MAV Software Development

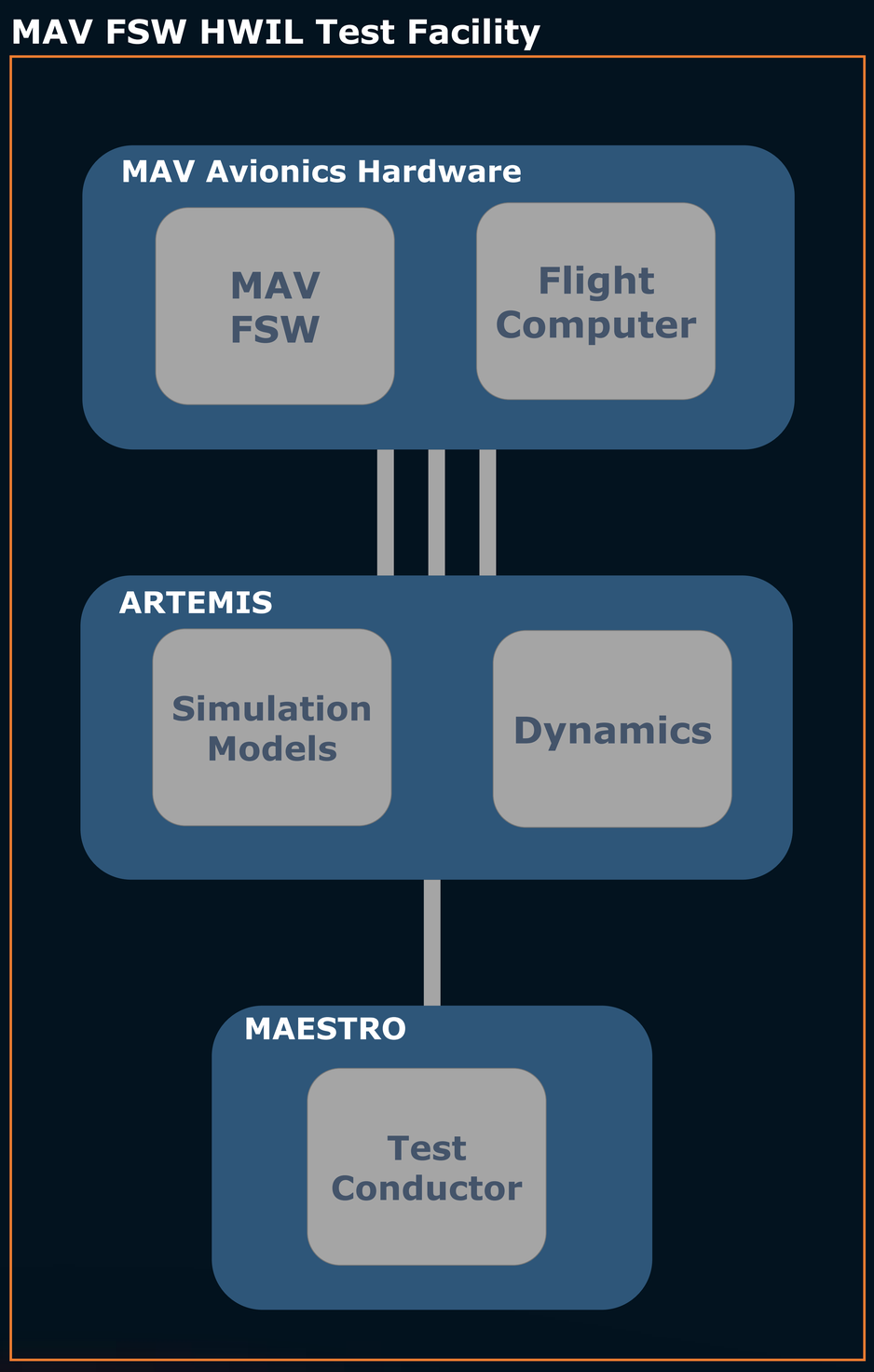
Streamlined Collaboration for MSR

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How We Develop Software for Mission Success

The Mars Sample Return (MSR) Campaign has made significant design and analysis advancements in recent years towards its goal of returning samples of the Martian surface and atmosphere to Earth. A primary component of this campaign includes the development of a Mars Ascent Vehicle (MAV). The mission of the MAV is to carry samples from the surface of Mars to orbit.

Interconnected and symbiotic, the teams overseeing the MAV software - Hardware-in-the-Loop (HWIL), ARTEMIS & MAESTRO, and the Flight Software (FSW) team - function as integral components of a cohesive unit.



Flight Software Team

The Flight Software responsible for controlling the MAV is overseen by MSFC, with additional support from the Core Flight System, a reusable software framework developed by Goddard Space Flight Center. Collaboration with commercial partner Lockheed Martin extends to the development of driver software for interfacing with delivered hardware components.

ARTEMIS & MAESTRO Team

ARTEMIS and MAESTRO represent a comprehensive simulation framework developed by MSFC, orginally designed for the Space Launch System Program. MAESTRO serves as a test conductor, managing automation processes for simulation, testing, and real-time operations. ARTEMIS functions as the simulation framework, providing a real-time environment for modeling, integration, and simulation.

Hardware-in-the-Loop Team

The HWIL team is tasked with constructing, certifying, operating and maintaining the MAV Software Test Facility and System Integration Lab to facilitate the Verification & Validation process for FSW and the integrated MAV avionics.



