The « BEST » WORKBENCH

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March 2012
OVERVIEW

- Brief history
- CNES recommended process
- The tools & utilities provided by the « BEST » workbench
- Some examples
- The benefits of a formal description
- Contact
Brief history

Process and tools based on standards

- 2 CCSDS standards:
  - The EAST language for the syntax of data (Enhanced Ada SubseT)
  - The DEDSL (Data Entity Specification Language) for the semantics of data

- OASIS ("Outil d’Aide à la Structuration des Informations Spatiales")
  - Impossible to impose to users to learn and master 2 languages
  - Need of friendly tools to hide the languages
  - Description through a GUI dedicated to data description
  - Production of the standard compliant description by a simple click

- BEST
  - Joint ESA CNES effort
  - Leads to the BEST workbench that enhances OASIS thanks to several other tools
Whatever the kind of data, CNES recommends the use of editors, checker and document producers:

- A specific editor to help the user in describing the data without any specific knowledge of the required syntax. The result consists in a formal ICD (in a formal language).

- A document producer that translates the formal definition in a more informal description (HTML, Word, PDF or Excel document). The result consists in a readable ICD.

- A data checker that controls the data compliance with the formal ICD. The data checker is used by the software that produces the data and by the software that consumes the data.
  - A formal language combined with a data checker enable easy software integration.
  - Ensures a valid OAIS representation information
Tools & Utilities

- The editor/modeller : OASIS
  - The key tool of the workbench
  - It produces formal data description for any kind of data (binary or ascii)
  - Internal format in XML (XIF is a CNES standard)
  - Many export formats (EAST, DEDSL, XTCE, XML Schema)

- The document producer : SCRIBE
  - A generic tool
  - Two kinds of users: designers that are able to define templates and users that are able to apply the previously defined templates to the formal description
  - Templates may address different purposes: e.g. a general documentation for review people, a detailed documentation for software programmers

- The data checker
  - A tool that validates data according to its formal description (syntax check only)
Additional Tools & Utilities (1)

- The OASIS plug-ins (to extend the capabilities of the tool)
  - The Monitoring & Control plug-in: a specific editor to design TM, TC, Monitoring functions, Calibrators... also dedicated to the import/export of descriptions to XTCE standard
  - XML Schema plug-in: a specific editor for the description of XML data

- The DPE to simulate data compliant to the formal description
  - Full random
  - In or out the legal ranges
  - Using simple directives
  - Using external code (for complex cases)

- Aladin
  - A tool that compares and merges 2 versions of a formal description
Additional Tools & Utilities (2)

- ASCII Dump
  - Prints binary data in a readable text format
  - Export formats: XML or ‘Label = Value’

- A library to manipulate data
  - It eases the writing of INPUT/OUTPUT software as soon as the formal description of data is available (e.g. it allows to read or write data without dealing with its physical format)
  - It eases the production of conversion programs (to transform data from a format into another one)
  - The API is available for (C, FORTRAN, Ada, Java)
OASIS: a graphical editor
OASIS : Syntax editor
OASIS : Semantic Editor

Modify field syntactic & semantic information

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Les TCs

toutesLesTC = $[ALL_TC(leXIF)]

(GET_TC_NAME(toutesLesTC))

(INIT_TABLE(leXIF))

(Node = $[XIF_NODES(toutesLesTC)])

[ADD FIELD(Node)]

(PRINT_TABLE(leXIF))

La taille de la TC est: $[GET_DATA_SIZE(leXIF)]
Some outputs

- CDPP: [Viking (PDF)](#) & [Viking (HTML)](#)
- H2: [Pseudo Arcs Fins (HTML)](#)
- Jason: [OSDR (Excel)](#)
- Nosyca: [TM (Excel)](#)
- Pléiades: [CCC - Stations (HTML)](#)
- SSALTO: [Altimetry Level 1 (HTML)](#)
- SVOM: [Satellite Data Base Export (HTML)](#)
- SWIM: [Instrument Commands (HTML)](#)
The benefits of a formal description

- The formal definition is the contractual agreement
  - An unambiguous description to avoid endless discussion
  - Time saving during software integration

- The formal definition allows data simulation very early in the project life cycle
  - Effort saving during software unit testing

- This formal definition describes data without any assumption on the underlying operating system and the way the data are encoded
  - Long term preservation is reinforced

- Documentation is deduced from the formal definition
  - Documentation is always up to date
The benefits for long term preservation

- The formal definition ensures a precise and unambiguous representation information
  - ICD in XIF format preserved with data
  - ICD in PDF and HTML format accessible by users

- The formal definition allows validation of data transferred to the archive
  - Theoretically ➔ it is not so simple
  - Performance problems for large amounts of data
  - Validation failures when data record are not complete

- Formal definition not adapted for data in standard formats: PDF, FITS, …
Contact

- Download: [http://logiciels.cnes.fr](http://logiciels.cnes.fr)
- Help Desk: [east@cnesc.fr](mailto:east@cnesc.fr)
- Training request at [east@cnesc.fr](mailto:east@cnesc.fr)
- User manuals available at [http://logiciels.cnes.fr](http://logiciels.cnes.fr)
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