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Document management — AFP interchange for PDF

Gestion des documents — Conversion de fichiers AFP en PDF

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 171, *Document management applications*, Subcommittee SC 2, *Document file formats, EDMS systems and authenticity of information*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Advanced Function Presentation (AFP) is a coordinated set of document creation, viewing, archiving and printing hardware, software, and services that is used heavily in the high-speed transactional printing market, which includes the printing of financial statements, utility bills, books, and marketing materials (brochures, etc.).

AFP has proven itself in these environments due to its performance, reliability, and flexibility.

— AFP performance comes from its hierarchical object-oriented structure, resulting in a condensed data stream size and efficient reuse of print resources (document objects). The document objects managed automatically by AFP include text, fonts, overlays, images, graphics, and other resource objects such as bar codes and ICC profiles for colour management.

— AFP reliability in print environments comes from an architected bi-directional printer data stream interface that manages every page through a print system, making sure that each page gets printed correctly for security, audit, and accounting purposes.

— AFP flexibility comes from its ability to include other standard document formats such as TIFF, JPEG, and PDF as included objects within an AFP object container. These included objects can then be used like any other document object in the AFP system and can be placed anywhere on a page where they can then be printed or viewed.

While AFP has had the ability to include PDF in object containers for many years, more customers in the transactional print environment are creating workflows that combine PDF content within AFP documents. This allows them to use PDF to create the document content and then embed these PDF pages in AFP to get the performance and management they need in high-speed print environments. These 'hybrid' workflows allow them to get the best of what both PDF and AFP have to offer.

AFP itself originated within IBM as a mainstream presentation architecture. In 2009, the AFP Consortium (AFPC) was formed as a peer-based open standards organization composed of companies from around the world with an interest in AFP. The entire AFP architecture is now developed and maintained by the AFP Consortium.

Document management — AFP interchange for PDF

1 Scope

This document specifies Advanced Function Presentation (AFP) interchange as a container for document objects by defining the AFP file format [Mixed Object Document Content Architecture (MO:DCA)[1)]]. It includes a means of identifying support for specifically including single and multi-page Portable Document Format (PDF) document objects as a container function set. It also includes a mechanism for pairing and managing resources associated with PDF.

NOTE For an example of how PDF external file references map into AFP secondary resources, see Annex A.

The use of AFP is applicable to AFP and PDF workflows where the final production is managed within an Intelligent Printer Data Stream (IPDS) environment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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 19005-2, *Document management — Electronic document file format for long-term preservation — Part 2: Use of ISO 32000-1 (PDF/A-2)*

ISO 32000-1, *Document management — Portable document format — Part 1: PDF 1.7*

Mixed Object Document Content Architecture. (MO:DCA) Reference. AFPC-0004-09. Tenth Edition. AFP Consortium, 2017[2)]

Bar Code Object Document Content Architecture Reference. AFPC-0005-09. Tenth Edition. AFP Consortium, 2015[3)]

Color Management Object Content Reference. AFPC-0006-01. Second Edition. AFP Consortium, 2012[4)]

Font Object Content Architecture Reference. AFPC-0007-06. Seventh Edition. AFP Consortium, 2015[5)].

Graphics Object Content Architecture for Advanced Function Presentation Reference. AFPC-0008-03. Fourth Edition. AFP Consortium, 2017[6)].

1) The Architecture references shown (MO:DCA as an example) are copyright of the AFP Consortium. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product.

2) Available at http://afpcinc.org/wp-content/uploads/2017/12/MODCA-Reference-09.pdf

3) Available at http://afpcinc.org/wp-content/uploads/2016/08/BCOCA-Reference-09.pdf

4) Available at http://afpcinc.org/wp-content/uploads/2016/08/cmoca_reference-01.pdf

5) Available at http://afpcinc.org/wp-content/uploads/2016/08/FOCA-Reference-Font-Object-Content-Architecture-Reference.pdf

6) Available at http://afpcinc.org/wp-content/uploads/2017/04/AFP-GOCA-Reference-Graphics-Object-Content-Architecture-for-AFP-Reference.pdf

Image Object Content Architecture Reference. AFPC-0003-07. Seventh Edition. AFP Consortium, 2010[7].

Presentation Text Object Content Architecture Reference. AFPC-0009-03. Fourth Edition. AFP Consortium, 2016[8].

Presentation Object Subsets for AFP. AFPC-0002-03. Third Edition. AFP Consortium, 2016[9].

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12651-1, ISO 19005-1, ISO 32000-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 AFP description

This clause introduces and defines the AFP Interchange Set and Function set for PDF used for containing PDF objects in AFP documents. AFP includes a base AFP presentation interchange set (MO:DCA IS/3) augmented with a function set for graphic arts (MO:DCA GA) that supports modern PDF objects within AFP. The base interchange set (hereafter referred to as IS/3) can contain native and non-native content, while the additional graphic art function set is essentially a non-native container for single and multi-page PDF.

For detailed definitions of native AFP content within IS/3, refer to the Object Content Architecture (OCA) documents listed in Clause 2.

Non-native content in IS/3 includes presentation object containers with defined subsets for TIFF and JPEG:

— AFPC TIFF;

— AFPC JPEG.

These are formally defined in Presentation Object Subsets for AFP. AFPC-0002-03. AFP Consortium, 2016. AFP full function document object container support is achieved by the inclusion of an additional presentation object container for PDF.

5 Compliance

5.1 General

The definition of compliance with this interchange set is limited to integrity of the resulting AFP MO:DCA file. The definition of what constitutes an AFP compliant product is not within the scope of this architecture definition.

7) Available at http://afpcinc.org/wp-content/uploads/2016/08/IOCA-Reference-Image-Object-Content-Architecture-Reference.pdf

8) Available at http://afpcinc.org/wp-content/uploads/2016/08/PTOCA-Reference-Presentation-Text-Object-Content-Architecture-Reference.pdf

9) Available at http://afpcinc.org/wp-content/uploads/2016/08/Presentation-Object-Subsets-for-AFP-03.pdf

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

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

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

— all structured field triplets shall be defined in AFP and shall comply with applicable IS/3 (AFP) restrictions;

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

— the print file shall not include any obsolete, retired or coexistence migration functions (as defined in the MO:DCA Reference, 2017, Appendix C.);

— the maximum structured field length shall be limited to X'7FF0' = 32,752;

— all Begin Document (BDT) structured fields shall specify the MO:DCA Interchange Set (X'18') triplet with ISid = X'0D80' (MO:DCA IS/3 with FS) or X'0D00' (MO:DCA IS/3 only) if there is no PDF content;

— the print file shall be enveloped with the Begin Print File (BPF) and End Print File (EPF) structured fields and the BPF structured field shall specify the MO:DCA Interchange Set (X'18') triplet with ISid = X'0D80' (MO:DCA IS/3 with FS) or X'0D00' (MO:DCA IS/3 only) if there is no PDF content;

— the print file shall identify AFP with PDF using the MO:DCA Function set (X’8F’) triplet with 2-byte FctSetID = X'0001' - MO:DCA GA function set on both BPF and BDT.

5.2 Structured Field Introducer

The Flag byte (byte 5) in the Structured Field Introducer (SFI) shall be set to X’00’. AFP interchange set 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 is limited to X’7FF0’ = 32,752.

5.3 Exception conditions

No additional exception conditions are defined within AFP for the structured fields or their parameters above and beyond what is defined in the general MO:DCA architecture.

6 Data Stream object structure

This clause defines the objects that make up the AFP Data Stream, including the base IS/3 structured fields and native content objects given in Table 1, the non-native presentation objects given in Tables 2 and 4, the non-presentation objects given in Table 3 and the related secondary resources given in Table 5.

a) The BPF and EPF structured fields are required in the AFP Data Stream.

b) The BDT and EDT structured fields are required in the AFP Data Stream.

c) The NOP structured field may appear within any begin-end domain and thus is not listed in the structured field groupings.

d) Object content shall not include functions that are not in AFP, i.e. a print file is not AFP compliant if it includes such content.

e) Table 1 contains summaries of the base AFP object structure derived from IS/3. All syntax, semantics and notes in the object structure definitions in the MO:DCA Reference, 2017, Chapter 4, apply, unless explicitly specified otherwise.

Table 1 — AFP base IS/3 objects

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Print File	Begin Print File (BPF) X'D3A8A5' to End Print File (EPF) X'D3A9A5'	The Print File shall: — be enveloped by the BPF and EPF structured fields; — specify the MO:DCA Interchange Set X'18' triplet on the BPF and — indicate ISid = X'0D80' (MO:DCA IS/3 with FS) or X'0D00' (MO:DCA IS/3 only) if there is no PDF content. The Print File shall contain nothing except the following structured fields and objects, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Print File*** (BPF, D3A8A5) [(Resource Grp)] (Index + Doc) (S) (EPF, D3A9A5) ***Index + Document*** [(Index)] (Document) (S) A compliant IS/3 Print File is subject to a single Form Definition and shall contain at most one BPF/EPF pair and at most one Print File level resource group.

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Resource Group (Print File)	Begin Resource Group (BRG) X'D3A8C6' to End Resource Group (ERG) X'D3A9C6'	The Resource Group shall contain nothing except the following structured fields and resource objects, as defined in the general architecture subject to all applicable IS/3 restrictions. (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) The only FOCA objects that may be included are: — FOCA code page object; — FOCA Unicode-extended code page object. IS/3 may limit function in the Resource Objects; for details, see the individual object definitions in this table.
Resource Object (in Print File Resource Group)	Begin Resource (BRS) X'D3A8CE' to End Resource (ERS) X'D3A9CE'	The Resource Object shall be enveloped by the BRS and ERS structured fields: (BRS, D3A8CE) (Res Object) (ERS, D3A9CE)
Document Index	Begin Document Index (BDI) X'D3A8A7' to End Document Index (EDI) X'D3A9A7'	The Document Index shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. (BDI, D3A8A7) + (IEL, D3B2A7) (S) + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] (EDI, D3A9A7)

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Document	Begin Document (BDT) X'D3A8A8' to End Document (EDT) X'D3A9A8'	The Document shall contain nothing except the following structured fields and objects, as defined in the general architecture subject to all applicable IS/3 restrictions. (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' to End Resource Environment Group (ESG) X'D3A9D9'	The Resource Environment Group shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. (BSG, D3A8D9) [(MDR, D3ABC3) (S)] [(MPO, D3ABD8) (S)] [(PPO, D3ADC3) (S)] (ESG, D3A9D9)
Page	Begin Page (BPG) X'D3A8AF' to End Page (EPG) X'D3A9AF'	The Page shall contain nothing except the following structured fields and objects, as defined in the general architecture subject to all applicable IS/3 restrictions. ***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)

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
		AEG (BAG, D3A8C9) [(PEC, D3A7A8)] [(MDR, D3ABC3) (S)] [(MPO, D3ABD8) (S)] [(MPS, D3B15F) (S)] (PGD, D3A6AF) [(OBD, D3A66B)] [(OBP, D3AC6B)] (PTD, D3B19B) F2 (EAG, D3A9C9) The OBD is only used for PTOCA objects without an OEG and, if specified: — the measurement units shall match the PGD units; — the extents shall match the PGD extents. These are the architected defaults if the OBD is not specified, and cause the text object area to have the same units and extents as the page. 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; — the object area orientation shall be set to (0°,90°). These are the architected defaults if the OBP is not specified, and cause the text object area to be positioned coincident with the page. 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 PGD units. IS/3 may limit function in the data objects; for details, see the individual object definitions in this table.

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Page Group	Begin Named Page Group (BNG) X'D3A8AD' to End Named Page Group (ENG) X'D3A9AD'	The Page Group shall contain nothing except the following structured fields and objects, as defined in the general architecture subject to all applicable IS/3 restrictions. (BNG, D3A8AD) [(TLE, D3A090) (S)] + [(IMM, D3ABCC) (S)] + [(LLE, D3B490) (S)] + [(Medium Map) (S)] + [(REG) (S)] + [(Page) (S)] + [(Page Group) (S)] (ENG, D3A9AD)
Overlay	Begin Overlay (BMO) X'D3A8DF' to End Overlay (EMO) X'D3A9DF'	The Overlay shall contain nothing except the following structured fields and objects, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Overlay*** (BMO, D3A8DF) (AEG) + [(IOB, D3AFC3) (S)] + [(IPS, D3AF5F) (S)] + [(LLE, D3B490) (S)] + [(TLE, D3A090) (S)] + [(BCOCA) (S)] + [(GOCA) (S)] + [(IOCA) (S)] + [(PTOCA) (S)] + [(Object Cont (S)] (EMO, D3A9DF) ***AEG*** (BAG, D3A8C9) [(PEC, D3A7A8)] [(MDR, D3ABC3) (S)] [(MPS, D3B15F) (S)] (PGD, D3A6AF) [(OBD, D3A66B)] [(OBP, D3AC6B)] (PTD, D3B19B) F2 (EAG, D3A9C9)

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
		The OBD is only used for PTOCA objects without an OEG and, if specified: — the measurement units shall match the PGD units; — the extents shall match the PGD extents. These are the architected defaults if the OBD is not specified, and cause the text object area to have the same units and extents as the overlay. 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; — the object area orientation shall be set to (0°,90°). These are the architected defaults if the OBP is not specified, and cause the text object area to be positioned coincident with the overlay. The PTD is only mandatory if the overlay contains one or more PTOCA objects without an OEG. It is strongly recommended that the measurement units in the PTD match the PGD units. IS/3 may limit function in the data objects; for details, see the individual object definitions in this table.

Page Segment	Begin Page Segment (BPS) X'D3A85F' to End Page Segment (EPS) X'D3A95F'	The Page Segment shall be a MO:DCA page segment and shall contain nothing except the following structured fields and objects, as defined in the general architecture subject to all applicable IS/3 restrictions.
		Page Segment
		`(BPS, D3A85F)`
		`+ [ (BCOCA ) (S) ]`
		`+ [ (GOCA ) (S) ]`
		`+ [ (IOCA ) (S) ]`
		`(EPS, D3A95F)`
		IS/3 may limit function in the data objects; for details, see the individual object definitions in this table.

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Bar Code Object	Begin Bar Code Object (BBC) X'D3A8EB' to End Bar Code Object (EBC) X'D3A9EB'	The object content shall comply with the BCOCA BCD2 subset definition. The Bar Code Object shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Bar Code Object*** (BBC, D3A8EB) (OEG) [(BDA, D3EEEB) (S)] (EBC, D3A9EB) ***OEG*** (BOG, D3A8C7) (OBD, D3A66B) (OBP, D3AC6B) [(MBC, D3ABEB)] [(MDR, D3ABC3) (S)] (BDD, D3A6EB) (EOG, D3A9C7)
Graphics Object	Begin Graphics Object (BGR) X'D3A8BB' to -End Graphics Object (EGR) X'D3A9BB'	The object content shall comply with the AFP GOCA GRS3 subset definition. The Graphics Object shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Graphics Object*** (BGR, D3A8BB) (OEG) [(GAD, D3EEBB) (S)] (EGR, D3A9BB) ***OEG*** (BOG, D3A8C7) [(PEC, D3A7A8)] (OBD, D3A66B) (OBP, D3AC6B) [(MGO, D3ABBB)] [(MDR, D3ABC3) (S)] (GDD, D3A6BB) (EOG, D3A9C7) If the boundary for an area is to be drawn but is not properly closed, IS/3 receivers should not draw a line to close the figure.

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Image Object	Begin Image Object (BIM) X'D3A8FB' to End Image Object (EIM) X'D3A9FB'	The object content shall comply with the IOCA FS10 or FS45 subset definitions. Compliance with IOCA FS45 includes compliance with IOCA FS40 and FS42. The Image Object shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Image Object*** (BIM, D3A8FB) (OEG) [(IPD, D3EEFB) (S)] (EIM, D3A9FB) ***OEG*** (BOG, D3A8C7) [(PEC, D3A7A8)] (OBD, D3A66B) (OBP, D3AC6B) [(MIO, D3ABFB)] [(MDR, D3ABC3) (S)] (IDD, D3A6FB) (EOG, D3A9C7) The object content includes support for the following additional IOCA functions: — IDD Set Extended Bilevel Image Color self-defining field; — all MO:DCA colour spaces for bilevel tiles on the Tile Set Color parameter.

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Presentation Text Object	Begin Presentation Text Object (BPT) X'D3A89B' to End Presentation Text (EPT) X'D3A99B'	The object content shall comply with the PTOCA PT3 subset definition, with support for the following additional PTOCA functions: — Set Text Color (STC) control sequence "Precision" parameter (byte 6) is retired; — New Exception id EC-1A03: Invalid Unicode Data; — Highlight Color Space, range X'0100' to X'FFFF', for Indexed CMRs; — support for the full range of colour values, as defined in the standard OCA Color Value Table (as defined in the MO:DCA Reference, 2017, Appendix A) in the STC control sequence; — support for the full PTOCA parameter ranges in the DBR, DIR, SIA, and SVI control sequences. The text object shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Text Object*** (BPT, D3A89B) [(PTX, D3EE9B) (S)] (EPT, D3A99B)
Object Container — Presentation Object	Begin Object Container (BOC) X'D3A892' to End Object Container (EOC) X'D3A992'	See Table 2 for the Presentation Object Containers included in IS/3. The Object Container shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. ***Presentation Object Container*** (BOC, D3A892) [(OEG)] [(OCD, D3EE92) (S)] (EOC, D3A992) ***OEG*** (BOG, D3A8C7) [(PEC, D3A7A8)] [(OBD, D3A66B)] [(OBP, D3AC6B)] [(MCD, D3AB92)] [(MDR, D3ABC3) (S)] [(CDD, D3A692)] (EOG, D3A9C7)

Table 1 *(continued)*

AFP Data Stream object structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
		— If included directly on a page/overlay, BOC/EOC , OEG with OBD, OBP, CDD shall be included, and all object data shall be carried in OCDs. — If included with an IOB and located in the resource group, BOC/EOC shall be included and all object data shall be carried in OCDs; OEG is optional. — If included with an IOB and located in a resource library, it can be wrapped with a BOC/EOC wrapper, all object data in OCDs, and optional OEG) or unwrapped (the data are unaltered in its original form). If installed with a RAT, the object shall not be wrapped. See Table 4 for the IS/3 presentation object containers that can be referenced with an IOB structured field and that can be processed with a Data Object Resource (DOR) Resource Access Table (RAT).

Object Container — Non-Presentation Object	Begin Object Container (BOC) X'D3A892' to End Object Container (EOC) X'D3A992'	See Table 3 for the Non-Presentation Object Containers included in IS/3. The Object Container shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions.
		Non-presentation Object Container
		`(BOC, D3A892)`
		`[ (OCD, D3EE92) (S) ]`
		`(EOC, D3A992)`
		— If located in the resource group, BOC/EOC shall be included and all object data shall be carried in OCDs.
		— If located in a resource library:
		— a CMT shall be wrapped (BOC/EOC wrapper and all data in OCDs);
		— an IOCA tile resource can be wrapped or unwrapped;
		— TTF/OTFs, TTF collections and CMRs, since always installed with a RAT, shall not be wrapped.

FOCA Objects	Only a FOCA code page can occur in the print file resource group within following container: Begin Resource (BRS) X'D3A8CE' to End Resource (ERS) X'D3A9CE'	The following objects are supported and may be referenced with an MDR structured field that specifies the name of the code page: — FOCA code pages; — single-byte and double-byte; — single-byte and double-byte with Unicode values.

Table 2 — Presentation Container Objects

Component ID	Object type	Encoded object-type OID
14	TIFF	X'06072B12000401010E'
22	GIF	X'06072B120004010116'
23	AFPC JPEG	X'06072B120004010117'
NOTE 1 All references to “transparency” refer to AFP Transparency, and not PDF or TIFF Transparency. NOTE 2 All references to “PDF” refer to ISO 32000-1.		

Table 2 *(continued)*

Component ID	Object type	Encoded object-type OID
25	PDF Single-page object	X'06072B120004010119'
49	PDF Single-page object with Transparency	X'06072B120004010131'
60	TIFF without Transparency	X'06072B12000401013C'
61	TIFF Multiple Image File	X'06072B12000401013D'
62	TIFF Multiple Image (without Transparency) File	X'06072B12000401013E'
63	PDF Multiple Page File	X'06072B12000401013F'
64	PDF Multiple Page (with Transparency) File	X'06072B120004010140'
66	AFPC TIFF	X'06072B120004010142'
NOTE 1 All references to "transparency" refer to AFP Transparency, and not PDF or TIFF Transparency. NOTE 2 All references to "PDF" refer to ISO 32000-1.		

Table 3 — Non-Presentation Container Objects

Component ID	Object type	Encoded object-type OID
20	Color Mapping Table (CMT)	X'06072B120004010114'
47	IOCA Tile Resource	X'06072B12000401012F'
51	TrueType/OpenType Font: — TrueType shapes (Unicode Cmap) — CFF Type 1 shapes (Unicode Cmap) — CFF CID shapes (Unicode Cmap)	X'06072B120004010133'
53	TrueType/OpenType Font Collection	X'06072B120004010135'
57	Color Management Resource (CMR) Baseline support as defined in the CMOCA reference, plus support for Indexed (IX) CMRs. Therefore, the following CMR types are supported: — Color Conversion (CC) CMRs — Generic Halftone (HT) CMRs — Generic Tone Transfer Curves (TTC) CMRs — Indexed (IX) CMRs. Support for the CMYK passthru function.	X'06072B120004010139'

Table 4 lists the AFP presentation object containers that can be referenced for presentation by the Include Object (IOB) structured field with ObjType = X'92'— other object data. This is also the list of AFP presentation object containers that can be processed with a Document Object Resource (DOR) RAT.

Table 4 — IOB and DOR RAT Presentation Container Objects

Are zou her	Object type	Encoded object-type OID
14	TIFF	X'06072B12000401010E'
22	GIF	X'06072B120004010116'
23	AFPC JPEG	X'06072B120004010117'
25	PDF Single-page object	X'06072B120004010119'
49	PDF Single-page object with Transparency	X'06072B120004010131'
NOTE 1 All references to "transparency" refer to AFP transparency, and not PDF or TIFF transparency. NOTE 2 All references to "PDF" refer to ISO 32000-1.		

Table 4 *(continued)*

Are zou her	Object type	Encoded object-type OID
60	TIFF without Transparency	X'06072B12000401013C'
61	TIFF Multiple Image File	X'06072B12000401013D'
62	TIFF Multiple Image (without Transparency) File	X'06072B12000401013E'
63	PDF Multiple Page File	X'06072B12000401013F'
64	PDF Multiple Page (with Transparency) File	X'06072B120004010140'
66	AFPC TIFF	X'06072B120004010142'
NOTE 1 All references to "transparency" refer to AFP transparency, and not PDF or TIFF transparency. NOTE 2 All references to "PDF" refer to ISO 32000-1.		

Table 5 lists the secondary resources that are supported by various AFP data object resources.

When a presentation container object with PDF references a font as a secondary resource, the FQN X'DE' triplet on the IOB, PPO or MDR shall specify the full font name. For an example of how PDF external file references map into AFP secondary resources, see Annex A.

Table 5 — Data Objects and Secondary Resources

Data Object Resource	Secondary Resource	Internal Resource Identifier
IOCA Image	IOCA Tile Resource Color Management Resource	4-byte local ID None
PTOCA Text (see notes)	TrueType/OpenType Font	1-byte local ID
AFP GOCA (see notes)	TrueType/OpenType Font Color Management Resource	1-byte local ID None
BCOCA Text (see notes)	TrueType/OpenType Font Color Management Resource	1-byte local ID None
TIFF, all formats	Color Management Resource	None
GIF	Color Management Resource	None
AFPC JPEG	Color Management Resource	None
PDF Single-Page object or Multi-page File (with or without transparency)	Resource Object Color Management Resource	Identifier with syntax defined by PDF None
NOTE 1 AFP native PTOCA, AFP GOCA, and BCOCA objects are not processed as resource objects. However, the resources for these objects are processed like other secondary resources. NOTE 2 All references to "transparency" refer to AFP transparency, and not PDF transparency. NOTE 3 All references to "PDF" refer to ISO 32000-1.		

7 Print control object structure

This clause defines the objects that are used to control the presentation of an AFP data stream.

Table 6 — Print Control Objects

AFP Print Control Object Structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Form Map	Begin Form Map (BFM) X'D3A8CD' to End Form Map (EFM) X'D3A9CD'	The Form Map shall contain nothing except the following objects, as defined in the general architecture subject to all applicable IS/3 restrictions. (BFM, D3A8CD) [(DEG)] (Medium Map) (S) (EFM, D3A9CD)
Document Environment Group	Begin Document Environment Group (BDG) X'D3A8C4' to End Document Environment Group (EDG) X'D3A9C4'	The Document Environment Group (DEG) contains only the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. (BDG, D3A8C4) [(PFC, D3B288) (S)] [(PEC, D3A7A8) (S)] [(MMO, D3B1DF)] [(MSU, D3ABEA)] (PGP, D3B1AF) F2 (MDD, D3A688) [(MFC, D3A088) (S)] [(MDR, D3ABC3) (S)] (EDG, D3A9C4) The PGP and MDD shall be included in either the DEG or the Medium Map. When the same structured field is specified in both the DEG and the Medium Map, the Medium Map overrides. IS/3 does not include support for UP3i finishing operations.

Table 6 *(continued)*

AFP Print Control Object Structure		
Object name	**Object envelope**	**Summary of AFP object structure; differences from general MO:DCA architecture noted**
Medium Map	Begin Medium Map (BMM) X'D3A8CC' to End Medium Map (EMM) X'D3A9CC'	The Medium Map shall contain nothing except the following structured fields, as defined in the general architecture subject to all applicable IS/3 restrictions. (BMM, D3A8CC) [(MMO, D3B1DF)] [(MPO, D3ABD8) (S)] [(MMT, D3AB88) (S)] [(MDR, D3ABC3) (S)] (PGP, D3B1AF) F2 (MDD, D3A688) (MCC, D3A288) [(MMC, D3A788) (S)] [(PMC, D3A7AF) (S)] [(MFC, D3A088) (S)] [(PEC, D3A7A8)] (EMM, D3A9CC) The PGP and MDD shall be included in either the DEG or the Medium Map. When the same structured field is specified in both the DEG and the Medium Map, the Medium Map overrides. IS/3 does not include support for UP3i finishing operations.

8 Structured fields and triplets

8.1 General

This clause lists the AFP structured fields and their supported triplets. Triplets that are not listed but that are allowed in the general architecture shall not be specified in an AFP-compliant print file. Unless otherwise noted, all non-migration structured field positional parameters are supported in AFP. Also, unless otherwise noted, the complete architected parameter range is supported in AFP for all structured field positional parameters and triplets. AFP does not include any obsolete, retired, or coexistence parameters or triplets as defined in the MO:DCA Reference, 2017, Appendix C. For brevity, Tables 7 to 10 are only intended to summarize the triplets that are allowed on a structured field. For a complete definition of how these triplets are used on a structured field and what restrictions may apply, the general architecture shall be consulted. If a triplet is allowed to have "0" occurrences, it is an optional triplet. If it is allowed to have "1" or "1 or more" occurrences but not "0" occurrences, it is a mandatory triplet.

The following rules apply to all AFP structured fields.

— The Local Date and Time Stamp (X'62') triplet is not included in AFP and shall not be specified. It is replaced by the ISO-based Universal Date and Time Stamp (X'72') triplet.

— The Presentation Space Mixing Rules (X'71') triplet is not included in AFP and shall not be specified.

— The Coded Graphic Character Set Global ID (X'01') triplet, while allowed on most structured fields in the general architecture, is only used in AFP on the BOC, BRS, IOB, MDR, PPO and TLE structured fields,

as noted explicitly in Tables 7 to 10. Support for the inheritance of encoding scheme, as specified with the X'01' triplet on Begin structured fields, to the lower levels of the MO:DCA hierarchy is not included in IS/3. While this triplet is mandatory on the BDT in the general architecture, it is optional on the BDT in AFP and, if specified, shall be ignored. It shall not be specified on any other structured field. The architected default encoding for the AFP print file or document is EBCDIC single-byte presentation, which is characterized with encoding scheme ID X'61nn', and which is identified with CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). This default can be overridden on the BOC, BRS, IOB, MDR, PPO, and TLE structured fields. The inheritance of the encoding scheme to lower levels of the MO:DCA hierarchy using the X'01' triplet is not included in IS/3.

8.2 Begin structured fields

The rules in this subclause and in Table 7 apply to all Begin structured fields in AFP.

— The matching of names using the FQN type X'01' triplets on Begin/End structured fields is not part of AFP. MO:DCA AFP generators can use matching 8-byte token names on Begin/End structured fields, or they can use the X'FFFF' wild card on End structured fields, which matches any name on the corresponding Begin structured field. The FQN type X'01' triplet on End structured fields, while allowed in the general architecture on most End structured fields, shall not be specified on End structured fields in an AFP print file.

Table 7 — Begin Structured Fields

AFP Begin Structured Fields			
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**	
Begin Active Environment Group (BAG)	X'D3A8C9'	**X'65'**	0 or more
Begin Bar Code Object (BBC)	X'D3A8EB'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Document Environment Group (BDG)	X'D3A8C4'	**X'65'**	0 or more
Begin Document Index (BDI)	X'D3A8A7'	**X'02' Tpe X'01'**	0 or 1
		X'02' Tpe X'83'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Document (BDT)	X'D3A8A8'	**X'18'**	1 occurrence; shall specify ISID = 'X'0D80' - MO:DCA IS/3 + function set
		X'8F'	1 occurrence; shall specify FctSetID = X'0001' - MO:DCA GA function set
		X'01'	0 or more. shall be ignored
		X'02' Tpe X'01'	0 or 1
		X'65'	0 or more
		X'72'	0 or more

Table 7 *(continued)*

AFP Begin Structured Fields			
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**	
		IS/3 does not include support for the inheritance by lower-level document components of the encoding scheme specified in the CGCSGID (X'01') triplet on the BDT. While this triplet is mandatory on the BDT in the general architecture, it is optional on the BDT in IS/3 and, if specified, shall be ignored. The architected default encoding for the document is EBCDIC single-byte presentation, which is characterized with encoding scheme ID X'61nn', and which is identified with CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). This default can be overridden on those structured fields where the X'01' triplet is supported (BOC, BRS, IOB, MDR, PPO, TLE). A document can be made compliant both with the IS/3 encoding rules and with encoding scheme inheritance if the CGCSGID (X'01') triplet is specified last on the BDT, and if it specifies CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697).	
Begin Form Map (BFM)	X'D3A8CD'	**X'65'**	0 or more
		X'72'	0 or 1
Begin Graphics Object (BGR)	X'D3A8BB'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Image Object (BIM)	X'D3A8FB'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Medium Map (BMM)	X'D3A8CC'	**X'45'**	0 or 1
		X'65'	0 or more
Begin Overlay (BMO)	X'D3A8DF'	**X'02' Tpe X'01'**	0 or 1. The Overlay name shall be less than or equal to 8 characters (bytes) in length.
		X'65'	0 or more
		X'72'	0 or 1
Begin Named Page Group (BNG)	X'D3A8AD'	**X'02' Tpe X'01'**	0 or 1
		X'02' Tpe X'8D'	0 or 1
		X'56'	0 or 1
		X'5E'	0 or 1 occurrence for pages counted
		X'65'	0 or more
		X'83'	0 or 1
Begin Object Container (BOC)	X'D3A892'	**X'10'**	1
		X'01'	0 or more NOTE 1 IS/3 requires full support of the CGCSGID (X'01') triplet on the BOC. NOTE 2 It is strongly recommended that this triplet is specified even if the parameter on the BOC defines a fixed encoding. For example, if the parameter defines a fixed UTF-16BE encoding, the triplet can be specified using the CCSID form with CCSID = 1200 (X'04B0').
		X'02' Tpe X'01'	0 or 1

Table 7 *(continued)*

AFP Begin Structured Fields			
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**	
		X'02' Tpe X'41'	0 or more
		X'02' Tpe X'6E'	0 or more
		X'02' Tpe X'7E'	0 or more
		X'57'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Object Environment Group (BOG)	X'D3A8C7'	**X'65'**	0 or more
Begin Print File (BPF)	X'D3A8A5'	**X'18'**	1 occurrence; shall specify ISID = 'X'0D80' - MO:DCA IS/3 + function set
		X'8F'	1 occurrence; shall specify FctSetID = X'0001' - MO:DCA GA function set
		X'02' Tpe X'01'	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
		IS/3 does not include support for the inheritance by lower-level document components of the encoding scheme specified in the CGCSGID (X'01') triplet on the BPF. The architected default encoding for the print file is EBCDIC single-byte presentation, which is characterized with encoding scheme ID X'61nn', and which is identified with CCSID 500 (corresponding to the combination of CPGID 500 and GCSGID 697). This default can be overridden on those structured fields where the X'01' triplet is supported (BOC, BRS, IOB, MDR, PPO, TLE).	
Begin Page (BPG)	X'D3A8AF'	**X'02' Tpe X'01'**	0 or 1
		X'02' Tpe X'8D'	0 or 1
		X'56'	0 or 1
		X'65'	0 or more
		X'81'	0 or 1
		X'83'	0 or 1
Begin Page Segment (BPS)	X'D3A85F'	The Page Segment shall be a MO:DCA Page Segment; see Table 1.	
		X'65'	0 or more
		X'72'	0 or 1
Begin Presentation Text Object (BPT)	X'D3A89B'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Resource Group (BRG)	X'D3A8C6'	**X'02' Tpe X'01'**	0 or 1
		X'65'	0 or more
		X'72'	0 or 1
Begin Resource (BRS)	X'D3A8CE'	**X'02' Tpe X'6E'**	1 or more if resource is a TTC; otherwise should not be specified
		X'10'	1 occurrence if ObjType = X'92' — Object Container; otherwise should not be specified

Table 7 *(continued)*

AFP Begin Structured Fields			
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**	
		X'21'	1 This is the Resource Object Type triplet that was previously retired but is now part of the general architecture.
		X'01'	0 or more IS/3 (AFP) requires full support of the CGCSGID (X'01') triplet on the BRS. It is strongly recommended that this triplet is specified even if the parameter on the BRS defines a fixed encoding. For example, if the parameter defines a fixed UTF-16BE encoding, the triplet can be specified using the CCSID form with CCSID = 1200 (X'04B0').
		X'02' Tpe X'01'	0 or more; 1 occurrence mandatory if resource is a CMR
		X'02' Tpe X'41'	0 or more if resource is a CMR; otherwise should not be specified
		X'02' Tpe X'7E'	0 or more if resource is a TTF/TTC; otherwise should not be specified
		X'65'	0 or more
Begin Resource Environment Group (BSG)	X'D3A8D9'	**X'65'**	0 or more

8.3 End structured fields

The rules in this subclause and in Table 8 apply to all End structured fields in AFP:

— The matching of names using the FQN type X'01' triplets on Begin/End structured fields is not part of AFP. Generators can use matching 8-byte token names on Begin/End structured fields, or they can use the X'FFFF' wild card on End structured fields which matches any name on the corresponding Begin structured field. The FQN type X'01' triplet on End structured fields, while allowed in the general architecture on most End structured fields, shall not be specified on End structured fields in an AFP print file.

Table 8 — End Structured Fields

AFP End Structured Fields		
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted**
End Active Environment Group (EAG)	X'D3A9C9'	
End Bar Code Object (EBC)	X'D3A9EB'	
End Document Environment Group (EDG)	X'D3A9C4'	
End Document Index (EDI)	X'D3A9A7'	
End Document (EDT)	X'D3A9A8'	
End Form Map (EFM)	X'D3A9CD'	
End Graphics Object (EGR)	X'D3A9BB'	
End Image Object (EIM)	X'D3A9FB'	
End Medium Map (EMM)	X'D3A9CC'	

Table 8 *(continued)*

AFP End Structured Fields		
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA Architecture noted**
End Overlay (EMO)	X'D3A9DF'	
End Named Page Group (ENG)	X'D3A9AD'	
End Object Container (EOC)	X'D3A992'	
End Object Environment Group (EOG)	X'D3A9C7'	
End Print File (EPF)	X'D3A9A5'	
End Page (EPG)	X'D3A9AF'	
End Page Segment (EPS)	X'D3A95F'	The Page Segment shall be a MO:DCA Page Segment; see Table 1.
End Presentation Text Object (EPT)	X'D3A99B'	
End Resource Group (ERG)	X'D3A9C6'	
End Resource (ERS)	X'D3A9CE'	
End Resource Environment Group (ESG)	X'D3A9D9'	

8.4 Structured fields without triplets

The AFP structured fields given in Table 9 do not support any triplets.

Table 9 — Structured Fields without Triplets

AFP Structured Fields without Triplets		
Structured Field name	**Structured Field ID**	**Differences from general MO:DCA architecture**
Bar Code Data (BDA)	X'D3EEEB'	
Graphics Data (GAD)	X'D3EEBB'	The GAD content shall comply with the AFP GOCA GRS3 subset definition. If the boundary for an area is to be drawn but is not properly closed, AFP receivers should not draw a line to close the figure.
Graphics Data Descriptor (GDD)	X'D3A6BB'	GDD content as defined by the AFP GOCA GRS3 subset definition. Measurement unit restrictions: — unit base = 10 inches; — X units per unit base = Y units per unit base; — range for X units per unit base and Y units per unit base is 1 to 32,767.
Image Data Descriptor (IDD)	X'D3A6FB'	IDD content as defined for MO:DCA data streams by IOCA, with the following optional self-defining fields (listed by ID) and their allowed occurrences: **X'F4'** 0 or more **X'F6'** 0 or more **X'F7'** 0 or 1

Table 9 *(continued)*

AFP Structured Fields without Triplets		
Structured Field name	**Structured Field ID**	**Differences from general MO:DCA architecture**
		Measurement unit restrictions: — unit base = 10 inches; — X units per unit base and Y units per unit base can be different; — range for X units per unit base and Y units per unit base is 1 to 32,767.
Image Picture Data (IPD)	X'D3EEFB'	The content shall comply with the IOCA FS10 or FS45 subset definitions. Note that compliance with IOCA FS45 includes compliance with IOCA FS40 and FS42.
Medium Copy Count (MCC)	X'D3A288'	
Medium Modification Control (MMC)	X'D3A788'	The following keywords, with allowed occurrences: **X'90nn'** 0 or 1 **X'91nn'** 0 or 1 **X'B4nn'** 0 or more; shall be paired with X'B5nn' **X'B5nn'** 0 or more; shall be paired with X'B4nn' **X'D1nn'** 0 or 1 **X'E0nn'** 0 or 1 **X'E1nn'** 0 or 1 **X'E8nn'** 0 or 1; shall be paired with X'E9nn' **X'E9nn'** 0 or 1; shall be paired with X'E8nn' **X'F2nn'** 0 or more, up to a maximum of 8 **X'F3nn'** 0 or more, up to a maximum of 8 **X'F4nn'** 0 or 1 **X'F9nn'** 0 or 1 **X'FCnn'** 0 or 1
Map Medium Overlay (MMO)	X'D3B1DF'	
Map Page Segment (MPS)	X'D3B15F'	The Page Segment shall be a MO:DCA Page Segment subject to all applicable IS/3 restrictions; see Table 1.
Map Suppression (MSU)	X'D3ABEA'	
No Operation (NOP)	X'D3EEEE'	
Object Area Position (OBP)	X'D3AC6B'	The Object Area Position only supports the 4 orthogonal orientations: 0 degrees, 90 degrees, 180 degrees, and 270 degrees. There are no restrictions on Object Area Position or Object Content Position. Objects may be positioned in a MO:DCA Page Segment at the IPS reference point using RefCSys = X'00'.
Object Container Data (OCD)	X'D3EE92'	Content as defined by the object types listed in Table 2 for Presentation Object Containers and Table 3 for Non-Presentation Object Containers.
Page Position Format 2 (PGP)	X'D3B1AF'	

Table 9 *(continued)*

AFP Structured Fields without Triplets		
Structured Field name	**Structured Field ID**	**Differences from general MO:DCA architecture**
Presentation Text Data Descriptor Format 2 (PTD)	X'D3B19B'	PTD content as defined for MO:DCA data streams by PTOCA, with the following optional control sequences. Each can have 0 or more occurrences: — AMB, AMI, SBI, SCFL, SEC, SIA, SIM, STC, STO. Measurement unit restrictions: — X unit base = Y unit base = 10 inches; — X units per unit base = Y units per unit base; — range for X units per unit base and Y units per unit base is 1 to 32,767.
Presentation Text Data (PTX)	X'D3EE9B'	The content shall comply with the PTOCA PT3 subset definition.

8.5 Structured fields with triplets

The AFP structured fields given in Table 10 support triplets.

Table 10 — Structured Fields with Triplets

AFP Structured Fields with Triplets			
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**	
Bar Code Data Descriptor (BDD)	X'D3A6EB'	BDD content as defined by the BCOCA BCD2 subset definition. **X'4E'** 0 or 1 Measurement unit restrictions: — unit base = 10 inches; — X units per unit base = Y units per unit base; — range for X units per unit base and Y units per unit base is 1 to 32,767.	
Container Data Descriptor (CDD)	X'D3A692'	**X'5A'**	0 or 1 occurrences with ObjTpe = X'AF' if the container contains one of the multi-page TIFF object types supported in IS/3 (see Table 2) or multi-page PDF object types supported in MO:DCA GA (see Table 5); otherwise should not be specified.
		X'9A'	0 or 1 occurrences if the Container contains one of the object types listed in Table 2; otherwise should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches; — X units per unit base and Y units per unit base can be different; — range for X units per unit base and Y units per unit base is 1 to 32,767.
		X'9C'	0 or 1 occurrences if the Container contains one of the PDF object types listed in Table 2; otherwise should not be specified.

Table 10 *(continued)*

AFP Structured Fields with Triplets		
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**
Index Element (IEL)	X'D3B2A7'	**X'02' Tpe X'CA'** 1 **X'2D'** 1 **X'02'** 0 or 1 occurrence of one of the following: — Type X'0D' — Type X'87' **X'02' Tpe X'8D'** 0 or 1 **X'56'** 0 or 1 **X'57'** 0 or 1 **X'58'** 0 or 1 **X'59'** 0 or 1 **X'5A'** occurrences for each object type counted **X'5E'** occurrences for pages counted **X'81'** 0 or 1 **X'83'** 0 or 1
Invoke Medium Map (IMM)	X'D3ABCC'	
Include Object (IOB)	X'D3AFC3'	The Include Object only supports the 4 orthogonal orientations: 0 degrees, 90 degrees, 180 degrees, and 270 degrees. **X'10'** 1 occurrence if ObjType = X'92' — Other object data; otherwise should not be specified **X'4B'** 1 occurrence if the IOB specifies an override for any of the following: — XocaOset — YocaOset — XoaSize — YoaSize Otherwise should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches; — X units per unit base = Y units per unit base; — range for X units per unit base and Y units per unit base is 1 to 32,767. **X'01'** 0 or more IS/3 requires full support of the CGCSGID (X'01') triplet on the IOB. **X'02' Tpe X'01'** 0 or 1 **X'02' Tpe X'DE'** 0 or more **X'02' Tpe X'BE'** 0 or more **X'04'** 0 or 1

Table 10 *(continued)*

AFP Structured Fields with Triplets			
Structured Field name	**Structured Field ID**	**Triplets (listed by ID) and their allowed occurrence; differences from general MO:DCA architecture noted**	
		X'4C'	0 or 1
		X'4E'	0 or 1
		X'5A'	0 or 1 occurrences with ObjTpe = X'AF' if the container contains one of the multi-page TIFF object types supported in IS/3 (see Table 2) or multi-page PDF object types supported in MO:DCA GA (see Table 5); otherwise should not be specified.
		X'70'	0 or 1
		X'91'	1 occurrence for each FQN type X'DE' that references a CMR; otherwise should not be specified.
		X'95'	0 or 1
		X'9A'	0 or 1 occurrences if the container contains one of the object types listed in Table 2; otherwise should not be specified. Measurement unit restrictions: — X unit base = Y unit base = 10 inches; — X units per unit base and Y units per unit base can be different; — range for X units per unit base and Y units per unit base is 1 to 32,767.
		X'9C'	0 or 1 occurrences if the container contains one of the PDF object types listed in Table 2; otherwise should not be specified.
Include Page Overlay (IPO)	X'D3AFD8'	**X'02' Tpe X'01'**	0 or 1. The Overlay name shall be less than or equal to 8 characters (bytes) in length. IS/3 does not impose any restrictions on the page Overlay orientation and origin.
Include Page Segment (IPS)	X'D3AF5F'	The Page Segment shall be a MO:DCA Page Segment subject to all applicable IS/3 restrictions; see Table 1.	
Link Logical Element (LLE)	X'D3B490'	**X'02' Tpe X'09'**	0 or 1 in source and target RG
		X'02' Tpe X'0A'	0 or 1 in source and target RG
		X'02' Tpe X'0C	0 or 1 in each RG
		X'02' Tpe X'0D'	0 or 1 in source and target RG
		X'02' Tpe X'83'	0 or 1 in source and target RG
		X'02' Tpe X'87'	0 or 1 in source and target RG
		X'02' Tpe X'B0'	0 or 1 in source and target RG
		X'02' Tpe X'CE'	0 or 1 in source and target RG
		X'10'	1 occurrence in source and target RG that specifies FQN Type X'CE'; otherwise shall not be specified.
		X'4B'	0 or 1 occurrences in source or target RG that specifies X'4D' triplet; otherwise should not be specified.