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AUTONOMOUS DATA VAULT ORGANIZATION FOR SELF-SOVEREIGN, BORDERLESS & CARBON-LIGHT SPACE TRAFFIC MANAGEMENT (INTER-DOM-STM)

Abstract

The European Union is making progress to achieve strategic autonomy in the Space Traffic Management (STM) domain by building up both capabilities and policy. The European Commission released a "joint communication" on February 15 outlining the E.U.'s approach to STM, calling for increasing E.U. abilities to track objects as well as help develop international regulations for responsible, safe operations in space. Presently, according to the EU SST consortium, the European Union still relies on U.S. data. Moreover, about 95% of the Space Traffic Awareness (SSA) data in the EU SST system comes from military sensors. At its foundation, studies conducted with the commercial sector showed that typical SSA data is not meeting the needs of satellite operators. Accuracy is not enough to use it in the manner that it's being used by them. The STM in its core is a complex public policy problem that involves balancing a lengthy set of technical, legal, and economic variables, therefore, progress is likely to come via a series of small steps that incrementally improve the overall situation. The solution to overcome the need for better cooperation, technological and systematic independence lies in the robust inter-domain platform connecting governmental sectors with European companies generating valuable data such as, SSA providers, Space Surveillance and Tracking (SST) providers and satellite operators. The mission is to share data in a protected, transparent and confidential environment allowing for data-ownership control, selective anonymity, and automatic economical and safety motivation mechanisms. Moreover, to integrate data driven decision making supported by disruptive technologies in STM, solutions such as performance driven contracts are viable candidates to buttress new services being developed and incentivise STM usage among all engaged parties in the short and long term. The paper introduces a unique platform allowing to connect governmental and private sectors via a secure environment on end-to-end principle with scalability to efficiently use artificial intelligence and including enhancement for automatic compliance monitoring based on standards, regulation and Concept of Operations (CONOPS). The system that employs measurements supporting data transparency necessary to empower artificial intelligence as well as service providing fusion of standards and operational rules to provide compliance monitoring. Presented platform allows resilient data (passive tracking or telemetry) sharing of space assets between various shareholders engaged in STM as well as STM providers themselves. Additionally, the platform offers migration tools for historical data, as well as, integration connector for data streams ingestion.