Status of CCSDS SOIS Services definition
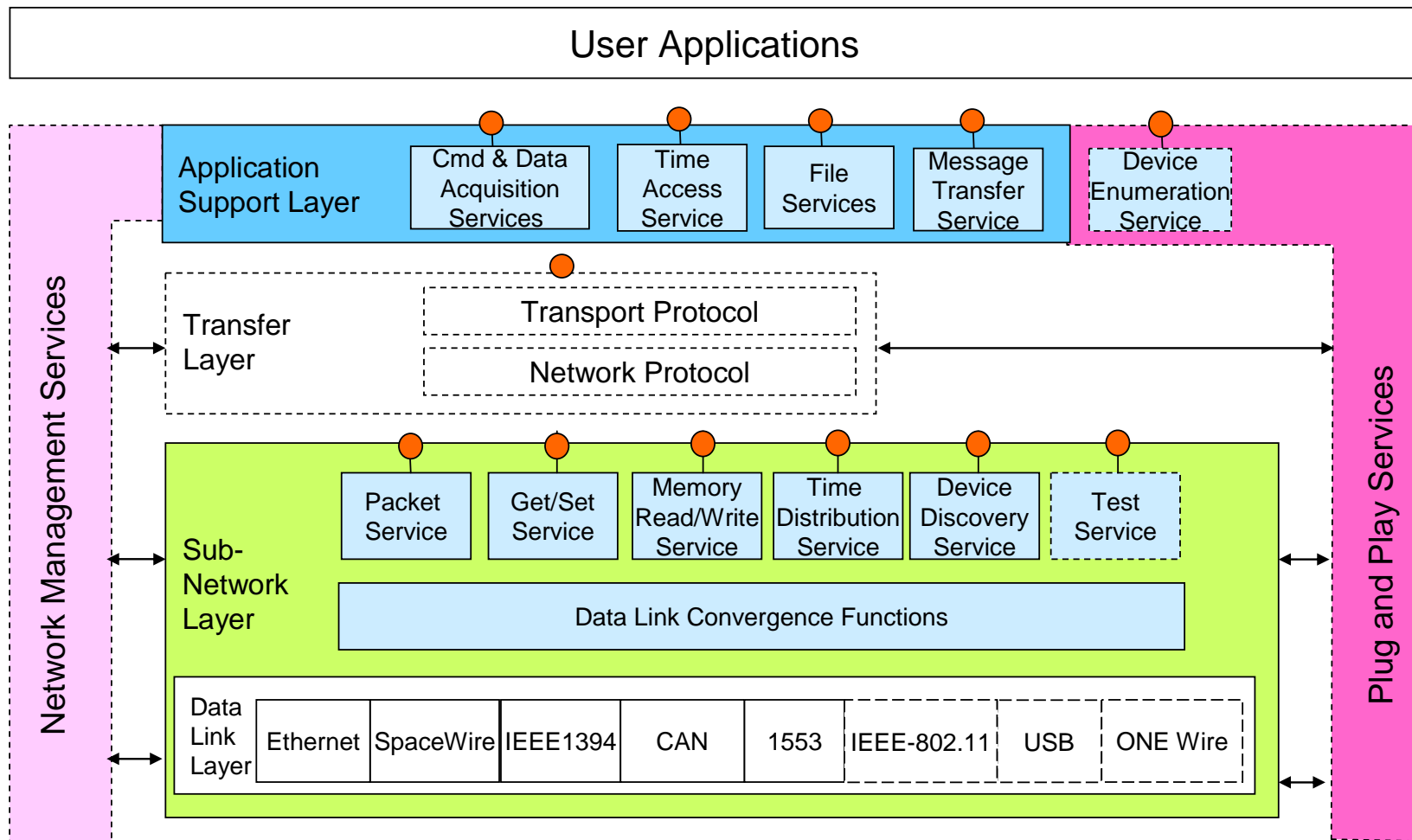
Working Group Meeting 8

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Background

- The SOIS (Standard Onboard Interface Services) activity is an initiative being undertaken within the CCSDS under ESA leadership

- The activity has two primary goals:
  - To define **a set of services to be provided by onboard subnetworks** (Lans, Buses etc)
  - To define **a set of services to be provided to Application specific software**

- This approach will allow for:

  - Standardisation of the onboard communications services available within the flight datahandling system, regardless of the actual physical implementation (CAN, SpaceWire etc)

  - Standardisation of the services available to Application software regardless of the kernel (RTEMS, VxWorks etc) and flight specific system software

- Taken together, this should lead to a greater reuse of software across missions and foster the development standard solutions, leading to reduced cost & integration times

SOIS Architecture

User Applications

Application Support Layer
- Cmd & Data Acquisition Services
- Time Access Service
- File Services
- Message Transfer Service
- Device Enumeration Service

Network Management Services

Plug and Play Services

Transfer Layer
- Transport Protocol
- Network Protocol

Sub-Network Layer
- Packet Service
- Get/Set Service
- Memory Read/Write Service
- Time Distribution Service
- Device Discovery Service
- Test Service

Data Link Convergence Functions

Data Link Layer

Ethernet	SpaceWire	IEEE1394	CAN	1553	IEEE-802.11	USB	ONE Wire

● Denotes service access point

Development approach and Prototyping

- It should be noted that the scope of SOIS Subnetwork definition has been intentionally limited to that of services (no protocol definition)

- This approach has been taken to allow a gradual take up of SOIS across different buses and to make optimum use of expert groups. Thus, the implementation of SOIS services:
  - over Milbus is being performed within ECSS Milbus working group
  - over SpaceWire is being performed by the SpaceWire working group

Current Status

- The SOIS **Green book** describing the overall SOIS activity has undergone Agency review and will be finalised at the current CCSDS meeting (January 2007)

- Application Support Layer - Draft Red Books
    - Command and Data acquisition services *Draft available for WG review*
    - File service *Draft available for WG review*
    - Time access *Draft available, undergoing RID review*
    - Message Transfer *at WG discussion level*
    - Device Enumeration at *WG discussion level*

- The message transfer service requires more discussion to determine the precise requirements and check if the work performed on Asynchronous Message Transfer can be directly reused – decision expected at CCSDS meeting

- Device Enumeration is immature and further discussion will be held at the CCSDS meeting, in particular with NASA "plug and play" supporters

Current Status

- Subnetwork services - Draft Red Books

  - Packet service   *Draft available for WG review*
  - Get/Set Service   *Draft available for WG review*
  - Memory Read/Write Service   *Draft available for WG review*
  - Device discovery   *Draft Available for WG review*
  - Time Distribution   *WG discussion*

- Time distribution is proving a little difficult but hopefully progress will be made during the working group meeting

- Memory Read/Write does not yet include the read/modify/write service required to align with RMAP. We still need to define the service interface for such a function and in particular for the failure case (SpaceWire working group could help by defining basic transfer scenario)

Outlook

- We are now proceeding quite rapidly towards having a complete set of Draft books on the table for review

- Before finalising the Red books it will be necessary to perform prototyping activities, both to confirm the defined approach and in some cases develop the required concept

- Agency prototyping commitments are currently insufficient and will be discussed at the CCSDS meeting and taken up internally at ESA in the near future

- We still predict maintaining the published schedule of Agency recommendations by early 2008

- All documents are available in the public area of the SOIS on the CCSDS web site
  - http://public.ccsds.org/sites/cwe/default.aspx