Cloud Computing Option for Modeling the Debris Environment

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ABSTRACT

NASA's Digital Transformation Initiative aims to promote the agency's adoption of current and evolving digital technologies. Through agency-wide collaboration with other NASA teams, the Office of Safety and Mission Assurance (OSMA) has directed the Orbital Debris Program Office and the Meteoroid Environment Office to integrate cloud computing technologies in their publicly released software models: the Orbital Debris Engineering Model (ORDEM) and the Meteoroid Engineering Model (MEM). Decoupling the user interface from the backend processor was key for the software packages to run on a cloud computing framework. Benefits to this design include horizontal scaling of computing resources, user authentication and authorization, and automated deployment. Both models are hosted on a cloud computing platform supported by the NASA authorized IT security and compliance framework.

This paper focuses on the new ORDEM web application, which includes the current features of the publicly released ORDEM software with an upgraded frontend design. The underlying ORDEM processor is run on a cloud container, allowing the user to run multiple spacecraft and telescope/radar mode simulations. Features exclusive to the ORDEM web application, such as importing multiple TLEs, auto-generated plotting, and the ability to check runtime progress are discussed. Comparisons between the current ORDEM software and the web application are summarized.