

**ISO/TC 130/WG2/TF3 — Variable Data Printing  
Minutes of 7<sup>th</sup> Meeting  
Berlin, Germany**

**19-21 January 2009**

**1 Call to Order - Welcome - Introductions, Roll Call of Experts, Announcements**

The meeting was called to order at 9:00 a.m. by Tim Donahue, Chair. The following technical experts were in attendance and introduced themselves:

Tim Donahue, Chair	Eastman Kodak Company	USA
Mary Abbott, Secretary	NPES	USA
Reuven Ackner	EFI	USA
Martin Bailey	Global Graphics	UK
Marc Delhoune	Punch Graphix	Belgium
Olaf Drümmer	Callas Software	Germany
Jyri Hujanen	Hansaprint	Finland
Dov Isaacs	Adobe	USA
Paul Jones	Teclyn bv	Netherlands
David McDowell (by phone)	NPES	USA
Christoph Oeters	Sofha	Germany
Rainer Prosi	Heidelberg	Germany
Craig Revie	Fujifilm	UK
Leonard Rosenthol	Adobe	USA
Luci Wahrmann (by phone)	Kodak	USA
David Williams (by phone)	Ricoh	USA
Karin Winkelmann	DIN	Germany

The attendance sheet is WG2/TF3 N 157.

Karin Winkelmann, TC 130 Secretariat, welcomed the committee and wished them well on the upcoming days of meeting.

**2. Review and approve agenda (N 143)**

The committee reviewed the draft agenda which had been distributed by e-mail prior to the meeting. The agenda was corrected to show that the committee would be reviewing Draft 12 of ISO/WD 16612-2. A discussion of how PDF/VT supports placeholders was added to Item 6 relating to technical reports.

The agenda was approved as revised.

**3. Approve minutes**

The committee reviewed the minutes of the September meeting held in Amstelveen, The Netherlands (N 104). There being no corrections, the minutes were approved as distributed.

The committee also reviewed the minutes of the teleconference meeting held 12 January (N 144). There being no corrections, the minutes were approved as distributed.

#### 4. Review action items

The committee reviewed the open action items, noting the status of each as follows:

#	Action Item	Status
08-08	<b>Donahue</b> will create a proposal and technical requirements to add new Boolean into DPart structure to state that all page boxes in a branch of the tree are equivalent.	Open; discussion of these proposed keys will continue during this week's meeting.
08-10-06-1	<b>Rosenthol</b> will propose a DPart action sub-type to be used in the DPart hierarchy to enhance interactive reader capability.	Completed; the proposal has been posted to the vPDF Yahoo group. It will be discussed at this week's meeting.
08-11-03-2	<b>Prosi</b> will provide an example of a JDF FileSpec demonstrating utilization of a package of files such as a PDF/VT MIME package.	Open; this will be considered as part of the TR application notes.
08-11-17-1	<b>Donahue</b> will register with IANA a new MIME type "application/pdf-vt-stream".	Open; in progress.
08-12-08	<b>Williams</b> will create an example JDF JobTicket referring into a document part hierarchy structure with Properties encoding of DPM using XPath in a JDF MetadataMap element.	Completed. An example has been added to the WD.
09-01-12	<b>Aronshtam</b> will provide wording for a newly-proposed informative annex that describes best practices relating to the general use of non-isolated transparency groups in PDF/VT files.	Completed. Text for a new annex has been posted to the vPDF Yahoo group and will be discussed at this week's meeting. The text will likely be moved to the application notes.
09-01-12-1	<b>Donahue</b> will provide Abbott with a copy of the latest draft (WD 12) for distribution to the committee prior to the Berlin meeting.	Completed (N 145)
09-01-12-2	Rosenthol will send DPart and related proposal to the committee developing ISO 32000 for inclusion.	Open; awaiting finalization of the DPart structure.

#### 5. Continue review of WD 12

The committee continued the review of ISO/WD 16612-2, working with Draft 12, which was distributed following the last conference call.

They began the review with a discussion of Annex B relating to DPM keys and values defined in the standard, which is where the committee left off in the previous teleconference.

It was questioned what the responsibility the conforming writer has to preserve preserving the integrity of the metadata contained in DPM keys. For example, an editor encounters metadata in a DPart node that it updates or deletes. If that metadata has a consistency requirement for application reasons and the editor is unaware of that requirement, what should it do?

One suggestion was to develop a table identifying the list of keys that must be maintained by an editor, and updated if necessary. The keys listed in the table must be preserved. It was agreed that if the key appears, the conforming writer should be allowed the choice to either update the DPM accordingly, if it has awareness of the metadata key, or it may delete it if it doesn't understand the key (e.g. a private, unconventional key). Another suggestion was to not list the DPM keys in a summary table at the root of the DPart hierarchy, but rather define them inside of a special DPM dictionary in the DPart node within which they are defined. They could be added to a dictionary type key such as **GTS\_Managed**.

It was recognized that requirements for conforming PDF/VT editor should also be defined in the document. A conforming editor is differentiated from a conforming writer in that it both reads and modifies a PDF/VT file. The following text was added to section 5: "A conforming PDF/VT editor shall be a conforming PDF/VT reader and writer."

The committee also discussed whether there needs to be method for storing an audit trail of DPM affected by edits, noting that there are some things that may be necessary to track, but others that are not significant. For example, if a DPM key specified in **GTS\_Managed** is unknown to the editor, the editor could move it to a context that implies that its use may no longer be consistent due to the file modification.

As a result of extensive discussion, it was agreed to add the following requirement to 6.5:

"If a **GTS\_Managed** key is present in the **DPMProperties** dictionary, it shall have a dictionary value that contains the DPM properties that may need to be changed when the PDF/VT file is modified by a conforming editor. A conforming editor shall ensure that the values of the keys in the **GTS\_Managed** dictionary are consistent with the modifications made to the PDF/VT file, or shall move them from the **GTS\_Managed** dictionary to the **GTS\_Suspect** dictionary.

"Note Keys present in the **GTS\_Managed** dictionary have values that are dependent on other parts of the PDF/VT file; therefore, modifications to the PDF/VT file might impact these values.

"If a **GTS\_Suspect** key is present in the **DPMProperties** dictionary it shall have a value that is a dictionary.

"Note DPM present in the **GTS\_Suspect** dictionary contains DPM values that might no longer be consistent."

The committee discussed the need to enable a reader to determine whether or not a PDF/VT file was modified by a non-conforming PDF/VT editor. For example, since PDF/VT is a PDF file, it can be read and modified by an existing Adobe Acrobat software application where the version of Acrobat has no awareness or sensitivity to the fact that it is a PDF/VT file that was modified. It will treat it simply as a PDF file. If pages are deleted, the PDF/VT file may have been modified and is no longer a conforming file.

The committee discussed the need for a new key to indicate the date and time the file was last written by a conforming PDF/VT writer or editor. This would be a key that would never be added by a non-conforming editor. One suggestion was to add a **GTS\_ModifiedDate** key to the **DPartRootRoot** dictionary as a required key. However, as a result of discussion it was agreed to make this a more generic feature and to add **pdfvtid:GTS\_PDFVTModDate** to Table 2 described as "the date and time that the PDF/VT file was last written".

Wording was also added to the end of Clause 5 (Conforming files, readers and writers) to state:

"All conforming PDF/VT writers and editors shall write the same date and time value for both the **pdfvtid:GTS\_PDFVTModDate** and the **xmp:ModifyDate** properties.

"All conforming PDF/VT editors shall write a new value for both **Pdfvtid:GTS\_PDFVTModDate** and the **xmp:ModifyDate** properties.

"Note PDF/X-4 and PDF/X-5 require the **xmp:ModifyDate** to match the **ModDate** in the document information dictionary. The above requirement assists a PDF/VT reader in recognizing whether or not the PDF/VT file has been modified by a non-conforming PDF/VT editor."

The term *editor* was also added to Clause 3, Terms and definitions.

The committee then began at the beginning of the document and reviewed each normative section of the document, making changes where needed. This process included the discussion of the editor's notes appearing in the document ignoring all informative clauses in this first pass. It was agreed that informative clauses, such as informative Annexes and the Introduction, will be reviewed in a second pass over the document.

Rosenthal provided a proposed revision for Clause 5 to improve the basic structure and flow of the existing requirements. The resulting agreed-to structure is as follows:

5.1 General, conformance, based on PDF/X-4 and PDF/X-5, how to identify a file

5.2 VT-1 conformance

5.3 VT-2 conformance

5.4 All PDF/VT file conformance levels, validation of VT-2 files (which may more appropriate in another section of the document)

It was proposed that a separate conformance level should be defined for a conforming PDF/VT MIME package reader. Such a reader would be required to read PDF/VT-1 and PDF/VT-2 files, both of which can be defined as PDF/VT chunks in a conforming MIME stream.

It was agreed the document should define a conforming PDF/VT MIME reader and writer, noting that a conforming PDF/VT MIME reader or writer would, by default, also be a conforming PDF/VT-2 reader or writer. In addition, changes were made to a new subclause, C.3, relating to the conformance requirements of a PDF/VT MIME stream reader.

Changes were made to Clause 5 to define a conforming PDF/VT MIME stream reader and writer. The agreed-to name of this MIME stream conformance level is the PDF/VT-2s conformance level. The following requirements were added to Clause 5:

"A conforming PDF/VT-2s stream is a MIME package of type *application/pdf-vt-stream* containing one or more PDF/VT chunks in which those features necessary for streaming are specified in Annex C of this part of ISO 16612.

"A conforming PDF/VT-2s writer is a software application that is able to write PDF/VT-2s streams in accordance with the conformance requirements specified in C.3 of this part of ISO streams in accordance with the conformance requirements specified in C.2 of this part of ISO 16612.

"A conforming PDF/VT-2s reader is a software application that is able to read and appropriately process PDF/VT-2s streams in accordance with the conformance requirements specified in C.3 of this part of ISO 16612."

A note was added to **GTS\_Scope** key G to read: "Performance of a conforming PDF/VT reader can be severely reduced if the **GTS\_Scope** values are not precise or are incorrect."

Concern was raised that the name of the GTS\_IID should be renamed as IID as it may be read incorrectly by an implementer.

6.1: It was agreed to replace **GTS\_IID** with **GTS\_XID**.

6.2: Removed last 2 sentences of first paragraph relating to metadata properties in XMP schemas, along with the note.

**Action Item 09-01-19-1:** Abbott will add the pdfvtid prefix id and URI to the NPES registry.

6.3/6.4: Jones noted there is no requirement that every page of the file shall be referenced by a **DPart** node of the document part hierarchy. It was also noted also that Sub-clause 6.4 requires that a **DPartRoot** dictionary entry shall be present, but does not ensure that each part is included in the **DPartRoot** dictionary. It was thought to be a requirement in the past, but it had been decided to remove that requirement. It was also questioned why **DPartRoot** is optional, rather than required. It was felt that it is only crucial to a VT file not being processed in total. It was suggested that if it is optional, there should be a requirement that if it is present, it must apply to the entire file.

Wording was added to 6.3 to state: "Each PDF page defined in the PDF/VT file shall be included in a page range defined by one and only one **DPart** dictionary."

Concern was raised as to why the **DPart** nodes specify a hierarchy using a fully linked list approach. It was agreed that this allows for improved interactive viewing performance. It was suggested that interactive performance should remain a second priority where consumption by a conforming non-interactive reader, such as a RIP, should be the first priority. An array-based alternative to linking the **DPart** nodes of the hierarchy was then proposed.

Concern with the need to generate a huge array was raised. Rosenthol pointed out that there are no array length limits imposed by PDF 1.6. It was agreed, however, that there may be implementation limits. It was agreed that this can be addressed by constructing the linear sequence of **DPart** node references of an array into a series of sub-arrays defined within an array. This would allow the use of arrays without allowing them to become too large.

The proposal is to add a **DParts** key to a **DPart** node of type array of arrays. The array element would contain an ordered set of references to immediate **DPart** ancestor nodes.

Jones noted that the **Start** and **End** keys will no longer be needed in this proposal.

Jones suggested that if all pages are required to be referenced by **DPart** nodes, only the **Start** key is needed, as it can be determined when the last page specified in the Pages array is referenced from another **DPart** node. It was felt that getting rid of the **End** key would not result in a more efficient performance and having the explicit **Endss** key is desirable.

This raised the question whether allowing other than sequential page order in the referencing order of leaf **DPart** nodes should be allowed. As a result of discussion, it was agreed to add a requirement that **Page** object order in the pages array shall be equal to the page order of the page ranges of the **DPart** leaf nodes and **DPart** order shall be defined by a depth first, LNR traversal order. Changes were made to 6.4 to require that the order of page definitions as defined by the page tree be in the same order in which **Page** objects are referenced from leaf **DPart** node dictionaries in a depth-first traversal of the document part hierarchy.

Regarding the requirement that all **DPart** objects be written into the file in a single compressed object stream, it was noted that this requirement is there because some felt that to have random access on the **DPart** node objects possibly scattered around the file would have undesirable access overhead. They prefer instead to be able to read the entire **DPart** structure in one read operation, primarily for improved performance. Jones expressed the opinion that having them compressed in a single object stream may slow performance in the case where there are a large number of records. It was noted that it is not a requirement they be compressed into a single stream, only a recommendation.

Section 6.4 - Note 3 was modified to read:

"This enables improvement in reader performance (e.g. single read operation) and file size optimization through the use of compression of similar items. Random access to the **DPart** nodes can

be impacted. There may be cases, such as for PDF/VT files with a large number of records, for which it would be necessary to store the **DPart** dictionaries in multiple compressed object streams."

Table 4: The **Type** key was changed to be *optional*. The change was also made in Table 5.

Table 4: Reviewed proposal from David Williams relating to the **Root** key of the **DPartRoot** dictionary, to rename this dictionary reference key from **Root** to **DParts** to minimize confusion. The committee agreed and the proposal was accepted.

Table 4: The notes under **NodeNameList** were moved to the normative Annex that defines XML representation of the **DPart** structure. The remaining text was edited to remove the first sentence.

**NodeNameList** is now described in the table as:

*"(Required)* Shall be present. Each name entry in this array shall correspond to a **DPart** node level of the document part hierarchy beginning with the **DPart** dictionary identified by the value of the **DPartRoot** dictionary's **DParts** key.

"The number of entries present in this array shall be equal to the number of **DPart** node levels in the document part hierarchy.

"Each entry in the **NodeNameList** array shall conform to the rules for XML Name token.

"The **NodeNameList** array is used in the interpretation of the document part hierarchy as XML as set out in Annex D."

As had been discussed in past meetings, the use of the parenthetical status *Optional* in the descriptions of Tables 4 and 5 is ambiguous, because some keys are actually required under certain conditions. It was proposed that the status *Conditional* be used in such cases.

Table 4: It was agreed to add a *Conditional* status, and to precede the table with the following paragraph that defines the meaning of the terms *Required*, *Optional* and *Conditional*:

"In the following tables the identifiers *Required*, *Optional* and *Conditional* are used to indicate the usage of the key. *Required* indicates that the key shall be present at all times, *Optional* indicates that the key may be present at the discretion of the writer and *Conditional* indicates that the presence of the key is dependent on a condition such as the presence or absence of other keys."

Table 5: The **Count** key was removed and a new **DParts** key with the type "array of arrays" was added. There was discussion of fixing to the number of **DPart** dictionary references allowed in each array entry of the array. It was ultimately agreed that the number of **DPart** dictionary reference entries per array element of the array shall be exactly 8192 for all but the last array entry. It was agreed that this approach places no arbitrary maximum limit on the overall number of immediate descendent **DPart** nodes and may provide a reader with more efficient access to references in some situations such as when the number of records at the record level that have a common parent node is large.

6.6: Edits were made to the text, including the removal of the text after Note 2 as well as Note 3.

Review of section 6.6.2: The committee discussed a proposed revision to state that the **GTS\_Env** key shall specify a text string value that should be a human readable name that may be used by a conforming PDF/VT reader to aid in the management of a group of XObject resources shared between multiple PDF/VT files and/or PDF/VT jobs. It was felt that this information already contained in the note is sufficient, and there is no need to add a normative requirement. As a result of extensive discussion, there was mixed support for the "array of

arrays" approach. Donahue polled the committee members as to whether or not they object to the array of arrays approach. It was agreed to include the array of arrays approach in the draft that will be circulated for CD ballot.

Information relating to these changes made to **DPart** in support for the new **DParts** array of arrays alternative to a fully linked list will be added to Rosenthol's proposal to ISO/TC171/SC2/WG8 to add the **DPart** hierarchy structure to ISO 32000-2. According to Rosenthol, it is expected we should have their reaction to this approach by our May meeting in Ft. Worth, Texas.

The header text for 6.4 was changed to "Document part hierarchy".

It was proposed that since Pages of a PDF/VT (as specified by the pages array) is required to be in lock step with the order of the page ranges of the leaf **DPart** nodes, it would also be useful if all page objects had reference to their respective referencing **DPart** dictionary. It was suggested that this would be useful for conforming PDF/VT readers that read the sequence of PDF pages in via the Pages tree during operations such as cut and stack imposition, and want efficient access to DPM data associated with the parent or ancestor **DPart** node(s) of the page. It was agreed in principal that it is useful in some cases and that it was OK to consider for the CD draft.

Text was added 6.4 to read: "Each **Page** object shall have a **DPart** key that has a value that is an indirect reference to the leaf node **DPart** dictionary that references this **Page** object."

The following related NOTE was also added:

"NOTE 1 The **DPart** key in a **Page** object allows a conforming reader to quickly retrieve the section of the document part hierarchy that applies to this **Page** object. For example, for certain implementation approaches to cut and stack imposition this allows for efficient retrieval of DPM based on page indices. This also allows for ready access of DPM data in interactive reader applications."

6.5: Fifth paragraph was deleted.

It was agreed that the example of this section needs to be moved to an appropriate annex and referenced from here. The document editor will do this off-line. It was noted that the PDF example must be updated to use the new **DParts** array of arrays key in the intermediate **DPart** nodes.

6.6: In response to the editor's note to add some guidance as to when it is important for a writer to use **GTS\_Encapsulated True**, it was agreed that this explanation will not be included in the document but will instead be included in the PDF/VT Technical Report or application notes. It was noted that Aronshtam has already provided draft informative text for this as a proposed annex and that this text will instead be reviewed in the context of content for the TR.

6.6.3: Reviewed key values for requirements. Made changes as shown in draft.

The editor will move 6.6.3 to section 6.6.1 since it defines the **GTS\_Scope** key, whose use is restricted by other sub-clauses of 6.6.

It was agreed that the short names of the values of **GTS\_Scope** would be expanded to full names for clarity. Thus, the values **S**, **R**, **F**, **J**, **G** and **U** were changed to *SingleUse*, *Record*, *File*, *Job*, *Global* and *Unknown*, respectively, for all occurrences throughout the document.

The related NOTE describing the short value names was deleted.

The normative requirements for the specific values of **GTS\_Scope** were examined and clarifications were made (refer to edited draft).

Questions were raised as to the responsibility of a conforming editor and its responsibility for maintaining consistency for the value of **GTS\_Scope** if pages referring to it are deleted resulting in an invalidated scope. For example, if a page that references an XObject having **GTS\_Scope** of *File* is deleted, resulting in only one reference to the **XObject**, does that **XObject** need to be updated to have a **GTS\_Scope** of *SingleUse*? Rosenthol raised concern that requiring revision of **GTS\_Scope** in such circumstances is too high a bar for a conforming reader since **GTS\_Scope** is intended as a hint, and insisted the status not exceed a recommendation ("should"). It was noted that regardless of the value of this attribute, this hint must not affect the resulting rendition.

Ackner strongly suggested that a conforming writer make sure the **GTS\_Scope** values are accurate and preferred the stronger requirement of "shall", noting that in his experience, making the status "optional" grants permission to producers to essentially forgo their use.

It was agreed that a producer should have no problem, in general, writing accurate values for **GTS\_Scope**. The main concern was that of the responsibility of a conforming editor.

It was agreed that a recommendation ("should") is sufficient for asserting a "strong recommendation" and that a note should also be added to draw attention to this recommendation.

After significant discussion and careful review of requirements for each value of **GTS\_Scope**, the following text was agreed to for part of this section of the document:

"A conforming PDF/VT writer should specify a **GTS\_Scope** key in an **XObject** if the lifetime scope of the **XObject** is known.

"NOTE 2 knowledge of the lifetime scope of references to **XObjects** provides hint information useful for optimized processing by a conforming PDF/VT reader.

"If multiple **XObjects** within a PDF/VT file, file collection or job specify the same value for **GTS\_XID** then those **XObjects** shall have the same value for **GTS\_Scope**.

"NOTE 3 This requirement forces multiple **XObjects** with equivalent content to have different values for their **GTS\_XID** keys if they have different values for their **GTS\_Scope** keys.

"If present, the **GTS\_Scope** key shall have a value of type Name that is one of *SingleUse*, *Record*, *File*, *Job*, *Global* or *Unknown*.

"The **GTS\_Scope** key may be present in an **XObject** and have a value of *Unknown* if the scope of the **XObject** is not known to the PDF/VT writer.

"If **GTS\_Scope** is not present in an **XObject**, its default value shall be *Unknown*.

If the value for the **GTS\_Scope** key is *SingleUse* then the **XObject** shall be referenced no more than once from a **Do** operator present in the PDF/VT file.

"NOTE 4 Even though an **XObject** could be referenced only once, this single reference can occur in a content stream that is referenced multiple times causing that **XObject** to be rendered multiple times.

"If the value for the **GTS\_Scope** key is *Record* then the **XObject** should be referenced more than once from **Do** operators present in the PDF/VT file from the pages belonging to a single recipient record and shall not be referenced from pages outside this record.

"If the value of the **GTS\_Scope** key is *File* then the **XObject** should be referenced more than once from **Do** operators present in the PDF/VT file.

"If the value for the **GTS\_Scope** key is *Job* then this **XObject**, or an **XObject** with an identical **GTS\_XID**, may be referenced from one or more **Do** operators present in a PDF/VT job containing this PDF/VT file.

"If the value for the **GTS\_Scope** key is *Global* then this **XObject**, or an **XObject** with an identical **GTS\_XID**, may be referenced from one or more **Do** operators present in more than one PDF/VT job.

"If the value for the **GTS\_Scope** key is *Global* then the **XObject** may be referenced more than once from one or more **Do** operators present in the PDF/VT job containing this PDF/VT file and a PDF/VT job containing a PDF/VT file with an **XObject** with an identical **GTS\_XID**.

"NOTE 5 The performance of a PDF/VT reader can be severely reduced if the **GTS\_Scope** values are not precise or are incorrect."

Review of section 6.6.3: The first paragraph was deleted. Occurrences of **GTS\_IID** to **GTS\_XID** were renamed, as agreed earlier.

The following requirement was added:

"If the **GTS\_Scope** key is present in the **XObject** and has a value of *Job* or *Global* then the **GTS\_XID** key shall be present and may be present for all other values of the **GTS\_Scope** key."

Review of section 6.6.4: The paragraph relating to the CTP, clipping path and graphics state operators was modified to read:

"The CTM and clipping path operators shall not be used in determining whether or not an **XObject** is encapsulated.

"An encapsulated **XObject**, including any content streams referenced from its definition, shall explicitly set all graphic state parameters that influence the appearance of path painting, text showing, **XObject** and inline image operators (table 4.1 of PDF Reference) used in that encapsulated **XObject**."

The committee also modified the wording of the requirement that an **XObject** explicitly set all graphic state parameters that influence the appearance of certain operators to add the exception that the current transformation matrix (CTM), clipping path, soft mask (SMask), current fill opacity (ca) current stroke opacity (CA) and transparency blending mode (BM) graphic state parameters. A note was added to explain that the excluded graphics state parameters are set implicitly when the **XObject** is invoked. It was agreed to include a more detailed explanation of this note to the application notes, when they are developed.

The committee changed the paragraph relating to the **Type** key to read: "If the **Type** key of the **XObject** has the value of *Image*, and the **ImageMask** key is not present or has the value *false*, then the **Intent** key shall also be present."

A note following the last paragraph was added to read: "This does not allow an encapsulated **XObject** to vary its appearance based on optional content; however, the **XObject** itself may be part of optional content. "

Review of normative Annex C

C.1: Donahue noted that the text of C.1 is the text proposed by Oeters. The second sentence of the first paragraph of C.1 was removed as being unclear and not completely accurate. A sentence was added to the

second paragraph to state: "MIME packaging guarantees the order of processing of the sequence of chunks."

The committee made some additional minor changes and the final text now reads as:

"Streamed generation of PDF/VT data allows a reader to start processing a PDF/VT job even when the writer has not yet finished producing it.

"A PDF/VT job can be sent as a stream of one or more PDF/VT chunks encoded as a MIME package. MIME packaging guarantees the order of processing of the sequence of chunks.

"In a streaming workflow the reader can start processing the PDF/VT job after receiving the first PDF/VT chunk, which may be much smaller than the whole PDF/VT job.

"The MIME packaging mechanism is intended for the transmission of a PDF/VT job as a stream via a communication channel. It is not intended for storing a PDF/VT job as a file on a file system."

C.2: It was noted that each chunk can be executed independently. It was also agreed to use "MIME parts" in place of "file" in select instances. Changes to incorporate this were made as appropriate.

It was noted that a MIME stream is currently allowed to contain PDF/VT files having different output intents. Revie suggested disallowing mixed output intents as providing for mixed output intents should first be addressed by a future PDF/X standard.

The following requirement was added: "All PDF/VT files in a PDF/VT-2s stream shall have the same **OutputIntent**."

It was agreed to remove the 2<sup>nd</sup> and 3<sup>rd</sup> paragraphs and the note, following an agreement during the 2008-11-17 teleconference that the preferred packaging of a PDF/VD MIME stream for MIME submission to a JDF device interface as a self-contained MIME stream is to encapsulate the PDF/VT MIME file as a content data entity within a JDF MIME package. In this approach there is no need to define requirements in this Annex for inclusion of JMF and JDF files within the PDF/VT MIME package.

The word "chunks" was removed or replaced with "files" in the paragraphs relating to MIME parts and to PDF/VT files in paragraphs 6-11.

References to the MIME package were replaced with PDF/VT-2s stream in light of the definition of the newly adopted PDF/VT-2s conformance level.

The paragraph relating to MIME parts that are ICC profiles was modified to read: "The MIME parts that are ICC profile files shall have the content type 'application/vnd.iccprofile', and shall have content disposition 'attachment'. Additionally, the content disposition parameter 'filename' shall be present."

For PDF/VT files containing re-usable content only, the requirement was added that the content disposition parameter 'filename' shall be present.

The paragraph relating to PDF/VT chunks was replaced with a content disposition of 'attachment' with the following: "The PDF files shall refer to ICC profiles or other PDF files by the value of the filename parameters defined in the MIME package."

The content of Note 2 was incorporated into the normative text.

To address the combining of a JDF with a MIME stream, Oeters proposed adding the following text:

"When a PDF/VT MIME package is combined with a JDF job ticket, it can be transmitted in two ways:

"1. The PDF/VT MIME package is packed into a JDF MIME package which refers to the stream containing the PDF/VT MIME package. The order of the elements should be JDF\_MIME([JMF], [JDF], PDF\_VT\_MIME(PDF/VT chunks and resource files...)).

"2. The JDF file is transmitted via a separate channel and refers to the stream containing the PDF/VT MIME package."

As a result of discussion, it was felt that more extensive information of how JDF works with a PDF/VT MIME package could best be addressed in the technical report/application notes.

As a result of extensive discussion, a new subclause (C.3) was added to address PDF/VT MIME stream reader conformance requirements (pointed to from Clause 5).

It was agreed that a PDF/VT-2s conforming stream could be described as a "virtual" PDF/VT-2 file if the various document part hierarchies of each PDF/VT file present in the stream have recipient records defined at the same level in the hierarchy. For example, the sequence of **DPart** trees of the files in the stream can be logically combined in sequence at the root node such that a conforming PDF/VT reader can then refer to the aggregate hierarchy of the virtual PDF/VT-2 file in a manor identical to an actual PDF/VT-2 file. Given this, the XML representation remains consistent for both the PDF/VT-2s stream and a PDF/VT file.

In addition, the 2<sup>nd</sup> paragraph of C.2 was replaced by the following text, which was moved further down in the subclause:

"When referring to PDF files or ICC profiles in the MIME stream, the PDF files shall only reference those files that are encoded earlier and shall refer to them by filename."

To address the need to be able to identify the presence of a MIME Stream, a requirement was added to C.2 to read:

"A PDF/VT-2s stream shall contain a header field named *X-PDFVT-Stream-version* with the value 1 which shall appear in the stream ahead of the content type field."

Annex D: Changes were made to Annex D to incorporate requirements necessitated by the introduction of MIME stream processing. To accommodate the virtual PDF/VT-2 file definition, it was necessary to introduce a root element to the XML representation. It was agreed that this root XML element have the name **PDFVT**.

D.2: The technical requirements were modified to better define the XML structure to be used to describe conforming PDF/VT files. Changes include the following:

– Replaced Note 1 (which is no longer valid) with the following: "The root element of the XML representation of the document part hierarchy shall be PDFVT."

– Added: "The order of the document hierarchy shall be represented of the representative XML elements."

– Added: "The XML representation of the **DPart** nodes of the first level shall be children of the **PDFVT** root XML element."

– Changed the XML element, **Page**, to **PDFPage**, to avoid confusion.

– Added: "The XML representation of a **DPart** note includes the XML representations of each of its immediate descendent **DPart** nodes in the order in which they are defined."

It was agreed that the contents of D.4 will be moved into application notes.

Annex E: The committee reviewed a proposed revision from Rosenthol relating to the information contained in Annex E. It was agreed that rather than include this information in an annex of the standard, Annex E would be deleted, and a pointer to an Adobe Technical Note entitled *Adobe Supplement to ISO 32000-1* would be added to 6.6.1. Rosenthol noted that the contents of this Technical Note will eventually be incorporated into ISO 32000-2, which is currently under development.

Annex G: This annex was deleted, with the necessary information being included elsewhere in the standard.

Once the review of all normative sections had been concluded, the committee proceeded to make a second pass over the document, this time focusing only on the informative sections.

The Introduction was modified to include information on the third conformance level, PDF/VT-3s, relating to the processing of MIME packages. Other edits were made for clarity.

Annex F: It was noted that there had been a request in a previous teleconference of this committee to include an informative annex that explains the use of isolated vs. non-isolated transparency groups. Draft text was provided by Aronshtam. After discussion of the need for this information being added to the document, it was decided such information should be added to the application notes or a related TR. This informative Annex was deleted.

Annex B: The committee reviewed informative Annex B, relating to DPM keys and values. It was noted that it is not required to support these keys, but they are a suggested set of keys that could be considered for use.

The committee debated whether this list of keys should be included in the standard (as either normative or informative) or if they should be included in a Technical Report. One argument for including them in a Technical Report is that a TR could be more quickly revised to extend list of keys, and it would not delay publication of the standard. However, some felt it would be more useful to have these keys in the standard, where the information would be more likely to be seen by an implementer of the standard. Another option is to include in the standard the keys to which everyone agrees, and put the other suggested keys into the Technical Report.

It was felt that this could be a normative annex that states that the keys are not required to be present or to be processed by a conforming reader. However, if they are used, their use is defined.

The keys discussed appear to fall into two categories:

- 1) digest information which may be derived from inspection of a conforming file
- 2) information (metadata) about the data in the file that is not encoded in any other way in the file (e.g. name, address, copy count). It was suggested and agreed that keys of this category should follow existing JDF naming with the added GTS\_ prefix.

Those in the second category appear to have agreement; however, those in the first category, which include the current entries of Table B-1, are the subject of debate.

There is some interest that keys in Annex B be normative in their definition and optional in their use. Some prefer that the information be included in the standard for ease of reference. Others prefer it be included in a Technical Report for various reasons, including the ability to revise a TR more quickly than a standard. One committee member prefers they be in a TR to lessen the likelihood that they will be used, possibly because some may perceive that if they are in the standard they have greater importance/validity than if they are in a TR.

As a result of discussion where concurrence has not been reached, it was decided to leave current information in Annex B, with edits to add the GTS\_ prefix to each key name of Table B.1. It was also agreed that any concerns as to the inclusion of Table B.1 and its content in the standard can be added as comments on the CD ballot to be addressed in the next face-to-face TF3 committee meeting in Ft. Worth in May.

It was noted that the **GTS\_UniformRecords** definition needs to be reworked, as it is no longer possible to specify DPM directly in the root of the document part hierarchy. Jones suggested encoding this as file level XMP. Donahue took this suggestion under advisement.

The following text was added before Table B.1:

"Where possible, this part of ISO 16612 follows existing JDF naming conventions for metadata keys with a GTS\_ second class PDF name prefix, as defined in Appendix E of PDF Reference. It is recommended that conforming PDF/VT writers who wish to add metadata that is not addressed in this part of ISO 16612 or related technical reports should follow existing JDF naming conventions for metadata keys, but use a prefix they registered themselves or use no prefix at all."

Prosi proposed, and the committee agreed, to now include the key **GTS\_CopyCount** in Table B.1, picking up the content from an earlier draft. It was noted that we need to ensure that **GTS\_NP** does not interact with **GTS\_CopyCount**. The editor will add this into the next WD.

## 6. Discussion of possible Technical Reports

The committee next reviewed and edited text as provided and presented by Jones (N 159) intended as the basis for the technical report on document part metadata definitions.

The general encodings for specifying recipient information was found to be generally acceptable.

During discussion of this proposal, Prosi objected to specifying keys that define characteristics of product intent as already defined by JDF. Jones maintained that there should be no requirement or dependence on JDF, and that such keys are, therefore, necessary. Jones agreed to make additional edits to the existing text he provided.

It was agreed there needs to be more discussion regarding the technical report, including the use of product intent oriented keys.

It was agreed that the committee must first focus on developing a scope statement and draft text that would allow us to submit a request for a New Work Item (NWI) ballot very soon if indeed the intention is to pursue this as an ISO Technical Report.

It was agreed that the weekly teleconference meetings will now focus on the development of the technical report(s), with a goal of getting the TR approved at about the same time as ISO 16612-2.

Oeters raised the issue of writing templates for variable data printing. The templates would be expanded on a RIP, using a search-and-replace technique. It was noted that this approach may encounter some patent issues. It was also noted that PDF/VT is intended for final form page representation and not as a template as suggested.

## 7. Review timeline and assignments

Donahue will complete edits agreed to at this meeting and provide a Word file to Abbott by the end of January. Abbott will make edits necessary to correct formatting and other editorial and style issues, and will forward the document to the TC 130 Secretariat the first week of February for circulation for CD ballot.

Comments from the CD ballot will be addressed at the 19-21 May meeting in Ft. Worth, Texas.

It was proposed that PODi be approach to see if they would allow Paul Jones to update CheckPPML (which allows for preview of PPML based jobs) to allow output of PPML based files as PDF/VT conforming files. It was agreed this would be appropriate, and Donahue, McDowell and Jones were asked to draft a letter to be sent from TC130/WG2/TF3 to PODi.

**Action Item 09-01-19-2:** McDowell, Jones and Donahue will draft a letter to PODi with a request to allow Jones to update the CheckPPML software to output PDF/VT conforming file(s).

Donahue will provide a copy of the rough draft from this meeting (before further scrubbing) to allow people to have a chance to take a look at it.

A teleconference will be held on Monday, 26 January, to give an overview of this week's meeting and answer any questions that may arises from this draft. The draft will be further refined and distributed to the committee in preparation for another conference call Monday, 2 February.

## **8. Adjournment**

The committee thanked DIN and Ms. Karin Winkelmann for the excellent support of the meeting, including lunches.