Standards Change Request

**Multiple occurrences of the same keyword in an object
- Valid or Not?**

SCR 3-1126.v6

Submitted:
Date: 2007-08-29
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History:
2008-04-01 (Version 1): First draft based on Anne Raugh's problem statement.
2008-05-07 (Version 2) : Slight re-wording of Proposed Solution. Added Impact items.
2008-05-13 (Version 3): Added text to clarify single occurrence rule applies to assignment
    statements.
2008-05-20 (Version 4): Re-worked text for adding to Section 12.4.2.
2008-10-22 (Version 5): Conversion of the proposed "PDS Usage" sections for Chapter 12
into clarification of Cpater 12 text. Simplified statements.
2008-10-23 (Version 6): reorganized form and updated content to align better with SC
    Process, Appendix B. Limited tool changes requested; estimated impact.
    Removed Raugh's name from Work Group list.

Working Group:

M. Cayanan, L. Huber, S. Hughes, T. King (lead), D. Simpson

Problem:

A Rosetta team has presented a draft label that contains multiple occurrences of the SPICE_FILE_NAME and NOTE keywords. A medium-depth search of the PDS standards documents reveals no PDS standard for how to deal with repeated keywords. The lvtool (current release 2.20) flags this as a warning of the same severity as an unmatched standard value (i.e., the sort of warning we expect to be cleaned up prior to or at final delivery). VTool was recently modified (version 1.2.0) so that an error is reported when a keyword is repeated. If multiple occurrences of a single keyword within an object is valid, the PDS standards should say so and provide an indication of the significance of a repeated keyword (are the values concatenated into a series or sequence, or does one overwrite another and in what order)? If multiple occurrences are not valid, the PDS standards need to say so explicitly.

Current Urgency:

Medium (normal flow through the queue)

Proposed Solution:

Modify the text of the Standards Reference to stipulate that elements can have only a single occurrence within a given object context. Confirm that VTool correctly detects and reports errors. No other tools will be modified.

Impact Assessment (by Todd King):

PDS Standards Reference – Changes as described in "Requested Changes"

Archive Preparation Guide – no impact

Proposer's Archive Guide – no impact

Planetary Science Data Dictionary – no impact

PDS tools – Confirm that VTool correctly detects and reports errors when there are multiple occurrences of elements, pointers, and identifiers. According to M. Cayanan (2008-10-22) such a fix was made in version 1.2.0. Less than one person-day of effort. No other tools will be modified; if an error is encountered, behavior of those tools cannot be predicted.

DN tools – No tools will be modified. If an error is encountered, behavior of those tools cannot be predicted.

PDS Web Site: - no impact

External Agencies –
Depending on what Rosetta and PSA have done, this may make those data incompatible with PDS Standards.

External Interfaces – no impact.

Compliance/compatibility with ODL and ISO Standards – no impact
- This change does not impact the grammar or syntax of ODL.
- The PDS applications of ISO standards are unaffected.

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Deleted: Add checks for multiple occurrences of element, and indicate an error if found.
In the latest release of VTool, version 1.2.0, a fix was made to report an error on duplicate keywords found in an object. (Communication M Cayanan 10/22/2008)

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Additional Information:

There are no known instances in which providers have delivered labels to PDS which contained multiple keywords or pointers.

References to "Elements" occur throughout the Standards Reference. No label examples were found that used multiple occurrences of elements. The sections that pertain to elements within objects are:

> 5. Data Product Labels (all)
> 12.4 Statements
> 12.4.2 Attribute Assignment Statement

Figures which use Pointers
> Figure 5.2 PDS Attached / Detached Label Structure
> Figure 5.6 Data Object Pointers – Detached & Combined Labels

Requested Changes:

Append the following to the paragraph in Section "5.3 Detailed Label Contents Description":

> Note that identifiers, pointers and data elements may only appear once within a given object definition (including an implicit object definition, such as a minimal label). If multiple values are needed, they must be represented using either the sequence or set syntax (see Sections 12.5.5 and 12.5.6, respectively).

Append to the first paragraph in "12.4.2 Attribute Assignment Statement".

> If there are multiple values, a single attribute assignment statement must be used with either sequence or set syntax; no assignment statement may be repeated.

Append to "12.4.5 GROUP Statement," restriction 2:

> If there are multiple values, a single statement must be used with either sequence or set syntax; no attribute assignment statement or pointer may be repeated.