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GATEWAY AVIONICS CONCEPT OF OPERATIONS AND COMMAND AND DATA HANDLING
ARCHITECTURE**Abstract**

With NASA and international partners preparing to launch the first women and next man to the Moon, and establish presence in the lunar orbit, solid implementation of avionics is of a vast importance. The NASA engineering community adopted highly reliable, deterministic, and redundant three-plane Time-Triggered Ethernet network implementation that is capable of handling three types of traffic: Time-Triggered (TT), Rate Constrained (RC) and Best Effort (BE). In this paper, we will present the overview of how concept of operations defines the operational capabilities of the Gateway Network. The Concept of Operations is a source for the development of system and module functional requirements, which in turn inform the design, development, and implementation of actual spacecraft hardware. End system hardware on the network includes a mobile robotic arm, cameras, critical alarms, telemetry, and payloads. This presentation will also overview how the design and operation of the Gateway Avionics network are constrained by the Gateway Program design and safety requirements. Implementation of avionics and command and data handling strategy will provide Gateway program with options for both human operated and highly autonomous reliable infrastructures. The architecture will be able to handle seamlessly reconfigurations and build up as new modules and visiting vehicles are added.