Joseph Flinn

Distributed

Mars Rover Article

During the process of building and testing the mars rover, the engineers were under a mountainous level of stress given the deadline of the mission. Through testing, there were a few system resets when the rover was deployed from the landing systems. But, these resets were not in the most critical stages of the mission: the landing. Instead, the resets were during the ground stage of the mission. The landing software was the highest priority because the mission would have been a total bust.

The real-time operating system for the rover has three priority levels for the processes, low, medium, and high. The operating system would send interrupts if there was a process that was of higher priority. The problem with the reset was that the medium priority task was scheduled during the interval where the high priority was blocked by the low priority task. Because of the priorities of the tasks, the information bus was blocked. After some time had passed, a watchdog timer would go off and system would do a total system reset.

To fix the priority inversion, the mutex was moved to be a global variable.