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MULTI-MISSION FEDERATION AND INTEROPERABILITY CONCEPTS FOR EARTH
OBSERVATION SYSTEMS

Abstract

The paper presents multi-mission federation and interoperability concepts for future Earth Observation systems and how they can be technically addressed at ground segment level.

The number of Earth Observation systems will keep increasing in the coming years, payloads will be more varied and the systems will be more connected between each other. It can also be expected that companies and governments will be increasingly interested in combined, self-owned, capabilities such as optical, radar and hyperspectral, and even SIGINT for certain applications. This way they can serve increasingly higher value products to their end users.

On top of such multi-mission federation of self-owned systems, companies and governments will likely be interested in interoperability with external systems, in order to further increase the reactivity and revisit capacity to their end users, further increasing the value for them. Examples of coordination at organizational level exist already across institutions for the purpose of timely sharing imagery between actors, often for disaster relief or for other civil needs. Certain governmental machine-to-machine systems also provide a level of interoperability between each other already, implementing timely data sharing agreements between respective governments. However a systematic and standardized way to interoperate these systems does not exist yet.

In order to address such demanding needs in the future, it is necessary to implement both multi-mission federation and interoperability functions. Beyond presenting the two concepts from a functional perspective, the paper also explains how software interfaces can be standardized, in order to easily connect systems together, while ensuring maintainability and evolutivity of systems.