

"Open Source Success Story: How a strong partnership can bring mutual success"

28th May 2024

Earth observation (EO) data has rapidly become an indispensable resource that directly addresses society's most pressing challenges. However, the increasing influx of data, often distributed across multiple independent locations, poses a significant challenge for end-users to access and collaborate on geospatial activities. The European Space Agency's (ESA) ground-breaking Earth Observation Exploitation Platform Common Architecture (EOEPCA) programme addresses this need and ESA has awarded a contract to Telespazio UK to lead the development of EOEPCA+.

Drawing heavily on Open Geospatial Consortium (OGC) standards and leading open-source projects, EOEPCA+'s vision is clear: to enable greater interoperability between these platforms and support cloud-based collaboration through an open network of resources. This ability for end-users to move their local workflows to the cloud - the 'moving code paradigm' - requires federated access, storage, and processing capabilities in the cloud. EOEPCA+ achieves this through a complementary set of software-based 'building blocks' (BBs) in the areas of Resource Management, Processing & Chaining, and User Management. These BBs integrate with existing EO platform architectures and, through abstraction layers and common interfaces, enable end-users to freely access, process, and visualize data without worrying about the technical details and specificities of individual platforms.

Of critical importance to EOEPCA+'s processing domain has been the successful incorporation of the ZOO-Project. This partnership has grown from humble beginnings to full integration and has enabled the ZOO-Project to become one of the coveted 'Official Projects' of the Open Source Geospatial Foundation (OSGeo). The ZOO-Project has more recently successfully passed the official OGC Executable Test Suite (ETS), becoming a reference implementation for the Web Processing Service (WPS) version 2.0 standard and for the OGC API Process Part 1 and 2. A remarkable achievement, key for EOEPCA+'s ambitions in federating multiple independent platforms. Its software building blocks will seamlessly bridge the differences between each platform, creating a unified operational infrastructure. This common architectural design ensures standardised interfaces across all platforms in the network. Within this cohesive framework, the ZOO-Project processing engine plays a key role in managing local resources, facilitating the deployment of custom geospatial applications, and integrating OGC API standards for interoperability. These allow users to interact with geospatial data using predefined, standardized processes that are understood across all platforms hosting the EOEPCA+/ZOO-Project, eliminating the need to navigate multiple portals and platforms.

Central to this cloud-based infrastructure is the use of Kubernetes clusters, which enable the containerisation of applications and ensures that they run reliably when moved from one cloud environment to another. This key feature is enabled by the embedded ZOO-Project through the OGC Best Practice for Earth Observation Application Package, based on the Common Workflow Language (CWL), an open standard for describing geospatial analysis workflows that makes them portable and capable of being transported between and scaled within cloud platforms. The subsequent execution of these containerised applications within the Kubernetes cluster is accomplished by the ZOO Calrissian Runner, which ensures that geospatial processes can be securely and efficiently managed in the cloud environment.

Ultimately, the EOEPKA+ project fosters a connected ecosystem of disparate platforms, while the ZOO-Project integration provides a full spectrum of capabilities that support and enhance user workflows and collaboration in the cloud environment. The synergy between EOEPKA+ and the ZOO-Project stands as a testament to the strength of collaboration within the open-source community. Through their longstanding partnership and continued support, both projects have reaped substantial mutual rewards and with the strong connection to the OSGeo foundation, the impact on the geospatial community will only grow stronger. Overall, the ZOO-Project provides key functionality that is officially recognised and endorsed by OSGeo, without which the EOEPKA+ project would not be able to reach its goals of interoperability.

If you are interested in staying up to date on this project, consider subscribing to our soon-to-be-released [EOEPKA+ newsletter](#). Alternatively, for more information on the EOEPKA+ project as well as relevant partners and projects, visit our [project website](#), [X](#), and [LinkedIn](#) pages. To learn more about the invaluable ZOO-Project, please visit their [GitHub](#).