

# Key CSS Standards that support Lunar Interoperability and DTN (1/2)

Standard	CCSDS #	Status	Synopsis	Comments
Communications Planning Information Formats	CCSDS 902.2-B-1	Published	Communications Geometry	Standardized predicted (link) communications geometry – facilitates understanding what options are available for planning lunar communications, DTN routing
Simple Scheduled Format	CCSDS 902.1-B-1	Published	Schedule of spacecraft and ground assets	Standardized data format for Service Providers to publish their schedules. Facilitates DTN routing by identifying link times from various apertures to various spacecraft.
Event Sequence	CCSDS 902.6	In progress	Choreography of space link service changes	Standardized space link changes anticipated during a tracking pass – e.g., changes in symbol/bit rate, starting/stopping ranging symbols, termination/re-start of forward and return carriers due to occultation, etc. Facilitate DTN routing by identifying when there are key changes in the space link data flow and/or its data flow characteristics

# Key CSS Standards that support Lunar Interoperability and DTN (2/2)

Standard	CCSDS #	Status	Synopsis	Comments
Monitored Data Cross Support Transfer Service	922.1-B-2	Published	Delivery of ground station monitor data	Standardized definition for reporting signal characterization (e.g., PC/N0, SNR, etc); useful for providing information on earth to space “trunk” lines as part of an overall comprehensive network connectivity assessment.
Tracking Data Cross Support Transfer Service	922.2-B-2	Published	Delivery for ground station tracking data	Standardized observables that help determine the position and heading of a spacecraft which in turn are one of the inputs needed for determining communication (link) geometry
Forward Frame Cross Support Transfer Service	922.3-B-1	Published	Multiplexing forward (uplink) frames from multiple sources	Allows multiple sources of frames to be multiplexed onto a forward carrier from a ground station to a spacecraft. Facilitates transition to DTN -- can have simultaneous “traditional” and DTN data flows.