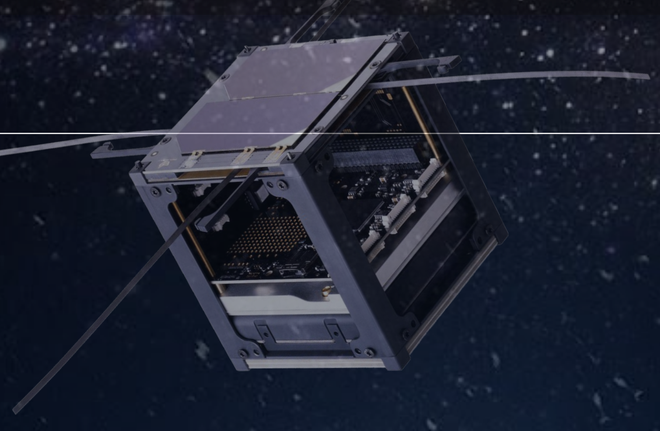
Satellite Anomaly Injection & Detection Testbed

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Background

Satellites deal with a numerous amount of different anomalies. These anomalies range from cyber attacks, hardware failures, system failures, and many more. This year's mission was to focus on detecting and resolving cyber attacks, Syn Flood and Single Bit Error attacks in particular.



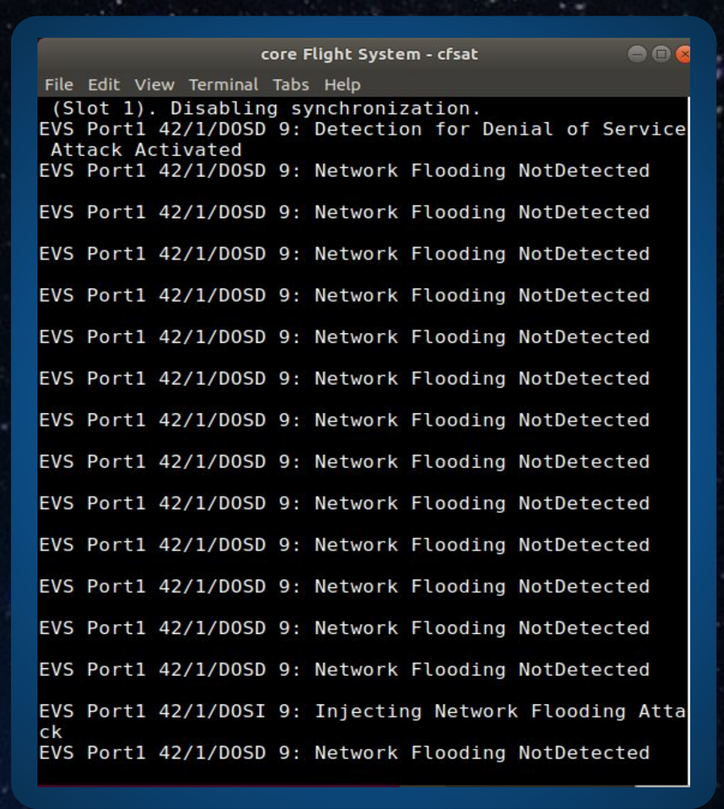
OpenSatKit

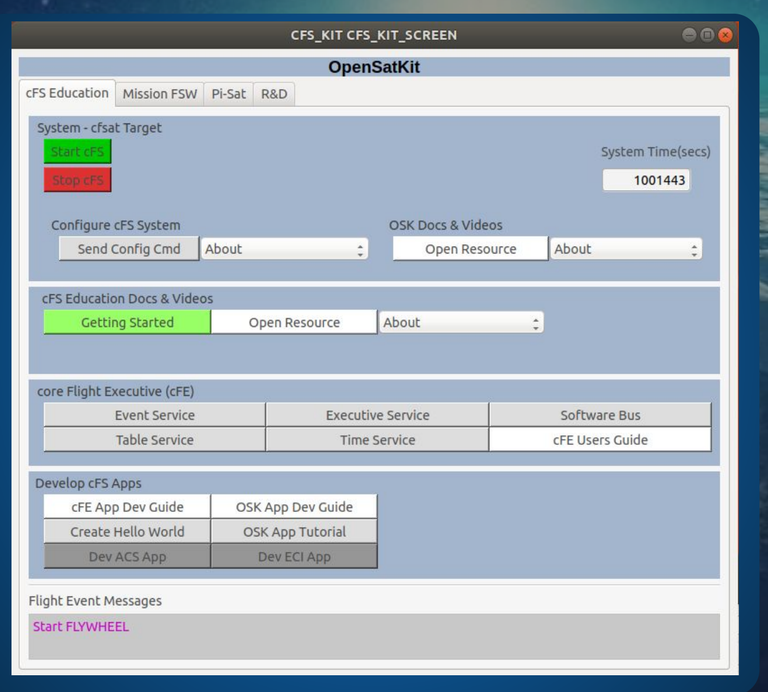
OSK is an open source project that connects cosmos with the core flight system to create applications and flight software

Deliverables

Single Bit Error

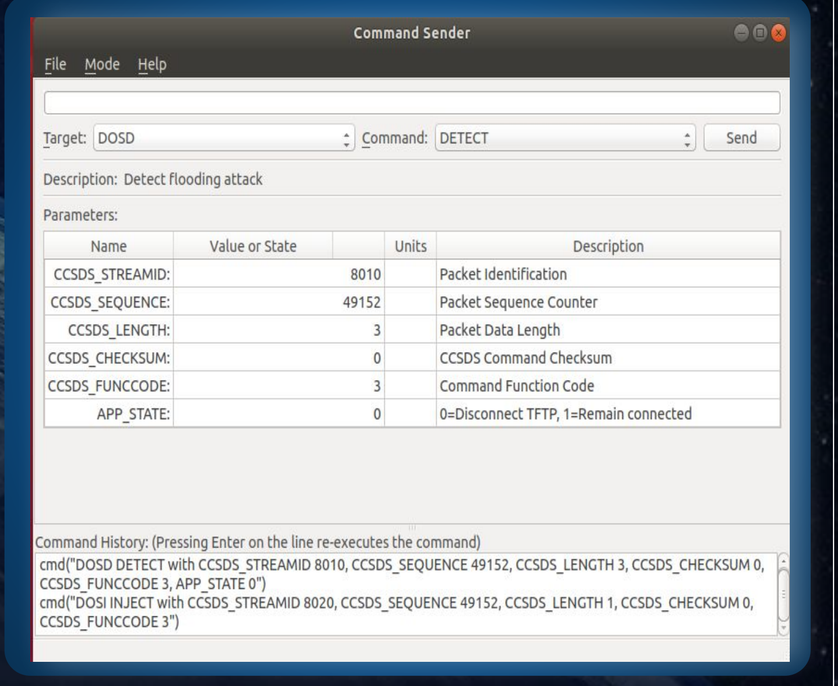
- **Occurs when one bit of a given data unit is changed from 1 to 0 or 0 to 1 undesirably.**
- **Implemented hamming code which utilizes a parity check system in order to determine if a single bit error has occurred**





Denial of Service

- **Syn flood attack occur when there is too many unsuccessful connections between a server and client.**
- **Implemented machine learning which helped notify our system when it was under an attack.**



Conclusion

We were able to detect and send alerts for single bit errors and syn flood attacks occurring in our satellites through the use of hamming code and machine learning. The satellites continue to operate with established communications with an extra layer of security.

Technologies Used

python