How Cloud Data Services are Easing Integration within the Scottish Public Sector

Central and local government in Scotland are benefiting from a new generation of Cloud data services that are providing easier, more open access to map and geographic data resources explains Faith Clark, Marketing Consultant, Marketing Edge.

The Global Geospatial Market

The latest market research has estimated that the global geospatial analytics market was worth around US$40 billion in 2017 and is expected to register a compound annual growth rate close to 18% per year, during the period 2018 to 2023. The report by Research and Markets, titled 'Global Geospatial Analytics Market - Growth, Trends, and Forecasts (2018 - 2023)' also revealed that, in 2017, Europe was the largest geospatial market, accounting for around 35% of the global market share.

However, as the Global Geospatial Analytics report authors go on to explain there is 'a gradual shift in market dynamics of geospatial analytics which has transformed the way end users interact with technology. The focus has shifted from standalone products with limited geo-referencing to the concept of 'system integration', wherein, geospatial analytics is being integrated across all the major workflows and solutions within a business.

Integration – A Challenge for Government

The One Scotland Mapping Agreement (OSMA) is an overarching licence agreement that gives local and central government in Scotland access to some of the UK's Ordnance Survey mapping products. With over 100 members, the OSMA has successfully removed the previous barriers to data sharing restrictions between members and it is estimated that this has led to a threefold increase in the use of spatial data within the public sector in Scotland. As the Global Geospatial Analytics report identified, organisations are shifting from standalone systems, previously deployed by OSMA members, to integrated systems.

To that effect the Scottish Government, as the lead for the OSMA, set about identifying and procuring a more efficient way of managing and distributing large volumes of data. Key goals of the project were to reduce the significant data processing overheads for members and reduce the individual organisation costs for managing data.

The proposed outcome was to find a single hosted solution that would provide access to up-to-date, fully maintained data across a multi-stakeholder environment via highly performant and secure web mapping services.

Scottish GIS company thinkWhere, a specialist in open source technologies that had already developed cloud-based solutions for organisations such as the British Library, Balfour Beatty, and Local Authorities, was appointed by the Scottish Government to tackle the OSMA requirement. The innovative technology company's latest platform, theMapCloud, offered the perfect solution - a platform that allows digital maps and associated information to be shared anywhere in the world using internet-connected devices.

Looking to Cloud & Open Source Technology

theMapCloud includes a securely hosted, fully managed depository for geographically referenced data, in this case, the 20 or so Ordnance Survey data products covered by the OSMA, effectively acting as an online 'geospatial library'. Hosted on a Cloud infrastructure offered by Amazon Web Services (AWS) and managed by thinkWhere, theMapCloud supports highly reliable, scalable and performant web-services as required by the Scottish Government and OSMA members.

The OSMA products are supplied, or accessed, through a Web Map Service (WMS), Web Map Tile Service (WMTS), or Web Feature Service (WFS) using credentials that are unique to each member organisation. Additionally, thinkWhere has developed an OSAddressBase Search, and users are currently running a pilot project to test an OS MasterMap WFS. Architected using Open Source technologies and frameworks, including PostgresSQL, PostGIS, GeoServer and MapProxy, the thinkWhere services are all fully compliant with the appropriate OGC standards.

OSMA Web Services in Action

The Web Services developed for the Scottish Government and OSMA members by thinkWhere are cost-effective, and efficiently streamline data distribution across all OSMA member sites. They are proving to be a speedy and effective way of accessing OS products using the existing software and infrastructure of the OSMA members. This includes access to data via desktop GIS (such as QGIS or ArcMap) or web clients, including OpenLayers. The web mapping service provides easy, on-demand access to background maps with WMTS tiles or rendered WMS images delivered as raster files, making them quick to load but without attributes. This means that they are ideal for plotting additional information, georeferencing other attributes, and for contextual background mapping purposes.

The WFS services provide access to OS AddressBase premium - a data product containing detailed address records for the whole of Scotland. thinkWhere's Search API offers dynamic querying and address records that can be extracted by geographic location, postcode, address lines or UPRN (Unique Property Reference Number).

"The OSMA web services provided by thinkWhere offer an efficient and practical way of accessing huge volumes of data," commented Ross McDonald, Corporate GIS Data Coordinator at Angus Council, an OSMA member organisation. "Using the thinkWhere web services saves us time and offers great flexibility, as well as providing an accurate up-to-date standardised base map for a consistent look and feel for all council mapping output."

One example of the OSMA web services in action is the Scottish Government Heat Map application, also developed by thinkWhere. An online solution to help support the work set out in the Scottish Government's Heat Generation Policy Statement on District Heating, the interactive map allows users to see where there are opportunities for decentralised energy products and heat networks, and to assess heat density and proximity to heat sources.

The Scottish Environment Protection Agency (SEPA) are also using thinkWhere web services and OSMA products to deliver an online flood map. "The OSMA web services delivered by thinkWhere are becoming the standard background for SEPA mapping applications," added Duncan Taylor, IS Development Unit Manager at SEPA. "Reliability and performance are excellent, and we have benefited from a significant reduction in the cost of the maintaining our own OS data services."

Alan Moore, Chief Executive of thinkWhere, concluded, "The work undertaken both with the Scottish Government and other OSMA member organisations has underpinned and informed the ongoing development of theMapCloud. We have exciting plans for expanding our service and product offerings into a market that goes way beyond individual or groups of organisations, even at the national scale of this project, and is without doubt global. The use of open source technology and market leading web services means that we can, and do, operate without borders, both in terms of location and the function and scale of partner organisations."

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