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Document management — AFP/ Archive

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 171, *Document management applications*, Subcommittee SC 2, *Application issues*.

Document management — AFP/Archive

1 Scope

This International Standard specifies the AFP document architecture by defining a subset appropriate for long-term preservation and retrieval. This subset will avoid ambiguity by assuring page independence and eliminating the use of resolution dependent fonts and images, device default fonts and external resources.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12651-1, *Electronic document management — Vocabulary — Part 1: Electronic document imaging*

ISO 19005-1, *Document management — Electronic document file format for long-term preservation — Part 1: Use of PDF 1.4 (PDF/A-1)*

Mixed Object Document Content Architecture (MO:DCA) Reference (AFPC-0004-08) Ninth Edition (July 2011)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12651-1, ISO 19005-1 and the following apply.

3.1
advanced function presentation
AFP
overall term used to describe architecture and solutions derived from the Mixed Object Document Content Architecture and its companion print protocol IPDS (Intelligent Printer Data Stream)

Note 1 to entry: AFP and its associated architecture was originally defined by IBM and is currently managed by the AFP Consortium http://www.afpcinc.org.

3.2
mixed object document content architecture
MO:DCA
presentation architecture including syntax, semantics and processing requirements capable of integrating native and non-native content objects into a single document or data stream

3.3
AFPC TIFF
subset of TIFF defined for printing as part of a collection of presentation object subsets for AFP

Note 1 to entry: See http://afpcinc.org/wp-content/uploads/2014/04/AFPC-Subsets-v2.0.pdf.

3.4
AFPC JPEG
subset of JPEG defined for printing as part of a collection of presentation object subsets for AFP

Note 1 to entry: See http://afpcinc.org/wp-content/uploads/2014/04/AFPC-Subsets-v2.0.pdf.

4 Conformance

4.1 General

The MO:DCA architecture definition of compliance with the AFP/A interchange set is limited to what compliance means for MO:DCA print files, it does not include definitions of AFP/A compliance for product compliance classes, e.g. generators and receivers. The architecture defines the content of AFP/A-compliant print files in terms of what is permitted (MAY), what is recommended (SHOULD), what is mandatory (SHALL), and what is prohibited (SHALL NOT).

A MO:DCA print file is compliant with the AFP/A interchange set definition if all the following conditions are met:

— all objects and their content shall be in AFP/A and shall comply with the AFP/A object structure definitions;

— all structured fields shall be in AFP/A and shall comply with the AFP/A parameter and triplet definitions;

— all structured field triplets shall be in AFP/A and shall comply with applicable AFP/A restrictions;

— all parameter values shall fall within the ranges defined by AFP/A;

— the print file shall not include any migration functions (as defined in the MO:DCA Reference, Appendix C) unless they are explicitly allowed in AFP/A (see Clause 9);

— the maximum structured field length shall be limited to X'7FF0' = 32752;

— all Begin Document (BDT) structured fields shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation) and one of the following:

  — ISid = X'0001' (AFP/A), or

  — ISid = X'0D01' (AFP/A, IS/3);

— the print file shall be enveloped with Begin Print File (BPF) and End Print File (EPF) structured fields and the BPF shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following:

  — ISid = X'0001' (AFP/A), or

  — ISid = X'0D01' (AFP/A, IS/3); in this case the same value shall be specified on the BDT for each document in the print file.

4.2 Migration functions

In general, AFP/A does not include any obsolete, retired, or coexistence MO:DCA parameters, triplets, structured fields, or objects as defined in MO:DCA Reference, Appendix C – MO:DCA Migration Functions. For exceptions, see Clause 9.

4.3 Structured field introducer

The Flag byte (byte 5) in the Structured Field Introducer (SFI) shall be set to X'00'. AFP/A does not include support for the following MO:DCA functions:

— SFI extension;

— Structured field segmentation;

— Structured field padding.

The maximum structured field length in AFP/A is limited to X'7FF0' = 32752.

4.4 Exception conditions

In general, no exception conditions are defined within the AFP/A definition for structured fields or their parameters above and beyond what the general MO:DCA architecture defines. The following general rules apply.

Exception conditions should not be generated solely due to non-compliance with AFP/A. When a valid print file is non-compliant with AFP/A, it should always be processed to the best of a receiver's capabilities. That is, any object, object content, structured field, or structured field triplet that is valid in the general architecture but that is not included in the AFP/A definition, should be processed to the best of a receiver's capability. For example, a receiver may generate an exception because it detected an error while processing an MCF-1 structured field, but not because the print file claimed to be AFP/A compliant and the MCF-1 structured field is not part of AFP/A.

4.5 Restrictions to avoid device dependence

To ensure that an AFP/A print file can be presented accurately and consistently in the future, functions that are allowed in IS/3 but that are inherently device-dependent are not included in AFP/A. The IS/3 functions that shall not appear in AFP/A print files are the following:

- Device-dependent colours
  - Use of the CMYK colour space (ColSpce = X'04') in Color Specification Triplet and equivalent OCA structures, when not qualified with an audit Color Conversion CMR;
  - Use of the Highlight Color Space (ColSpce = X'06') in Color Specification Triplet and equivalent OCA structures, when not qualified with an Indexed CMR that specifies a substitute CIELab value;
- Device-dependent fonts
  - Use of the device default font in PTOCA text (local ID = X'FF' in SCFL control sequence);
  - Use of the device default font in GOCA graphics (local ID = X'00' or X'FF' in GSCS drawing order);
  - BCOCA allows the use of a default font to print HRI, and since the HRI is not the actual bar code, AFP/A allows the use of the default font for HRI. However, this may lead to a slightly different appearance when the archived file is re-printed. If it is mandatory that the HRI is reproduced the same way each time the AFP file is printed, the default font should not be used. Instead, a TrueType/OpenType font that is carried in the print file resource group should be referenced and used;
- Images without clearly defined resolution
  - AFPC JPEG and GIF images normally do not inherently specify their resolution. This resolution is needed to properly size the object for image presentation space mapping options other than: the following:
    - Scale to fit;
    - Scale to fill.

  When a mapping option, other than these is specified, these images cannot be included in AFP/A print files unless they specify an Image Resolution (X'9A') triplet.
- Device-dependent medium map functions — the following MMC keywords:
  - X'90nn', X'91nn': high/low media destination selector;
  - X'A0nn': fixed medium information;

— X’A1nn’: fixed perforation cut;

— X’A2nn’: fixed separation cut;

— X’B4nn’, X’B5nn’: high/low presentation subsystem set-up ID;

— X’E0nn’: media source selector;

— X’E1nn’: media source ID;

— X’F8nn’: print quality control.

In general, archiveability is improved by avoiding resolution dependent data since presentation device resolutions will change over time. For example, it is preferable to archive bar code data as a BCOCA object, which is resolution independent, instead of as an image or a raster font.

4.6 Page independence

In AFP/A it is imperative that a single page can be retrieved from a document and viewed or printed exactly as it appears when printed within the context of the complete archived print file. This means that the last invoked medium map (the “active” medium map for the page) shall be known, and the numerical order of the page with respect to the last invoked medium map shall be known. As a result, the following triplets, which are optional in the general MO:DCA architecture and in IS/3, are mandatory on BPG structured fields in AFP/A.

— FQN type X’8D’ — Begin Medium Map Reference. This triplet points to the last medium map that was invoked before the given page; that is it points to the active medium map for the page. Note that the referenced medium map may be an internal medium map, and this medium map takes precedence over a medium map in the print file resource group.

— Either the Medium Map Page Number (X’56’) triplet or the Page Position Information (X’81’) triplet. If both are specified the X’81’ triplet overrides. These triplets specify the sequence number of the page in the set of pages controlled by the active medium map.

NOTE The Presentation Control (X’83’) triplet remains optional on the BPG in AFP/A; if not specified, the page is both viewable and indexable.

To ensure that colours are rendered properly, a page shall specify all CMRs and rendering intents required for presentation; the page cannot rely on inheriting these functions from higher levels in the document hierarchy.

4.7 Availability of correct resources

All resources that are referenced within the AFP/A print file shall be carried in the print file resource group. AFP/A does not support referencing a resource that is stored in an external resource library. This ensures that

— the resource is available whenever the print file is processed and

— the same version of the resource is used whenever the print file is processed.

5 Data stream object structure

This clause defines the objects that make up an AFP/A data stream (see p. 79 of the MO:DCA Reference for a definition of the syntax used to describe object structure).

NOTE 1 The MO:DCA Begin Print File (BPF) and End Print File (EPF) structured fields are required in an AFP/A data stream.

NOTE 2 The MO:DCA Begin Document (BDT) and End Document (EDT) structured fields are required in an AFP/A data stream.

NOTE 3 The MO:DCA No Operation (NOP) structured field may appear within any begin-end domain and thus is not listed in the structured field groupings.

NOTE 4 Object content shall not include functions that are not in AFP/A. This is, a print file is not AFP/A compliant if it includes such content.

NOTE 5 Table 1 contains summaries of the AFP/A object structure. All syntax, semantics, and notes in the object structure definitions in the MO:DCA Reference, Chapter 4 "MO:DCA Objects" apply, unless explicitly specified otherwise.

Table 1 — AFP/A objects

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Print File	Begin Print File (BPF) X'D3A8A5' – End Print File (EPF) X'D3A9A5'	The print file: — shall be enveloped by the Begin Print File (BPF) and End Print File (EPF) structured fields; — shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following: — ISid = X'0001' (AFP/A), or — ISid = X'0D01' (AFP/A, IS/3); in this case the same value shall be specified on the BDT for each document in the print file. The print file contains only the following objects, as defined in the general architecture subject to all applicable AFP/A restrictions: **Print file** (BPF, D3A8A5) [(Resource Grp)] (Index + Doc) (S) (EPF, D3A9A5) **Index + document** [(Index)] (Document) (S) NOTE AFP/A compliant consumers must consider a physical file, which is an operating system file that, when it contains AFP data, is printed with a single Form Definition, as a single MO:DCA (AFP) print file that contains at most one BPF/EPF pair and at most one print-file-level resource group. Such consumers should generate a product-specific exception if the physical file contains more than one BPF/EPF pair.
Resource group (print file)	Begin Resource Group (BRG)	The resource group may only contain the following resource objects, as defined in the general architecture subject to all applicable AFP/A restrictions:

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
	X'D3A8C6' - End Resource Group (ERG) X'D3A9C6'	(BRG, D3A8C6) + [(Overlay) (S)] + [(MO:DCA Pseg) (S)] + [(Form Map) (S)] + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] + [(Object Cont) (S)] + [(FOCA Object) (S)] (ERG, D3A9C6) Each resource referenced in an AFP/A print file shall be carried in the resource group and shall be enveloped by the Begin Resource (BRS) and End Resource (ERS) structured fields. AFP/A may limit the function in objects that are carried as resources; for details see the individual AFP/A object definitions in this table. If an object container in the resource group contains a Metadata Object (MO), it shall be specified first in the resource group. Multiple MO containers may be specified in a contiguous sequence; their collection specifies the metadata for the print file. If MOs are specified anywhere else in the resource group, they are ignored.
Resource object (in print file resource group)	Begin Resource (BRS) X'D3A8CE' - End Resource (ERS) X'D3A9CE'	The resource object shall be enveloped by the Begin Resource (BRS) and End Resource (ERS) structured fields: (BRS, D3A8CE) (Res Object) (ERS, D3A9CE)
Document index	Begin Document Index (BDI) X'D3A8A7' - End Document Index (EDI) X'D3A9A7'	The document index contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. (BDI, D3A8A7) + (IEL, D3B2A7) (S) + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] (EDI, D3A9A7)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
Document	Begin Document (BDT) X'D3A8A8' - End Document (EDT) X'D3A9A8'	The document contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions. The BDT for the document shall specify the MO:DCA Interchange Set (X'18') triplet with IStype = X'05' (archive/presentation), and one of the following: — ISid = X'0001' (AFP/A), or — ISid = X'0D01' (AFP/A, IS/3) (BDT, D3A8A8) + [(IMM, D3ABCC) (S)] + [(LLE, D3B490) (S)] + [(Medium Map) (S)] + [(REG) (S)] + [(Page) (S)] + [(Page Group) (S)] (EDT, D3A9A8)
Resource Environment Group (REG)	Begin Resource Environment Group (BSG) X'D3A8D9' - End Resource Environment Group (ESG) X'D3A9D9'	The Resource Environment Group contains only the following structured fields, as defined in the general architecture subject to all applicable AFP/A restrictions. (BSG, D3A8D9) [(MDR, D3ABC3) (S)] [(MPO, D3ABD8) (S)] [(PPO, D3ADC3) (S)] (ESG, D3A9D9)
Page	Begin Page (BPG) X'D3A8AF' - End Page (EPG) X'D3A9AF'	The page contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions.

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
		Page (BPG, D3A8AF) (AEG) + [(IOB, D3AFC3) (S)] + [(IPO, D3AFD8) (S)] + [(IPS, D3AF5F) (S)] + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] + [(PTOCA) (S)] + [(Object Cont) (S)] (EPG, D3A9AF) **AEG** (BAG, D3A8C9) [(PEC, D3A7A8)] [(MCF, D3AB8A) F2 (S)] [(MDR, D3ABC3) (S)] [(MPO, D3ABD8) (S)] [(MPS, D3B15F) (S)] (PGD, D3A6AF) [(OBD, D3A66B)] [(OBP, D3AC6B)] (PTD, D3B19B) F2 (EAG, D3A9C9)

Table 1 *(continued)*

AFP/A data stream object structure		
Object name	**Object envelope**	**Summary of AFP/A object structure; differences from general MO:DCA architecture noted**
		Notes: 1. The OBD is only used for PTOCA objects without an OEG, and if specified, — the measurement units shall match the units in the PGD and — the extents shall match the extents in the PGD. These are the architected defaults if the OBD is not specified, and will cause the text object area to have the same units and extents as the page presentation space. 2. The OBP is only used for PTOCA objects without an OEG, and if specified — the object area origin shall be set to zero, — the object content origin shall be set to zero and — the object area orientation shall be set to (0°,90°). These are the architected defaults if the OBP is not specified, and will cause the text object area to be positioned coincident with the page presentation space. 3. The PTD is only mandatory if the page contains one or more PTOCA objects without an OEG. It is strongly recommended that the measurement units in the PTD match the units in the PGD. AFP/A may limit the function in the objects; for details see the individual AFP/A object definitions in this table.
Page group	Begin Named Page Group (BNG) X'D3A8AD' - End Named Page Group (ENG) X'D3A9AD'	The page group contains only the following structured fields and objects, as defined in the general architecture subject to all applicable AFP/A restrictions. (BNG, D3A8AD) [(TLE, D3A090) (S)] + [(IMM, D3ABCC) (S)] + [(LLE, D3B490) (S)] + [(Medium Map) (S)] + [(REG) (S)] + [(Page) (S)] + [(Page Group) (S)] (ENG, D3A9AD)