

Trying to write a general PDS4 data tool

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Small Bodies Node

Talk Concentration

- Design principles
- Writing general PDS software, rather than node-specific
- Writing to allow all possibilities in PDS4 Standards, and how difficult Standards complicate code

Project start

- Allow data to be read-in to a programming language
- Possibly create a GUI quick look tool
- IDL is proprietary, both reviewers and users complained
- Python is commonly used by scientists

User Considerations

- Target user?
Scientist, non-programmer
- Runs under Python
Version? 2.6+, 3.3+
- Heavy dependencies?
NumPy - optional
LXML? - not used
SciPy? - not used

RAM Usage

- 7 GB images
- Lazy read-in of data structures
- Memory mapping of data structures?
- Viewer memory usage

Tables - Group Fields

- Arrays d

```
<Group_Field_Binary>
  <repetitions>1024</repetitions>
  <fields>0</fields>
  <groups>1</groups>
  <group_location unit="byte">198</group_location>
  <group_length unit="byte">8388608</group_length>
```

- Disconti

```
<Group_Field_Binary>
  <repetitions>1024</repetitions>
  <fields>1</fields>
  <groups>0</groups>
  <group_location unit="byte">1</group_location>
  <group_length unit="byte">8192</group_length>
  <Field_Binary>
    <name>WAVELENGTH</name>
    <field_location unit="byte">1</field_location>
    <data_type>IEEE754MSBDouble</data_type>
    <field_length unit="byte">8</field_length>
  </Field_Binary>
</Group_Field_Binary>
```

rays?)

Unbounded numeric types

- ASCII_Integer and ASCII_NonNegative Integer
 - Not limited to 64-bits
- ASCII_Real
 - Limited to IEEE754 64-bits?

Reading Labels

- Collapsed text fields

“ Hello World \n” -> “Hello World”

- Namespaces

Delimited Tables

- No length required
- Certain cases ambiguous (is a newline or linefeed character allowed in a record?)
- RAM vs speed tradeoff

PDS4 Viewer:

http://sbndev.astro.umd.edu/wiki/PDS4_Viewer

PDS4 Python Tools:

http://sbndev.astro.umd.edu/wiki/Python_PDS4_Tools

Links available from Tools section of PDS-SBN website, or PDS tools registry.

Backup Slides

Product_Update

- Store two (or more) labels
- Show two (...) labels
- Validate two (...) labels