

SPACECRAFT ONBOARD INTERFACE SERVICES AREA

Title of Group	4.2 Application Support Services Working Group
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4.2.1 RATIONALE

The Application Support Services Working Group defines standard services that are provided to onboard software applications. These services isolate the flight software from the underlying hardware details and thereby increase the portability and reuse potential of the flight software. Furthermore, the service access points constitute cross support interfaces.

The standard services that are addressed by this working group are those that have been identified during previous CCSDS SOIF activities as being common requirements in all spacecraft missions, and providing the maximum benefit for flight software development. Furthermore, it is explicitly recognized that interoperability and cross support capabilities need to be provided throughout the project lifecycle, not just during operations, and particularly during application development, integration, and testing.

4.2.2 GOALS

The goals of this Working Group are to:

- 1) produce a document to describe the concepts of onboard applications, showing the interfaces needed for inter agency cross support and interoperability, and showing clearly the relationship between the onboard application services and other CCSDS standards;
- 2) produce a specification for a spacecraft command and data acquisition service that enables onboard applications to read and write simple onboard devices, and define the service interface used to access that service (previously referred to as SOIF C&DA capability set 1);
- 3) produce a specification for a spacecraft command and data acquisition service that enables onboard applications to access pooled data from simple onboard devices, and define the service interface used to access that service (previously referred to as SOIF C&DA capability set 6);

- 4) produce a specification for a spacecraft command and data acquisition service that enables onboard applications to access virtualized onboard devices, and define the service interface used to access that service (previously referred to as SOIF C&DA capability set 5);
- 5) produce a specification for the onboard time access service that enables flight applications located on any node of the spacecraft to obtain the onboard time with bounded accuracy, and define the service interface used to access that service;
- 6) produce a specification for the onboard message transfer service that enables applications hosted onboard a spacecraft to communicate with each other using asynchronous ad hoc messaging, and define the service interface used to access that service;
- 7) produce a specification for the onboard file access service that enables flight applications located on any node of the spacecraft to read from and write to files within a (nominal) global file store, and define the service interface used to access that service;
- 8) produce a specification for the device enumeration service that provides support for dynamic spacecraft configuration, and define the service interface used to access that service;
- 9) negotiate with other Working Groups and BOFs to determine what qualities of service need to be provided by the onboard application services;
- 10) make representations to the other Working Groups and BOFs about the use of the onboard application services in real systems.

NOTE – This will take the form of a workshop to which all interested working groups will be invited.

4.2.3 SCHEDULE AND DELIVERABLES

Date	Milestone
31 September 2006	Green Book
15 Dec 2006	Device Access Service Red Book – final draft
1 May 2006 1 Dec 2007	Device Access Service prototyping
15 Dec 2006	Time Access Service Red Book – final draft
10 May 2006 1 Dec 2007	Time Access Service prototyping

Date	Milestone
15 Dec 2006	Message Transfer Service and Protocol Red Book – initial draft
July 2007	Message Transfer Service and Protocol Red Book – final draft
1 September 2006 1 Dec 2007	Message Transfer Service prototyping
15 Dec 2006	File Services and Protocols Red Book – initial draft
July 2007	File Services and Protocols Red Book – final draft
1 Sept 2006 Dec 2007	File Services prototyping
15 Dec 2006	Device Data Pooling Service Red Book – initial draft
July 2007	Device Data Pooling Service Red Book – final draft
1 Sept 2006 1 Dec 2006	Device Data Pooling Service prototyping
15 Dec 2006	Device Virtualization White Book
Jan 2007	Device Virtualization Service Red Book – initial draft
July 2007	Device Virtualization Service Red Book – final draft
Jan 2007 Dec 2007	Device Virtualization Service prototyping
Jan 2007	Device Enumeration Service Red Book – initial draft
July 2007	Device Enumeration Service Red Book – final draft
Jan 2007 Dec 2007	Device Enumeration Service prototyping
Mar 2008	Application Services Blue Books

4.2.4 RISK MANAGEMENT STRATEGY

4.2.4.1 Technical Risks

The services that are to be defined by this working group have already been discussed extensively in previous SOIF activities, and a number of prototype and demonstration models have been developed. The lowest risk approach to developing these standards formally under CCSDS is to capitalize on these activities by taking them fully into account, and recruiting the personnel who have previously been involved into the new working group.

4.2.4.2 Management Risks

The Working group addresses several topics, in particular Command and Data Acquisition and Message Transfer, which should require full availability of the members of the working group. To this one could be added the 'plug and play applications services'. Maintaining the schedule may require continuous and possibly an increasing support of Agencies.

4.2.5 RESOURCE REQUIREMENTS

Working Group Chair: Effort estimated at around 40 man-days per year assuming two meetings per year of one week duration each.	BNSC, NASA
Research and Prototyping Activities: Initial estimate is around 2.5 man-years effort for the research and prototyping activities.	ESA, NASA