



Communication
Satellite Software
Test System

vSim.Device

DISCOVERY → SIMULATION → VIRTUALIZATION → LAB AUTOMATION → GOVERNANCE

COMMUNICATION SATELLITE SOFTWARE TESTING:

The vSIM technology was used to test the software which would be running on the communication satellites that the vendor was building. However, the software for the satellite was completed before the hardware was built on which it would execute. In addition, the Telemetry interface to the ground stations, the black box cryptologic interface where commands were decrypted and encrypted, and the analog interfaces to the spacecraft environment (fans, etc), were not yet built, and some not yet designed. But the interfaces themselves, along with the command request/response formats were well specified. So vSIM technology was used to put the software code on the computer, and simulate all spacecraft interfaces. Every functional requirement of the software code was tested, by fooling the software into thinking it was talking to the real equipment over these interfaces. When the hardware was built, and the software was installed on the spacecraft, it ran the very first time, because functional testing was completed per the interface specifications. One interesting note is that vSIM was connected directly to the message queues that the satellite software used to talk to the interfaces, and this was done by actually executing vSIM inside the same computer.

Typical Scenario:

- A-cmd sent to satellite to turn on the fans
- B-cmd received in encrypted form, and sent to be decrypted
- C-cmd received in decrypted form
- D-cmd is interpreted, and analog signal sent to turn on fan

Typical Scenario:

- E-fan signals that it is turned on
- F-data is sent to be encrypted
- G-data is received back in encrypted form
- H-data is sent to the ground facility to close the loop that cmd has been executed



