

Software/Document Overview

PDS 2010 Tech Session

June 10, 2009

PDS 2010 Data Design WG

Software/Document Similarities

- Several discreet parts constitute a whole
- Application-specific formats
- General search should yield access to all formats

In PDS4

- In PDS4, software and documents are digital data products on a par with observational data.
 - Unique identifiers
 - Associations with other PDS4 elements
 - Metadata for indexing and packaging

PDS4 SOFTWARE_SET Class

CT = SOFTWARE_SET	Req/Opt Car	dinalit
OBJECT = TAGGED SOFTWARE FORMAT	Required	1
DESCRIPTION	Optional	1
OBJECT = TAGGED_FILE	Required	1*
LOCAL_IDENTIFIER	Required	1
CHECKSUM	Required	1
FILE_SIZE	Required	1
FILE_SPECIFICATION_NAME	Required	1
FILE TYPE	Required	1
END_OBJECT = TAGGED_FILE		
OBJECT = SOFTWARE_BINARY	Optional	1*
END_OBJECT = SOFTWARE_BINARY		
OBJECT = SOFTWARE_SCRIPT	Optional	1*
END_OBJECT = SOFTWARE_SCRIPT		
OBJECT = SOFTWARE_SOURCE	Optional	1
END_OBJECT = SOFTWARE_SOURCE		
END_OBJECT = TAGGED_SOFTWARE_FORMAT		
OBJECT = SOFTWARE_SET_DESC	Required	1
END_OBJECT = SOFTWARE_SET_DESC		
JECT = IDENTIFICATION SECTION	Required	1
URN	Required	1
IDENTIFIER	Required	1
TITLE	Required	1
VERSION	Required	1
DD VERSION ID	Required	1
PDS VERSION ID	Required	1
LABEL REVISION NOTE	Required	1
PRODUCT CREATION TIME	Required	
O_OBJECT = IDENTIFICATION_SECTION	•	

SOFTWARE_SET references Documents

- The PDS4 SOFTWARE_SET class includes references to documents that assist in the description of the software "pieces / fragments"
 - The PROGRAMMERS_MANUAL_IDENTIFIER and the USERS_MANUAL_IDENTIFIER are each unique identifiers that reference documents "stored" somewhere within the PDS

OBJECT = SOFTWARE_SET_DESC	Required	1
VERSION	Required	1
AUTHOR_LIST	Required	1
DESCRIPTION	Required	1
NAME	Required	1
SOFTWARE ID	Required	1
SOFTWARE_TYPE	Required	1
PROGRAMMERS_MANUAL_IDENTIFIER	Required	1
USERS_MANUAL_IDENTIFIER	Required	1
END_OBJECT = SOFTWARE_SET_DESC		

PDS4 DOCUMENT_SET Class

OBJECT = TAGGED DOCUMENT FORMAT	Required	1*
DESCRIPTION	Optional	1
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OBJECT = TAGGED_FILE	Required	1*
LOCAL_IDENTIFIER	Required Required Required	1
CHECKSUM	Required	1
FILE_SIZE	Required	1
FILE_NAME	Required	1
FILE_TYPE	Required	1
END_OBJECT = TAGGED_FILE		
OBJECT = DOCUMENT FORMAT	Required	1
DESCRIPTION	Optional	1
FORMAT TYPE	Required	1
END_OBJECT = DOCUMENT_FORMAT END_OBJECT = TAGGED_DOCUMENT_FORMAT		
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END_OBJECT = TAGGED_DOCUMENT_FORMAT	Required	1
END_OBJECT = TAGGED_DOCUMENT_FORMAT BJECT = DOCUMENT_SET_DESC	Required	1
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END_OBJECT = TAGGED_DOCUMENT_FORMAT BJECT = DOCUMENT_SET_DESC DD_OBJECT = DOCUMENT_SET_DESC BJECT = IDENTIFICATION_SECTION URN	Required	1 1 1
END_OBJECT = TAGGED_DOCUMENT_FORMAT BJECT = DOCUMENT_SET_DESC DD_OBJECT = DOCUMENT_SET_DESC BJECT = IDENTIFICATION_SECTION URN IDENTIFIER	Required Required Required	1 1 1
END_OBJECT = TAGGED_DOCUMENT_FORMAT BJECT = DOCUMENT_SET_DESC ID_OBJECT = DOCUMENT_SET_DESC BJECT = IDENTIFICATION_SECTION URN IDENTIFIER TITLE	Required Required Required Required	1 1 1 1
END_OBJECT = TAGGED_DOCUMENT_FORMAT BJECT = DOCUMENT_SET_DESC ID_OBJECT = DOCUMENT_SET_DESC BJECT = IDENTIFICATION_SECTION URN IDENTIFIER TITLE VERSION	Required Required Required Required Required	1 1 1 1
END_OBJECT = TAGGED_DOCUMENT_FORMAT BJECT = DOCUMENT_SET_DESC ID_OBJECT = DOCUMENT_SET_DESC BJECT = IDENTIFICATION_SECTION URN IDENTIFIER TITLE VERSION DD_VERSION_ID	Required Required Required Required Required Required	1 1 1 1 1
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Backup

PDS3 SOFTWARE Catalog File

```
PDS VERSION ID
                 = PDS3
RECORD TYPE = STREAM
OBJECT = SOFTWARE
SOFTWARE ID = SBN REFSORT
SOFTWARE VERSION ID = "V1.0"
SOFTWARE PURPOSE = VERIFICATION
 OBJECT = SOFTWARE INFORMATION
   SOFTWARE NAME = REFSORT
   DATA FORMAT = PDS
   SOFTWARE LICENSE TYPE = "PUBLIC DOMAIN"
   TECHNICAL_SUPPORT_TYPE = FULL
   REQUIRED STORAGE BYTES = 5000
   PDS_USER_ID = "N/A"
   NODE ID
                      = SBN
   SOFTWARE_DESC = "This Perl utility sorts a file
    containing
                        a series of (properly-formatted)
     REFERENCE
                          objects according to the value of the
                          REFERENCE KEY ID elements. "
 END OBJECT = SOFTWARE INFORMATION
 OBJECT = SOFTWARE ONLINE
  ON LINE IDENTIFICATION = "http://pdssbn.astro.umd.edu/software/
   refsort.tar"
  ON_LINE_NAME = "SBN REFERENCE Object Source Routine"

NODE_ID = SBN
   PROTOCOL_TYPE = URL
PLATFORM = MULTIPLE
  END OBJECT = SOFTWARE ONLINE
END OBJECT = SOFTWARE
```

SOFTWARE Example

 The simplest software product consists of a single script file, a user's document and the PDS label:

> SOFTWARE/SORTREF.LBL SOFTWARE/SORTREF.L SOFTWARE/SORTREF.L

PDS3 to PDS4 Parallelisms

- In June/1999, Version 3.3 of the Standards Reference repurposed the original SOFTWARE_INVENTORY template to become the SOFTWARE template
 - The SOFTWARE template was a more streamlined version of the SOFTWARE_INVENTORY
 - The SOFTWARE template provides information relevant to obtaining the software from online source(s)
- PDS4 proposes to re-purpose the PDS3 SOFTWARE template to be a data object description that treats software like "science data" where each is defined by a set of attributes
- PDS4 proposes to provide a "linking" mechanism whereby data providers can reference documents that assist in the description of the software "pieces / fragments"

SOFTWARE in PDS3

- In PDS3, the SOFTWARE metadata was provided in the form of a catalog template
 - Provides general information about "software" included in a PDS archive volume
 - Includes applications, tools, or libraries proven useful for the display, analysis, formatting, transformation, or preparation of science data

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OBJECT = TAGGED_SOFTWARE_FORMAT	Required	
DESCRIPTION	Optional	1
OBJECT = TAGGED_FILE	Required	1*
LOCAL_IDENTIFIER	Required	1
CHECKSUM	Required	1
FILE SIZE	Required	1
FILE SPECIFICATION NAME	Required	
FILE TYPE	Required	1
END_OBJECT = TAGGED_FILE		
OBJECT = SOFTWARE_BINARY	Optional	
OS_VERSION	Required	
FILES	Required	
SUPPORTED_OS	Required	
SUPPORTED_ARCHITECTURE	Required	
SW_FORMAT_TYPE	Required	1
SYSTEM_REQUIREMENTS	Required	1
PROGRAM NOTES IDENTIFIER	Required	1
END OBJECT = SOFTWARE BINARY		
FILES INSTALL_NOTES SUPPORTED_ARCHITECTURE SYSTEM_REQUIREMENTS END_OBJECT = SOFTWARE_SCRIPT	Required Required Required Required	1
OBJECT = SOFTWARE_SOURCE	Optional	1*
OS_VERSION	Required	1
COMPILE_NOTES	Required	1
FILES	Required	
SOFTWARE_DIALECT	Required	
SOFTWARE_LANGUAGE	Required	
SUPPORTED_OS	Required	
SUPPORTED_ARCHITECTURE	Required	
SW_FORMAT_TYPE	Required	
SYSTEM_REQUIREMENTS	Required	1
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OBJECT = SOFTWARE SET_DESC	Required	1
VERSION	Required	1
AUTHOR LIST	Required	1
DESCRIPTION	Required	1
NAME	Required	1
SOFTWARE ID	Required	1
SOFTWARE_TYPE	Required	1
PROGRAMMERS_MANUAL_IDENTIFIER	Required	1
USERS MANUAL IDENTIFIER	Required	1
END_OBJECT = SOFTWARE_SET_DESC		
BJECT = IDENTIFICATION_SECTION	Required Required	1
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BJECT = IDENTIFICATION_SECTION	Required Required	1 1 1
BJECT = IDENTIFICATION_SECTION URN IDENTIFIER	Required Required Required	1 1 1 1
BJECT = IDENTIFICATION_SECTION URN IDENTIFIER TITLE VERSION	Required Required Required Required	1 1 1 1 1
BJECT = IDENTIFICATION_SECTION URN IDENTIFIER TITLE VERSION DD_VERSION_ID	Required Required Required	1 1 1 1 1 1
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BJECT = IDENTIFICATION_SECTION URN IDENTIFIER TITLE VERSION DD_VERSION_ID	Required Required Required Required Required	1 1 1 1 1 1

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)_VERSION_ID	Required Required	1
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OBJECT = IDENTIFICATION SECTION	required	Ť.
BODOT - IDENTIFICATION_DECTION		

Terminology

- A Data Model defines the entities to be processed, their attributes, and the relationships that add meaning.
- An attribute has alternate names.
 - Data Element
 - Vocabulary Term
- The set of all attributes in a data model is also called its vocabulary and is collected into a data dictionary.
- When defining an attribute, a set of meta-attributes or "attributes about attributes" are used.
 - The name of an attribute is a meta-attribute.
 - For example when defining the data element sample_type, the metaattribute, attribute_name, has the value "sample_type".