

Advanced CCSDS File Delivery Protocol Hardware IP Core

The CCSDS File Delivery Protocol (CFDP) standard was released to extend the CCSDS protocol stacks for space communication on higher layers, enabling reliable file transfer and remote file system management over interplanetary distances.

It features delay tolerant reliable and un-reliable file delivery functions, management services and advanced configuration that can reduce operations cost and risk in future space missions.

In this ESA study we developed a VHDL IP Core implementing the full CFDP protocol features. The IP Core implements uplink and downlink functionalities, includes SEE mitigation measures and can be used in conjunction with space-grade Leon2FT and Leon3FT processors.

It is using a high-speed AHB interface configuration that was evaluated in a Design Space Exploration in course of the project, resulting in an optimized version of the IP which supports streaming interfaces with low latency and a maximum throughput of 400MB/s.