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ACTIVITIES (D5)

Cybersecurity in space systems, risks and countermeasures (4)

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IMPROVING ICE CUBES SECURITY RESILIENCE WITH 7SHIELD

**Abstract**

The ICE Cubes service was commissioned on August 2018 onboard the ISS (International Space Station) to provide a commercial service allowing private and public entities to launch and operate experiments hosted on the ISS in the ICE Cubes Facility. The ICE Cubes facility, designed and built by Space Applications Service is in European Space Agency's space laboratory Columbus. It is managed and operated under a public private partnership agreement with ESA. It offers plug-and-play installation for cube-sized experiments that relay experiment data back to Earth through the International Space Station's infrastructure. The ICE Cubes Control Centre in Belgium offers unique continuous access to experiments. From anywhere in the world a customer can login to their Experiment Cube through an internet connection. The ICE Cubes service provides Internet protocols (TCP/IP, UDP) to the investigators for point to point communication with their Experiment Cube, from their office up to the ISS. The security aspect of the service, especially in terms of cyber security is of high priority.

The cooperation with the ESA is essential to access to the ISS, both in technical terms for the access to the communication networks of the ISS, and in term of cyber security processes and collaboration to ensure the cyber security of both the space and ground assets, both institutional and commercial.

To further improve its cyber security processes, the ICE Cubes service is participating in the EU project 7SHIELD: Safety and Security Standards of Space Systems, ground Segments and Satellite data assets, via prevention, detection, response and mitigation of physical and cyber threats. 7SHIELD aims at providing a holistic framework to enable confronting complex threats by covering all the macrostages of crisis management, namely pre-crisis, crisis and post-crises phases.

This last year, the ICE Cubes service has been deploying and evaluating the benefits brought by the cyber security framework 7SHIELD. This presentation will introduce this new European cyber security framework, the result of its evaluation on the ICE Cubes infrastructure, and the potential benefits for the ICE Cubes service, for the cyber security cooperation with both its institutional partner (ESA) and its commercial customers.