PDS 4 Data Architecture Reprise

PDS 4 Data Architecture Team

September 2008

"fewer, simpler structures"

- File storage
 - PDS3
 - implicit data structures
 - rely on descriptions of structures
 - data structure and logical view are not related
 - PDS4
 - explicit data structures
 - rigorously defined structures
 - data structure parallels logical view

"fewer, simpler structures"

- Data Objects
 - PDS3
 - Some fairly complex 2D, 3D, banded images, variable length records
 - PDS4
 - Probably have more, but simpler, objects
 - Binary_Table and Character_Table
- Recommend changing to:
- "a few, simple structures for data storage and interpretation"

		ATM	EN	GEO	IMG	NAIF	PPI	RINGS	SBN	Total	Mean	StDev
а	available to current community	9	9	10	7	10	9	9	9	72	9.0	0.9
е	long term preservation	10	10	3	10	0	10	10	10	63	7.9	4.0
С	easy data submission	8	8	5	2	0	3	6	7	39	4.9	2.9
i	standards - simple, straightforward, consistent	7	6	6	1	4	0	5	8	37	4.6	2.8
b	easy to use (contemporary formats)	4	1	8	6	8	1	7	1	36	4.5	3.2
0	Search/retrieve and granularity	6	0	9	0	6	6	8	0	35	4.4	3.8
d	preserve in contemporary formats	3	0	7	9	0	8	2	0	29	3.6	3.8
f	Enable "one-stop shopping",	5	7	0	5	9	0	0	0	26	3.3	3.7
m	Easily extensible/adaptable	0	5	1	0	3	5	4	4	22	2.8	2.1
g	deliver derived data products	0	0	4	4	7	4	0	0	19	2.4	2.7
k	Improve data transfer, integrity, maintenance	2	3	0	3	1	0	3	3	15	1.9	1.4
j	safely and efficiently archived & retrieved	0	0	0	8	0	0	0	6	14	1.8	3.3
n	Scalability of capacity	0	2	2	0	2	7	0	0	13	1.6	2.4
I.	Simplify addition of future user services	0	4	0	0	5	0	0	2	11	1.4	2.1
р	Tools (utilities, QA, etc.)	1	0	0	0	0	0	1	5	7	0.9	1.7
q	Reporting and accounting	0	0	0	0	0	2	0	0	2	0.3	0.7
h	same as c	0	0	0	0	0	0	0	0	0	0.0	0.0
		ATM	E NI	GEO	1140	NAIF	PPI	DINCO		Tatal	Maara	C4Deve
		AIW	EN	GEU	IMG	NAIF	PPI	RINGS	SBN	Total	Mean	StDev
											_	
h	same as c	0	0	0	0	0	0	0	0	0	0.0	0.0
q	Reporting and accounting	0 0	0 0	0 0	0 0	0 0	0 2	0 0	0 0	0 2	0.0 0.3	0.0 0.7
q a	Reporting and accounting available to current community	0 0 9	0 0 9	0 0 10	0 0 7	0 0 10	0 2 9	0 0 9	0 0 9	0 2 72	0.0 0.3 9.0	0.0 0.7 0.9
q a k	Reporting and accounting available to current community Improve data transfer, integrity,maintenance	0 0	0 0 9 3	0 0 10 0	0 0 7 3	0 0 10 1	0 2 9 0	0 0 9 3	0 0 9 3	0 2 72 15	0.0 0.3 9.0 1.9	0.0 0.7 0.9 1.4
q a	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.)	0 0 9 2 1	0 0 9 3 0	0 0 10 0 0	0 0 7 3 0	0 0 10 1 0	0 2 9 0 0	0 0 9 3 1	0 0 9 3 5	0 2 72 15 7	0.0 0.3 9.0 1.9 0.9	0.0 0.7 0.9 1.4 1.7
q a k p I	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services	0 0 9 2 1 0	0 0 9 3 0 4	0 0 10 0	0 0 7 3 0 0	0 0 10 1 0 5	0 2 9 0 0 0	0 0 9 3 1 0	0 0 9 3 5 2	0 2 72 15 7 11	0.0 0.3 9.0 1.9 0.9 1.4	0.0 0.7 0.9 1.4 1.7 2.1
q a k p I m	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable	0 9 2 1 0	0 0 9 3 0 4 5	0 0 10 0 0 1	0 0 7 3 0 0 0	0 0 10 1 0 5 3	0 2 9 0 0 0 5	0 0 9 3 1 0 4	0 9 3 5 2 4	0 2 72 15 7 11 22	0.0 0.3 9.0 1.9 0.9 1.4 2.8	0.0 0.7 0.9 1.4 1.7 2.1 2.1
q a k p I m n	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity	0 9 2 1 0 0	0 9 3 0 4 5 2	0 0 10 0 0 1 2	0 0 7 3 0 0 0 0	0 0 10 1 0 5 3 2	0 2 9 0 0 5 7	0 9 3 1 0 4 0	0 9 3 5 2 4 0	0 2 72 15 7 11 22 13	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4
q a k p I m n g	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products	0 9 2 1 0 0 0	0 9 3 0 4 5 2 0	0 0 10 0 0 1 2 4	0 0 7 3 0 0 0	0 0 10 1 0 5 3 2 7	0 2 9 0 0 5 7 4	0 9 3 1 0 4 0 0	0 9 3 5 2 4 0 0	0 2 72 15 7 11 22 13 19	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7
q a k p I m n g i	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent	0 9 2 1 0 0 0 7	0 9 3 0 4 5 2 0 6	0 0 10 0 0 1 2 4 6	0 0 7 3 0 0 0 0 0 4 1	0 10 1 5 3 2 7 4	0 2 9 0 0 5 7 4 0	0 9 3 1 0 4 0 5	0 9 3 5 2 4 0 8	0 2 72 15 7 11 22 13 19 37	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8
q a k p I m n g i c	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent easy data submission	0 9 2 1 0 0 0 7 8	0 9 3 0 4 5 2 0	0 0 10 0 0 1 2 4 6 5	0 0 7 3 0 0 0 0 4 1 2	0 10 1 5 3 2 7 4 0	0 2 9 0 0 5 7 4 0 3	0 9 3 1 0 4 0 5 6	0 9 3 5 2 4 0 8 7	0 2 72 15 7 11 22 13 19 37 39	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6 4.9	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8 2.9
q a k p I m n g i	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent easy data submission easy to use (contemporary formats)	0 9 2 1 0 0 0 7 8 4	0 9 3 0 4 5 2 0 6 8 1	0 0 10 0 0 1 2 4 6 5 8	0 0 7 3 0 0 0 0 4 1 2 6	0 0 10 1 0 5 3 2 7 4 0 8	0 2 9 0 0 5 7 4 0 3 1	0 9 3 1 0 4 0 5 6 7	0 9 3 5 2 4 0 8 7 1	0 2 72 15 7 11 22 13 19 37 39 36	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6 4.9 4.5	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8 2.9 3.2
q a k p l m n g i c b j	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent easy data submission easy to use (contemporary formats) safely and efficiently archived & retrieved	0 9 2 1 0 0 0 7 8 4 0	0 9 3 0 4 5 2 0 6	0 0 10 0 0 1 2 4 6 5 8 0	0 0 7 3 0 0 0 0 4 1 2 6 8	0 0 10 1 0 5 3 2 7 4 0 8 0	0 2 9 0 0 5 7 4 0 3 1 0	0 9 3 1 0 4 0 5 6 7 0	0 9 3 5 2 4 0 8 7 1 6	0 2 72 15 7 11 22 13 19 37 39 36 14	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6 4.9 4.5 1.8	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8 2.9 3.2 3.3
q a k p l m n g i c b j f	 Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent easy data submission easy to use (contemporary formats) safely and efficiently archived & retrieved Enable "one-stop shopping", 	0 9 2 1 0 0 0 7 8 4 0 5	0 9 3 0 4 5 2 0 6 8 1 0 7	0 0 10 0 0 1 2 4 6 5 8 0 0	0 0 7 3 0 0 0 0 4 1 2 6 8 5	0 0 10 1 5 3 2 7 4 0 8 0 9	0 2 9 0 0 5 7 4 0 3 1 0 0	0 9 3 1 0 4 0 5 6 7 0 0	0 9 3 5 2 4 0 8 7 1 6 0	0 2 72 15 7 11 22 13 19 37 39 36 14 26	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6 4.9 4.5 1.8 3.3	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8 2.9 3.2 3.3 3.7
q a k p l m n g i c b j f o	Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent easy data submission easy to use (contemporary formats) safely and efficiently archived & retrieved Enable "one-stop shopping", Search/retrieve and granularity	0 9 2 1 0 0 7 8 4 0 5 6	0 9 3 0 4 5 2 0 6 8 1 0 7 0	0 0 10 0 0 1 2 4 6 5 8 0 0 9	0 0 7 3 0 0 0 0 4 1 2 6 8 5 0	0 0 10 1 0 5 3 2 7 4 0 8 0 9 6	0 2 9 0 0 5 7 4 0 3 1 0 6	0 9 3 1 0 4 0 5 6 7 0 8	0 9 3 5 2 4 0 8 7 1 6 0 0	0 2 72 15 7 11 22 13 19 37 39 36 14 26 35	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6 4.9 4.5 1.8 3.3 4.4	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8 2.9 3.2 3.3 3.7 3.8
q a k p l m n g i c b j f	 Reporting and accounting available to current community Improve data transfer, integrity,maintenance Tools (utilities, QA, etc.) Simplify addition of future user services Easily extensible/adaptable Scalability of capacity deliver derived data products standards - simple, straightforward, consistent easy data submission easy to use (contemporary formats) safely and efficiently archived & retrieved Enable "one-stop shopping", 	0 9 2 1 0 0 0 7 8 4 0 5	0 9 3 0 4 5 2 0 6 8 1 0 7	0 0 10 0 0 1 2 4 6 5 8 0 0	0 0 7 3 0 0 0 0 4 1 2 6 8 5	0 0 10 1 5 3 2 7 4 0 8 0 9	0 2 9 0 0 5 7 4 0 3 1 0 0	0 9 3 1 0 4 0 5 6 7 0 0	0 9 3 5 2 4 0 8 7 1 6 0	0 2 72 15 7 11 22 13 19 37 39 36 14 26	0.0 0.3 9.0 1.9 0.9 1.4 2.8 1.6 2.4 4.6 4.9 4.5 1.8 3.3	0.0 0.7 0.9 1.4 1.7 2.1 2.1 2.4 2.7 2.8 2.9 3.2 3.3 3.7

Exercise 1 Sorted by Mean and Std Dev

Exercise 2

Sort by Mean

	10 group>	1	2	3	4	5	6	7	8	Total	ave s	stdev 1
4	Local repositories use one layout	8	8	3	10	8	10	3	7	57	7.1	2.7 Local repositories independent
7	General utilities support all classes	7	7	8	5	7	8	8	5	55	6.9	1.2 Utilities produced by DNs
10	1 PDS	7	8	8	2	4	10	4	7	50	6.3	2.7 Requirement Proliferation
3	Nodes & data location transparent	10	6	4	2	6	10	3	5	46	5.8	3.0 User sees DN not PDS as whole
5	Structures & formats highly rigid	6	7	5	2	6	5	9	5	45	5.6	2.0 High flexibility
9	Cheap, universal software	5	7	8	5	2	7	2	7	43	5.4	2.3 Limited interoperability
1	Objects & elements defined globally	8	7	5	3	6	4	5	4	42	5.3	1.7 Highest-level requirements global
6	Global configuration control	5	8	3	5	1	10	1	4	37	4.6	3.2 Nodes handle configuration control
2	One interface into PDS holdings	5	6	3	3	4	3	2	5	31	3.9	1.4 DNs use independent catalogs
8	No mission or discipline tailoring	4	5	5	2	2	3	2	2	25	3.1	1.4 User-Oriented Service

Sort by Std Dev

	10 group>	1	2	3	4	5	6	7	8	Total	ave	stdev	1
7	General utilities support all classes	7	7	8	5	7	8	8	5	55	6.9	1.2 U	tilities produced by DNs
2	One interface into PDS holdings	5	6	3	3	4	3	2	5	31	3.9	1.4 D	Ns use independent catalogs
8	No mission or discipline tailoring	4	5	5	2	2	3	2	2	25	3.1	1.4 U	ser-Oriented Service
1	Objects & elements defined globally	8	7	5	3	6	4	5	4	42	5.3	1.7 H	lighest-level requirements global
5	Structures & formats highly rigid	6	7	5	2	6	5	9	5	45	5.6	2.0 H	ligh flexibility
9	Cheap, universal software	5	7	8	5	2	7	2	7	43	5.4	2.3 Li	imited interoperability
10	1 PDS	7	8	8	2	4	10	4	7	50	6.3	2.7 R	equirement Proliferation
4	Local repositories use one layout	8	8	3	10	8	10	3	7	57	7.1	2.7 Lo	ocal repositories independent
3	Nodes & data location transparent	10	6	4	2	6	10	3	5	46	5.8	3.0 U	ser sees DN not PDS as whole
6	Global configuration control	5	8	3	5	1	10	1	4	37	4.6	3.2 N	odes handle configuration control
	total	65	69	52	39	46	70	39	51	431	53.9	12.7	