

GENERAL DESCRIPTION

Alén On-Board Software (OBSW) is the result of several years of development and the accumulated experience of the team during operation of four satellites. The OBSW is based on the **ESA Packet Utilization Standard (PUS)**. This allows to standardize the data interfaces of the satellites avoiding provider-dependent interfaces and allowing the deployment of different platforms/architectures reusing the same ground segment software. All of the provided services allow to design operations adjusted to client-specific scenarios without additional software development.

MAIN FEATURES

- **Core services** of the OBSW based on ESA Packet Utilization Standard:
 - **Event reporting** of autonomous actions and anomalies
 - **Housekeeping** service for periodic parameters collection
 - **Configuration** parameters management
 - **Real-time forwarding** control
 - On-board telemetry **storage**
 - **Scheduler** for time-based operations execution
 - On-board **request sequencing** for operations **automation**
 - Telecommand execution **verification**
 - On-board **time management**
 - Memories management
 - Test service
- **Additional services** included in the OBSW:
 - **Recovery system**, for reliable recovery on reboots.
 - **Fault detection, recovery and isolation (FDIR)** system for both software and hardware autonomous fault management (on agreed failures)
 - **TMTC transfer layer** based on CCSDS recommendations for reliable TM/TC channels
 - Autonomous payloads monitoring and data collection
 - Telemetry and payload data dump to files for ground retrieval (download)
 - Hardware services to manage platform subsystems and payloads based on PUS services foundation model.
 - Filesystem and **file transmission** protocol (FTP-like)

```
SpacePacket* rq_pkt  
unsigned int service = rq_pkt_ServiceType(rq_pkt)  
unsigned int subtype = rq_pkt_MessageSubtype(rq_pkt)  
return (criticalCmd.service == service && criticalCmd.subtype == subtype)
```

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