

IAF SPACE OPERATIONS SYMPOSIUM (B6)
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AURORA, A CLOUD-BASED MISSION CONTROL SOLUTION

Abstract

D-Orbit is a service provider for the NewSpace sectors, with capabilities in satellite manufacturing, launch, deployment, satellite operations, end-of-life strategies and solutions, space propulsion and related critical software. D-Orbit's products and services cover the entire lifecycle of a space mission, including mission analysis and design, engineering, manufacturing, integration, testing, launch, as well as end-of-life decommissioning. The objective of the solution here proposed is to provide a powerful cloud-based mission control software suite to control a single satellite or a complete constellation through a user-friendly, fully customizable control interface. D-Orbit developed Aurora as the solution to the need for controlling, operating and exploiting space missions in a flexible and scalable way. Aurora is an end-to-end space vehicles control platform deployed on a cloud infrastructure and ubiquitously accessible through a web interface. It shortens the time to market and reduces costs associated with the control of a wide variety of space missions, especially for small satellites and constellations. Aurora will also facilitate ground communication accessibility, space data integration and the exploitation of downstream applications. Aurora's marketplace will bring together space mission owners, ground stations operators and space software developers in a modular and scalable ecosystem. The Aurora core functionalities were tested on D-SAT mission, 2017 and 2018. The next evolutionary step of the mission control and ground station software that controls D-Orbit's D-SAT mission launched in 2017, Aurora will control D-Orbit's In-Orbit NOW small-satellite deployers, starting with the first one to be launched in March 2020. D-Orbit developed two main components into Aurora: 1. Mission Control – A mission control and ground station software solution, adaptable to different space mission architectures and communications protocols. This component enables to manage queues of telecommands scripts and access/visualization of satellite telemetry. The Aurora Mission Control today can manage any Cubesat is using the Cubesat Space Protocol (CSP). 2. Ground Communications – Enable ground station scheduling and use of multiple ground station networks depending on the specific requirements of the space mission. D-Orbit is able today to offer Ground Stations from LeafSpace and Amazon (AWS) Ground Station. The presentation will include the status of Aurora and the lesson learnt. We'll present as well how the results will be integrated in the development of the future and enhanced versions of Aurora.