CCSDS File Delivery Protocol

The major objective was the implementation of a file transfer protocol which is integrated into an onboard software framework and which sets the basis for a further use or an adaption for future missions. The implementation will contain Class 1 & 2 message transfer and Store and Forward Overlay procedures.

The 2nd objective was to avoid a standalone CFDP protocol implementation but to integrate the new development into an existing onboard software framework. The integration of the CFDP protocol into the development framework will facilitate the development of applications making use of the CFDP protocol as basic services such as event notification, message handling, equipment handling and logging are already available. This was achieved using KARS framework provided by Airbus.

The CFDP implementation was design to support multiple architectures (x86, SPARC) and OSes (RTEMS, PIKEOS and Linux). The programing language used for CFDP implementation is C. The CFDP implementation software consists of three major components: CFDP Core (implements the CFDP class 1 and class 2 and SFO), CFDP User (is using the CFDP User library to exercise the CFDP Core features), UT (this component is transferring the in/out CFDP PDUs of CFPD Core – Ethernet (UDP) and Spacewire are supported). Each component is available as standalone executable application.

We can mention also other challenges that we encounter like: writing unit tests to achieve high code coverage numbers and develop a flexible functional test system to be able to handle complex test setup (x86 pc running Linux and Leon4-N2X board running RTEMS).

For the demo we will transfer a file from Leon4-N2X board running RTEMS to a Regular PC x86 running Ubuntu using Class 2 procedures.