

Abstract for the 2003 International Telemetry Conference

Title: CCSDS File Delivery Protocol (CFDP) – why it's useful and how it works

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Reliable delivery of data products is often required across space links. For example, a NASA mission will require reliable delivery of images produced by an on-board detector. Many missions have their own (unique) way of accomplishing this, requiring custom software. Many missions also require manual operations (e.g. the telemetry receiver software keeps track of what data is missing, and a person manually inputs the appropriate commands to request retransmissions).

The Consultative Committee for Space Data Systems (CCSDS) developed the CCSDS File Delivery Protocol (CFDP) specifically for this situation. CFDP is an international standard communication protocol that provides reliable delivery of data products. It is designed for use across space links. It will work well if run over the widely used CCSDS Telemetry and Telecommand protocols. However, it can be run over any protocol, and will work well as long as the underlying protocol delivers a reasonable portion of the data. The CFDP receiver will autonomously determine what data is missing, and request retransmissions as needed. The CFDP sender will autonomously perform the requested transmissions. When the entire data product is delivered, the CFDP receiver will let the CFDP sender know that the transaction has completed successfully. The result is that custom software becomes standard, and manual operations become autonomous.

This paper will consider various ways of achieving reliable file delivery, explain why CFDP is the optimal choice for use over space links, explain how the core protocol works, and give some guidance on how to best utilize CFDP within various mission scenarios. It will also touch on additional features of CFDP, as well as other uses for CFDP (e.g. the loading of on-board memory and tables).