Operational Use of OGC Web Services at the Met Office

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The Met Office has adopted the Service-Orientated Architecture paradigm to deliver services to a range of customers through Rich Internet Applications (RIAs). The approach uses standard Open Geospatial Consortium (OGC) web services to provide information to web-based applications through a range of generic data services.

"Invent", the Met Office beta site, is used to showcase Met Office future plans for presenting web-based weather forecasts, product and information to the public. This currently hosts a freely accessible Weather Map Viewer, written in JavaScript, which accesses a Web Map Service (WMS), to deliver innovative web-based visualizations of weather and its potential impacts to the public. The intention is to engage the public in the development of new web-based services that more accurately meet their needs. As the service is intended for public use within the UK, it has been designed to support a user base of 5 million, the analysed level of UK web traffic reaching the Met Office's public weather information site. The required scalability has been realised through the use of multi-tier tile caching:
- WMS requests are made for 256x256 tiles for fixed areas and zoom levels;
- a Tile Cache, developed in house, efficiently serves tiles on demand, managing WMS request for the new tiles;
- Edge Servers, externally hosted by Akamai, provide a highly scalable (UK-centric) service for pre-cached tiles, passing new requests to the Tile Cache;
- the Invent Weather Map Viewer uses the Google Maps API to request tiles from Edge Servers.
(We would expect to make use of the Web Map Tiling Service, when it becomes an OGC standard.)

The Met Office delivers specialist commercial products to market sectors such as transport, utilities and defence, which exploit a Web Feature Service (WFS) for data relating forecasts and observations to specific geographic features, and a Web Coverage Service (WCS) for sub-selections of gridded data. These are locally rendered as maps or graphs, and combined with the WMS pre-rendered images and text, in a FLEX application, to provide sophisticated, user impact-based view of the weather.

The OGC web services supporting these applications have been developed in collaboration with commercial companies. Visual Weather was originally a desktop application for forecasters, but IBL have developed it to expose the full range of forecast and observation data through standard web services (WCS and WMS). Forecasts and observations relating to specific locations and geographic features are held in an Oracle Database, and exposed as a WFS using Snowflake Software's GO-Publisher application.

The Met Office has worked closely with both IBL and Snowflake Software to ensure that the web services provided strike a balance between conformance to the standards and performance in an operational environment. This has proved challenging in areas where the standards are rapidly evolving (e.g. WCS) or do not allow adequate description of the Met-Ocean domain (e.g. multiple time coordinates and parametric vertical coordinates). It has also become clear that careful selection of the features to expose, based on the way in which you expect users to query those features, in necessary in order to deliver adequate performance. These experiences are providing useful 'real-world' input in to the recently launched OGC MetOcean Domain Working Group and World Meteorological Organisation (WMO) initiatives in this area.