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**Information technology — Digital  
publishing — EPUB 3.0.1 —**

**Part 6:  
Canonical fragment identifiers**

*Technologies de l'information — Publications numériques — EPUB  
3.0.1 —*

**iTeh STANDARD PREVIEW**  
*Partie 6: Identificateurs de fragment canoniques*  
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Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted (see [www.iso.org/directives](http://www.iso.org/directives)).

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This document was prepared by the World Wide Web Consortium (W3C) (as EPUB Canonical Fragment Identifiers 1.1) and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

A list of all parts in the ISO/IEC 23736 series can be found on the ISO website.

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Document history

[Changes to this document](#)

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Editors

Peter Sorotokin, Adobe

[ISO/IEC 23736-6:2020](#)

Garth Conboy, Google Inc.

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Brady Duga, Google Inc.

John Rivlin, Google Inc.

Don Beaver, Apple Inc.

Kevin Ballard, Apple Inc.

Alastair Fettes, Apple Inc.

Daniel Weck, DAISY Consortium

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## Status of this Document

This section describes the status of this document at the time of its publication. Other documents might supersede this document.

This document was produced by the EPUB Working Group under the [EPUB Working Group Charter](#) approved on 8 July 2015.

This document has been reviewed by the IDPF membership and is endorsed by the IDPF Board as a Recommended Specification. This document is considered stable and can be referenced from other specifications and documents.

Feedback on this document can be provided to the EPUB Working Group's [mailing list](#) or [issue tracker](#).

This document is governed by the [IDPF Policies and Procedures](#).

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## › 1 Overview

### › 1.1 Purpose and Scope

#### **This section is informative**

This specification, EPUB Canonical Fragment Identifier (epubcfi), defines a standardized method for referencing arbitrary content within an EPUB® Publication through the use of fragment identifiers.

The Web has proven that the concept of hyperlinking is tremendously powerful, but EPUB Publications have been denied much of the benefit that hyperlinking makes possible

because of the lack of a standardized scheme to link into them. Although proprietary schemes have been developed and implemented for individual Reading Systems, without a commonly-understood syntax there has been no way to achieve cross-platform interoperability. The functionality that can see significant benefit from breaking down this barrier, however, is varied: from reading location maintenance to annotation attachment to navigation, the ability to point into any Publication opens a whole new dimension not previously available to developers and Authors.

This specification attempts to rectify this situation by defining an arbitrary structural reference that can uniquely identify any location, or simple range of locations, in an EPUB Publication: the EPUB CFI. The following considerations have strongly influenced the design and scope of this scheme:

- The mechanism used to reference content should be interoperable: references to a reading position created by one Reading System should be usable by another.
- Document references to EPUB content should be enabled in the same way that existing hyperlinks enable references throughout the Web.
- Each location in an EPUB file should be able to be identified without the need to modify the document.
- All fragment identifiers that reference the same logical location should be equal when compared.
- Comparison operations, including tests for sorting and comparison, should be able to be performed without accessing the referenced files.
- Simple manipulations should be possible without access to the original files (e.g., given a reference deep in a file, it should be possible to generate a reference to the start of the file).
- Identifier resolution should be reasonably efficient (e.g., processing of the first chapter is not necessary to resolve a fragment identifier that points to the last chapter).
- References should be able to recover their target locations through parser variations and document revisions.
- Expression of simple, contiguous ranges should be supported.
- An extensible mechanism to accommodate future reference recovery heuristics should be provided.

In the case of both Standard EPUB CFIs and Intra-Publication EPUB CFI, this specification conforms with the guidelines expressed by W3C in [Section 6. Best Practices for Fragid Structures \[FragIDBestPractices\]](#).

In other words, both standard CFI URIs (e.g., "`book.epub#epubcfi(...)`", referred media type "`application/epub+zip`") and intra-publication CFI URIs (e.g., "`package.opf#epubcfi(...)`", referred media type "`application/oebps-package+xml`") make use of a fragment identifier syntax that does not overlap with existing schemes in the context of the aforementioned media types' suffix registrations (i.e., "`-xml`" and "`-zip`").

## › 1.2 Terminology

Please refer to [\[EPUB 3.1\]](#) for definitions of EPUB-specific terminology used in this document.

#### Standard EPUB CFI

A publication-level EPUB CFI links into an EPUB Publication. The path preceding the EPUB CFI references the location of the EPUB Publication.

#### Intra-Publication EPUB CFI

An intra-publication EPUB CFI allows one Content Document to reference another within the same Rendition of an EPUB Publication. The path preceding the EPUB CFI references the current Rendition's Package Document.

Refer to [Intra-Publication CFIs](#) for more information.

## › 1.3 Typographic Conventions

The following typographic conventions are used in this specification:

#### `markup`

All markup (elements, attributes, properties), code (JavaScript, pseudo-code), machine-readable values (string, characters, media types) and file names are in red monospace font.

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#### `markup link`

Links to markup and code definitions are in underlined red monospace font.

`http://www.idpf.org/` `https://standards.iteh.ai/catalog/standards/sist/bfef3de1-07fd-4066-a1e4-8f086f6d8876/iso-iec-23736-6-2020`

URIs are in navy blue monospace font.

#### `hyperlink`

Hyperlinks are underlined and blue.

#### `[reference]`

Normative and informative references are enclosed in square brackets.

#### Term

Terms defined in the [Terminology](#) are in capital case.

#### Term Link

Links to term definitions have a dotted blue underline.

Normative element, attribute and property definitions are in blue boxes.

Informative markup examples are in light gray boxes.



## NOTE

Informative notes are in green boxes with a "Note" header.

## CAUTION

Informative cautionary notes are in red boxes with a "Caution" header.

## › 1.4 Conformance Statements

The keywords **MUST**, **MUST NOT**, **REQUIRED**, **SHALL**, **SHALL NOT**, **SHOULD**, **SHOULD NOT**, **RECOMMENDED**, **MAY**, and **OPTIONAL** in this document are to be interpreted as described in [RFC2119].

All sections and appendixes of this specification are normative except where identified by the informative status label "This section is informative". The application of informative status to sections and appendixes applies to all child content and subsections they contain.

All examples in this specification are informative.

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## › 2 EPUB CFI Definition

[ISO/IEC 23736-6:2020](https://standards.iteh.ai/catalog/standards/sist/b1ef3de1-07fd-4066-a1e4-8f086fd8876/iso-iec-23736-6-2020)

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### › 2.1 Introduction

#### **This section is informative**

A fragment identifier is the part of an IRI [RFC3987] that defines a location within a resource. Syntactically, it is the segment attached to the end of the resource IRI starting with a hash (#). For HTML documents, IDs and named anchors are used as fragment identifiers, while for XML documents the Shorthand XPointer [XPTRSH] notation is used to refer to a given ID.

A Canonical Fragment Identifier (CFI) is a similar construct to these, but expresses a location within an EPUB Publication. For example:

```
book.epub#epubcfi(/6/4[chap01ref]!/4[body01]/10[para05]/3:10)
```

The function-like string immediately following the hash (`epubcfi(...)`) indicates that this fragment identifier conforms to the scheme defined by this specification, and the value contained in the parentheses is the syntax used to reference the location within the specified EPUB Publication (`book.epub`). Using the processing rules defined in [Path Resolution](#), any Reading System can parse this syntax, open the corresponding Content Document in the EPUB Publication and load the specified location for the user.

A complete definition of the EPUB CFI syntax is provided in the next section.

## NOTE

**epub** has been prepended to the name of the scheme, as a more generic CFI-like scheme might be defined in the future for all XML+ZIP-based file formats.

## 2.2 Syntax

(EBNF productions [ISO/IEC 14977](#))

All terminal symbols are in the Unicode Block 'Basic Latin' (U+0000 to U+007F).

fragment = "epubcfi(" , ( path , [ range ] ) , ")" ;

path = step , local\_path ;

range = "," , local\_path , "," , local\_path ;

local\_path = { step } , ( redirected\_path | [ offset ] ) ;

redirected\_path = "!" , ( offset | path ) ;

step = "/" , integer , [ "[" , assertion , "]" ] ;

offset = ( ( ":" , integer ) | ( "@" , number , "." , number ) | ( "~" , number , [ "@" , number , "." , number ] ) ) , [ "[" , assertion , "]" ] ;

number = ( digit-non-zero , { digit } , [ "." , { digit } , digit-non-zero ] ) | ( zero , [ "." , { digit } , digit-non-zero ] ) ;

integer = zero | ( digit-non-zero , { digit } ) ;

assertion = ( ( value , [ "," , value ] ) | ( "," , value ) | ( parameter ) ) { parameter } ;

parameter = ";" , value-no-space , "=" , csv ;

csv = value , { "," , value } ;

value = string-escaped-special-chars ;

value-no-space = value - ( [ value ] , space , [ value ] ) ;

special-chars = circumflex | square-brackets | parentheses | comma | semicolon | equal ;

escaped-special-chars = ( circumflex , circumflex ) | ( circumflex , square-brackets ) | ( circumflex , parentheses ) | ( circumflex , comma ) | ( circumflex , semicolon ) | ( circumflex , equal ) ;

character-escaped-special = ( character - special-chars ) | escaped-special-chars ;

string-escaped-special-chars = character-escaped-special , { character-escaped-special } ;

digit = zero | digit-non-zero ;

<u>digit-non-zero</u>	= "1"   "2"   "3"   "4"   "5"   "6"   "7"   "8"   "9" ;
<u>zero</u>	= "0" ;
<u>space</u>	= " " ;
<u>circumflex</u>	= "^" ;
<u>square-brackets</u>	= "["   "]" ;
<u>parentheses</u>	= "("   ")" ;
<u>comma</u>	= "," ;
<u>semicolon</u>	= ";" ;
<u>equal</u>	= "=" ;
<u>character</u>	= ? Unicode Characters ? ;

## Unicode Characters

The definition of allowed Unicode characters is the same as [XML]. This excludes the surrogate blocks, FFFE, and FFFF:

#x9 | #xA | #xD | [#x20-#xD7FF] | [#xE000-#xFFFF] | [#x10000-#x10FFFF]

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Document authors are encouraged to avoid "compatibility characters", as defined in section 2.3 of [Unicode]. The characters defined in the following ranges are also discouraged. They are either control characters or permanently undefined Unicode characters:

[#x7F-#x84], [#x86-#x9F], [#xFDD0-#xFDEF],  
 [#x1FFFE-#x1FFFF], [#x2FFFE-#x2FFFF], [#x3FFFE-#x3FFFF],  
 [#x4FFFE-#x4FFFF], [#x5FFFE-#x5FFFF], [#x6FFFE-#x6FFFF],  
 [#x7FFFE-#x7FFFF], [#x8FFFE-#x8FFFF], [#x9FFFE-#x9FFFF],  
 [#xAFFFE-#xAFFFF], [#xBFFFE-#xBFFFF], [#xCFFFE-#xCFFFF],  
 [#xDFFFE-#xDFFFF], [#xEFFFE-#xEFFFF], [#xFFFFE-#xFFFFF],  
 [#x10FFFE-#x10FFFF].

A Canonical Fragment Identifier (CFI) consists of an initial sequence `epubcfi` that identifies this particular reference method, and a parenthesized path or range. A path is built up as a sequence of structural steps to reference a location. A range is a path followed by two local (or relative) paths that identify the start and end of the range.

Steps are denoted by the forward slash character (/), and are used to traverse XML content. The last step in a CFI path represents a location within a document, either structural (XML element), textual (character data), or aural-visual (image, audio, or video media). Such terminating steps **MAY** be complemented by an **OPTIONAL** "offset", which denotes a particular character position, temporal or spatial fragment.

Substrings in brackets are extensible assertions that improve the robustness of traversing paths and migrating them from one revision of the document to another. These assertions