# Online strategic Plan

(<http://cwe.ccsds.org/fm/sp/SitePages/SIS.aspx>)

(http://cwe.ccsds.org/fm/sp/Lists/SISContent/AllItems.aspx)

SPACE INTERNETWORKING SERVICES AREA

The objective of the SIS area is to address the communications services and protocols supporting end-to-end communications among applications, particularly where those communications may span multiple heterogeneous physical and data link technologies. Areas addressed by SIS include the networking infrastructure to support application-to-application communication onboard a single spacecraft, communications among multiple spacecraft, and communications between space-based applications and their counterparts on Earth and/or other planetary bodies.

The SIS area deals with communication services and protocols that are independent of specific link technology (as a lower layer bound) and independent of application-specific semantics (as an upper bound). Thus the SIS area covers essentially the Network through Transport Layers of the OSI reference model. The SIS area also develops application support protocols where the services provided are intended to operate over an internetworked infrastructure. An example of such an application support protocol is the Asynchronous Messaging System (AMS), which is intended to be invoked by applications to effect message exchange.

SIS protocols use the underlying communication and infrastructure services provided by the SLS and SOIS areas and any other onboard networks, and provide the networked connectivity needed by applications developed in other CCSDS areas such as MOIMS and SOIS. The SIS services provide hardware-independent mechanisms for identifying end systems and provide communications services that allow users to operate the same way whether communication is over a single data link layer or over multiple hops. The suite of capabilities developed by the SIS area accommodates all ranges of delay, interactivity, and directionality, although not all protocols are appropriate for all environments.

The SIS area needs to coordinate the following:

* SIS security mechanisms need to be consistent with other security mechanisms at other layers in the stack, such as those deployed at the link layer.
* The MOIMS area is developing Mission Operations data and services that might, depending on mission design choices, need to be deployed over SIS infrastructure. SIS needs to coordinate with MOIMS to ensure that such missions can efficiently use MOIMS data and services over SIS internetworks.
* The internetworking technologies developed by SIS need to be managed during operations. Since the deployed internetworks will typically span agency boundaries, the management mechanisms need to be coordinated with CSS for ground station interfaces and with MOIMS for application-level services required for operations, in particular for network management.
* The SOIS area is advocating for the use of wireless technologies for both onboard and inter-spacecraft communication. SIS needs to coordinate with SOIS and provide protocols that support internetworked communication over a mix of wireless technologies and/or heterogeneous wireless/wired scenarios.
* SOIS also develops a set of onboard services that SIS can leverage (e.g. file and packet storage services). SIS needs to coordinate with SOIS to ensure that SIS requirements are reflected in the SOIS designs.

The strategic goals of the SIS area are:

SIS GOAL 1

​Promote the use of Internet standards for data transport, routing, and auxiliary functions in environments where end-to-end paths exist and are relatively stable. This includes the use of Transmission Control Protocol (TCP) (including options defined by CCSDS and/or the Internet Engineering Task Force [IETF]) when round trip times are low (~<2s), and possible use of User Datagram Protocol (UDP) for unidirectional paths and/or high delay paths.​

SIS GOAL 2

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| Develop a Solar System Internet (SSI) suite of protocols and procedures to enable, under policy control of the asset (e.g., spacecraft) managers, cross-supported internetworked data communications.​ The SSI protocols can be used as a replacement for Internet technologies where delays are low with minimal impact, and also function in environments with long delays (days or weeks) and scheduled or unscheduled intermittent end-to-end connectivity. |

SIS GOAL 3

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| ​Develop application support protocols that facilitate internetworked mission operations that are capable of running over internetworked (e.g. IP suite, BP suite) or single-hop mechanisms such as the Encapsulation Service and the Licklider Transmission Service.​ |