

GSAW 2011 Tutorial E:

Consultative Committee for Space Data Systems (CCSDS) Tutorial

Length: Half day

Overview:

The CCSDS tutorial provides an overview of the Consultative Committee for Space Data Systems (CCSDS) standards for communications. It includes an organizational and technical background to the standards that have been adopted by a majority of the world's space agencies. It presents descriptions of the publications and adopting agencies, and example protocol architectures for ground-ground, ground-space and space-space communication links. It provides a graphical depiction of the CCSDS protocol stacks with references to the more common OSI stack. It includes specific descriptions of the optimized stack components for high-latency and error-prone links, and includes basic frame and packet formats. It also addresses issues such as security, authentication, encryption, error detection/correction, and co-use of assets (including DoD and civil programs). The course focuses on standard commanding, telemetry and node-to-node communication operations for spacecraft, and also covers the growing interest of adapting bi-directional IP links to space.

Instructors: Robert Ritter, RT Logic; Brian Safigan, Avtec Systems, Inc.

Biographies:

Mr. Robert Ritter is a Director of Communication Systems Engineering for RT Logic Corporation, of Colorado Springs, Colorado. He has more than 25 years of experience in designing ground system architectures for satellite missions, and data communication networks. Robert has been involved in many worldwide programs implementing CCSDS Standards, and he has worked closely with DoD, NASA, ESA and other agency personnel to find practical means for standards adaptation and co-utilization of assets. He has designed boards for communications and signal processing, has written signal processing and simulation software, and has taught numerous courses in the past, including CCSDS at ETC. Mr. Ritter has a BSEE from the University of Virginia, an MSEE from Virginia Tech, and an MBA from George Mason University.

What Participants Should Expect to Learn:

The CCSDS tutorial is an introductory program for engineers and managers who are designing or specifying spacecraft ground or space communication systems. It is applicable for spacecraft designers who are contemplating adaptation of standards for buses and payloads. It is also useful for mission planners and space agency personnel who are involved in specifying or approving communication and control systems.

Who Should Attend:

Students should have a general technical competency and understanding of communications theory, protocols and systems.