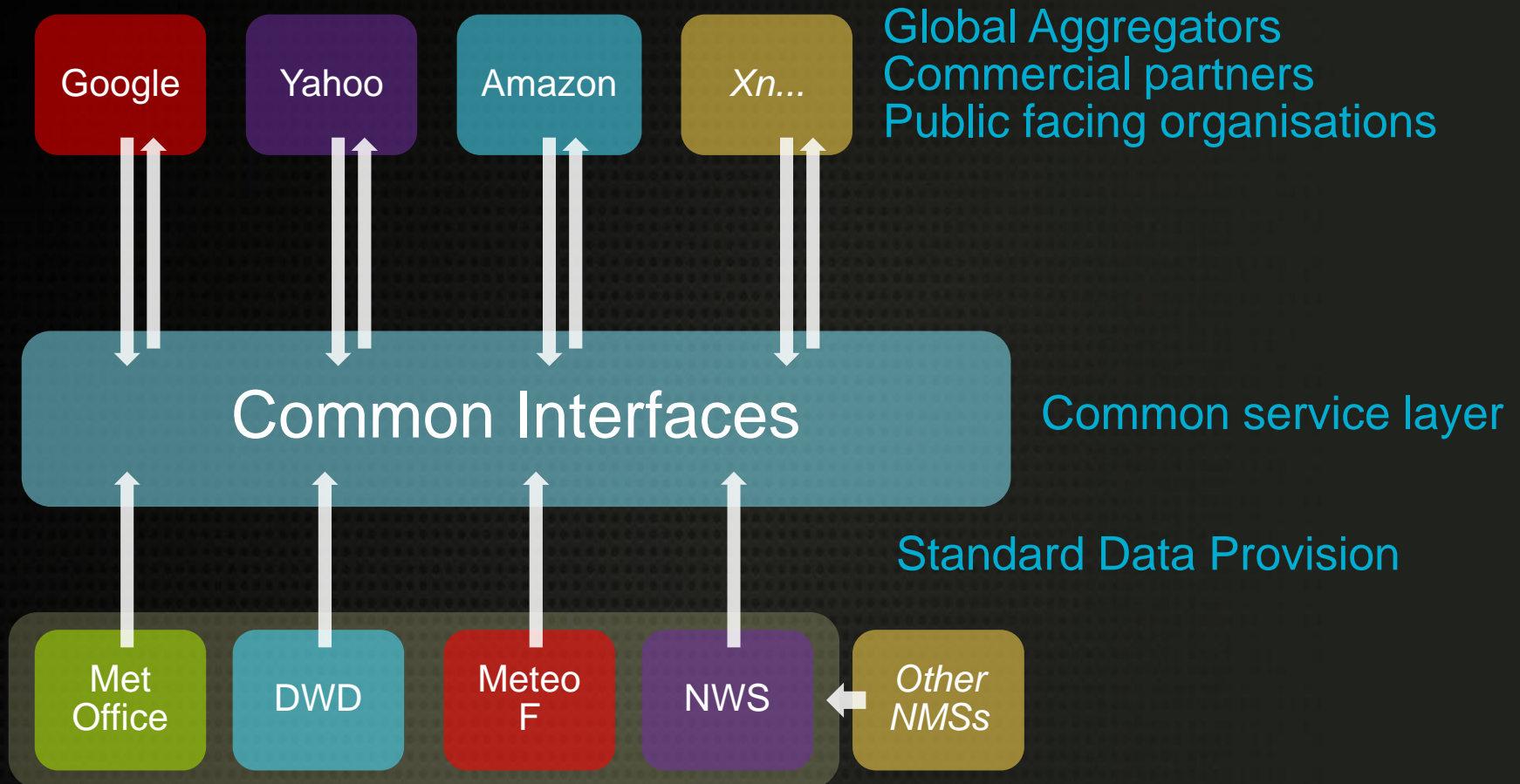
Open Weather - Purpose

- Maintaining the **authoritative** voice of NMSs
- Ensuring **consistency** between Warnings and forecast
- **Supporting** the global weather market
- Allowing **seamless** access to global weather from multiple NMS providers



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Contextual Diagram





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