COMPLETED TRANSFORMATIONS

Input	Output	Comment	Status
PDS3 Table	CSV	[GEO] Would like to see a focus on binary table conversion. [PPI] Already have tools to perform this transformation (for both ASCII and binary).	Included in Build 8a
	PDS4 Labeled Table	[EN] Need to break this out into specific PDS4 product types. [IMG] GDAL only has a PDS3 table reader. Can write about 20+ "table" formats (e.g. csv). If Latitude and Longitude are headings in PDS3 table, it will support writing out geometry/GIS point formats (GML, shapefiles, KML,… http://www.gdal.org/drv_pds.html) [PPI] PPI has an existing tool (igpp.docgen) to transform a PDS3 label to a PDS4 label, but external information is needed to create a label that takes advantage of the full capabilities of PDS4.	Included in Build 8b
PDS4 Binary Table* (Table_Binary)	CSV		Included in Build 7b
PDS4 Character Table** (Table_Character)	CSV	[EN] PDS Table Character to selected standard implementation(s) of CSV.	Included in Build 7b
PDS4 Array_2D Image	FITS	[EN] This should work on anything derived from an Array_Base. See Binary Data Type Conversion below for details.	Included in Build 9a
PDS4 DelimitedTable** (Table_Delimited)	CSV	[EN] PDS DSV to selected standard implementation(s) of CSV.	Included in Build 7b
PDS4 2D Image* (Array_2D_Image)	GIF, JPEG, JPEG 2000, PNG, PNM, TIFF	[EN] These output formats are included in the Java Advanced Imaging library which is included in the PDS4 Tools library.	Included in Build 7b
	PDS3 Image	[EN] Including a minimal PDS3 label. [IMG] important for those users who already have PDS3 tools and want to use PDS4 data [Mike] This is achieved by doing the PDS4 label to PDS3 label transformation	Included in Build 8a
PDS4 3D Image* (Array_3D_Image)	GIF, JPEG, JPEG 2000, PNG, PNM, TIFF	[EN] These output formats are included in the Java Advanced Imaging library which is included in the PDS4 Tools library. The current implementation defaults to transforming band 1. Will add support for selecting bands in the future.	Included in Build 7b
PDS4 3D Hyper-Spectral Cube* (Array_3D_Spectrum)	GIF, JPEG, JPEG 2000, PNG, PNM, TIFF	[EN] These output formats are included in the Java Advanced Imaging library which is included in the PDS4 Tools library. The current implementation defaults to transforming band 1. Will add support for selecting bands in the future.	Included in Build 7b
PDS4 Label	Object Description Language (ODL)	[EN] This can be supported by XSLT-based transformations in the Transform Tool.	Included in Build 8a
	Parameter Value Language (PVL)	[EN] This is supported by XSLT-based transformations in the Transform Tool.	Included in Build 7b
	HTML	[EN] This is supported by XSLT-based transformations in the Transform Tool.	Included in Build 7b
PDS3 Image (8-Bit Image) (16-Bit Image)	PDS4 Labeled Image	[EN] Need to break this out into specific PDS4 product types. [IMG] Priority for GDAL is a PDS4 reader not currently a writer. There are plans for an ISIS3 writer. [Mike] I consider this done as we currently have a PDS3 label to PDS4 label transformation	Included in Build 4b
PDS4 Character Table** (Table_Character)	PDS4 Delimited Table	[EN] See PDS4 Delimited Separated Value (DSV) standard. [PPI] CSV meets the need for table to delimited table conversion. [Mike] Table is transformed into a CSV along with a Table_Delimited label	Included in Build 8b

TO-DO TRANSFORMATIONS

				Priority (High, Medium, Low)								
Input	Output	Comment	Status	ATMOS	GEO	IMG	PPI	RMS	SBN	PSA	Score	Level of Effort *****
PDS4 Array_3D Image	FITS	[EN] This should work on anything derived from an Array_Base. See Binary Data Type Conversion below for details.	Planned for Build 9b	High	Low ***	Low	Low(*)	High	Low	Low	10	medium
PDS4 Binary Table* (Table_Binary)	FITS	[EN] See Binary Data Type Conversion below for details. [PPI] PPI sees negative value in converting tables to FITS format.	Planned for Build 10a and beyond	High	Low ***	Low	Low	Low	Low	Low	8	medium
	~~PDS4 Character Table~~	[PPI] CSV meets the need for binary to ASCII conversion. [Geo] Converting binary table to CSV should be enough. I'm OK with removing this requirement. [Mike] I propose we nix this. Tool can do Table_Binary to CSV, along with a Table_Delimited label	~~Planned for Build 8b~~	~~High~~	~~High~~	~~Medium~~	~~Low~~	~~Medium~~	~~Low~~	~~Medium~~	~~13~~	
PDS4 Character Table** (Table_Character)	FITS	[EN] Note that FITS does not allow UTF-8, so if we do it might not be possible to translate an arbitrary PDS4 character table into FITS. [PPI] PPI sees negative value in converting tables to FITS format.	Planned for Build 10a and beyond	Low	Low ***	Low	Low	Low	Low	Low	8	medium
	VOTable	[PPI] Already have tools to perform this transformation.	Planned for Build 10a and beyond	Low	Low	Low	Medium	Low	Low	Low	7	medium
PDS4 DelimitedTable** (Table_Delimited)	FITS	[EN] Note that FITS does not allow UTF-8, so if we do it might not be possible to translate an arbitrary PDS4 character table into FITS. [PPI] PPI sees negative value in converting tables to FITS format.	Planned for Build 10a and beyond	Low	Low ***	Low	Low	Low	Low	Low	8	medium
	~~PDS4 Character Table~~	[PPI] This conversion makes ASCII data more difficult to work with. [Mike] I propose we nix this unless there is a use-case for this. Geo has voted to remove this requirement as well	~~Planned for Build 10a and beyond~~	~~High~~	~~Low~~	~~Medium~~	~~Low~~	~~Medium~~	~~Low~~	~~Low~~	~~10~~	
	VOTable	[PPI] Already have tools to perform this transformation.	Planned for Build 10a and beyond	Low	Low	Low	Medium	Low	Low	Low	7	medium
PDS4 2D Image* (Array_2D_Image)	PDF	[ATM] I really don't recall this one from last time. PDF doesn't make sense for an image.	Planned for Build 10a and beyond	Low	Low	Low	Low(*)	Low	High	Low	7	long
	VICAR	[EN] Since the VICAR standard accommodates various binary encoding forms, we would definitely need to support byte order inverting, and possibly conversion from IEEE real to VAX real if we think there will be demand. See Binary Data Type Conversion below for details	Planned for Build 10a and beyond	Low	Low	Medium	Low(*)	High	Low	Low	9	long
	GeoTiff	[IMG] What about for 2D image data that contains some geometry information we put in the label? A tool that can recognize that GeoTiff header information in a PDS4 and output the image as a GeoTIFF versus a TIFF could be very helpful for users. (we have a PDART use case) [Mike] This will likely be a service only capability as the GDAL library is not a pure Java implementation. It is a wrapper to a C/C++ library, which means that this would have to be built for every platform that needs to be supported.	Planned for Build 10a and beyond			High	Low(*)		High	High	7	medium
PDS4 3D Image* (Array_3D_Image)	ENVI Image Cube	[EN] The better option may be to generate a format that ENVI supports, allowing ENVI users to perform local transformations.	Planned for Build 10a and beyond	Low	Medium	High	Low(*)	Low	Medium	Medium	10	long
	ISIS-3	[EN] Perhaps the ISIS folks will supply a plug-n-play module for the PDS System to apply? [IMG] An ISIS3 cube can be output to be a PDS4 compliant format (raw byte stream) with a simple addition to the "to=" command. The ISIS3 development team is also working on a capable input/output tool. And it will be accomplished using plugins so that missions can create their own conversion table. [IMG] Plans for a PDS4 reader for GDAL which would then allow conversion to GeoTiff, ENVI, minimal ISIS2, minimal FITS, Jpeg, PNG, PDF… [EN] Although the EN development team won't be implementing the transformation in this case, it is likely that we will want to integrate this software into the Transform Tool or a future transformation service.	Planned for Build 10a and beyond	Medium	Medium	High	Low(*)	****	Medium	Medium	9	long

	Format	Description	Build									Duration
	Multi-Dimensional Array	[EN] For example, a plain 3D raster array (no header or other additional objects).	Planned for Build 10a and beyond	Low	Low	High	Low(*)	Low	Medium	Medium	9	long
	GeoTIFF	[IMG] What about for 3D image data that contains some geometry information we put in the label? A tool that can recognize that GeoTiff header information in a PDS4 and output the image as a GeoTIFF versus a TIFF could be very helpful for users. (we have a PDART use case) [Mike] This will likely be a service only capability as the GDAL library is not a pure Java implementation. It is a wrapper to a C/C++ library, which means that this would have to be built for every platform that needs to be supported.	Planned for Build 10a and beyond			High	Low(*)		Medium	High	7	medium
PDS4 3D Hyper-Spectral Cube* (Array_3D_Spectrum)	ENVI Image Cube	[EN] The better option may be to generate a format that ENVI supports, allowing ENVI users to perform local transformations.	Planned for Build 9a	Low	Medium	High	Low(*)	Low	Medium	High	11	long
	ISIS-3	[EN] Perhaps the ISIS folks will supply a plug-n-play module for the PDS System to apply? [IMG] IMG-USGS will interface with ISIS team for this work. See C-19 for more details. [EN] Although the EN development team won't be implementing the transformation in this case, it is likely that we will want to integrate this software into the Transform Tool or a future transformation service.	Planned for Build 10a and beyond	Low	Medium	High	Low(*)	****	Medium	Medium	9	long
	Multi-Dimensional Array	[EN] For example, a plain 3D raster array (no header or other additional objects).	Planned for Build 10a and beyond	Medium	Low	Medium	Low(*)	Low	Medium	Medium	9	long
PDS4 Map* (Array_2D_Map)	GeoTIFF	[Mike] This will likely be a service only capability as the GDAL library is not a pure Java implementation. It is a wrapper to a C/C++ library, which means that this would have to be built for every platform that needs to be supported.	Planned for Build 9a	Low	High	High	Low(*)	Low	Medium	High	12	long
PDS4 Movie* (Array_3D_Movie)	Animated GIF		Planned for Build 10a and beyond	Medium	Medium	Low	Low(*)	Low	Low	Low	8	long
	Flash		Planned for Build 10a and beyond	Low	Medium	Low	Low(*)	Low	Low	Low	8	long
	MPEG		Planned for Build 10a and beyond	Medium	Medium	Low	Low(*)	Low	Low	Low	8	long
*Binary Data Type Conversion		[EN] PDS4 data structures with binary data types. Convert LSB to MSB or conversely. (See the PDS4 Information Model for a complete list of all binary data types and byte orderings.)										
**Character Data Type Conversion		[EN] PDS4 data structures with Character data types. Note that FITS does not allow UTF-8. (See the PDS4 Information model for a complete list of all character data types and character encodings.)										
***		[GEO] Geosciences have rated transforms dealing with FITS low priority because we do not work with FITS formats.										
****		[RMS] These are not tasks for PDS. I confirmed with Chris Isbell that the ISIS team is already working on them. The spreadsheet should indicate that PDS is not responsible for these.										
		[IMG] Missing GIS (GML) and mesh (OBJ) format transformations.										
(*)		[PPI] PPI has rated images transforms with low priority because we do not work with images as a data format.										
*****		short = 1-2 weeks medium = ~1 month long = greater than 1 month										