

Advanced Function Presentation Consortium

Metadata Guide for AFP

AFPC-0018-01



AFPConsortiumTM
Advanced Function Presentation

Note:

Before using this information, read the information in [“Notices” on page 47](#).

AFPC-0018-01**First Edition (November 2023)**

This edition applies to the Advanced Function Presentation™ (AFP™) Architecture. This is the first edition and is produced by the AFP Consortium™ (AFPC™). This edition remains current until a new edition is published.

Internet

Visit the AFP Consortium home page at: www.afpconsortium.org

Preface

This guide describes the implementation of a suggested Metadata structure for Advanced Function Presentation (AFP) to be used with the metadata object defined in the AFP architecture.

Who Should Read This Book

This book is for systems programmers and other developers who need such information to develop or adapt a product or program to interoperate with other presentation products.

AFP Consortium (AFPC)

The AFP Consortium is an international group bringing together voices from across the print industry to keep the AFP architecture up to date and continually improving. AFP Consortium members, often market competitors, work together to ensure this stable, efficient, flexible architecture continues to thrive, even as the world of printing changes.

The Advanced Function Presentation (AFP) architectures began as the strategic, general purpose document and information presentation architecture for the IBM® Corporation. The first specifications and products go back to 1984. Although all of the components of the architecture have grown over the years, the major concepts of object-driven structures, print integrity, resource management, and support for high print speeds were built in from the start.

In the early twenty-first century, IBM saw the need to enable applications to create color output that is independent from the device used for printing and to preserve color consistency, quality, and fidelity of the printed material. This need resulted in the formation, in October 2004, of the AFP Color Consortium™ (AFPCC™). The goal was to extend the object architectures with support for full-color devices including support for comprehensive color management. The idea of doing this via a consortium consisting of the primary AFP architecture users was to build synergism with partners from across the relevant industries, such as hardware manufacturers that produce printers as well as software vendors of composition, work flow, viewer, and transform tools. Quickly more than 30 members came together in regular meetings and work group sessions to create the AFP Color Management Object Content Architecture™ (CMOCA™). A major milestone was reached by the AFP Color Consortium with the initial official release of the CMOCA specification in May 2006.

Since the cooperation between the members of the AFP Color Consortium turned out to be very effective and valuable, it was decided to broaden the scope of the consortium efforts and IBM soon announced its plans to open up the complete scope of the AFP architecture to the consortium. In June 2007, IBM's role as founding member of the consortium was transferred to the InfoPrint® Solutions Company, an IBM/Ricoh® joint venture ; currently Ricoh holds the founding member position. In February 2009, the consortium was incorporated under a new set of bylaws with tiered membership and shared governance resulting in the creation of a formal open standards body called the AFP Consortium (AFPC). Ownership of and responsibility for the AFP architectures was transferred at that time to the AFP Consortium.

Data Definitions Used in the AFP Tagging Structures

Throughout this book, syntax is described for the AFP Tagging Structures using the following data definitions:

Integer Zero (0) and positive whole numbers

String Character strings that can contain characters, line feeds, carriage returns, and tab characters

In addition, a column heading of “M/O” for Textual Content, Attributes, or Child Elements indicates if the entry is Mandatory (M) or Optional (O).

Related Publications

Following is a list of related Architecture publications.

AFP Architecture Publications

Several other publications can help you understand the architecture concepts described in this book. AFP Consortium publications are available on the AFP Consortium web site at www.afpconsortium.org.

Table 1. AFP Consortium Architecture References

AFP Architecture Publication	Book Identification
<i>AFP Programming Guide and Line Data Reference</i>	AFPC-0010
<i>Bar Code Object Content Architecture™ Reference</i>	AFPC-0005
<i>Color Management Object Content Architecture Reference</i>	AFPC-0006
<i>Font Object Content Architecture Reference</i>	AFPC-0007
<i>Graphics Object Content Architecture for Advanced Function Presentation Reference</i>	AFPC-0008
<i>Image Object Content Architecture Reference</i>	AFPC-0003
<i>Intelligent Printer Data Stream™ Reference</i>	AFPC-0001
<i>Metadata Object Content Architecture Reference</i>	AFPC-0013
<i>Mixed Object Document Content Architecture™ (MO:DCA™ Reference</i>	AFPC-0004
<i>Presentation Text Object Content Architecture Reference</i>	AFPC-0009

Table 2. Additional AFP Consortium Documentation

AFPC Publication	Book Identification
<i>AFP Color Management Architecture™ (ACMA™)</i>	G550-1046 (IBM)
<i>AFPC Company Abbreviation Registry</i>	AFPC-0012
<i>AFPC Font Typeface Registry</i>	AFPC-0016
<i>BCOCA™ Frequently Asked Questions</i>	AFPC-0011
<i>Metadata Guide for AFP</i>	AFPC-0018
<i>MO:DCA-L: The OS/2 PM Metafile (.met) Format</i>	AFPC-0014
<i>Presentation Object Subsets for AFP</i>	AFPC-0002
<i>Recommended IPDS™ Values for Object Container Versions</i>	AFPC-0017

Other References

AFP Metadata uses XML and requires languages to be specified in a consistent manner. For that purpose, we use the following publications:

Table 3. Other References

Publication
<i>Extensible Markup Language (XML) 1.0 (Fifth Edition)</i> Available at: www.w3.org/TR/xml
<i>Tags for Identifying Languages</i> Available at: www.rfc-editor.org/rfc/rfc5646.txt
<i>IANA Language Subtag Registry</i> Available at: www.iana.org/assignments/language-subtag-registry/language-subtag-registry

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Chapter 1. Introduction

AFP Metadata Description

Advanced Function Presentation data streams allow inclusion of non-AFP objects. Among the many non-AFP objects supported are objects that carry descriptive metadata, providing extra information for archive and presentation systems. These objects, known as Metadata Objects (MOs) are defined in the *Metadata Object Content Architecture Reference*.

While the inclusion of MOs is well defined in the architecture, the recommended interchange content of these MOs is defined in this document. The purpose of this guide is to define a tagging schema in XML format for carrying AFP tagging information within an MO for use by archiving and presentation systems. An example of the benefit of metadata tagging is the ability to associate extra information with a given part of an AFP document, allowing users with vision impairments or other restrictions to make full use of the content provided by an AFP system – meeting the requirements of universal accessibility (UA). Another example is the case where an automated archive system could use the extra information provided in the metadata tagging to provide a more comprehensive index of the data in an archived AFP file.

In AFP environments, the MOs have no presentation semantic and may be ignored by products not interested in the metadata.

Chapter 2. Overview

AFP Tagging

This chapter provides an Overview of AFP tagging, what it is used for, and related concepts.

To *tag* something is to associate “extra” information (metadata) to a given piece of AFP data. By its very nature, the AFP data to be tagged must be visible to a reader or viewer of the AFP document. To be useful there must be an association between where something is in the AFP stream and the “extra” tagging information to be associated with it. AFP itself contains Metadata objects that act as containers for metadata.

DocumentObjectModel and DOMNode Tags

The DocumentObjectModel tag defines the scope of how the tags are parsed and defines the version, method, default language, and XML Schema for these tags. It is designed to allow maximum flexibility over time to allow new tags or XML schema to be used as new tags and technologies are developed. The DocumentObjectModel contains DOMNode tags that carry all the semantic properties (using the <SemanticProperties> tag), pointers to the corresponding AFP data (using the <AFPTag> tag), and private (using the <Private> tag) data to be tagged in an AFP print file.

The DOMNode tags are the “backbone” of the logical document structure. The nesting of DOMNode tags in the XML corresponds to the logical hierarchical organization of the document contents. They contain the semantics of the elements, in terms of their structural meaning (paragraph, section, table, heading, and so on). In turn, these semantics (the “what”) are associated with pointers into the AFP file (the “where”). DOMNode tags contain the ordered list of pointers to AFP page contents, but do not carry contents themselves (since the contents are already defined in the AFP page stream). Rather, they link to the contents by means of pointers, pointers that are defined by AFPTag elements.

Additionally, DOMNode tags can carry unarchitected information, using the Private tag. The private section is intended for custom extensions to AFP Tagging that may be needed to address specific use cases outside of what is currently defined in this guide. An example of this would be the case where additional information might be required for AFP processing applications (archive, etc.). These private extensions are ignored by conformant metadata processors. Note that any information relevant to assistive technology should not be included in the private section.

Pointer and Pointer Position

A pointer is used to indicate the start of the AFP data that will have metadata associated with it. Each AFPTag has one pointer associated with it. The pointer position starts at zero in the AFP following the Metadata Object (MO) containing this metadata tagging information. The pointer position is set by the Offset tag or the BeginIndex tag. These tags move the pointer to the correct spot in the AFP in the following manner:

1. The Offset tag specifies the number of bytes the pointer position is to be moved using the bytes parameter from the start of the AFP object pointed to by the IndexElement tag.
2. The index element tags (BeginIndex, EndIndex, and IndexElement) move the pointer by going to the AFP structured field identified by the AFPIId parameter in the metadata object. The AFPIId parameter moves the pointer by the number of this type of AFP structured fields found in the AFP object.

Reading Order

Reading order is defined as the sequence in which the tagged information associated with text will be presented to the user. For AFP tagging, the reading order is determined by visiting the sequence of DOMNode tags in the DomainObjectModel using a depth-first traversal, seeking the corresponding PTOCA and other visible objects on the page, pointed to by the AFPTag elements.

Ignore Data

Any content not explicitly tagged is to be considered as ignored by default.

Chapter 3. AFP Tagging Structures

AFP Tagging Description

Advanced Function Presentation data streams allow inclusion of non-AFP objects. Among the many non-AFP objects supported are objects that carry descriptive metadata, providing extra information for archive and presentation systems. These objects, known as Metadata Objects (MOs) are defined in the *Metadata Object Content Architecture Reference*.

This chapter:

- Defines the tag syntax structure of the descriptive Metadata in AFP.

Tag Syntax Structure

This section specifies the syntax used to define the Metadata tags for AFP.

The conventions used in these tag descriptions are:

- []** Brackets indicate optional tags. When a tag is shown without brackets, it must appear between the beginning and ending tags.
- (S)** The enclosed (S) indicates that the tag may be repeated. When present on a required tag, at least one occurrence of the tag is required, but multiple instances of it may occur.

If a specific tag is used, it must appear exactly in the order shown in this chapter.

To assist with readability, some end tags (</tag>) have been omitted in this chapter, but are required when the XML is generated.

DocumentObjectModel

This section describes the contents of the DocumentObjectModel structure.

Table 4. DocumentObjectModel Tag Structure

```
<DocumentObjectModel version="..." method="..." XMLLang="..." AFPLang="..." xmlns="...">
  <DOMNode did="..." AFPLang="..." fromPage="..." toPage="..." XMLLang="..."> (S)
</DocumentObjectModel>
```

Note: All of the XML tags and attributes found in this version of the AFP Tagging Guide belong to the following XML namespace (xmlns): "<https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0>" (with the exception of the xmlns attribute itself). For more information about XML namespaces, refer to the W3C website (www.w3.org/TR/xml-names/).

DOMNode

This section describes the contents of the DOMNode structure.

Table 5. DOMNode Tag Structure

	<DOMNode did="..." AFPLang="..." fromPage="..." toPage="..." XMLLang="...">	(S)
	<SemanticProperties>	
	<AFPTag tid="..." page="...">	(S)
[	<Private>]
[	<DOMNode did="..." AFPLang="..." fromPage="..." toPage="..." XMLLang="...">	(S)]
	</DOMNode>	

SemanticProperties

This section describes the contents of the SemanticProperties structure.

Table 6. SemanticProperties Tag Structure

	<SemanticProperties>	
	<NodeType>	
[	<ActualText XMLLang="...">	(S)]
[	<Alt XMLLang="...">	(S)]
[	<Hyperlink>]
	</SemanticProperties>	

AFPTag

This section describes the contents of the AFPTag structure.

Table 7. AFPTag Tag Structure

	<AFPTag tid="..." page="...">	
[	<BeginIndex AFPLid="..." count="...">]
[	<EndIndex AFPLid="..." count="...">]
[	<IndexElement AFPLid="..." count="...">]
[	<Offset bytes="..." length="...">]
	</AFPTag>	

Note: The AFPTag Tag Structure shows all of the listed child elements as optional, but in practice, either the BeginIndex/EndIndex tag pair or the IndexElement/Offset tag pair must be specified, or an error condition will result.

Private

This section describes the contents of the Private tag.

Table 8. Private Tag Structure

```
<Private>
    Private extensions — not architected
</Private>
```

Chapter 4. AFP Metadata Tags

This chapter:

- Briefly describes the purpose of each AFP metadata tag
- Provides the syntax and semantics for each AFP metadata tag
- Identifies each AFP metadata tag's attribute set
- Identifies exception conditions

General Information

Detailed formats, syntaxes, and semantics are provided here to enable product developers to design and produce applications that can be used in the AFP data stream.

The syntax tables in this chapter describe the less restrictive requirements of the overall architecture and include whether a data element is Mandatory (M) or Optional (O) as indicated by the column heading of “**M/O**”.

Exception conditions that may occur because of special conditions such as a mismatch between the individual attributes of one or more tags are listed under the “Exception Condition Summary” heading for each tag.

Metadata must be valid XML as defined in *Extensible Markup Language (XML) 1.0 (Fifth Edition)* and encoding must be in UTF-8.

The following AFP metadata tags are sorted in alphabetical order based on the XML tag name.

ActualText

The ActualText tag associates text contained within this tag with the corresponding tagged AFP and can be any text. A typical use of this tag is to provide text for use by a screen reader.

Textual Content of Element

Value	Meaning	M/O
Text	Text data associated with the tagged AFP	M

Attributes

Attribute	Type	Range	Meaning	M/O
XMLLang	string	language	Indicates the language used for the XML text	O

Semantics

- XMLLang** Indicates the language used for the text.
- This specifies the language using *RFC 5646: "Tags for Identifying Languages"* and *"IANA Language Subtag Registry"*. Some examples follow:
- de — German
 - en — English
 - en-US — US English
 - es — Spanish
 - fr — French
 - it — Italian
 - jp — Japanese

Child Elements

None.

Example

```
<ActualText XMLLang="en-US">Hello, world. Follow our website for details.</ActualText>
```

Exception Condition Summary

- The XMLLang language is not recognized.
- The text has zero length (e.g., an empty string).

AFPTag

The AFPTag surrounds a group of AFP specific sub-elements.

Textual Content of Element

None

Attributes

Attribute	Type	Range	Meaning	M/O
tid	integer	1– <i>n</i>	Defines a unique AFP Tag associated with a group of AFP controls in a given DOMNode.	M
page	integer	1– <i>n</i>	Defines the page the AFPTag is to be used in. In the case of an MO in a page, this defaults to 1. If the MO is in a Begin Named Page Group (BNG), the page indicates the page the AFPTag applies to.	O

Semantics

tid This is a number that defines a unique AFP Tag associated with a group of AFP controls in a given DOMNode – this value must be a positive integer. “Unique”, in this case, refers to a tag id (tid) number that is unique to the AFP page being tagged.

page This is a number that defines the page number the AFP Tag is to be used with. In the case where the MO is at the AFP page object level, this value defaults to 1.

Child Elements

Although all child elements are shown as “optional” in this table, in practice, the BeginIndex and EndIndex tags must be used as a pair, and together they describe the begin and end of a group of AFP structured fields to tag and reference as a whole. In the same way, the IndexElement and Offset tags must also be used as a pair, and together they describe a single AFP structured field and an offset and length; this serves to tag a portion of an AFP object (typically, PTOCA text). These elements cannot be used individually and are not meant to be intermixed (for example, you cannot use a BeginIndex and an Offset together).

Element	Meaning	M/O
BeginIndex	The BeginIndex tag starts a group of index-specific sub-elements. See “BeginIndex” on page 12.	O
EndIndex	The EndIndex tag ends a group of index-specific sub-elements. See “EndIndex” on page 18.	O
IndexElement	The IndexElement tag surrounds a group of index-specific sub-elements. See “IndexElement” on page 20.	O
Offset	The Offset tag surrounds a group of offset-specific sub-elements. See “Offset” on page 22.	O

AFPTag

Note: The AFPTag child elements are all shown as “optional” but in practice, either the BeginIndex/EndIndex tag pair or the IndexElement/Offset tag pair must be specified, or an error condition will result.

Example

```
<AFPTag tid="1" page="3"> <!-- Identifies this as AFP Tag ID 1 in page 3
    of a Named Page Group -->
  <IndexElement AFPIId="BPT" count="3"></IndexElement><!-- Advances the pointer to the
    start of the third BPT on the page -->
  <Offset bytes="72" length="19"> <!-- Advances the pointer position 72 bytes and
    associates the next 19 bytes with the associated tag -->
</Offset>
</AFPTag>
```

Exception Condition Summary

- The tid attribute is not specified.
- The tid attribute is out of range.
- The tid attribute is not unique on the target page.
- The page attribute is out of range.
- No child element is specified.

Alt

The Alt tag associates descriptive text contained within this tag with the corresponding tagged AFP. A typical use of this tag is to provide extra information about the AFP being tagged for items that are not text based (graphics, images, scanned documents, etc.) or where the ActualText needs to be augmented (abbreviations, numbers, formulas, etc.). It can also be used to provide an alternative translation for the ActualText.

Textual Content of Element

Value	Meaning	M/O
Descriptive Text	Text that provides extra information about an AFP tagged item	M

Attributes

Attribute	Type	Range	Meaning	M/O
XMLLang	string	language	Indicates the language used for the XML text	O

Semantics

XMLLang Indicates the language used for the text.

This specifies the language using *RFC 5646: “Tags for Identifying Languages”* and *“IANA Language Subtag Registry”*. Some examples follow:

- de — German
- en — English
- en-US — US English
- es — Spanish
- fr — French
- it — Italian
- jp — Japanese

Child Elements

None.

Example

```
<ActualText>This is a calendar from 1958.</ActualText>
<Alt>This is a calendar from Nineteen Hundred Fifty-eight.</Alt>
```

Exception Condition Summary

- The XMLLang language is not recognized.
- The text has zero length (e.g., an empty string).

BeginIndex

The BeginIndex tag starts a group of index-specific sub-elements.

Textual Content of Element

None.

Attributes

Attribute	Type	Range	Meaning	M/O
AFPIId	string		The AFPIId tag defines the AFP acronym to look for in the AFP data stream.	M
count	integer	1– <i>n</i>	Count advances the pointer position in the AFP file by the number of structured fields or controls specified by the AFPIId attribute. Must be a positive integer. Default value is 1.	O

Semantics

- AFPIId** This specifies the AFP acronym ID to search for. See [Table 11 on page 27](#) for the list of allowed acronyms.
- count** Count advances the pointer position in the AFP file by the number of structured fields or controls specified by the AFPIId attribute. Must be a positive integer. Default value is 1.

Child Elements

None.

Example

```
<BeginIndex AFPIId="BPG" count="3">
  <!-- Find the third BPG in the AFP file -->
</BeginIndex>
```

Exception Condition Summary

- The AFPIId attribute is not specified.
- The AFPIId attribute is not recognized.
- The count attribute is out of range.

DocumentObjectModel

The DocumentObjectModel tag is the top-level tag of the AFP tagging structure and defines the schema, version number, method, and default language of the AFP tagging model.

Textual Content of Element

None

Attributes

Attribute	Type	Range	Meaning	M/O
method	string	"Index"	Indicates the method of the AFP Tagging model to be used	M
version	string	"1.0"	Indicates the version of the AFP Tagging model to be used	M
AFPLang	string	language	Indicates the default language to be used for the AFP text	O
XMLLang	string	language	Indicates the default language to be used for the XML text	O
xmlns	string	XML namespace	Specifies the XML namespace that contains the schema used for AFP Tagging	M

Semantics

method Indicates the method of the AFP tagging model to be used. For this document, the only allowed value is "Index".

version Indicates the version of the AFP Tagging model to be used.

AFPLang Indicates the default language to be used for the AFP text.

This specifies the language using *RFC 5646: "Tags for Identifying Languages"* and *"IANA Language Subtag Registry"*. Some examples follow:

- de — German
- en — English
- en-US — US English
- es — Spanish
- fr — French
- it — Italian
- jp — Japanese

XMLLang Indicates the default language to be used for the XML text.

This specifies the language using *RFC 5646: "Tags for Identifying Languages"* and *"IANA Language Subtag Registry"*. Some examples follow:

- de — German
- en — English
- en-US — US English
- es — Spanish
- fr — French
- it — Italian

DocumentObjectModel

- jp — Japanese

xmlns This specifies the XML namespace that contains the schema used for AFP Tagging.
For this version of the Guide, the namespace is:
“<https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0>”.

Child Elements

Element	Meaning	M/O
DOMNode	Specifies the nodes that make up the DocumentObjectModel. See “DOMNode” on page 15 .	M

Example

```
<DocumentObjectModel xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0"
version="1.0" method="Index" XMLLang="en-US">
```

Exception Condition Summary

- Missing attributes.
- The method is not recognized.
- The version is not recognized.
- The AFPLang language is not recognized.
- The XMLLang language is not recognized.
- No DOMNode child element is specified.
- No xmlns is specified.

DOMNode

The DOMNode tag contains all of the AFPTags, SemanticProperties, and Private data to be tagged in an AFP print file.

Textual Content of Element

None

Attributes

Attribute	Type	Range	Meaning	M/O
did	integer	1– <i>n</i>	Defines a unique node in the table of tags associated with a group of AFP tags	M
AFPLang	string	language	Indicates the default language to be used for the AFP text	O
fromPage	integer	1– <i>n</i>	Indicates the page in the AFP document where a given DOMNode (and its descendants) is located, so it is possible to immediately fetch the start of the node	O
toPage	integer	1– <i>n</i>	Indicates the page in the AFP document where a given DOMNode (and its descendants) is located, so it is possible to immediately fetch the end of the node	O
XMLLang	string	language	Indicates the default language to be used for the XML text	O

Child Elements

Element	Meaning	M/O
AFPTag	The AFPTag surrounds a group of AFP specific sub-elements. See “AFPTag” on page 9 .	M
SemanticProperties	Specifies the semantic properties of the node. See “SemanticProperties” on page 24 .	M
DOMNode	Specifies the subnodes that make up the DOMNode. DOMNode tags may have other DOMNode tags defined within them, provided each is terminated correctly in the nesting with a corresponding “</DOMNode>”.	O
Private	The Private tag surrounds a group of private sub-elements that are not architected, but are expected to follow the semantic rules of XML. See “Private” on page 23 .	O

Semantics

did This is a number that makes each DOMNode in the tagging information unique – this value must be a positive integer. Unique, in this case, refers to a DOMNode id number that is unique to the collection of structured fields being tagged in the print file. The same did number can

DOMNode

appear multiple times if the same metadata element is referred to in different places. Examples include a named page group that includes multiple different pages, or a text block that spans multiple pages.

fromPage	Indicates the page in the AFP document where a given DOMNode (and its descendants) is located, so it is possible to immediately fetch the start of the node.
toPage	Indicates the page in the AFP document where a given DOMNode (and its descendants) is located, so it is possible to immediately fetch the end of the node.
AFPLang	<p>Indicates the default language to be used for the AFP text.</p> <p>This specifies the language using <i>RFC 5646: “Tags for Identifying Languages”</i> and <i>“IANA Language Subtag Registry”</i>. Some examples follow:</p> <ul style="list-style-type: none">• de — German• en — English• en-US — US English• es — Spanish• fr — French• it — Italian• jp — Japanese
XMLLang	<p>Indicates the default language to be used for the XML text.</p> <p>This specifies the language using <i>RFC 5646: “Tags for Identifying Languages”</i> and <i>“IANA Language Subtag Registry”</i>. Some examples follow:</p> <ul style="list-style-type: none">• de — German• en — English• en-US — US English• es — Spanish• fr — French• it — Italian• jp — Japanese

Example

```
<DOMNode did="1" XMLLang="en-US">  
  ... tagging information for node 1  
  <DOMNode did="2">  
    ... tagging information for node 2  
  </DOMNode>  
  ... more tagging information for node 1  
</DOMNode>
```

Note: DOMNode tags may have other DOMNode tags defined within them, provided each is terminated correctly in the nesting with a corresponding “</DOMNode>”, as shown in this example.

Exception Condition Summary

- The did is not specified.
- The did is out of range.
- The did is not unique.
- The AFPLang language is not recognized.
- The XMLLang language is not recognized.
- The fromPage attribute is out of range.
- The toPage attribute is out of range.

- The toPage attribute is smaller than the fromPage attribute.
- No AFPTag child element is specified.
- No SemanticProperties child element is specified.

EndIndex

The EndIndex tag ends a group of index-specific sub-elements.

Textual Content of Element

None.

Attributes

Attribute	Type	Range	Meaning	M/O
AFPIId	string		The AFPIId tag defines the AFP acronym to look for in the AFP data stream.	M
count	integer	1– <i>n</i>	Count sets the end pointer position in the AFP file by the number of structured fields or controls specified by the AFPIId attribute. Must be a positive integer. Default value is 1.	O

Semantics

AFPIId This specifies the AFP acronym ID to search for. See [Table 11 on page 27](#) for the list of allowed acronyms.

count Count sets the end pointer position in the AFP file by the number of structured fields or controls specified by the AFPIId attribute. Must be a positive integer. Default value is 1.

Child Elements

None.

Example

```
<EndIndex AFPIId="EPG" count="3">
  <!-- Find the third EPG in the AFP file -->
</EndIndex>
```

Exception Condition Summary

- The AFPIId attribute is not specified.
- The count attribute is out of range.
- The AFPIId attribute is not recognized.
- The EndIndex is earlier in the file than the BeginIndex. For example, the BeginIndex points to the third BPG and the EndIndex points to the second BPG.

Hyperlink

The Hyperlink tag is used to associate tagged data with an external URL.

Textual Content of Element

Value	Meaning	M/O
URL	Defines the Uniform Resource Locator (URL) to be associated with tagged data.	M

Attributes

None.

Child Elements

None.

Example

```
<Hyperlink>https://www.afpconsortium.org/</Hyperlink>
```

Exception Condition Summary

- The URL is missing.
- The URL is not valid.

IndexElement

The IndexElement tag surrounds a group of index-specific sub-elements.

Textual Content of Element

None.

Attributes

Attribute	Type	Range	Meaning	M/O
AFPIId	string		The AFPIId tag defines the AFP acronym to look for in the AFP data stream.	M
count	integer	1– <i>n</i>	Count advances the pointer position in the AFP file by the number of structured fields or controls specified by the AFPIId attribute. Must be a positive integer. Default value is 1.	O

Semantics

AFPIId This specifies the AFP acronym ID to search for. See [Table 11 on page 27](#) for the list of allowed acronyms.

count Count advances the pointer position in the AFP file by the number of structured fields or controls specified by the AFPIId attribute. Must be a positive integer. Defaults to 1.

Child Elements

None.

Example

```
<IndexElement AFPIId="BPG" count="3">
  <!-- Find the third BPG in the AFP file -->
</IndexElement>
```

Exception Condition Summary

- The AFPIId attribute is not specified.
- The AFPIId attribute is not recognized.
- The count attribute is out of range.

NodeType

The NodeType tag defines the structural element the tagged AFP is associated with.

Textual Content of Element

Value	Meaning	M/O
string: structural element	The NodeType tag defines the structural element the tagged AFP is associated with.	M

Attributes

None.

Semantics

structural element This specifies the structural element the AFP is associated with. See [Table 12 on page 29](#) for the list of allowed elements.

Child Elements

None.

Example

```
<SemanticProperties>
  <NodeType>P</NodeType> <!-- Tagged text is a Paragraph -->
</SemanticProperties>
```

Exception Condition Summary

- Structural element is not specified.
- Structural element is not recognized.

Offset

The Offset tag surrounds a group of offset-specific sub-elements.

Textual Content of Element

None.

Attributes

Attribute	Type	Range	Meaning	M/O
bytes	integer	0– <i>n</i>	This parameter advances the pointer position into the AFP file by the number of bytes specified. Must be a non-negative integer.	M
length	integer	1– <i>n</i>	This parameter specifies the number of AFP bytes to be tagged from the pointer position in the AFP file. Must be a positive integer. Default value is 1.	O

Semantics

bytes This advances the pointer position into the AFP file by the number of bytes specified.

length This specifies the number of AFP bytes to be tagged from the pointer position in the AFP file. Must be a positive integer. Default value is 1.

Child Elements

None.

Example

```
<Offset bytes="72" length="19"> <!-- Advances the pointer position 72 bytes and  
  associates the next 19 bytes with the associated tag -->  
</Offset>
```

Exception Condition Summary

- The bytes attribute is not specified.
- The bytes attribute is out of range.
- The length attribute is out of range.

Private

The Private tag surrounds a group of private sub-elements that are not architected, but are expected to follow the semantic rules of XML.

Textual Content of Element

None.

Attributes

None.

Child Elements

None architected.

Note: The children of the <Private> tag must not be part of the following XML namespace (xmlns): “**https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0** (with the exception of the xmlns attribute itself)”. For more information about XML namespaces, refer to the W3C website (www.w3.org/TR/xml-names).

Example

```
<Private>
  <!-- Private extensions - not architected-->
</Private>
```

Exception Condition Summary

- None.

SemanticProperties

The SemanticProperties tag surrounds a group of semantic-specific sub-elements.

Textual Content of Element

None.

Attributes

None.

Child Elements

Element	Meaning	M/O
ActualText	The ActualText tag associates text contained within this tag with the corresponding tagged AFP and can be any text. See “ActualText” on page 8 .	O
Alt	The Alt tag associates descriptive text contained within this tag with the corresponding tagged AFP. See “Alt” on page 11 .	O
Hyperlink	The Hyperlink tag is used to associate tagged data with an external URL. See “Hyperlink” on page 19 .	O
NodeType	The NodeType tag defines the structural element the AFP is associated with. See “NodeType” on page 21 .	M

Example

```
<SemanticProperties>
  <NodeType>P</NodeType>
  <ActualText>Hello World</ActualText>
  ...
</SemanticProperties>
```

Exception Condition Summary

- No NodeType child element is specified.

Appendix A. Tag Cross Reference

AFP Tags Sorted by Name

Table 9. AFP Tags Sorted by Name

Tag Name	Parent	Sibling(s)	Children	Page
ActualText	SemanticProperties	Alt, Hyperlink, NodeType	(None)	8
AFPTag	DOMNode	DOMNode, Private, SemanticProperties	BeginIndex, EndIndex, IndexElement, Offset	9
Alt	SemanticProperties	ActualText, Hyperlink, NodeType	(None)	11
BeginIndex	AFPTag	EndIndex	(None)	12
DocumentObjectModel	(None)	(None)	DOMNode	13
DOMNode	DocumentObjectModel, DOMNode	AFPTag, DOMNode, Private, SemanticProperties	AFPTag, DOMNode, Private, SemanticProperties	15
EndIndex	AFPTag	BeginIndex	(None)	18
Hyperlink	SemanticProperties	ActualText, Alt, NodeType	(None)	19
IndexElement	AFPTag	Offset	(None)	20
NodeType	SemanticProperties	ActualText, Alt, Hyperlink	(None)	21
Offset	AFPTag	IndexElement	(None)	22
Private	DOMNode	AFPTag, DOMNode, SemanticProperties	(None)	23
SemanticProperties	DOMNode	AFPTag, DOMNode, Private	ActualText, Alt, Hyperlink, NodeType	24

AFP Tag Attributes Sorted by Name

Table 10. AFP Tag Attributes Sorted by Name

Tag Attribute Name	Parent Tag	Sibling Attribute(s)
AFPIId	BeginIndex, EndIndex, IndexElement	count
AFPLang	DocumentObjectModel DOMNode	method, version, XMLLang, xmlns did, fromPage, toPage, XMLLang
bytes	Offset	length
count	BeginIndex, EndIndex, IndexElement	AFPIId
did	DOMNode	AFPLang, fromPage, toPage, XMLLang

Tag Cross Reference

Table 10 AFP Tag Attributes Sorted by Name (cont'd.)

Tag Attribute Name	Parent Tag	Sibling Attribute(s)
fromPage	DOMNode	AFPLang, did, toPage, XMLLang
length	Offset	bytes
method	DocumentObjectModel	AFPLang, version, XMLLang, xmlns
page	AFPTag	tid
tid	AFPTag	page
toPage	DOMNode	AFPLang, did, fromPage, XMLLang
version	DocumentObjectModel	AFPLang, method, XMLLang, xmlns
XMLLang	ActualText	(None)
	Alt	(None)
	DocumentObjectModel	AFPLang, method, version, xmlns
	DOMNode	AFPLang, did, fromPage, toPage
xmlns	DocumentObjectModel	AFPLang, method, version, XMLLang

Note: All of the XML tags and attributes found in this version of the AFP Tagging Guide belong to the following XML namespace (xmlns): “<https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0>” (with the exception of the xmlns attribute itself). For more information about XML namespaces, refer to the W3C website (www.w3.org/TR/xml-names/).

Appendix B. AFPId Subsets

AT1 Subset

The following table shows the allowed AFP Acronym IDs that can be used in the AFPId parameter. The acronyms come from a variety of AFP Object Content Architectures as noted in the table below.

Table 11. AFP Acronyms Allowed for the AFPId Attribute Sorted by Acronym

Acronym	Name	Object Content Architecture	Reference
AMB	Absolute Move Baseline	PTOCA	<i>Presentation Text Object Content Architecture Reference</i>
BBC	Begin Bar Code Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BDT	Begin Document	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BGR	Begin Graphics Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BIM	Begin Image Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BMO	Begin Overlay	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BNG	Begin Named Page Group	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BOC	Begin Object Container	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BPG	Begin Page	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BPS	Begin Page Segment	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BPT	Begin Presentation Text Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
BSD	Bar Code Symbol Descriptor	BCOCA	<i>Bar Code Object Content Architecture Reference</i>
EBC	End Bar Code Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EDT	End Document	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EGR	End Graphics Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EIM	End Image Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EMO	End Overlay	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>

AFPId Subsets

Table 11 AFP Acronyms Allowed for the AFPId Attribute Sorted by Acronym (cont'd.)

Acronym	Name	Object Content Architecture	Reference
ENG	End Named Page Group	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EOC	End Object Container	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EPG	End Page	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EPS	End Page Segment	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
EPT	End Presentation Text Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
IOB	Include Object	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>
PTD	Presentation Text Data Descriptor	PTOCA	<i>Presentation Text Object Content Architecture Reference</i>
SCFL	Set Coded Font Local	PTOCA	<i>Presentation Text Object Content Architecture Reference</i>
TLE	Tag Logical Element	MO:DCA	<i>Mixed Object Document Content Architecture (MO:DCA) Reference</i>

Appendix C. NodeType Subsets

NT1 Subset

The following table shows the allowed structural elements for the NodeType tag. These structural elements are derived from HTML5.

Table 12. Structural Elements Allowed for the NodeType Tag Sorted by Element

Structural Element	Name
DD	Definition Details
Div	Division of page content
DL	Definition List
DT	Definition Term
Figcaption	Figure caption
Figure	Figure
Footer	Footer
H1	Heading level 1
H2	Heading level 2
H3	Heading level 3
H4	Heading level 4
H5	Heading level 5
H6	Heading level 6
Header	Header
Img	Image
LI	List Item
Link	Hyperlink
OL	Ordered List
P	Paragraph
Part	Part of a hierarchical document content group
Section	Section
Span	Span
Table	Table
TD	Table cell
TH	Table Heading
TR	Table Row
UL	Unordered List

Appendix D. Examples

Text Example

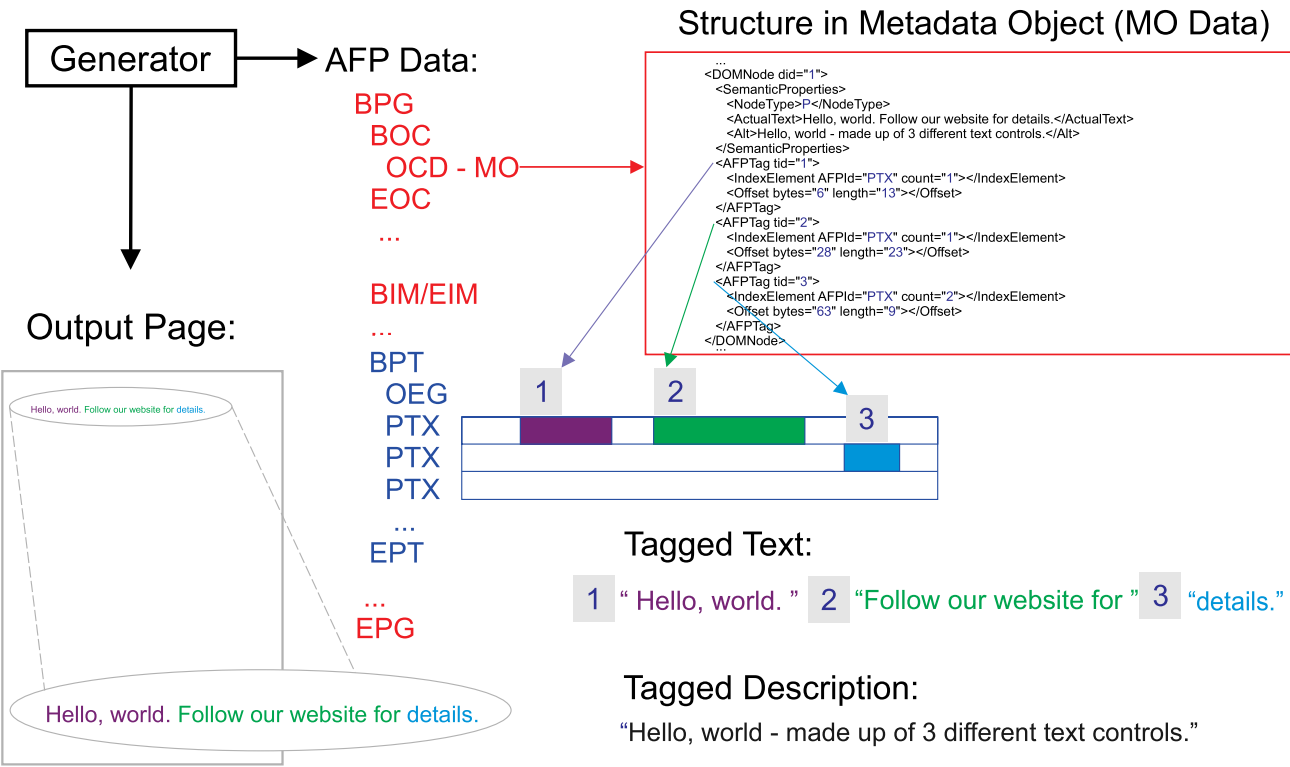
This example shows how to associate metadata with text information carried in a BPT object.

In this example, the tags shown are contained within a Metadata Object at the AFP page level:

Figure 1. Text Example

```
<?xml version="1.0" encoding="UTF-8"?>
<DocumentObjectModel xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0" version="1.0"
  method="Index" XMLLang="en-US">
  <DOMNode did="1">
    <SemanticProperties>
      <NodeType>P</NodeType>
      <ActualText>Hello, world. Follow our website for details.</ActualText>
      <Alt>Hello, world - made up of 3 different text controls.</Alt>
    </SemanticProperties>
    <AFPTag tid="1">
      <IndexElement AFPIId="PTX" count="1"></IndexElement>
      <Offset bytes="6" length="13"></Offset>
    </AFPTag>
    <AFPTag tid="2">
      <IndexElement AFPIId="PTX" count="1"></IndexElement>
      <Offset bytes="28" length="23"></Offset>
    </AFPTag>
    <AFPTag tid="3">
      <IndexElement AFPIId="PTX" count="2"></IndexElement>
      <Offset bytes="63" length="9"></Offset>
    </AFPTag>
  </DOMNode>
</DocumentObjectModel>
```

Text Example



Hypertext Example

This example shows how to associate metadata with text showing a hyperlink in the second PTX in a BPT.

In this example, the tags shown are contained within a Metadata Object at the AFP page level:

Figure 2. Hypertext Example

```
<?xml version="1.0" encoding="UTF-8"?>
<DocumentObjectModel xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0" version="1.0"
  method="Index" XMLLang="en-US">
  <DOMNode did="1">
    <SemanticProperties>
      <NodeType>link</NodeType>
      <Alt>AFP Consortium website</Alt>
      <Hyperlink>https://www.afpconsortium.org</Hyperlink>
    </SemanticProperties>
    <AFPTag tid="1">
      <IndexElement AFPIId="PTX" count="3"></IndexElement>
      <Offset bytes="6" length="30"></Offset>
    </AFPTag>
  </DOMNode>
</DocumentObjectModel>
```

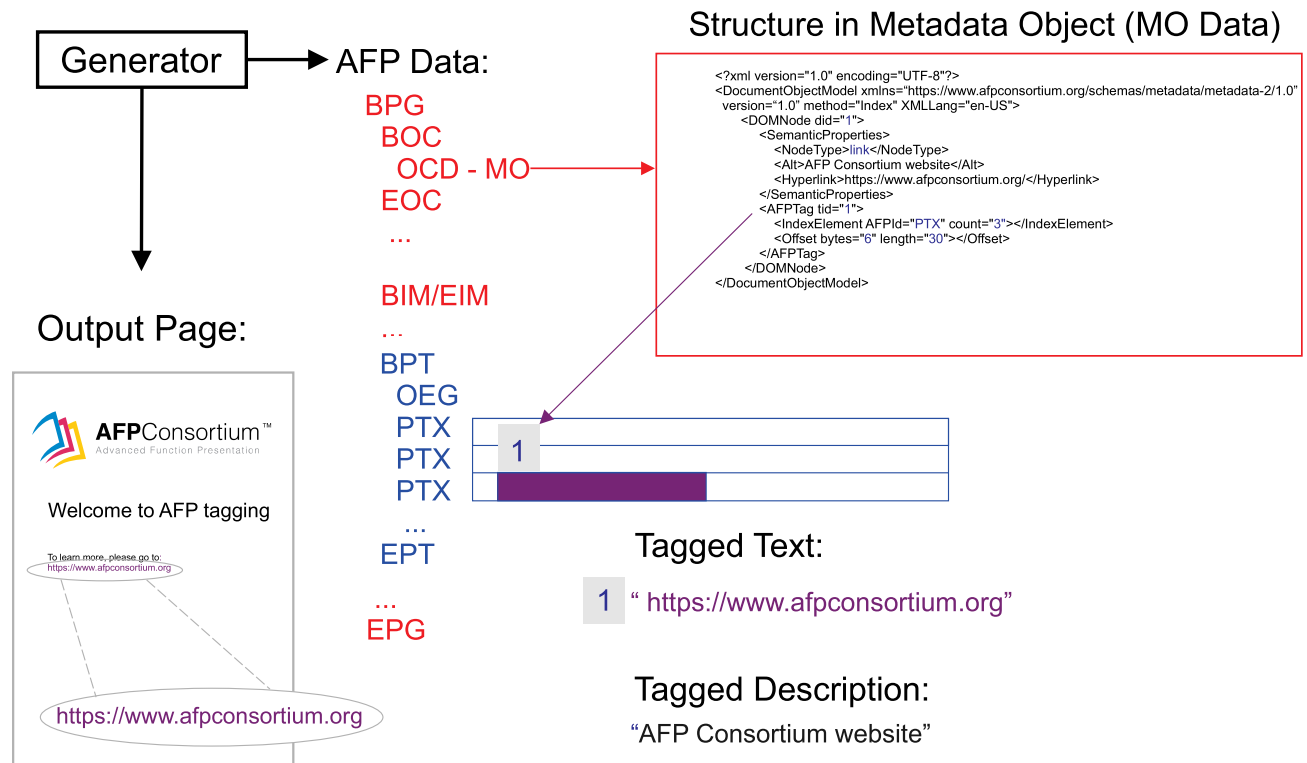


Image Example

This example shows how to associate metadata with an AFP image.

In this example, the tags shown are contained within a Metadata Object at the AFP page level:

Figure 3. Image Example

```
<?xml version="1.0" encoding="UTF-8"?>
<DocumentObjectModel xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0" version="1.0"
  method="Index" XMLLang="en-US">
  <DOMNode did="1">
    <SemanticProperties>
      <NodeType>Img</NodeType>
      <Alt>Large AFP Consortium logo</Alt>
    </SemanticProperties>
    <AFPTag tid="1">
      <BeginIndex AFPIId="BIM" count="1"></BeginIndex>
      <EndIndex AFPIId="EIM" count="1"></EndIndex>
    </AFPTag>
  </DOMNode>
</DocumentObjectModel>
```

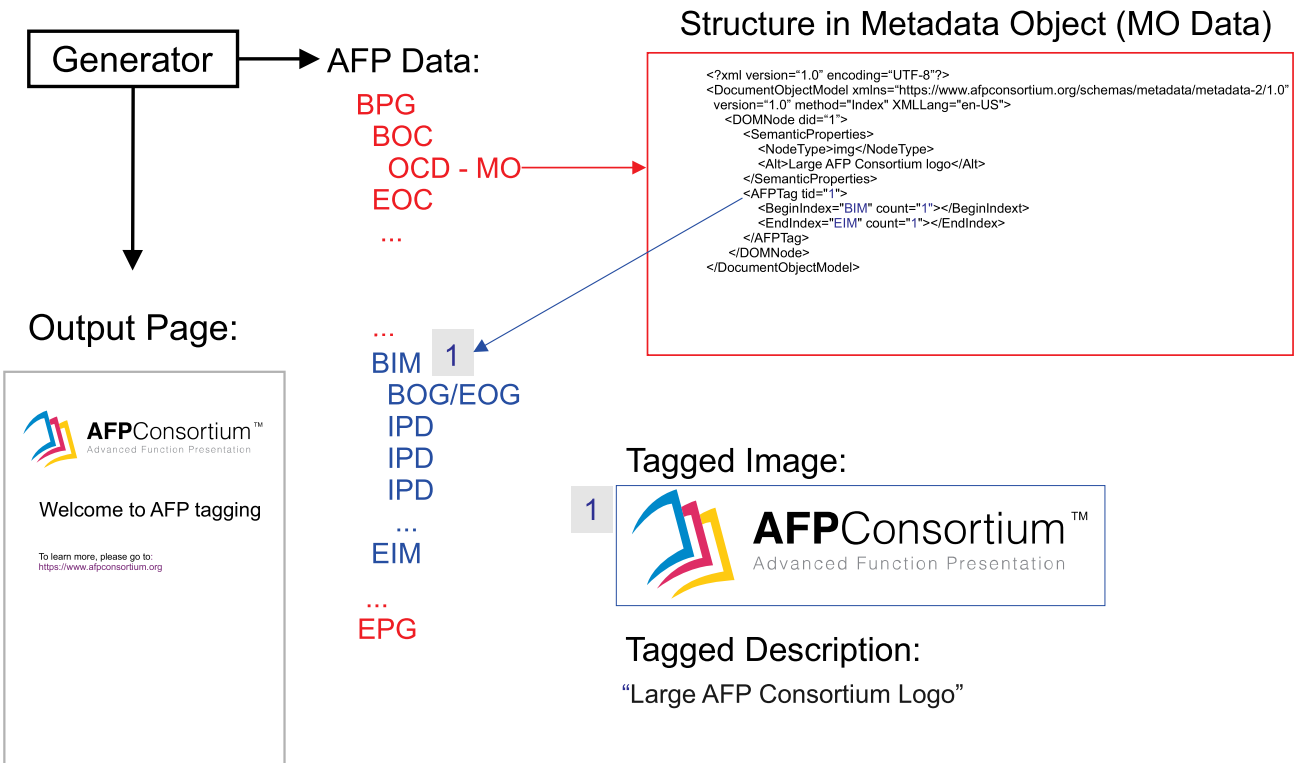


Table Example

This example shows how to associate metadata with a table built using AFP.

In this example, the tags shown are contained within a Metadata Object at the AFP page level:

Figure 4. Table Example

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<DocumentObjectModel method="Index" version="1.0"
  xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0"
  xmlns:p="https://www.isis-papyrus.com/metadata-2/1.0/private">
  <DOMNode did="2" AFPLang="en" XMLLang="en">
    <SemanticProperties>
      <NodeType>Document</NodeType>
    </SemanticProperties>
    <DOMNode did="3" XMLLang="en">
      <SemanticProperties>
        <NodeType>Part</NodeType>
      </SemanticProperties>
      <DOMNode did="4" XMLLang="en">
        <SemanticProperties>
          <NodeType>Figure</NodeType>
          <Alt>Large AFP Consortium logo.</Alt>
        </SemanticProperties>
        <Private>
          <p:BBox>1701;2268;10235;4541</p:BBox>
        </Private>
        <AFPTag tid="4">
          <BeginIndex AFPIId="BIO" count="1"/>
          <EndIndex AFPIId="EIO" count="1"/>
        </AFPTag>
      </DOMNode>
    <DOMNode did="5">
      <SemanticProperties>
        <NodeType>Div</NodeType>
        <Alt>Welcome to AFP UA</Alt>
      </SemanticProperties>
      <DOMNode did="6">
        <SemanticProperties>
          <NodeType>P</NodeType>
        </SemanticProperties>
        <AFPTag tid="6">
          <IndexElement AFPIId="PTX" count="1"/>
          <Offset bytes="8" length="55"/>
        </AFPTag>
      </DOMNode>
    </DOMNode>
    <DOMNode did="7">
      <SemanticProperties>
        <NodeType>Div</NodeType>
        <Alt>No text here</Alt>
      </SemanticProperties>
      <DOMNode did="8">
        <SemanticProperties>
```

Table Example

```
<NodeType>P</NodeType>
</SemanticProperties>
<DOMNode did="9">
  <SemanticProperties>
    <NodeType>Span</NodeType>
  </SemanticProperties>
  <AFPTag tid="9">
    <IndexElement AFPIId="PTX" count="1"/>
    <Offset bytes="63" length="91"/>
  </AFPTag>
</DOMNode>
<DOMNode did="10">
  <SemanticProperties>
    <NodeType>Link</NodeType>
    <Alt>AFP consortium website</Alt>
    <Hyperlink>https://www.afpconsortium.org/</Hyperlink>
  </SemanticProperties>
  <Private>
    <p:BBox>5875;7414;9468;7735</p:BBox>
  </Private>
  <DOMNode did="11">
    <SemanticProperties>
      <NodeType>Span</NodeType>
    </SemanticProperties>
    <AFPTag tid="11">
      <IndexElement AFPIId="PTX" count="1"/>
      <Offset bytes="154" length="106"/>
    </AFPTag>
  </DOMNode>
</DOMNode>
<DOMNode did="12">
  <SemanticProperties>
    <NodeType>Span</NodeType>
  </SemanticProperties>
  <AFPTag tid="12">
    <IndexElement AFPIId="PTX" count="1"/>
    <Offset bytes="260" length="32"/>
  </AFPTag>
</DOMNode>
</DOMNode>
<DOMNode did="13">
  <SemanticProperties>
    <NodeType>Div</NodeType>
    <Alt>No text here</Alt>
  </SemanticProperties>
  <DOMNode did="14">
    <SemanticProperties>
      <NodeType>P</NodeType>
    </SemanticProperties>
    <AFPTag tid="14">
      <IndexElement AFPIId="PTX" count="1"/>
      <Offset bytes="292" length="58"/>
    </AFPTag>
  </DOMNode>
</DOMNode>
```

```

<DOMNode did="15">
  <SemanticProperties>
    <NodeType>Table</NodeType>
  </SemanticProperties>
</DOMNode did="15">
  <DOMNode did="16">
    <SemanticProperties>
      <NodeType>TR</NodeType>
    </SemanticProperties>
    <DOMNode did="17">
      <SemanticProperties>
        <NodeType>TH</NodeType>
      </SemanticProperties>
      <DOMNode did="18">
        <SemanticProperties>
          <NodeType>Div</NodeType>
          <Alt>AFP Consortium standard document name:</Alt>
        </SemanticProperties>
        <DOMNode did="19">
          <SemanticProperties>
            <NodeType>P</NodeType>
          </SemanticProperties>
          <AFPTag tid="19">
            <IndexElement AFPIId="PTX" count="1"/>
            <Offset bytes="350" length="39"/>
          </AFPTag>
        </DOMNode>
      </DOMNode>
    </DOMNode>
  </DOMNode>
</DOMNode>
<DOMNode did="20">
  <SemanticProperties>
    <NodeType>TH</NodeType>
  </SemanticProperties>
  <DOMNode did="21">
    <SemanticProperties>
      <NodeType>Div</NodeType>
      <Alt>Current revision number:</Alt>
    </SemanticProperties>
    <DOMNode did="22">
      <SemanticProperties>
        <NodeType>P</NodeType>
      </SemanticProperties>
      <AFPTag tid="22">
        <IndexElement AFPIId="PTX" count="1"/>
        <Offset bytes="389" length="66"/>
      </AFPTag>
    </DOMNode>
  </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="23">
  <SemanticProperties>
    <NodeType>TR</NodeType>
  </SemanticProperties>
  <DOMNode did="24">
    <SemanticProperties>
      <NodeType>TD</NodeType>
    </SemanticProperties>
  </DOMNode>
</DOMNode>

```

Table Example

```
</SemanticProperties>
<DOMNode did="25">
  <SemanticProperties>
    <NodeType>Div</NodeType>
  </SemanticProperties>
  <DOMNode did="26">
    <SemanticProperties>
      <NodeType>P</NodeType>
    </SemanticProperties>
    <AFPTag tid="26">
      <IndexElement AFPIId="PTX" count="1"/>
      <Offset bytes="455" length="23"/>
    </AFPTag>
  </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="27">
  <SemanticProperties>
    <NodeType>TD</NodeType>
  </SemanticProperties>
  <DOMNode did="28">
    <SemanticProperties>
      <NodeType>Div</NodeType>
    </SemanticProperties>
    <DOMNode did="29">
      <SemanticProperties>
        <NodeType>P</NodeType>
      </SemanticProperties>
      <AFPTag tid="29">
        <IndexElement AFPIId="PTX" count="1"/>
        <Offset bytes="478" length="89"/>
      </AFPTag>
    </DOMNode>
  </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="30">
  <SemanticProperties>
    <NodeType>TR</NodeType>
  </SemanticProperties>
  <DOMNode did="31">
    <SemanticProperties>
      <NodeType>TD</NodeType>
    </SemanticProperties>
    <DOMNode did="32">
      <SemanticProperties>
        <NodeType>Div</NodeType>
      </SemanticProperties>
      <DOMNode did="33">
        <SemanticProperties>
          <NodeType>P</NodeType>
        </SemanticProperties>
        <AFPTag tid="33">
          <IndexElement AFPIId="PTX" count="1"/>
          <Offset bytes="567" length="20"/>
        </AFPTag>
      </DOMNode>
    </DOMNode>
  </DOMNode>
</DOMNode>
```

```

        </DOMNode>
    </DOMNode>
</DOMNode>
<DOMNode did="34">
    <SemanticProperties>
        <NodeType>TD</NodeType>
    </SemanticProperties>
    <DOMNode did="35">
        <SemanticProperties>
            <NodeType>Div</NodeType>
        </SemanticProperties>
        <DOMNode did="36">
            <SemanticProperties>
                <NodeType>P</NodeType>
            </SemanticProperties>
            <AFPTag tid="36">
                <IndexElement AFPIId="PTX" count="1"/>
                <Offset bytes="587" length="89"/>
            </AFPTag>
        </DOMNode>
    </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="37">
    <SemanticProperties>
        <NodeType>TR</NodeType>
    </SemanticProperties>
    <DOMNode did="38">
        <SemanticProperties>
            <NodeType>TD</NodeType>
        </SemanticProperties>
        <DOMNode did="39">
            <SemanticProperties>
                <NodeType>Div</NodeType>
            </SemanticProperties>
            <DOMNode did="40">
                <SemanticProperties>
                    <NodeType>P</NodeType>
                </SemanticProperties>
                <AFPTag tid="40">
                    <IndexElement AFPIId="PTX" count="1"/>
                    <Offset bytes="676" length="18"/>
                </AFPTag>
            </DOMNode>
        </DOMNode>
    </DOMNode>
</DOMNode>
<DOMNode did="41">
    <SemanticProperties>
        <NodeType>TD</NodeType>
    </SemanticProperties>
    <DOMNode did="42">
        <SemanticProperties>
            <NodeType>Div</NodeType>
        </SemanticProperties>
        <DOMNode did="43">
            <SemanticProperties>

```

Table Example

```

        <NodeType>P</NodeType>
      </SemanticProperties>
    <AFPTag tid="43">
      <IndexElement AFPIId="PTX" count="1"/>
      <Offset bytes="694" length="89"/>
    </AFPTag>
  </DOMNode>
</DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="44">
  <SemanticProperties>
    <NodeType>TR</NodeType>
  </SemanticProperties>
  <DOMNode did="45">
    <SemanticProperties>
      <NodeType>TD</NodeType>
    </SemanticProperties>
    <DOMNode did="46">
      <SemanticProperties>
        <NodeType>Div</NodeType>
      </SemanticProperties>
      <DOMNode did="47">
        <SemanticProperties>
          <NodeType>P</NodeType>
        </SemanticProperties>
        <AFPTag tid="47">
          <IndexElement AFPIId="PTX" count="1"/>
          <Offset bytes="783" length="20"/>
        </AFPTag>
      </DOMNode>
    </DOMNode>
  </DOMNode>
</DOMNode>
<DOMNode did="48">
  <SemanticProperties>
    <NodeType>TD</NodeType>
  </SemanticProperties>
  <DOMNode did="49">
    <SemanticProperties>
      <NodeType>Div</NodeType>
    </SemanticProperties>
    <DOMNode did="50">
      <SemanticProperties>
        <NodeType>P</NodeType>
      </SemanticProperties>
      <AFPTag tid="50">
        <IndexElement AFPIId="PTX" count="1"/>
        <Offset bytes="803" length="89"/>
      </AFPTag>
    </DOMNode>
  </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="51">
  <SemanticProperties>
    <NodeType>TR</NodeType>
  </SemanticProperties>

```

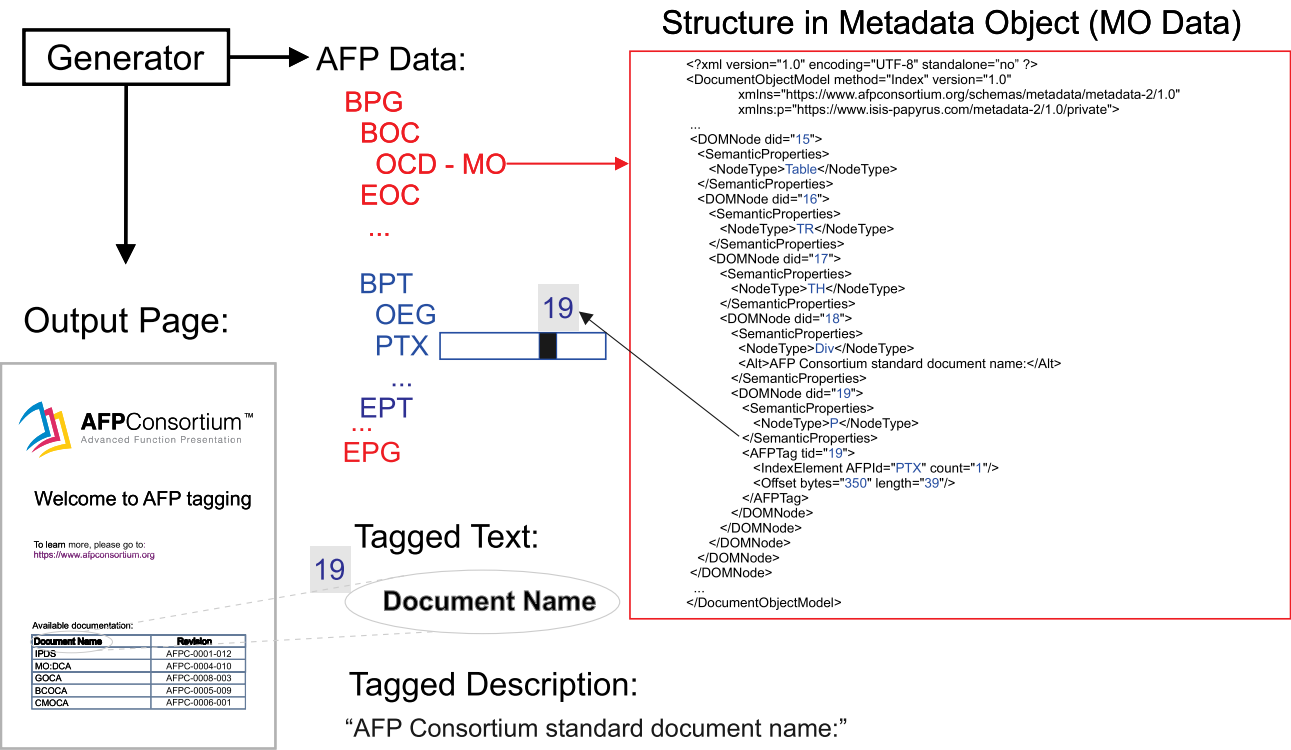
```

</SemanticProperties>
<DOMNode did="52">
  <SemanticProperties>
    <NodeType>TD</NodeType>
  </SemanticProperties>
</DOMNode did="53">
  <SemanticProperties>
    <NodeType>Div</NodeType>
  </SemanticProperties>
  <DOMNode did="54">
    <SemanticProperties>
      <NodeType>P</NodeType>
    </SemanticProperties>
    <AFPTag tid="54">
      <IndexElement AFPIId="PTX" count="1"/>
      <Offset bytes="892" length="18"/>
    </AFPTag>
  </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="55">
  <SemanticProperties>
    <NodeType>TD</NodeType>
  </SemanticProperties>
  <DOMNode did="56">
    <SemanticProperties>
      <NodeType>Div</NodeType>
    </SemanticProperties>
    <DOMNode did="57">
      <SemanticProperties>
        <NodeType>P</NodeType>
      </SemanticProperties>
      <AFPTag tid="57">
        <IndexElement AFPIId="PTX" count="1"/>
        <Offset bytes="910" length="89"/>
      </AFPTag>
    </DOMNode>
  </DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="58">
  <SemanticProperties>
    <NodeType>TR</NodeType>
  </SemanticProperties>
  <DOMNode did="59">
    <SemanticProperties>
      <NodeType>TD</NodeType>
    </SemanticProperties>
    <DOMNode did="60">
      <SemanticProperties>
        <NodeType>Div</NodeType>
      </SemanticProperties>
      <DOMNode did="61">
        <SemanticProperties>
          <NodeType>P</NodeType>
        </SemanticProperties>

```

Table Example

```
<AFPTag tid="61">
  <IndexElement AFPIId="PTX" count="1"/>
  <Offset bytes="999" length="18"/>
</AFPTag>
</DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="62">
  <SemanticProperties>
    <NodeType>TD</NodeType>
  </SemanticProperties>
  <DOMNode did="63">
    <SemanticProperties>
      <NodeType>Div</NodeType>
    </SemanticProperties>
    <DOMNode did="64">
      <SemanticProperties>
        <NodeType>P</NodeType>
      </SemanticProperties>
      <AFPTag tid="64">
        <IndexElement AFPIId="PTX" count="1"/>
        <Offset bytes="1017" length="89"/>
      </AFPTag>
    </DOMNode>
  </DOMNode>
</DOMNode>
</DOMNode>
</DOMNode>
<DOMNode did="65">
  <SemanticProperties>
    <NodeType>P</NodeType>
  </SemanticProperties>
  <AFPTag tid="65">
    <IndexElement AFPIId="PTX" count="1"/>
    <Offset bytes="1106" length="84"/>
  </AFPTag>
</DOMNode>
</DOMNode>
</DOMNode>
</DocumentObjectModel>
```

Text Block Across Page Boundaries Example

This example shows how to associate metadata with a block of text that crosses page boundaries.

In this example, the tags shown are contained within a Metadata Object at the AFP page level for both pages:

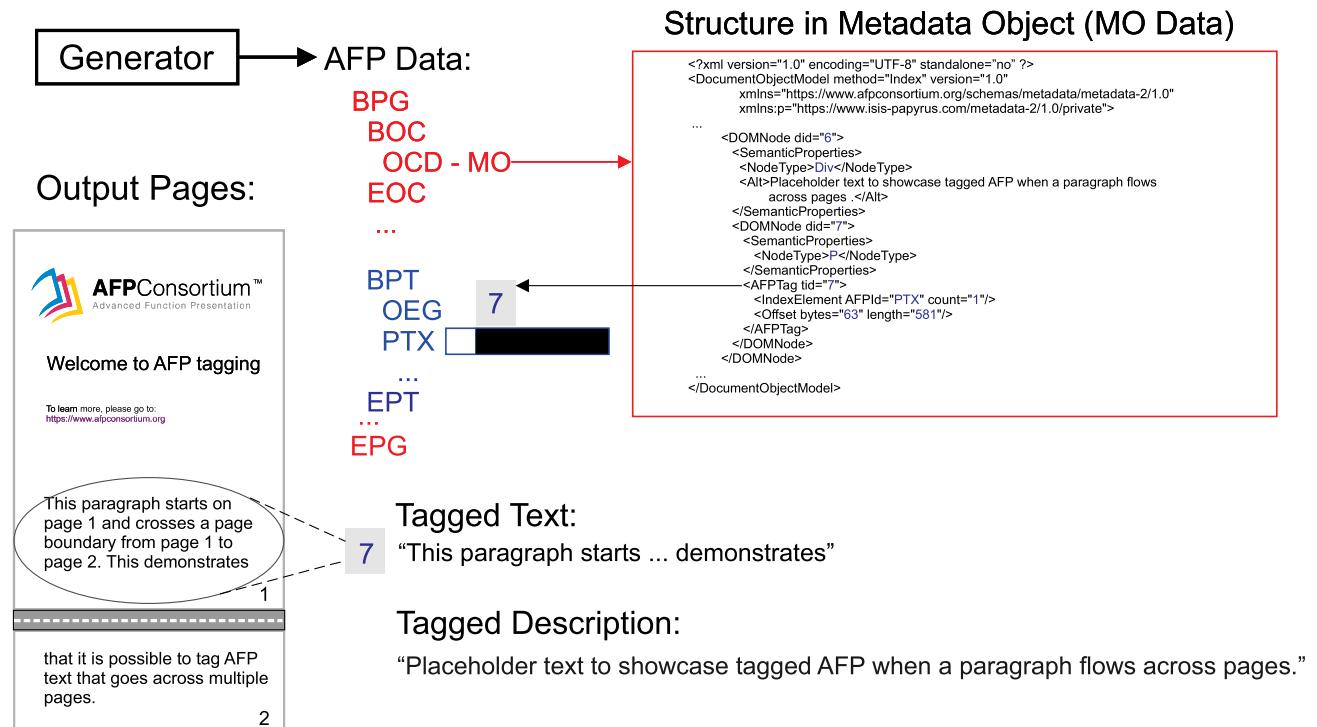
Figure 5. Text Block Across Page Boundaries — First Page Example

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<DocumentObjectModel method="Index" version="1.0"
  xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0"
  xmlns:p="https://www.isis-papyrus.com/metadata-2/1.0/private">
  <DOMNode did="1" AFPLang="en" XMMLang="en">
    <SemanticProperties>
      <NodeType>Document</NodeType>
    </SemanticProperties>
    <DOMNode did="2" XMMLang="en">
      <SemanticProperties>
        <NodeType>Part</NodeType>
      </SemanticProperties>
      <DOMNode did="3" XMMLang="en">
        <SemanticProperties>
          <NodeType>Figure</NodeType>
          <Alt>Large AFP Consortium logo.</Alt>
        </SemanticProperties>
        <Private>
          <p:BBox>1701;2268;10235;4541</p:BBox>
        </Private>
        <AFPTag tid="3">
          <BeginIndex AFPIId="BIO" count="1"/>
          <EndIndex AFPIId="EIO" count="1"/>
        </AFPTag>
      </DOMNode>
    <DOMNode did="4">
      <SemanticProperties>
        <NodeType>Div</NodeType>
        <Alt>Welcome to AFP UA</Alt>
      </SemanticProperties>
      <DOMNode did="5">
        <SemanticProperties>
          <NodeType>P</NodeType>
        </SemanticProperties>
        <AFPTag tid="5">
          <IndexElement AFPIId="PTX" count="1"/>
          <Offset bytes="8" length="55"/>
        </AFPTag>
      </DOMNode>
    </DOMNode>
    <DOMNode did="6">
      <SemanticProperties>
        <NodeType>Div</NodeType>
        <Alt>Placeholder text to showcase tagged AFP when a
          paragraph flows across pages.</Alt>
      </SemanticProperties>
      <DOMNode did="7">
```

```

<SemanticProperties>
  <NodeType>P</NodeType>
</SemanticProperties>
<AFPTag tid="7">
  <IndexElement AFPIId="PTX" count="1"/>
  <Offset bytes="63" length="581"/>
</AFPTag>
</DOMNode>
</DOMNode>
</DOMNode>
</DOMNode>
</DocumentObjectModel>

```



This is the second page, where the text at the bottom of the first page is continued on to the second page:

Figure 6. Text Block Across Page Boundaries — Second Page Example

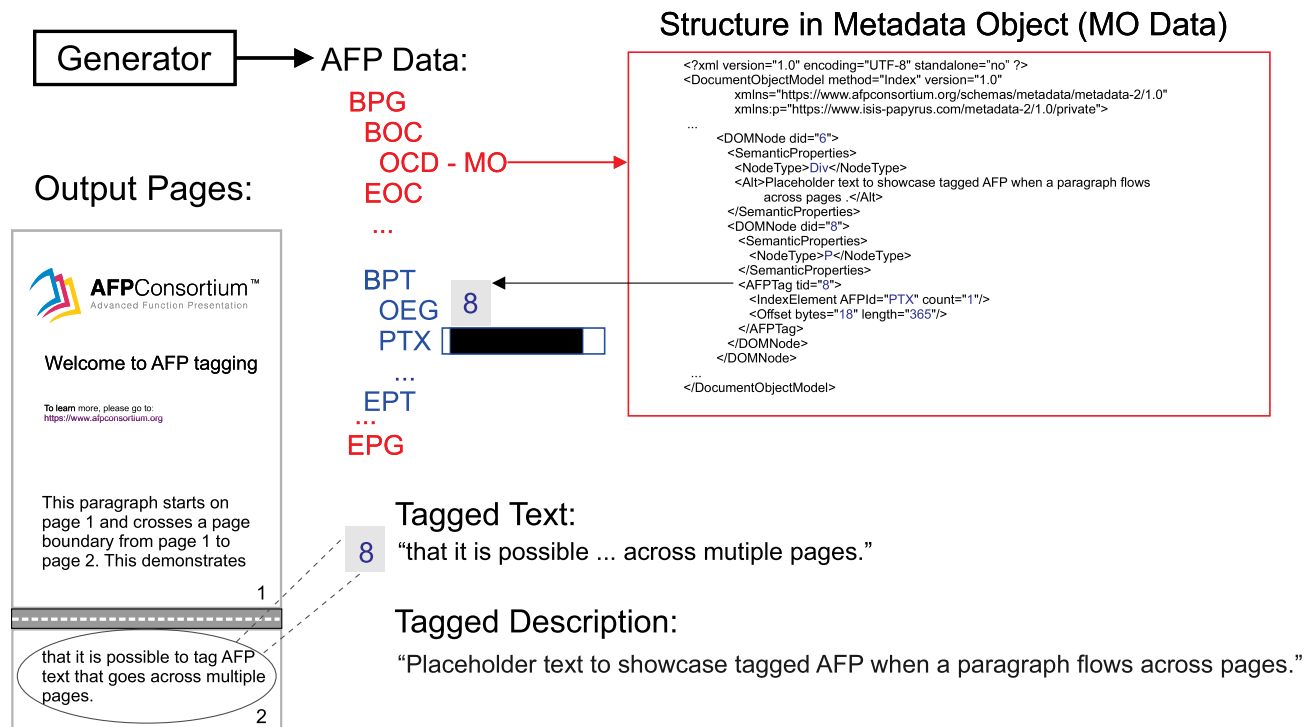
```

<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<DocumentObjectModel method="Index" version="1.0"
  xmlns="https://www.afpconsortium.org/schemas/metadata/metadata-2/1.0"
  xmlns:p="https://www.isis-papyrus.com/metadata-2/1.0/private">
  <DOMNode did="1" AFPLang="en" XMLLang="en">
    <SemanticProperties>
      <NodeType>Document</NodeType>
    </SemanticProperties>
  </DOMNode>
  <DOMNode did="2" XMLLang="en">
    <SemanticProperties>
      <NodeType>Part</NodeType>
    </SemanticProperties>

```

Text Block Across Page Boundaries Example

```
<DOMNode did="6">
  <SemanticProperties>
    <NodeType>Div</NodeType>
    <Alt>Placeholder text to showcase tagged AFP when a
      paragraph flows across pages.</Alt>
  </SemanticProperties>
</DOMNode>
<DOMNode did="8">
  <SemanticProperties>
    <NodeType>P</NodeType>
  </SemanticProperties>
  <AFPTag tid="8">
    <IndexElement AFPIId="PTX" count="1"/>
    <Offset bytes="18" length="365"/>
  </AFPTag>
</DOMNode>
</DOMNode>
<DOMNode did="9">
  <SemanticProperties>
    <NodeType>P</NodeType>
  </SemanticProperties>
  <AFPTag tid="9">
    <IndexElement AFPIId="PTX" count="1"/>
    <Offset bytes="373" length="84"/>
  </AFPTag>
</DOMNode>
</DOMNode>
</DOMNode>
</DocumentObjectModel>
```



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- AFPCC
- AFP Color Consortium
- AFP Color Management Architecture
- Bar Code Object Content Architecture
- BCOCA
- CMOCA
- Color Management Object Content Architecture
- InfoPrint
- Intelligent Printer Data Stream
- IPDS
- Mixed Object Document Content Architecture
- MO:DCA
- Ricoh

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Glossary

Some of the terms and definitions that appear in this glossary have been taken from other source documents.

XML terms are not listed here; for those, see [“Other References” on page vi](#).

The following definitions are provided as supporting information only, and are not intended to be used as a substitute for the semantics described in the body of this reference.

A

A space. The distance from the [character reference point](#) to the least positive [character coordinate system](#) X-axis value of the [character shape](#). A-space can be positive, zero, or negative. See also [B space](#) and [C space](#).

absolute coordinate. One of the [coordinates](#) that identify the location of an addressable point with respect to the [origin](#) of a specified [coordinate system](#). Contrast with [relative coordinate](#).

Acknowledge Reply. A printer-to-[host](#) reply that returns printer information or reports [exceptions](#). An Acknowledge Reply can be positive or negative. See also [Positive Acknowledge Reply](#) and [Negative Acknowledge Reply](#).

acknowledgment-required flag (ARQ). A flag that requests a printer to return an [Acknowledge Reply](#). The acknowledgment-required flag is bit zero of an [IPDS command](#)'s flag byte.

additive primary colors. Red, green, and blue light, transmitted in video monitors and televisions. When used in various degrees of intensity and variation, they create all other colors of light; when superimposed equally, they create white. Contrast with [subtractive primary colors](#).

addressable position. A position in a [presentation space](#) or on a [physical medium](#) that can be identified by a coordinate from the [coordinate system](#) of the presentation space or physical medium. See also [picture element](#). Synonymous with [position](#).

Advanced Function Presentation (AFP). An open architecture for the management of presentable information that is developed by the AFP Consortium (AFPC). AFP comprises a number of data stream and data object architectures:

- [Mixed Object Document Content Architecture \(MO:DCA\)](#); formerly referred to as AFPDS
- [Intelligent Printer Data Stream \(IPDS\)](#)
- [AFP Line Data Architecture](#)
- [Bar Code Object Content Architecture \(BCOCA\)](#)

- [Color Management Object Content Architecture \(CMOCA\)](#)
- [Font Object Content Architecture \(FOCA\)](#)
- Graphics Object Content Architecture for AFP ([AFP GOCA](#))
- [Image Object Content Architecture \(IOCA\)](#)
- [Metadata Object Content Architecture \(MOCA\)](#)
- [Presentation Text Object Content Architecture \(PTOCA\)](#)

AFP. See [Advanced Function Presentation](#).

AFP Consortium (AFPC). A formal open standards body that develops and maintains AFP architecture. Information about the consortium can be found at www.afpconsortium.org.

AFP data stream. A presentation data stream that is processed in [AFP](#) environments. The [MO:DCA](#) architecture defines the strategic AFP [interchange](#) data stream. The [IPDS](#) architecture defines the strategic AFP printer data stream.

AFP Tagging. (1) Associating extra information, contained in a [metadata object](#), with a given piece of [AFP](#) data. Among other uses, such information could enable users with vision impairments or other restrictions to make full use of the content provided by an AFP system. (2) In [MOCA](#), a known format of a [metadata object](#).

AFPDS. A term formerly used to identify the composed-page [MO:DCA](#)-based data stream interchanged in [AFP](#) environments. See also [MO:DCA](#) and [AFP data stream](#).

AFP GOCA. A subset of the GOCA architecture, originally defined by IBM, specifically designed for [AFP](#) environments. See [Graphics Object Content Architecture \(GOCA\)](#).

AFP Line Data Architecture. An AFP architecture that controls formatting of [line data](#) using a [Page Definition \(PageDef\)](#).

AIAG. See [Automotive Industry Action Group](#).

application. (1) The use to which an information system is put. (2) A collection of software components used to perform specific types of work on a computer.

arc. A continuous portion of the curved line of a circle or ellipse. See also [full arc](#).

arc parameters. Variables that specify the curvature of an [arc](#).

area. In [GOCA](#), a set of closed figures that can be filled with a [pattern](#) or a color.

architected • character angle

architected. Identifies data that is defined and controlled by an architecture. Contrast with [unarchitected](#).

asynchronous exception. Any [exception](#) other than those used to report a synchronous data-stream defect (action code X'01' or X'1F'), function no longer achievable (action code X'06'), or synchronous resource-storage problem (action code X'0C'). Asynchronous exceptions occur after the received page station. An example of an asynchronous exception is a paper jam. See also [data-stream exception](#). Contrast with [synchronous exception](#).

attribute. A property or characteristic of one or more [constructs](#). See also [character attribute](#), [color attribute](#), [current drawing attributes](#), [default drawing attributes](#), [line attributes](#), [marker attributes](#), and [pattern attributes](#).

Automotive Industry Action Group (AIAG). The coalition of automobile manufacturers and suppliers working to standardize electronic communications within the auto industry.

B

B axis. The axis of the [I,B coordinate system](#) that extends in the [baseline](#) or [B direction](#). The B axis does not have to be parallel to the Y_p axis of its bounding [X_p,Y_p coordinate space](#).

B direction (B). The direction in which successive lines of [text](#) appear on a [logical page](#). Synonymous with [baseline direction](#) and [baseline progression](#).

B space. The distance between the [character coordinate system](#) X-axis values of the two extremities of a [character shape](#). See also [A space](#) and [C space](#).

background. (1) The part of a [presentation space](#) that is not occupied with [object data](#). Contrast with [foreground](#). (2) In [GOCA](#), that portion of a graphics primitive that is mixed into the presentation space under the control of the current values of the [background mix](#) and background [color attributes](#). (3) In [GOCA](#), that portion of a character cell that does not represent a [character](#). (4) In [bar codes](#), the [spaces](#), [quiet zones](#), and area surrounding a printed [bar code symbol](#).

background color. The color of a [background](#). Contrast with [foreground color](#).

bar. In [bar codes](#), the darker element of a printed [bar code symbol](#). See also [element](#). Contrast with [space](#).

background mix. (1) An [attribute](#) that determines how the color of the background of a [graphics primitive](#) is combined with the existing color of the [graphics presentation space](#). (2) An attribute that determines how the points in overlapping [presentation space](#) backgrounds are combined. Contrast with [foreground mix](#).

bar code. An array of elements, such as [bars](#), [spaces](#), and two-dimensional modules that together represent [data elements](#) or [characters](#) in a particular [symbolology](#). The elements are arranged in a predetermined [pattern](#) following unambiguous rules defined by the symbolology. See also [bar code symbol](#).

bar code symbol. A combination of characters including start and stop characters, [quiet zones](#), data characters, and [check characters](#) required by a particular [symbolology](#), that form a complete, scannable entity. See also [bar code](#).

Bar Code Object Content Architecture (BCOCA). An architected collection of [constructs](#) used to [interchange](#) and present [bar code](#) data.

bar code symbolology. A [bar code language](#). Bar code symbolologies are defined and controlled by various industry groups and standards organizations. Bar code symbolologies are described in public domain bar code specification documents. Synonymous with [symbolology](#). See also [Canadian Grocery Product Code \(CGPC\)](#), [European Article Numbering \(EAN\)](#), [Japanese Article Numbering \(JAN\)](#), and [Universal Product Code \(UPC\)](#).

baseline. A conceptual line with respect to which successive [characters](#) are aligned. See also [character baseline](#). Synonymous with [printing baseline](#) and [sequential baseline](#).

baseline direction (B). The direction in which successive lines of text appear on a [logical page](#). Synonymous with [baseline progression](#) and [B direction](#).

baseline progression (B). The direction in which successive lines of [text](#) appear on a [logical page](#). Synonymous with [baseline direction](#) and [B direction](#).

C

C space. The distance from the most positive [character coordinate system](#) X-axis value of a [character shape](#) to the [character escapement point](#). C-space can be positive, zero, or negative. See also [A space](#) and [B space](#).

Canadian Grocery Product Code (CGPC). The [bar code symbolology](#) used to code grocery items in Canada.

character. (1) A member of a set of elements used for the organization, control, or representation of data. A character can be either a graphic character or a control character. See also [graphic character](#) and [control character](#). (2) In [bar codes](#), a single group of bar code elements that represent an individual number, letter, punctuation mark, or other symbol.

character angle. The angle that is between the [baseline](#) of a [character string](#) and the horizontal axis of a [presentation space](#) or [physical medium](#).

character attribute. A characteristic that controls the appearance of a [character](#) or [character string](#).

character baseline. A conceptual reference line that is coincident with the X axis of the [character coordinate system](#).

character coordinate system. An orthogonal [coordinate system](#) that defines [font](#) and [character](#) measurement distances. The [origin](#) is the [character reference point](#). The X axis coincides with the [character baseline](#).

character escapement point. The point where the next [character reference point](#) is usually positioned. See also [character increment](#) and [presentation position](#).

character identifier. The unique name for a [graphic character](#).

character increment. The distance from a [character reference point](#) to a [character escapement point](#). For each [character](#), the increment is the sum of a character's [A space](#), [B space](#), and [C space](#). A character's character increment is the distance the [inline coordinate](#) is incremented when that character is placed in a [presentation space](#) or on a [physical medium](#). Character increment is a property of each [graphic character](#) in a [font](#) and of the font's [character rotation](#).

character metrics. Measurement information that defines individual [character](#) values such as height, width, and space. Character metrics can be expressed in specific fixed units, such as [pels](#), or in relative units that are independent of both the [resolution](#) and the size of the [font](#). Often included as part of the more general term font metrics. See also [character set metrics](#) and [font metrics](#).

character origin. The point within the graphic pattern of a [character](#) that is to be aligned with the [presentation position](#). See also [character reference point](#).

character pattern. The scan [pattern](#) for a [graphic character](#) of a particular size, style, and weight.

character reference point. The [origin](#) of a [character coordinate system](#). The X axis is the [character baseline](#). See also [character origin](#).

character rotation. The alignment of a [character](#) with respect to its [character baseline](#), measured in degrees in a clockwise direction. Examples are 0°, 90°, 180°, and 270°. Zero-degree character rotation exists when a character is in its customary alignment with the baseline. Character rotation and [font inline sequence](#) are related in that character rotation is a clockwise rotation; font inline sequence is a counter-clockwise rotation. Contrast with [rotation](#).

character set. A finite set of different [graphic characters](#) or [control characters](#) that is complete for a given purpose. For example, the character set in ISO Standard 646, 7-Bit

Coded Character Set for Information Processing Interchange.

character set metrics. The measurements used in a [font](#). Examples are height, width, and [character increment](#) for each [character](#) of the font. See also [character metrics](#) and [font metrics](#).

character shape. The visual representation of a [graphic character](#).

character string. A sequence of [characters](#).

check character. In [bar codes](#), a [character](#) included within a bar code message whose value is used to perform a mathematical check to ensure the accuracy of that message. Synonymous with [check digit](#).

check digit. In [bar codes](#), a [character](#) included within a bar code message whose value is used to perform a mathematical check to ensure the accuracy of that message. Synonymous with [check character](#).

CIE. See [Commission Internationale d'Éclairage](#).

clear area. A clear space that contains no machine-readable marks preceding the start character of a [bar code symbol](#) or following the stop character. Synonymous with [quiet zone](#). Contrast with [intercharacter gap](#) and [space](#).

CMYK color space. (1) The [color model](#) used in four-color printing. Cyan, magenta, and yellow, the [subtractive primary colors](#), are used with black to effectively create a multitude of other colors. (2) The primary colors used together in printing to effectively create a multitude of other colors: cyan, magenta, yellow, and black. Based on the subtractive color theory; the primary colors used in four-color printing processes.

Code 39. A [bar code symbology](#) characterized by a variable-length, bidirectional, [discrete](#), self-checking, alphanumeric code. Three of the nine elements are wide and six are narrow. It is the standard for LOGMARS (the Department of Defense) and the [AIAG](#).

code table. A table showing the [character](#) allocated to each code point in a code. See also [code page](#) and [code point](#).

code page. (1) A [resource](#) object containing descriptive information, [graphic character identifiers](#), and code points corresponding to a coded graphic character set. [Graphic characters](#) can be added over time; therefore, to specifically identify a code page, both a [GCSGID](#) and a [CPGID](#) should be used. See also [coded graphic character set](#). (2) A set of assignments, each of which assigns a code point to a [character](#). Each code page has a unique name or identifier. Within a given code page, a code point is assigned to one character. More than one [character set](#) can be assigned code points from the same code page. See also [code point](#) and [section](#).

Code Page Global Identifier (CPGID). A unique [code page](#) identifier that can be expressed as either a two-byte binary or a five-digit decimal value.

code point. A unique bit [pattern](#) that can serve as an element of a [code page](#) or a site in a code table, to which a [character](#) can be assigned. The element is associated with a binary value. The assignment of a character to an element of a code page determines the binary value that will be used to represent each occurrence of the character in a [character string](#). Code points are one or more bytes long. See also [code table](#) and [section](#).

coded font. (1) A [resource](#) containing elements of a code page and a font character set, used for presenting text, graphics character strings, and bar code [HRI](#). See also [code page](#) and [font character set](#). (2) In [FOCA](#), a resource containing the resource names of a valid pair of font character set and code page resources. The graphic character set of the font character set must match the graphic character set of the code page for the coded font resource pair to be valid. (3) In the [IPDS](#) architecture, a raster font resource containing code points that are directly paired to [font metrics](#) and the raster representation of [character shapes](#), for a specific [graphic character set](#). (4) In the IPDS architecture, a font resource containing descriptive information, a code page, font metrics, and a digital-technology representation of character shapes for a specific graphic character set.

coded graphic character set. A set of [graphic character](#)s with their assigned [code points](#).

color. A visual attribute of things that results from the light they emit, transmit, or reflect.

color attribute. An [attribute](#) that affects the color values provided in a [graphics primitive](#), a text [control sequence](#), or an [IPDS command](#). Examples of color attributes are [foreground color](#) and [background color](#).

color image. [Images](#) whose [image data elements](#) are represented by multiple bits or whose image data element values are mapped to color values. [Constructs](#) that map image-data-element values to color values are [look-up tables](#) and image-data-element structure parameters. Examples of color values are [screen](#) color values for displays and color toner values for printers.

Color Management Object Content Architecture (CMOCA). An architected collection of [constructs](#) used for the interchange and presentation of the color management information required to render a print file, document, group of pages or sheets, page, overlay, or data object with color fidelity.

color model. The method by which a color is specified. For example, the RGB color space specifies color in terms of three intensities for red (R), green (G), and blue (B). Also referred to as [color space](#).

coordinate system. A Cartesian coordinate system. An example is the [image coordinate system](#) that uses the fourth quadrant with positive values for the Y axis. The [origin](#) is the upper left-hand corner of the fourth quadrant. A pair of (x,y) values corresponds to one [image point](#). Each image point is described by an [image data element](#). See also [character coordinate system](#).

Color Management Object Content Architecture (CMOCA). An architected collection of [constructs](#) used for the interchange and presentation of the color management information required to render a print file, document, group of pages or sheets, page, overlay, or data object with color fidelity.

Color Management Object Content Architecture (CMOCA). An architected collection of [constructs](#) used for the interchange and presentation of the color management information required to render a print file, document, group of pages or sheets, page, overlay, or data object with color fidelity.

color space. The method by which a color is specified. For example, the RGB color space specifies color in terms of three intensities for red (R), green (G), and blue (B). Also referred to as [color model](#).

color table. A collection of color element sets. The table can also specify the method used to combine the intensity levels of each element in an element set to produce a specific color. Examples of methods used to combine intensity levels are the additive method and the subtractive method. See also [color model](#).

colorimetry. The science of measuring color and color appearance. Classical colorimetry deals primarily with color matches rather than with color appearance as such. The main focus of colorimetry has been the development of methods for predicting perceptual matches on the basis of physical measurements.

command. (1) In the [IPDS](#) architecture, a [structured field](#) sent from a [host](#) to a printer. (2) In [GOCA](#), a [data-stream construct](#) used to communicate from the [controlling environment](#) to the drawing process. The command introducer is environment dependent. (3) A request for system action.

Commission Internationale d'Éclairage (CIE). An association of international color scientists who produced the standards that are used as the basis of the description of [color](#).

construct. An [architected](#) set of data such as a [structured field](#) or a [triplet](#).

continuous-form media. Connected [sheets](#). An example of connected sheets is sheets of paper connected by a perforated tear strip. Contrast with [cut-sheet media](#).

control character. (1) A character that denotes the start, modification, or end of a control function. A control

character can be recorded for use in a subsequent action, and it can have a graphic representation. See also [character](#). (2) A control function the coded representation of which consists of a single code point.

control sequence. A sequence of bytes that specifies a control function. A control sequence consists of a [control sequence introducer](#) and zero or more [parameters](#).

control sequence class. An assigned coded character that identifies a [control sequence](#)'s [syntax](#) and how that syntax is to be interpreted. An example of a control sequence class is X'D3', that identifies [presentation text object](#) control sequences.

control sequence function type. The coded character occupying the fourth byte of an unchained [control sequence introducer](#). This code defines the function whose [semantics](#) can be prescribed by succeeding [control sequence parameters](#).

control sequence introducer. The information at the beginning of a [control sequence](#). An unchained control sequence introducer consists of a [control sequence prefix](#), a [class](#), a [length](#), and a [function type](#). A chained control sequence introducer consists of a length and a function type.

control sequence length. The number of bytes used to encode a [control sequence](#) excluding the [control sequence prefix](#) and [class](#).

control sequence prefix. The escape character used to identify a [control sequence](#). The control sequence prefix is the first byte of a control sequence. An example of a control sequence prefix is X'2B'.

controlling environment. The environment in which an [object](#) is embedded, for example, the [IPDS](#) and [MO:DCA data streams](#).

coordinates. A pair of values that specify a position in a coordinate space. See also [absolute coordinate](#) and [relative coordinate](#).

current drawing attributes. The set of [attributes](#) used at the present time to direct a drawing process. Contrast with [default drawing attributes](#).

CPGID. See [Code Page Global Identifier](#).

custom line type value. A user-defined [line type](#), defined by a series of pairs of a dash/dot length followed by a move length. Contrast with [standard line type value](#).

cut-sheet media. Unconnected [sheets](#). Contrast with [continuous-form media](#).

D

data element. A unit of data that is considered indivisible.

Data Map. A [print control object](#) in a [Page Definition \(PageDef\)](#) that establishes the page environment and specifies the mapping of [line data](#) to the page. Synonymous with [Page Format](#).

data stream. A continuous stream of data that has a defined format. An example of a defined format is a [structured field](#).

data-stream exception. In the [IPDS](#) architecture, a condition that exists when the printer detects an invalid or unsupported [command](#), [order](#), control, or parameter value from the [host](#). Data-stream exceptions are those whose action code is X'01', X'19', or X'1F'. See also [asynchronous exception](#) and [synchronous exception](#).

default drawing attributes. The set of drawing [attributes](#) adopted at the beginning of a drawing process and usually at the beginning of each root segment that is processed. See also [root segment](#). Contrast with [current drawing attributes](#).

device profile. A structure that provides a means of defining the color characteristics of a given device in a particular state.

discrete code. A [bar code symbology](#) characterized by placing [spaces](#) that are not a part of the code between [characters](#), that is, [intercharacter gaps](#).

document. (1) A machine-readable collection of one or more [objects](#) that represents a composition, a work, or a collection of data. (2) A publication or other written material.

document component. An architected part of a [document data stream](#). Examples of document components are documents, [pages](#), [page groups](#), indexes, resource groups, [objects](#), and [process elements](#).

document content architecture. A family of architectures that define the [syntax](#) and [semantics](#) of the document component. See also [document component](#) and [structured field](#).

document element. A self-identifying, variable-length, bounded record, that can have a content portion that provides control information, data, or both. An [application](#) or device does not have to understand control information or data to parse a [data stream](#) when all the records in the data stream are document elements. See also [structured field](#).

downloaded resource. In the [IPDS](#) architecture, a [resource](#) in a printer that is installed and removed under control of a [host presentation services](#) program. A downloaded resource is referenced by a host-assigned name that is valid for the duration of the session between the [presentation services](#) program and the printer. Contrast with [resident resource](#).

drawing control. A control that determines how a picture is drawn. Examples of drawing controls are [arc parameters](#), [transforms](#), and the [viewing window](#).

drawing order. In [GOCA](#), a graphics [construct](#) that the [controlling environment](#) builds to instruct a [drawing processor](#) about what to draw and how to draw it. The order can specify, for example, that a [graphics primitive](#) be drawn, a change to drawing [attributes](#) or [drawing controls](#) be effected, or a [segment](#) be called. One or more graphics primitives can be used to draw a picture. Drawing orders can be included in a [structured field](#). See also [order](#).

drawing processor. A [graphics processor](#) component that executes segments to draw a picture in a [presentation space](#). See also [segment](#), [graphics presentation space](#), and [image presentation space](#).

E

element. (1) A [bar](#) or [space](#) in a [bar code character](#) or a [bar code symbol](#). (2) A [structured field](#) in a [document content architecture data stream](#). (3) In [GOCA](#), a portion of a [segment](#) consisting of either a single [order](#) or a group of orders enclosed in an [element](#) bracket, in other words, between a *begin* element and an *end* element. (4) A basic member of a mathematical or logical class or set.

environment interface. The part of the [graphics processor](#) that interprets [commands](#) and instructions from the [controlling environment](#).

European Article Numbering (EAN). The [bar code symbology](#) used to code grocery items in Europe.

exchange. The predictable interpretation of shared information by a family of system processes in an environment where the characteristics of each process must be known to all other processes. Contrast with [interchange](#).

exception. (1) An invalid or unsupported [data-stream construct](#). (2) In the [IPDS](#) architecture, a condition requiring [host](#) notification. (3) In the [IPDS](#) architecture, a condition that requires the host to resend data. See also [data-stream exception](#), [asynchronous exception](#), and [synchronous exception](#).

F

fillet. A curved line drawn tangential to a specified set of straight lines. An example of a fillet is the concave junction formed where two lines meet.

FOCA. See [Font Object Content Architecture](#).

font. A set of [graphic characters](#) that have a characteristic design, or a font designer's concept of how the graphic characters should appear. The characteristic design specifies the characteristics of its graphic characters.

Examples of characteristics are [character shape](#), graphic [pattern](#), style, size, [weight class](#), and increment. Examples of fonts are [fully described fonts](#), symbol sets, and their internal printer representations. See also [coded font](#) and [symbol set](#).

font character set. A [FOCA resource](#) containing descriptive information, [font metrics](#), and the digital representation of [character shapes](#) for a specified graphic character set.

font index. (1) The mapping of a descriptive [font](#) name to a font member name in a font library. An example of a font member in a font library is a [font resource object](#). Examples of [attributes](#) used to form a descriptive font name are [typeface](#), family name, point size, style, [weight class](#), and [width class](#). (2) In the [IPDS](#) architecture, an LF1-type raster-font resource containing character metrics for each code point of a raster font or raster-font section for a particular [font inline sequence](#). There can be a font index for 0 degree, 90 degree, 180 degree, and 270 degree font inline sequences. A font index can be downloaded to a printer using the Load Font Index command. An LF1-type coded font or coded-font section is the combination of one fully described font and one font index. See also [fully described font](#).

font inline sequence. The clockwise [rotation](#) of the [inline direction](#) relative to a [character pattern](#). [Character rotation](#) and font inline sequence are related in that character rotation is a clockwise rotation; font inline sequence is a counter-clockwise rotation.

font metrics. Measurement information that defines individual character values such as height, width, and space, as well as overall font values such as averages and maximums. Font metrics can be expressed in specific fixed units, such as [pels](#), or in relative units that are independent of both the [resolution](#) and the size of the [font](#). See also [character metrics](#) and [character set metrics](#).

font object. A [resource](#) object that contains some or all of the description of a [font](#).

Font Object Content Architecture (FOCA). An architected collection of [constructs](#) used to describe [fonts](#) and to [interchange](#) those font descriptions.

foreground color. A [color attribute](#) used to specify the color of the [foreground](#) of a primitive. Contrast with [background color](#).

foreground. (1) The part of a [presentation space](#) that is occupied by [object data](#). (2) In [GOCA](#), the portion of a [graphics primitive](#) that is mixed into the presentation space under the control of the current value of the [mix](#) and [color attributes](#). See also [pel](#). Contrast with [background](#).

foreground mix. An attribute used to determine how the [foreground color](#) of data is combined with the existing color of a [graphics presentation space](#). An example of data is a [graphics primitive](#). Contrast with [background mix](#).

form. A division of the [physical medium](#); multiple forms can exist on a physical medium. For example, a roll of paper might be divided by a printer into rectangular pieces of paper, each representing a form. Envelopes are an example of a physical medium that comprises only one form. The [IPDS](#) architecture defines four types of forms: [cut-sheet media](#), [continuous-form media](#), envelopes, and computer output on microfilm. Each type of form has a top edge. A form has two [sides](#), a front side and a back side. Synonymous with [sheet](#).

Form Definition (Formdef). A [print control object](#) that contains an environment definition and one or more [Medium Maps](#). Synonymous with [Form map](#).

Form Map. A [print control object](#) that contains an environment definition and one or more Medium Maps. Synonymous with [Form Definition](#). See also [Medium Map](#).

full arc. A complete circle or ellipse. See also [arc](#).

fully described font. In the [IPDS](#) architecture, an LF1-type raster-font resource containing font metrics, descriptive information, and the raster representation of character shapes, for a specific graphic character set. A fully described font can be downloaded to a printer using the Load Font Control and Load Font commands. An LF1-type coded font or coded-font section is the combination of one fully described font and one font index. See also [font index](#).

G

gamut. In color reproduction, the subset of colors which can be accurately represented in a given circumstance, such as within a given [color space](#) or by a certain output device.

GCSGID. See [Graphic Character Set Global Identifier](#).

glyph. (1) A member of a set of symbols that represent data. Glyphs can be letters, digits, punctuation marks, or other symbols. Synonymous with [graphic character](#). See also [character](#). (2) In typography, a glyph is a particular graphical representation of a [grapheme](#), or sometimes several graphemes in combination (a composed glyph), or only a part of a grapheme. In computing as well as typography, the term [character](#) refers to a grapheme or grapheme-like unit of text, as found in natural language writing systems (scripts). A character or grapheme is a unit of text, whereas a glyph is a graphical unit. TrueType/OpenType fonts describe glyphs as a set of paths.

GOCA. See [Graphics Object Content Architecture](#).

grapheme. (1) A minimally distinctive unit of writing in the context of a particular writing system. For example, å (“a + Combining Ring Above” or “Latin Small Letter A with Ring Above”) is a grapheme in the Danish writing system. (2) What an end-user thinks of as a [character](#). (3) In typography, a grapheme is the fundamental unit in written

language. Graphemes include alphabetic letters, Chinese characters, numerals, punctuation marks, and all the individual symbols of any of the world's writing systems. In a [typeface](#) each character typically corresponds to a single [glyph](#), but there are exceptions, such as a font used for a language with a large alphabet or complex writing system, where one character may correspond to several glyphs, or several characters to one glyph.

graphic character. A member of a set of symbols that represent data. Graphic characters can be letters, digits, punctuation marks, or other symbols. Synonymous with [glyph](#). See also [character](#).

graphic character identifier. The unique name for a [graphic character](#) in a [font](#) or in a graphic [character set](#). See also [character identifier](#).

Graphic Character Set Global Identifier (GCSGID). A unique graphic [character set](#) identifier that can be expressed as either a two-byte binary or a five-digit decimal value.

graphics data. Data containing lines, [arcs](#), [markers](#), and other [constructs](#) that describe a picture.

graphics model space. A two-dimensional conceptual space in which a picture is constructed. All [model transforms](#) are completed before a picture is constructed in a graphics model space. Contrast with [graphics presentation space](#). Synonymous with [model space](#).

graphics object. An object that contains [graphics data](#). See also [object](#).

Graphics Object Content Architecture (GOCA). An architected collection of [constructs](#) used to [interchange](#) and present [graphics data](#). GOCA was originally defined by IBM; this architecture is no longer used in [AFP](#). Instead, a subset of GOCA was defined for use in AFP environments, called [AFP GOCA](#). Usually when the term “GOCA” is used in AFP documentation, it means AFP GOCA.

graphics presentation space. A two-dimensional conceptual space in which a picture is constructed. In this space graphics [drawing orders](#) are defined. The picture can then be mapped onto an output [medium](#). All [viewing transforms](#) are completed before the picture is generated for presentation on an output medium. An example of a graphics presentation space is the abstract space containing graphics pictures defined in an [IPDS](#) Write Graphics Control [command](#). Contrast with [graphics model space](#).

graphics primitive. A basic [construct](#) used by an output device to draw a picture. Examples of graphics primitives are [arc](#), line, [fillet](#), [character string](#), and [marker](#).

graphics processor. The processing capability required to interpret a [GOCA object](#), that is, to present the picture represented by the object. It includes the [environment](#)

[interface](#), that interprets [commands](#) and instructions, and the [drawing processor](#), that interprets the [drawing orders](#).

graphics segment. A set of graphics [drawing orders](#) contained within a Begin Segment [command](#). See also [segment](#).

grayscale image. [Images](#) whose [image data elements](#) are represented by multiple bits and whose image data element values are mapped to more than one level of brightness through an image data element structure parameter or a [look-up table](#).

H

highlight color. A spot color that is used to accentuate or contrast monochromatic areas. See also [spot color](#).

host. (1) In the [IPDS](#) architecture, a computer that drives a printer. (2) In [IOCA](#), the host is the [controlling environment](#).

HRI. See [human-readable interpretation](#).

human-readable interpretation (HRI). The printed translation of [bar code characters](#) into equivalent Latin alphabetic characters, Arabic numeral decimal digits, and common special characters normally used for printed human communication.

I

I,B coordinate system. The [coordinate system](#) used to present [graphic characters](#). This coordinate system is used to establish the [inline direction](#) and [baseline direction](#) for the placement of successive graphic characters within a [presentation space](#). See also [X_p,Y_p coordinate system](#).

I direction. (1) The direction in which successive [characters](#) appear in a line of [text](#). (2) In [GOCA](#), the direction specified by the [character angle attribute](#). Synonymous with [inline direction](#).

ICC. See [International Color Consortium](#).

ICC-absolute colorimetric. A [rendering intent](#) in which the chromatically adapted [tristimulus values](#) of the in-[gamut](#) colors are unchanged. It is useful for [spot colors](#) and when simulating one medium on another (proofing). Note that this definition of ICC-absolute colorimetry is actually called “relative colorimetry” in [CIE](#) terminology, since the data has been normalized relative to the perfect diffuser viewed under the same illumination source as the sample.

ICC profile. A file in the International Color Consortium profile format, containing information about the [color](#) reproduction capabilities of a device such as a scanner, a digital camera, a monitor, or a printer. An ICC profile includes three elements: 128-byte file header, tag table, and tagged element data. The intent of this format is to

provide a cross-platform [device profile](#) format. Such device profiles can be used to translate color data created on one device into another device's native color space.

illuminant. Something that can serve as a source of light.

image. An electronic representation of a picture produced by means of sensing light, sound, electron radiation, or other emanations coming from the picture or reflected by the picture. An image can also be generated directly by software without reference to an existing picture.

image content. [Image data](#) and its associated [image data parameters](#).

image coordinate system. An X,Y Cartesian coordinate system using only the fourth quadrant with positive values for the Y axis. The [origin](#) of an image coordinate system is its upper left hand corner. An X,Y coordinate specifies a [presentation position](#) that corresponds to one and only one [image data element](#) in the [image content](#).

image data. Rectangular arrays of raster information that define an [image](#).

image data element (IDE). A basic unit of image information. An image data element expresses the intensity of a signal at a corresponding [image point](#). An image data element can use a [look-up table](#) to introduce a level of indirection into the expression of [grayscale image](#) or [color image](#).

image data parameter (IDP). A parameter that describes characteristics of [image data](#).

image object. An object that contains [image data](#). See also [object](#).

Image Object Content Architecture (IOCA). An architected collection of [constructs](#) used to [interchange](#) and present [images](#).

image point. A discrete X,Y coordinate in the [image presentation space](#). See also [addressable position](#).

image presentation space (IPS). A two-dimensional conceptual space in which an [image](#) is generated.

image segment. [Image content](#) bracketed by Begin Segment and End Segment self-defining fields. See also [segment](#).

IM Image. A migration image object that is resolution dependent, bi level, and cannot be compressed or scaled. Contrast with [IO Image](#).

inline coordinate. The first of a pair of values that identifies the position of an [addressable position](#) with respect to the [origin](#) of a specified [I,B coordinate system](#). This value is specified as a distance in addressable positions from the [B axis](#) of an I,B coordinate system.

inline direction (I). (1) The direction in which successive [characters](#) appear in a line of [text](#). (2) In [GOCA](#), the direction specified by the [character angle attribute](#).
Synonymous with [I direction](#).

Intelligent Printer Data Stream (IPDS). An [architected host-to-printer data stream](#) that contains both data and controls defining how the data is to be presented.

interchange. The predictable interpretation of shared information in an environment where the characteristics of each process need not be known to all other processes. Contrast with [exchange](#).

intercharacter gap. In [bar codes](#), the space between two adjacent bar code characters in a [discrete code](#), for example, the space between two characters in [Code 39](#). Synonymous with [intercharacter space](#). Contrast with [clear area](#), [element](#), and [space](#).

intercharacter space. In [bar codes](#), the space between two adjacent bar code characters in a [discrete code](#), for example, the space between two characters in [Code 39](#). Synonymous with [intercharacter gap](#). Contrast with [element](#) and [space](#).

interchange. The predictable interpretation of shared information in an environment where the characteristics of each process need not be known to all other processes. Contrast with [exchange](#).

International Color Consortium (ICC). A group of companies chartered to develop, use, and promote cross-platform standards so that applications and devices can exchange [color](#) data without ambiguity.

IO Image. An image object containing [IOCA constructs](#). Contrast with [IM Image](#).

IOCA. See [Image Object Content Architecture](#).

IPDS. See [Intelligent Printer Data Stream](#).

italics. A [typeface](#) with [characters](#) that slant upward to the right. In [FOCA](#), italics is the common name for the defined inclined typeface [posture attribute](#) or parameter.

J

Japanese Article Numbering (JAN). The [bar code symbology](#) used to code grocery items in Japan.

L

language. A set of [symbols](#), conventions, and rules that is used for conveying information. See also [pragmatics](#), [semantics](#), and [syntax](#).

line attributes. Those [attributes](#) that pertain to straight and curved lines. Examples of line attributes are [line type](#) and [line width](#).

line data. Unformatted [text](#) data. Line data can be formatted using a [Page Definition \(PageDef\)](#).

line type. A [line attribute](#) that controls the appearance of a line. The line type can either be a [standard line type value](#) or a [custom line type value](#). Contrast with [line width](#).

line width. A [line attribute](#) that controls the appearance of a line. Examples of line width are normal and thick. Contrast with [line type](#).

logical page. A [presentation space](#). One or more [object areas](#) can be mapped to a logical page. A logical page has specifiable characteristics, such as size, shape, [orientation](#), and offset. The shape of a logical page is the shape of a rectangle. Orientation and offset are specified relative to a [medium coordinate system](#).

look-up table (LUT). (1) A table used to map one or more input values to one or more output values. (2) A logical list of colors or intensities. The list has a name and can be referenced to select a color or intensity. See also [color table](#).

M

marker. A symbol with a recognizable appearance that is used to identify a particular location. An example of a marker is a symbol that is positioned by the center point of its cell.

marker attributes. The characteristics that control the appearance of a [marker](#). Examples of marker [attributes](#) are size and color.

marker set. In [GOCA](#), an [attribute](#) used to access a [coded font](#).

Medium Map. A [print control object](#) in a Form Map that defines resource mappings and controls modifications to a [form](#), page placement on a form, and form copy generation. See also [Form Map](#).

medium preprinted form overlay (M-PFO). In [MO:DCA](#), a [PFO](#) that is designed to simulate a [preprinted form](#) for a sheet-side. An M-PFO is invoked with the MMC structured field and is applied last to the medium presentation space after all other data for the sheet-side has been applied.

medium presentation space. A two-dimensional conceptual space with a base [coordinate system](#) from which all other coordinate systems are either directly or indirectly derived. A medium presentation space is mapped onto a physical medium in a presentation-system-dependent manner. Synonymous with [medium](#). See also [logical page](#), [physical medium](#), and [presentation space](#).

media-relative colorimetric. This [rendering intent](#) rescales the in-[gamut](#), chromatically-adapted [tristimulus values](#) such that the [white point](#) of the actual medium is mapped to the [PCS](#) white point (for either input or output). It is useful for colors that have already been mapped to a medium with a smaller gamut than the reference medium (and therefore need no further compression).

medium. A two-dimensional conceptual space with a base [coordinate system](#) from which all other coordinate systems are either directly or indirectly derived. A medium is mapped onto a physical medium in a presentation-system-dependent manner. Synonymous with [medium presentation space](#). See also [logical page](#), [physical medium](#), and [presentation space](#).

metadata. Descriptive information that is associated with and augments other data.

metadata object. In [AFP](#), the resource object that carries [metadata](#).

Metadata Object Content Architecture (MOCA). A resource object architecture to carry metadata that serves to provide context or additional information about an [AFP](#) object or other AFP data.

mix. A method used to determine how the color of a [graphics primitive](#) is combined with the existing color of a [graphics presentation space](#). See also [foreground mix](#) and [background mix](#).

Mixed Object Document Content Architecture (MO:DCA). An [architected](#), presentation-system-independent [data stream](#) for [interchanging documents](#).

MO:DCA. See [Mixed Object Document Content Architecture](#).

model space. A two-dimensional conceptual space in which a picture is constructed. All [model transforms](#) are completed before a picture is constructed in a graphics model space. Contrast with [graphics presentation space](#). Synonymous with [graphics model space](#).

model transform. A [transform](#) that is applied to [drawing-order coordinates](#). Contrast with [viewing transform](#).

M-PFO. See [medium preprinted form overlay \(M-PFO\)](#).

N

Negative Acknowledge Reply (NACK). In the [IPDS](#) architecture, a reply from a printer to a [host](#), indicating that an [exception](#) has occurred. Contrast with [Positive Acknowledge Reply](#).

O

object. (1) A collection of [structured fields](#). The first structured field provides a begin-object function, and the last structured field provides an end-object function. The object can contain one or more other structured fields whose content consists of one or more data elements of a particular data type. An object can be assigned a name, that can be used to reference the object. Examples of objects are [presentation text](#), [font](#), [graphics](#), and [image](#) objects. (2) Something that a user works with to perform a task.

object area. A rectangular area in a [presentation space](#) into which a data [object](#) is mapped. The presentation space can be for a [page](#) or an [overlay](#). Examples are a graphics object area, an image object area, and a bar code object area.

object data. A collection of related data elements bundled together. Examples of object data include [graphic characters](#), [image data elements](#), and [drawing orders](#).

order. (1) In [GOCA](#), a graphics [construct](#) that the [controlling environment](#) builds to instruct a [drawing processor](#) about what to draw and how to draw it. The order can specify, for example, that a [graphics primitive](#) be drawn, a change to drawing [attributes](#) or [drawing controls](#) be effected, or a [segment](#) be called. One or more graphics primitives can be used to draw a picture. Orders can be included in a [structured field](#). Synonymous with [drawing order](#). (2) In the [IPDS](#) architecture, a construct within an execute-order [command](#). (3) In [IOCA](#), a functional operation that is performed on the [image content](#).

orientation. The angular distance a [presentation space](#) or [object area](#) is rotated in a specified [coordinate system](#), expressed in degrees and minutes. For example, the orientation of printing on a [physical medium](#), relative to the X_m axis of the [X_m,Y_m coordinate system](#). See also [presentation space orientation](#) and [text orientation](#).

origin. The point in a [coordinate system](#) where the axes intersect. Examples of origins are the [addressable position](#) in an [X_m,Y_m coordinate system](#) where both coordinate values are zero and the [character reference point](#) in a [character coordinate system](#).

overlay. (1) A [resource object](#) that contains presentation data such as, [text](#), [image](#), [graphics](#), and [bar code](#) data. Overlays define their own environment and are often used as pre-defined pages or electronic forms. Overlays are classified according to how they are presented with other presentation data: a medium overlay is positioned at the origin of the medium presentation space before any pages are presented, and a page overlay is positioned at a specified point in a page's logical page. A Page Modification Control (PMC) overlay is a special type of page overlay used in MO:DCA environments. (2) The final representation of such an object on a [physical medium](#). Contrast with [page segment](#).

P

page. (1) A [data stream object](#) delimited by a Begin Page [structured field](#) and an End Page structured field. A page can contain presentation data such as [text](#), [image](#), [graphics](#), and [bar code](#) data. (2) The final representation of a page object on a [physical medium](#).

Page Definition (PageDef). A [print control object](#) used to format [line data](#) into page data. A Page Definition contains one or more Data Maps and may optionally specify conditional processing of the line data. Synonymous with [Page Map](#). See also [Data Map](#).

Page Format. Synonymous with [Data Map](#).

page group. A named group of sequential [pages](#). A page group is delimited by a Begin Named Page Group [structured field](#) and an End Named Page Group structured field. A page group can contain nested page groups. All pages in the page group inherit the attributes and processing characteristics that are assigned to the page group.

Page Map. A [print control object](#) used to format [line data](#) into page data. A Page Map contains one or more Data Maps and may optionally specify conditional processing of the line data. Synonymous with [Page Definition](#). See also [Data Map](#).

page segment. (1) In the [IPDS](#) architecture, a [resource object](#) that can contain [text](#), [image](#), [graphics](#), and [bar code](#) data. Page segments do not define their own environment, but are processed in the existing environment. (2) In [MO:DCA](#), a resource object that can contain any mixture of bar code objects, graphics objects, and [IOCA](#) image objects. A page segment does not contain an active environment group. The environment for a page segment is defined by the active environment group of the including page or overlay. (3) The final representation of such an object on a [physical medium](#). Contrast with [overlay](#).

parameter. (1) A variable that is given a constant value for a specified [application](#). (2) A variable used in conjunction with a [command](#) to affect its result.

pattern. An array of symbols used to fill an [area](#).

pattern attributes. The characteristics that specify the appearance of a [pattern](#).

pattern set. An [attribute](#) in [GOCA](#) used to access a [symbol set](#) or [coded font](#).

PCS. (1) See [Print Contrast Signal](#). (2) See [Profile Connection Space](#).

pel. The smallest printable or displayable unit on a [physical medium](#). In computer graphics, the smallest element of a physical medium that can be independently assigned color and intensity. Pels per inch is often used as

a measurement of presentation granularity. Synonymous with [picture element](#) and [pixel](#).

perceptual rendering intent. The exact [gamut](#) mapping of the perceptual [rendering intent](#) is vendor specific and involves compromises such as trading off preservation of contrast in order to preserve detail throughout the tonal range. It is useful for general reproduction of images, particularly pictorial or photographic-type images.

PFO. See [preprinted form overlay \(PFO\)](#).

physical medium. A physical entity on which information is presented. Examples of a physical medium are a sheet of paper, a roll of paper, an envelope, and a display screen. See also [medium presentation space](#) and [sheet](#).

picture chain. A string of [segments](#) that defines a picture. Synonymous with [segment chain](#).

picture element. The smallest printable or displayable unit on a [physical medium](#). In computer graphics, the smallest element of a physical medium that can be independently assigned color and intensity. Picture elements per inch is often used as a measurement of presentation granularity. Synonymous with [pel](#) and [pixel](#).

pixel. The smallest printable or displayable unit on a [physical medium](#). In computer graphics, the smallest element of a physical medium that can be independently assigned color and intensity. Picture elements per inch is often used as a measurement of presentation granularity. Synonymous with [pel](#) and [picture element](#).

position. A position in a [presentation space](#) or on a [physical medium](#) that can be identified by a coordinate from the [coordinate system](#) of the presentation space or physical medium. See also [picture element](#). Synonymous with [addressable position](#).

Positive Acknowledge Reply (ACK). In the [IPDS](#) architecture, a reply to an IPDS [command](#) that has its [acknowledgment-required flag](#) on and in which no [exception](#) is reported. Contrast with [Negative Acknowledge Reply](#).

posture. Inclination of a letter with respect to a vertical axis. Examples of inclination are upright and inclined. An example of upright is [Roman](#). An example of inclined is [italics](#).

pragmatics. Information related to the usage of a [construct](#). See also [semantics](#) and [syntax](#).

preprinted form. A [form](#) or [sheet](#) that is not blank when it is selected as input media for presentation.

preprinted form overlay (PFO). An [overlay](#) and associated processing designed to simulate a preprinted form.

presentation position • root segment

presentation position. An addressable position that is coincident with a character reference point. See also [addressable position](#) and [character reference point](#).

presentation services. In printing, a software component that communicates with a printer using a printer [data stream](#), such as the [IPDS](#) data stream, to print [pages](#), download and manage print [resources](#), and handle [exceptions](#).

presentation space. A conceptual address space with a specified [coordinate system](#) and a set of [addressable positions](#). The coordinate system and addressable positions can coincide with those of a [physical medium](#). Examples of presentation spaces are medium, logical page, and [object area](#). See also [graphics presentation space](#), [image presentation space](#), [logical page](#), [medium presentation space](#), and [text presentation space](#).

presentation space orientation. The number of degrees and minutes a [presentation space](#) is rotated in a specified [coordinate system](#). For example, the orientation of printing on a [physical medium](#), relative to the X_m axis of the $X_m.Y_m$ [coordinate system](#). See also [orientation](#) and [text orientation](#).

presentation text object. An object that contains presentation text data. See also [object](#).

Presentation Text Object Content Architecture (PTOCA). An [architected](#) collection of [constructs](#) used to [interchange](#) and present presentation text data.

print contrast. A measurement of the ratio of the reflectivities between the [bars](#) and [spaces](#) of a [bar code symbol](#), commonly expressed as a percent. Synonymous with [Print Contrast Signal](#).

Print Contrast Signal (PCS). A measurement of the ratio of the reflectivities between the [bars](#) and [spaces](#) of a [bar code symbol](#), commonly expressed as a percent. Synonymous with [print contrast](#).

print control object. A [resource](#) object that contains layout, finishing, and resource mapping information used to present a [document](#) on physical media. Examples of print control objects are [Form Maps](#) and [Medium Maps](#).

printing baseline. A conceptual line with respect to which successive [characters](#) are aligned. See also [character baseline](#). Synonymous with [baseline](#) and [sequential baseline](#).

process color. A color that is specified as a combination of the components, or primaries, of a color space. A process color is rendered by mixing the specified amounts of the primaries. An example of a process color is C=0.1, M=0.8, Y=0.2, K=0.1 in the cyan/magenta/yellow/black (CMYK) color space. Contrast with [spot color](#).

process element. In [MO:DCA](#), a [document component](#) that is defined by a [structured field](#) and that facilitates a

form of document processing that does not affect the presentation of the document. Examples of process elements are Tag Logical Elements (TLEs) that specify document attributes and Link Logical Elements (LLEs) that specify linkages between document components.

Profile Connection Space (PCS). The reference [color space](#) defined by [ICC](#), in which colors are encoded in order to provide an interface for connecting source and destination transforms. The PCS is based on the [CIE](#) 1931 standard colorimetric observer.

Q

quiet zone. A clear space that contains no machine-readable marks preceding the start character of a [bar code symbol](#) or following the stop character. Synonymous with [clear area](#). Contrast with [intercharacter gap](#) and [space](#).

R

relative coordinate. One of the [coordinates](#) that identify the location of an addressable point by means of a displacement from some other addressable point. Contrast with [absolute coordinate](#).

rendering intent. A particular [gamut](#)-mapping style or method of converting colors in one gamut to colors in another gamut. [ICC profiles](#) support four different rendering intents: [perceptual](#), [media-relative colorimetric](#), [saturation](#), and [ICC-absolute colorimetric](#).

resident resource. In the [IPDS](#) architecture, a [resource](#) in a printer or in a resource-caching intermediate device. A resident resource can be installed manually or can be captured by the device if it is intended for public use. A resident resource is referenced by a global ID that is valid for the duration of the resource's presence in the device. Contrast with [downloaded resource](#).

resolution. (1) A measure of the sharpness of an input or output device capability, as given by some measure relative to the distance between two points or lines that can just be distinguished. (2) The number of addressable [pels](#) per unit of length.

resource. An [object](#) that is referenced by a [data stream](#) or by another object to provide data or information. Resource objects can be stored in libraries. In [MO:DCA](#), resource objects can be contained within a resource group. Examples of resources are [fonts](#), [overlays](#), and [page segments](#). See also [downloaded resource](#), [resident resource](#), and [secondary resource](#).

Roman. Relating to a [type style](#) with upright letters.

root segment. A [segment](#) in the [picture chain](#) that is not called by any other segment. If a single segment that is not in a [segment chain](#) is drawn, it is treated as a root segment for the duration of the drawing process.

rotation. The [orientation](#) of a [presentation space](#) with respect to the [coordinate system](#) of a containing presentation space. Rotation is measured in degrees in a clockwise direction. Zero-degree rotation exists when the angle between a presentation space's positive X axis and the containing presentation space's positive X axis is zero degrees. Contrast with [character rotation](#).

S

saturation rendering intent. The exact [gamut](#) mapping of the saturation [rendering intent](#) is vendor specific and involves compromises such as trading off preservation of hue in order to preserve the vividness of pure colors. It is useful for images that contain objects such as charts or diagrams.

screen. (1) A halftone-threshold array. (2) The display surface of a display device such as a computer monitor.

secondary resource. A [resource](#) for an object that is itself a resource.

section. A portion of a double-byte code page that consists of 256 consecutive entries. The first byte of a two-byte code point is the [section identifier](#). A code-page section is also called a code-page ward in some environments. See also [code page](#) and [code point](#).

section identifier. A value that identifies a [section](#). Synonymous with [section number](#).

section number. A value that identifies a [section](#). Synonymous with [section identifier](#).

segment. (1) In [GOCA](#), a set of graphics [drawing orders](#) contained within a Begin Segment [command](#). See also [graphics segment](#). (2) In [IOCA](#), [image content](#) bracketed by Begin Segment and End Segment self-defining fields. See also [image segment](#).

segment chain. A string of [segments](#) that defines a picture. Synonymous with [picture chain](#).

segment transform. A [model transform](#) that is applied to a whole [segment](#).

semantics. The meaning of the [parameters](#) of a [construct](#). See also [pragmatics](#) and [syntax](#).

sequential baseline. A conceptual line with respect to which successive [characters](#) are aligned. See also [character baseline](#). Synonymous with [baseline](#) and [printing baseline](#).

sheet. A division of the [physical medium](#); multiple sheets can exist on a physical medium. For example, a roll of paper might be divided by a printer into rectangular pieces of paper, each representing a sheet. Envelopes are an example of a physical medium that comprises only one sheet. The [IPDS](#) architecture defines four types of

sheets: [cut-sheet media](#), [continuous-form media](#), envelopes, and computer output on microfilm. Each type of sheet has a top edge. A sheet has two [sides](#), a front side and a back side. Synonymous with [form](#).

side. A physical surface of a sheet. A sheet has a front side and a back side. See also [sheet](#).

space. In [bar codes](#), the lighter element of a printed [bar code symbol](#), usually formed by the background between bars. See also [element](#). Contrast with [bar](#), [clear area](#), [intercharacter gap](#), and [quiet zone](#).

spot color. A color that is specified with a unique identifier such as a number. A spot color is normally rendered with a custom colorant instead of with a combination of process color primaries. See also [highlight color](#). Contrast with [process color](#).

standard line type value. A predefined [line type](#), like solid, invisible, or dash dot. Contrast with [custom line type value](#).

stroke. A straight or curved line used to create the shape of a letter.

structured field. A self-identifying, variable-length, bounded record, that can have a content portion that provides control information, data, or both. See also [document element](#).

structured field introducer. In [MO:DCA](#), the header component of a [structured field](#) that provides information that is common for all structured fields. Examples of information that is common for all structured fields are length, function type, and category type. Examples of structured field function types are begin, end, data, and descriptor. Examples of structured field category types are presentation text, [image](#), graphics, and [page](#).

subtractive primary colors. Cyan, magenta, and yellow colorants used to subtract a portion of the white light that is illuminating an object. Subtractive colors are reflective on paper and printed media. When used together with various degrees of coverage and variation, they have the ability to create billions of other colors. Contrast with [additive primary colors](#).

symbol. (1) A visual representation of something by reason of relationship, association, or convention. (2) In [GOCA](#), the subpicture referenced as a character definition within a [font character set](#) and used as a [character](#), [marker](#), or fill pattern. A bitmap can also be referenced as a symbol for use as a fill pattern. See also [bar code symbol](#).

symbol set. A [coded font](#) that is usually simpler in structure than a [fully described font](#). Symbol sets are used where typographic quality is not required. Examples of devices that might not provide typographic quality are dot-matrix printers and displays. See also [character set](#), [marker set](#), and [pattern set](#).

symbology. A [bar code language](#). Bar code symbologies are defined and controlled by various industry groups and standards organizations. Bar code symbologies are described in public domain bar code specification documents. Synonymous with [bar code symbology](#). See also [Canadian Grocery Product Code \(CGPC\)](#), [European Article Numbering \(EAN\)](#), [Japanese Article Numbering \(JAN\)](#), and [Universal Product Code \(UPC\)](#).

synchronous exception. In the [IPDS](#) architecture, a [data-stream](#), function no longer achievable, or resource-storage [exception](#) that must be reported to the [host](#) before a printer can return a [Positive Acknowledge Reply](#) or can increment the received-page counter for a [page](#) containing the exception. Synchronous exceptions are those with action code X'01', X'06', X'0C', or X'1F'. See also [data-stream exception](#). Contrast with [asynchronous exception](#).

syntax. The rules governing the structure of a [construct](#). See also [pragmatics](#) and [semantics](#).

T

text. A graphic representation of information. Text can consist of alphanumeric [character](#)s and symbols arranged in paragraphs, tables, columns, and other shapes. An example of text is the data sent in an [IPDS](#) Write Text [command](#).

text orientation. A description of the appearance of text as a combination of inline direction and baseline direction. See also [baseline direction](#), [inline direction](#), [orientation](#), and [presentation space orientation](#).

text presentation space. A two-dimensional conceptual space in which text is generated for presentation on an output medium.

transform. A modification of one or more characteristics of a picture. Examples of picture characteristics that can be transformed are position, orientation, and size. See also [model transform](#), [segment transform](#), and [viewing transform](#).

triplet. A three-part self-defining variable-length parameter consisting of a length byte, an identifier byte, and parameter-value bytes.

tristimulus values. Three values that together are used to describe a specific color. These values are the amounts of three reference colors (such as red, green, and blue) that can be mixed to give the same visual sensation as the specific color.

type family. All [character](#)s of a single design, regardless of [attributes](#) such as width, weight, [posture](#), and size. Examples are Courier and Gothic.

type style. The form of [characters](#) within the same [font](#), for example, Courier or Gothic.

type weight. A parameter indicating the degree of boldness of a [typeface](#). A [character](#)'s [stroke](#) thickness determines its type weight. Examples are light, medium, and bold. Synonymous with [weight class](#).

type width. A parameter indicating a relative change from the [font](#)'s normal width-to-height ratio. Examples are normal, condensed, and expanded. Synonymous with [width class](#).

typeface. All [characters](#) of a single [type family](#) or style, [weight class](#), [width class](#), and [posture](#), regardless of size. For example, Helvetica Bold Condensed [Italics](#), in any point size.

U

unarchitected. Identifies data that is neither defined nor controlled by an architecture. Contrast with [architected](#).

Universal Product Code (UPC). A standard [bar code symbology](#), commonly used to mark the price of items in stores, that can be read and interpreted by a computer.

V

viewing transform. A [transform](#) that is applied to [model-space coordinates](#). Contrast with [model transform](#).

viewing window. That part of a [model space](#) that is [transformed](#), clipped, and moved into a [graphics presentation space](#).

W

weight class. A parameter indicating the degree of boldness of a [typeface](#). A [character](#)'s [stroke](#) thickness determines its weight class. Examples are light, medium, and bold. Synonymous with [type weight](#).

white point. One of a number of reference [illuminants](#) used in [colorimetry](#) that serve to define the color "white". Depending on the application, different definitions of white are needed to give acceptable results. For example, photographs taken indoors might be lit by incandescent lights, that are relatively orange compared to daylight. Defining "white" as daylight will give unacceptable results when attempting to color correct a photograph taken with incandescent lighting.

width class. A parameter indicating a relative change from the [font](#)'s normal width-to-height ratio. Examples are normal, condensed, and expanded. Synonymous with [type width](#).

X

X_p, Y_p coordinate system. The [coordinate system](#) of a presentation space or a logical page. This coordinate

system describes the size, position, and orientation of a presentation space or a logical page. Orientation of an X_p, Y_p coordinate system is relative to an environment-specified coordinate system. An example of an environment-specified coordinate system is the [X_m,Y_m coordinate system](#). The X_p,Y_p coordinate system [origin](#) is specified by an [IPDS Logical Page Position command](#). See also [logical page](#), [medium presentation space](#), and [presentation space](#).

X_{io},Y_{io} coordinate system. The [IO-Image presentation space coordinate system](#).

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