IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Vehicles in Service or in Development (1)

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KEYNOTE: DEVELOPMENT OF THE VULCAN LAUNCH SYSTEM

Abstract

United Launch Alliance's next generation Vulcan rocket successfully entered into service with its inaugural launch on Jan. 8, 2024. Vulcan was developed to address a diverse set of missions in support of national security, civil exploration, and the commercial marketplace. It builds upon ULA's decades of experience operating the Atlas and Delta families of launch vehicles. Vulcan offers medium to heavy lift performance to destinations ranging from low earth orbit (LEO), direct inject to geostationary orbit (GSO), and interplanetary trajectories. A key challenge in developing Vulcan was selecting a system architecture and leveraging the latest technologies to support this wide range of missions with a single basic launch vehicle configuration. The detailed design in support of this architecture was refined over multiple iterations to maximize system performance and streamline operations, thereby maximizing the value provided with the launch service. The resultant vehicle relies upon a common single core, two stage architecture for all missions. Booster performance is adjusted to meet mission requirements with the addition of solid rocket boosters as needed, and a modular payload fairing design accommodates a range of volumetric requirements driven by the payloads. A cryogenic (LO2/LH2) upper stage is key to Vulcan's high energy architecture, providing the efficiency and endurance necessary to reach the most challenging orbits beyond LEO.