CCSDS LINK

CCSDS Plug-and-Play Efforts

Read about how the existing CCSDS Spacecraft Onboard Interface Services (SOIS) architecture is being extended to support the requirements for plug-and-play of devices, and how a reference plug-and-play architecture has been defined to augment existing subnetwork-specific plug-and-play capabilities to meet these requirements.
Page 3

June 2008 Meeting Recap

The CMC, CESG, and ISO TC20/SC13 met in Tsukuba, Japan the week of 16 June. We've prepared a brief summary of the meetings for your information.
Page 6

For Your Information

We've gathered information about upcoming meetings and other items that you may find of interest.
Page 7

New and noteworthy

Take a look at the CCSDS documents that have recently been published or released for formal review. **Page 8**

Welcome to the CCSDS *Link*

The *Link* is intended to serve as a communication forum for the CCSDS community. Through content developed by CCSDS technical experts, members of the CMC and CESG, and by secretariat staff we hope to provide readers with a wealth of information about the organization and its work. Information in the *Link* is aimed at CCSDS participants as well as users of CCSDS specifications and technical information.

During the recent CMC meeting Tsukuba, Japan the China National Space Administration was welcomed as the newest member agency of CCSDS. We've included coverage of the event in the following pages.

This issue of the *Link* also contains two articles detailing ongoing CCSDS projects. The first, submitted by Mario Merri, discusses the current status of work in the Spacecraft Monitoring and Control (SM&C) working group. Stuart Fowell then provides an in-depth look at the SOIS effort to define plug-and-play standards.

We've reprinted an interesting article about Dr. Vinton Cerf and the interplanetary internet starting on page 5.

Starting on page 6 you will find a brief recap of the CESG, CMC, and ISO TC20/SC13 meetings held in Tsukuba, Japan recently.

Finally, updated information about the upcoming Fall meetings in Berlin, Germany is included in this issue to assist in your planning for the meetings.

We hope you find this issue of the *Link* informative and useful and would be interested in any feedback or comments you may have. Feel free to contact the Secretariat with any suggestions.

Kibo Attached to ISS
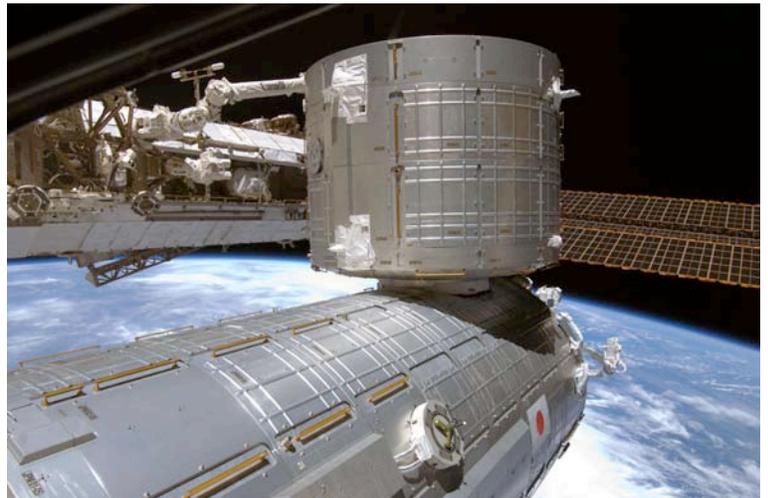
The blackness of space and Earth's horizon provide the backdrop for the scene.

The Kibo Japanese Pressurized Module and Kibo Japanese logistics module are featured in this image photographed by a STS-124 crew member while space shuttle Discovery is docked with the International Space Station.

Photo credit: NASA/JSC, 6 June 2008

Spacecraft Monitoring & Control (SM&C) Working Group Update

SM&C Framework and XTCE Workshop

The MOIMS SM&C working group hosted two Users Workshops at the CCSDS Spring 2008 meetings in Washington, D.C. On 12 March, the first SM&C Users Workshop attracted considerable interest from both Agency and Industry experts. The day was split between presentations detailing the Service concepts and an open session where attendees asked the working group questions regarding the forthcoming standards and their implementation.

On 13 March, the second XTCE Users Workshop also attracted a large industry attendance, but this time it was to discuss their use of, and experiences with, the exchange standard. The authors of the standard introduced the day and then various attendees presented their experience, notably James Webb Space Telescope and Landsat. The day was finished off with discussions on future use of the standard and outstanding issues.

As everyone considered these users workshops a great opportunities for Industry and agencies to exchange information on benefits of these standards and how best to implement them, it is planned to host them again in conjunction with the CCSDS meetings in Berlin in October 2008. We'll announce more details in the next issue of the *Link*.

Three New SM&C Documents Near Publication

The working group has recently submitted three documents to the CCSDS Engineering Steering Group (CESG) for adoption as CCSDS recommendations. This is the conclusion of over five years of continued effort by the working group in exploring and specifying the recommendations for the Message Abstraction Layer (MAL), Common and Core services for the Spacecraft Monitor & Control framework.

Updates to the SM&C Informational Report Under Development

Due to the extensive amount of work performed during the development of the SM&C recommendations, the corresponding Informational Report (Green Book), describing the main concepts behind SM&C and originally issued in 2006, is now due for update. The updated document will be available in the second half of 2008.

CNES Working on SM&C Java API and Space Packet Encoding

One of the fundamental aspects of the SM&C framework is the use of message abstraction. This is specified in the Message Abstraction Layer (MAL) document, but basically defines the informational content of the messages and the rules for exchanging them. For a concrete implementation, these need to be cast into both a communications protocol, for exchange with another component, and into a programming language for consistent representation in software. CNES is leading the way in this work with the specification of a SM&C MAL Java API (down to Java ME compliance) and is now starting on a CCSDS Space Packet encoding.

For more information on the work of the CCSDS SM&C Working Group, please contact Mario Merri of ESA.

# CNSA Approved as 11th CCSDS Member Agency

During the CCSD Management Council meeting in Tsukuba, Japan on 17 June, the China National Space Administration (CNSA) was accepted as the eleventh full member agency of the organization. China's admission to the organization marks the first addition to the membership since 1997. As the leading international organization for space communication standardization, CCSDS relies on its agency members to provide technical engineering support to its working groups. The addition of CNSA to the membership of CCSDS indicates the continued, broad international support for space communication standardization necessary to promote greater cooperation and interoperability among the space and ground assets of the major space exploration agencies around the world.

In remarks following the CMC's approval of CNSA as the newest CCSDS Member Agency, Mike Kearney, CMC Chair, remarked "Adding China's expertise to the technical knowledge base of the CCSDS working groups will further enable the CCSDS mission of enhancing worldwide governmental and commercial interoperability and cross-support, while reducing operational risk, development time, and project costs."

Cheng Wang, CNSA's primary representative to CCSDS, added "The China National Space Administration expresses its willingness to participate in and contribute to CCSDS. We look forward to supporting the work of CCSDS and contributing to the interoperability of international space missions."

CNSA was created in 1993 to define China's national space policies and priorities. It has quickly become an important player in the international space arena, with cooperative agreements between more than ten international space agencies. CNSA's membership in CCSDS continues this trend of increased exposure and cooperation with the broader space community.

CNSA's has already begun implementation of CCSDS standards on some of its spacecraft. CCSDS protocols were successfully used to enable interoperability between CNSA and ESA in 2007. In November of that year the CNSA Chang'e 1 lunar-orbiting spacecraft transmitted telemetry signals to ESA tracking stations which then relayed telecommands back to the satellite. This successful cross-support exercise was enabled by the CCSDS developed Advanced Orbiting Systems protocols.
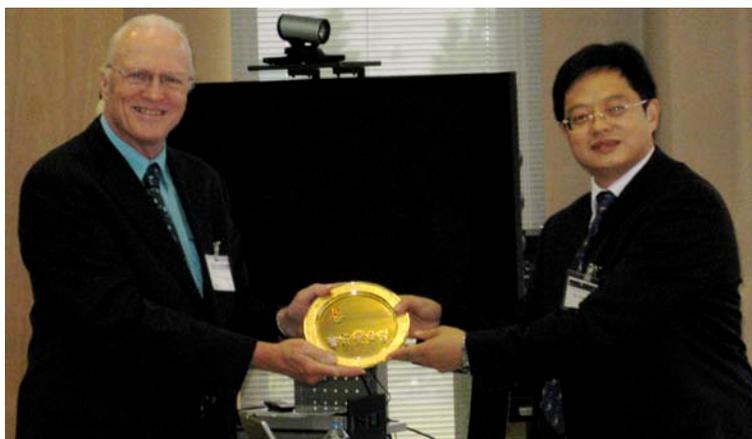
On behalf of CCSDS, CMC Chairman Mike Kearney accepts a commemorative plate from Cheng Wang of CNSA to mark CNSA's admission to CCSDS as a Member Agency.

The SOIS Plug-and-Play Architecture[1]

This article describes how the existing CCSDS Spacecraft On-board Interface Services (SOIS) architecture is being extended to support the requirements for plug-and-play of devices, and how a reference plug-and-play architecture has been defined to augment existing subnetwork-specific plug-and-play capabilities to meet these requirements. This initiative promises to both simplify the configuration of existing, static spacecraft communications networks and enable more dynamic networks such as those being introduced through the application of wireless communications.

Existing SOIS Architecture

The CCSDS SOIS area is developing standards to radically improve the spacecraft flight segment data systems design and development process by defining generic services that will simplify the way flight software interacts with flight hardware and permitting interoperability and reusability both for the benefit of Agencies and Industrial contractors. As part of the standardization process for SOIS, a subnetwork-neutral architecture of services has been defined, as illustrated in Figure 1. Mappings of these services to capabilities of specific subnetworks are then defined, e.g. protocols on SpaceWire, MIL-STD-1553B and CAN. This allows, amongst other benefits, for satellite architectures to be re-used across different busses and standardized off-the-shelf devices and subsystems to be developed.
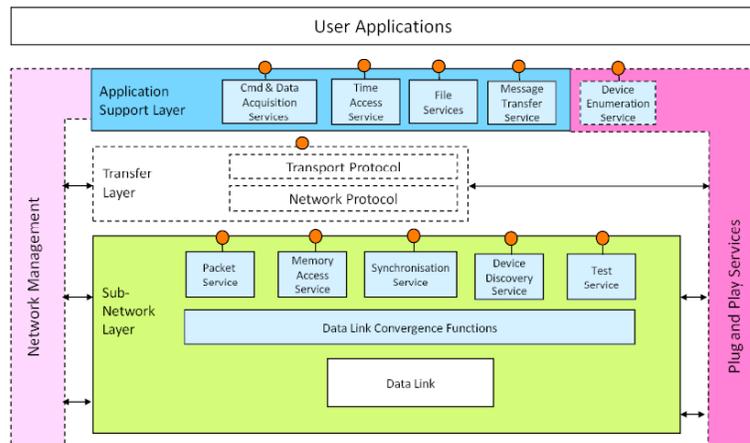

Figure 1: CCSDS SOIS Architecture

The first set of draft documents has being reviewed by the various CCSDS Member Agencies and is awaiting prototyping prior to publication as CCSDS Recommended Practices. The ECSS is currently developing protocols to provide the mappings onto SpaceWire and MIL-STD-1553B and a similar exercise is planned in 2008 for CAN.

However, these standards only address a static or top-down configured communications architecture. In addition, support for "wireless" capabilities is being considered and by their nature can result in a more dynamic communications architecture. To address these issues, it has been identified that the SOIS archi-

tecture needs extending to support "plug-and-play" concepts and a "Birds-of-a-Feather" (BoF) group has been organized to address this. This paper summarizes the current position of the SOIS Plug-and-Play BoF.

Definition of "Plug-and-Play"

The Wikipedia definition of "plug-and-play" is as follows:

"**Plug and play** is a computer feature that allows the addition of a new device, normally a peripheral, without requiring reconfiguration or manual installation of device drivers. … Modern plug-and-play includes both the traditional boot-time assignment of I/O addresses and interrupts to prevent conflicts and identify drivers, as well as hotplug systems such as USB and Firewire."

Translated to a spacecraft domain, "peripheral" should include onboard computing modules such as processing, IO and mass memory modules, as well as devices traditionally associated with avionics, from the simple (e.g. thrusters, magnetometers, thermistors) to the more complex (e.g. star trackers), and simple instruments.

Therefore, we limit the definition of "plug-and-play" in a SOIS context to:

"the mechanisms necessary to establish communication services between two data systems in a spacecraft's onboard (sub-)network, without requiring reconfiguration or manual installation of device drivers by any user (higher-level service or OBSW application)."

SOIS Plug-and-Play Use Cases

In conjunction with defining the term "plug-and-play", the following use cases are to be solved by plug-and-play within the SOIS domain:

- **Dynamic Spacecraft Network Reconfiguration** – activation of redundant devices on a flying spacecraft in response to faults;

- **Spacecraft Integration & Test** – Electrical Ground Support Equipment (EGSE) connection to Spacecraft under test using wireless technologies;

- **Rapid Spacecraft Assembly of Devices** – to reduce/eliminate the need for aspects of a spacecraft database for configuring OBSW;

- **Biometric Health Monitoring of ISS/Orbiter crew** – characterized as facilitating the incorporation of heterogeneous sensing and control devices in a wireless, heterogeneous communications network.

From these uses cases, a tentative set of requirements of SOIS plug-and-play has been extracted. Having established the requirements, the architecture itself must be designed. Within SOIS, the "adopt-adapt-innovate" approach is used.

Existing Plug-and-Play Technologies and Studies

To do this then, a survey of existing standards, technologies, and prototypes has been considered, including MIL-STD-

---

[1] This article is based on a paper presented at DASIA 2008 in Palma de Majorca, Spain.

1553B, SpaceWire, various serial standards, 802.11x, Bluetooth, Ethernet, IEEE 1451, USB, FireWire, 1-wire.

These different subnetwork types have differing existing levels of plug-and-play capabilities. In general, these can be split into 3 functions, some or all of which may be already supported by a particular subnetwork type:

- **device discovery** – discovery of initial and subsequent changes to subnetwork topology and devices attached to the subnetwork;

- **service discovery** – discovery of the capabilities of the devices added to the subnetwork;

- **device adaptation** – adaptation of specific devices to generic classes and functions of devices.

Reference SOIS Plug-and-Play Architecture

Because of these differing levels of capabilities, a reference SOIS plug-and-play architecture has been defined, as illustrated in Figure 2. It is a reference as it must be adaptable to cope with existing complete or partial provision and is used as a basis for augmenting existing capabilities to meet the overall SOIS plug-and-play requirements.
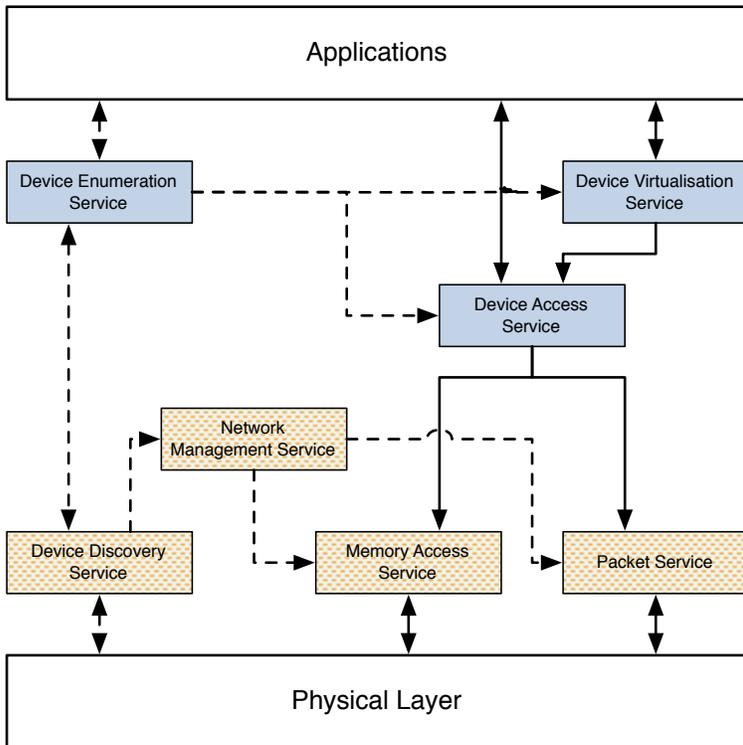

Figure 2: Reference SOIS Plug-and-Play Architecture

Device Discovery

Device Discovery is responsible for discovering and enabling communication with added devices using SOIS subnetwork services and notifying higher layers of the architecture of changes. To achieve this, a number of subnetwork-specific services are specified:

- The **Device Discovery Service** is used to discover added and removed devices.

- The **Network Management Service** is responsible for discovering the initial subnetwork topology (if required), allocating or obtaining a subnetwork-specific address for new devices, and any reconfiguration of the subnetwork services that may be required.

Typically, these services are already provided by the subnetworks considered for SOIS (MIL-STD-1553B being the obvious exception).

Service Discovery

Service Discovery is responsible for discovering and enabling use of the capability of added devices and notifying higher layers of the architecture of changes. To achieve this, the following typically-generic service is specified:

- The **Device Enumeration Service** is responsible for managing the discovery of added devices' capabilities and reconfiguration of the application support services to allow/disallow use of the capabilities of the added/removed device.

Differing levels of capabilities are provided associated with specific subnetworks. Unlike device discovery, there are more opportunities for the wide adoption or development of generic solutions. In particular there are a number of options for discovering the capability of a device, all based in part on obtaining information from the device itself. The selection of the appropriate option should be based on the complexity of the device itself, taking into account power, mass and data rates. Two examples at the either end of the range of options are outlined in the following list:

- **Device Class and Type** information can be read directly from registers on a device, e.g. using RMAP and the configuration port 0, and matched with the functions and access protocols of expected device classes and types.

- **Electronic Data Sheets** (EDS) define the device type and capabilities (e.g. functions, access protocols and classes-of-service supported). A well defined standard for this is **xTEDS** (XML Transducer Electronic Data Sheets).

Device Adaptation

Device Adaptation is responsible for providing generic interfaces to the functions of classes of devices and adapting between these generic interfaces and the specific ones actually provided by individual device implementations, e.g. information encodings and command/data acquisition protocols. In fact, this service provision is valuable independently of plug-and-play. To achieve this, the following generic services are specified:

- The **Device Virtualization Service** is responsible for mapping standard functions onto device-specific functions, including calibration and/or unit conversions and formatting of commands and data. To achieve this, standardization of a framework and class types and functions to populate this framework are required. Of course these must be extensible to allow for new classes and new specific devices to be added. As a starting point for the device classification, the

ETSI SSDHI standard will be used. The Device Access Service is used to send the actual commands and acquire data.

- The **Device Access Service** is an existing SOIS standard that provides "access" to the device through defined command and data acquisition protocols, i.e. subnetwork type, address and packet or memory access service.

Both of these services are updated by the Device Enumeration Service when a device is added or removed. This may be dynamic, e.g. by loading a new xTEDS for an XML Interpreter to use, or static, e.g. updating the services' Management Information Bases (MIBs) to identify added devices with offline-defined access mechanisms.

As part of developing the SOIS plug-and-play standards, the mappings onto particular subnetworks must be considered, with SpaceWire being considered the most appropriate as there are real, emerging mission requirements. To confirm this, an ESA-funded project to provide a reference SOIS implementation has an activity to prototype SOIS and SpaceWire plug-and-play using existing SpaceWire hardware. For the demonstrator, a use-case of the activation of a simple instrument on an Earth Observation satellite in LEO has been defined. This will be realized using ESA's RASTA test facility.

SOIS Plug-and-Play BoF

With SOIS there is an active group defining the plug-and-play concept, with current members from Europe and the USA. To date we have completed the technology survey for Device Discovery and are focussing on Service Definition and Discovery. Finally we will categorize Device Classes and Types. It is expected that this concept work will be completed and reported at the next CCSDS meeting in mid October 2008 in Berlin, Germany.

For more information on the work of the CCSDS Plug-and-Play BoF, please contact the Chairman, Stuart Fowell.

Space the Next Frontier for the Internet[2]

by Ridzwan A. Rahim

KUALA LUMPUR: Space is the next frontier for the Internet, says Internet pioneer Dr Vinton Cerf.

The Google vice-president and Chief Internet Evangelist, revealed that he was working on the Interplanetary Internet, a project of the NASA Jet Propulsion Laboratory that aims to extend the Internet into outer space for planet-to-planet communications.

"The project has been going on for about 10 years now and requires some significant development in the new protocols in addition to TCP/IP," he told the New Straits Times at the World Congress on Information Technology (WCIT), referring to the Internet's common language.

Those protocols, he said, were now stable and were being standardized in the Consultative Committee for Space Data Systems, a group of international space agencies working together to standardize communications in space.

The group will start doing space-based testing of the protocols at the end of this year using NASA's Deep Impact spacecraft. This will be followed by testing on a space station which Cerf expects to take place next year.

"If those tests are successful, we will offer these protocols with no constraints whatsoever and hope that all the space agencies will use them.

"If they do, every mission launched, whether its manned or unmanned, will have the ability to communicate with each other."

Cerf is widely known as the "father of the Internet", although it is a title he rejects.

In 1969, while at University California, Los Angeles, Cerf and two fellow graduate students, Bob Kahn and Leonard Klienrock, took the first crucial step of hooking up a computer to a switch in a military-commissioned project known as Arpanet, the predecessor of the global Internet.

Decades later, a new set of protocols called DTN, which stands for Delay and Disruption Tolerance Networking, had to be invented in order to make interplanetary communications possible. It is different from TCP/IP.

"When we originally started this work, we thought we could use the standard Internet protocols but we quickly discovered that they wouldn't work very well.

"For one thing, it takes quite a long time for radio signals to propagate back and forth between the planets because the distances are so big. Between Earth and Mars, for example, the one-way propagation time at the speed of light is between three to 20 minutes.

"It's not like a phone call; when you say hello, the person on the other end cannot hear you say that for three minutes or maybe as much as 20 minutes - at the speed of light."

Cerf said the goal was not to "build a big interplanetary network and hope somebody will use it".

"It simply means that when I launch a mission, if there are previous assets from other missions, or my own, up there still, I can make use of them to support my mission. So in an interesting way, over time we will accumulate an interplanetary backbone of communication using the standard protocols."

Cerf also spoke of a merging between TV and the Internet. He said by 2035, through a technology called IPTV, it would be viable to deliver an hour's worth of TV content through the Internet in just 16 seconds.

---

[2] Reprinted with permission from the 5 June 2008 issue of the New Strait Times Online <http://www.nst.com.my/>.

"People are going to download the video and play it back whenever they want it, just like the iPod."

Internet Protocol Television will also open up an exciting new form of advertising that is not disruptive, unlike the commercials on conventional television.

In Cerf's version of IPTV, the images in the field of view can be sensitized so that if there is an item of interest, viewers can click on it and find out more about the item.

Calling it a "quite doable" technology, Cerf said conventional broadcast, cable and satellite TV would have to adapt to the idea of people wanting to download and play back their shows.

Spring 2008 CESG/CMC/SC13 Meeting Report

The management bodies of CCSDS, the CCSDS Engineering Steering Group (CESG), the CCSDS Management Council (CMC), and ISO TC20/SC13 met in Tsukuba, Japan the week of 16 June. The excellent meeting facilities provided by our JAXA hosts helped to make the meetings productive and efficient.

The CESG reviewed the current work being undertaken within each of the CCSDS topic areas. The current status of each working group was presented and discussed to ensure that sufficient resources were being applied to make progress on the CCSDS work program. With few exceptions, the technical work within CCSDS is proceeding effectively.

The meeting attendance statistics from the Spring working group meetings in the Washington, D.C. area were examined by the CESG to understand the current support levels for each of the working groups. This information also assists the CESG and Secretariat staff in planning for future meetings by providing an understanding of the logistics footprint of the meeting week to adequately size future meeting venues.

A great deal of discussion during the CESG sessions was focused on the CCSDS input to the upcoming meeting of the Interagency Operations Advisory Group (IOAG). The IOAG provides a forum for identifying common needs across multiple agencies for coordinating space communications policies, high-level procedures, technical interfaces, and other matters related to interoperability and space communications. The technical standardization work done by CCSDS and other bodies is a key enabler of the interoperability goals set by the IOAG. The recommendations made by the CESG concerning input to the upcoming IOAG meetings is still being reviewed by the CMC. Upon approval of the draft CMC resolutions, appropriate information will be transmitted to the IOAG. The final text of the resolutions will be made available as part of the CMC meeting minutes package through the CMC portal on the CCSDS website.

The other major discussion point within the CESG focused on the current CCSDS deliverables. The intent and content of CCSDS recommended practices and recommended standards was reviewed as defined in current CCSDS operating procedures. The CESG resolved to form an ad-hoc group to review these current definitions of all CCSDS deliverables. The intent of the group is to draft an update to the current CCSDS operating procedures that will reinforce the organizations' commitment to producing high-quality, technically sound, implementable recommended standards and practices.

In addition to welcoming the China National Space Agency to CCSDS and interfacing with the CESG on a number of the topics outlined above, the CMC reviewed the current activities of each member agency. Special discussion topics included a review of the current IT initiatives of the secretariat staff, a review of the CCSDS strategic plan, and potential new capabilities to better support our customers.

Potential approaches to establishing a Space Assigned Numbers Authority (SANA) were reviewed. A SANA registry will register information about protocols and standards, as they relate to spaceflight, that need updating or extension more frequently than is practical in a CCSDS standard or report. Funding is necessary to support the establishment and continuing operations of such a body and CCSDS member agencies were tasked to investigate the possibility of contributing to this initiative. Final decisions on this topic will be made soon with a view toward setting up this functionality within this calendar year.

ISO TC20/SC13 is the body through which CCSDS transitions its recommended standards to ISO specifications. This group also held a plenary meeting in Tsukuba to review the current status of those documents currently proceeding through the ISO process. Coordination with other international standardization bodies, most notably ISO TC20/SC14 on space systems and operations, was discussed.

The minutes and presentations from all three of these meetings will be posted to the appropriate folders on the CCSDS Collaborative Work Environment (CWE) in the near future. If you would like to be notified when they are available, please contact the secretariat.

With all of the official work out of the way, our JAXA hosts invited all of the meeting attendees to a reception to allow the delegates to network with colleagues and review the work of the week.

Secretariat Update

After nearly a year of design, development, and testing the CCSDS Secretariat recently released a new online system to develop and maintain working group charters. The system is built into the existing CCSDS Collaborative Work Environment (CWE) and allows WG members to collaborate on the development of their charters and provides Area Directors with alerts as changes are made. The system also alerts secretariat staff when an approval poll is needed to ratify substantive changes to a charter. In addition to collecting charter information, the new system implements a new approach to managing the individual document development projects within a working group. The new process allows project leads to define and maintain document development schedules in a centralized location on the website. The system provides an overview of all of the projects associated with a working group and the current status of each in a convenient single view, allowing more detailed drill down capability to view the complete schedule.

Currently the charters for all of the approved working groups have been entered and WG chairs are entering the data associated with all ongoing projects. In the future, all new work will be maintained in this system as we begin to fully transition from the current process. If you have a CWE login, you can view the information in this system by clicking on the "Framework" link on the left-side navigation within any of the approved working groups' CWE pages. Many thanks to Brain Oliver and Laura Stafford, our secretariat IT staff, for their hard work over the last year to bring this system to fruition.

Of course, we continue to support the day to day work of the CESG, CMC, ISO TC20/SC13, and the CCSDS working groups. To contact the secretariat, simply send an email to secretariat@mailman.ccsds.org.

For Your Information

Save the Date for Future CCSDS Meetings

The Fall 2008 CCSDS meetings will be held in Berlin, Germany at the DIN facilities. Currently, the meetings are scheduled as follows:

- CCSDS Technical Plenary: 13-17 October 2008

The following week will be the management meetings:

- CESG: 20 October 2008

- SC13: 20 October (p.m.) 2008

- CESG/CMC joint meeting: 21-22 October 2008

- CMC wrap-up: 23 October 2008

Updated meeting information, including hotel recommendations near the meeting venue, a Berlin subway map, meeting venue layout, and directions to DIN have been posted to the CCSDS website. Please begin to make your travel arrangements at your convenience. These meetings are being hosted by DLR and supported by the German standards organization, DIN. The most up-to-date meeting information is always available on our website.

The Spring 2009 meetings will again be held at the scenic Penrose House in Colorado Springs, CO, USA. The current schedule has the technical meetings being held 20-25 April with the management meetings the following week. Watch the website for more information as it becomes available.

International Workshop on Lunar Surface Wireless Communications and Navigation Planned for 13 October 2008 in Berlin

Wireless surface communications for Lunar and Martian exploration activities will be necessary for future manned missions, robotic missions and surface operations. Multiple international partners are anticipated to independently develop surface communications infrastructure which will need to interoperate to increase system robustness and maximize return on investment.

The Consultative Committee for Space Data Systems, CCSDS, is investigating standards and technologies (e.g., IEEE 802.11 Wi-Fi, IEEE 802.16 Wi-Max, etc.) to support planetary surface communications and navigation. This international workshop is dedicated specifically to address planetary surface communication domains as inherently networked segments that will potentially make use of commercially-derived wireless technologies.

A call for presentations and technical discussion material is currently posted on the CCSDS website. Please refer to the document for further information.

Help Recognize Your Colleagues for Outstanding Work

The *AIAA Excellence in Aerospace Standardization Award* is presented on odd years to recognize contributions by individuals that advance the health of the aerospace community by enabling cooperation, competition, and growth through the standardization process.

Past winners of this award include:
- Dr. William W. Vaughan (2005)
- Dr. Macgregor S. Reid (2007)

Nominations for this award are accepted through the AIAA website and must be submitted by 1 July 2008.

Help Spread the Word About CCSDS

In an effort to keep the widespread and continued use of CCSDS work in front of the greater space community, we have developed an organization communication plan. Part of this plan calls for issuing periodic press releases coinciding with significant missions, mission milestones, successes, demonstrations in which CCSDS specifications have played a role.

While we on the Secretariat staff can monitor the U.S.-based missions fairly well, we would very much appreciate your help in keeping us apprised of events worthy of further publicity occurring within your local space programs.

Of course an opportunity for publicity does not necessarily have to be directly mission-related. If you feel that ongoing standard development work may be of interest to a broader audience, let us know and we will help you to get the word out.

Please send any and all suggestions you may have at any time to secretariat@mailman.ccsds.org.

New and Noteworthy

The following documents have recently been released for formal agency review or have been published.

Documents Under Review (beginning July 2008)

CCSDS 502.0-P-1.1 (Pink Sheets): *Orbit Data Messages*

This Recommendation specifies two standard message formats for use in transferring spacecraft orbit information between space Agencies: the Orbit Parameter Message (OPM) and the Orbit Ephemeris Message (OEM). The document includes sets of requirements and criteria that the message formats have been designed to meet. For exchanges where these requirements do not capture the needs of the participating Agencies, another mechanism may be selected.

The current draft pink sheets make a number of editorial changes to the document to conform with CCSDS style guidelines as well as a number of technical updates. Most notably, an Orbit Mean-Elements Message (OMM) was added to support collision avoidance objectives of ISO TC20/SC14. A full list of the changes is found in Annex E of the draft document.

This document will be released for Agency review and comment in early July. Please watch the website for document availability and review guidelines.

Recently Published Documents (since February 2008)

CCSDS 135.0-B-3: *Space Link Identifiers*

The CCSDS Recommended Standard for Space Link Identifiers documents the identifiers that are defined or reserved by CCSDS as part of the specification of the CCSDS space link protocols, and it shows how these identifiers are managed at the CCSDS level. The current issue adds a security subsection; adds protocol IDs for IPv4, Encapsulation Service, and Encapsulation Service Extended Protocol IDs; and expands and clarifies the meaning of the Proximity-1 port ID for Packets. The current version of this document contains all updates through Technical Corrigendum 1, dated March 2008

CCSDS 350.2-G-1: *Encryption Algorithm Trade Survey*

This Report presents the results of a survey conducted by the CCSDS Security Working Group.

CCSDS 350.3-G-1: *Authentication/Integrity Algorithm Issues Survey*

This Report presents the results of a survey conducted by the CCSDS Security Working Group.

CCSDS 504.0-B-1: *Attitude Data Messages*

The Attitude Data Messages Recommended Standard specifies two standard message formats for use in transferring spacecraft attitude information between space agencies.

The current mission count stands at 351! Please help us to stay on top of this important statistic by informing the Secretariat any time a new program, mission, or vehicle you are working on decides to implement one of our specifications.

CCSDS Leadership

Mike Kearney — CMC Chair and General Secretary
Adrian Hooke — CESG Co-Chair
Nestor Peccia — CESG Co-Chair
Eduardo Bergamini — ISO TC20/SC13 Chair

Secretariat Staff

Tom Gannett — Documentation Support
Erin Cliggett Kahn — CMC/CESG/SC13 Operations
Brian Oliver — Web Design and Engineering Support
Craig Day — Process Support