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Chū-iû ê Pek-kho-choân-su

PDF

PDF sī **Sûi-sin Bûn-kiāⁿ Kek-sek** (*Portable Document Format*) ê Eng-gí kán-lio̍k, pún khoán bûn-kiāⁿ chū-sin kòa bûn-jī, tô͘-ōe, jī-hêng kap kî-tha su-iàu ê chu-sìn, keng-kòe it-tēng ê nńg-thé, thang tī kok khoán hē-thóng tián-sī. I tāi-seng sī 1990 nî-tāi Adobe kong-si khai-hoat--ê.

Adobe Systems	[tián-khui]

Lâi-goân: "https://zh-min-nan.wikipedia.org/w/index.php?title=PDF&oldid=1889548"

WIKIPEDIA
Entziklopedia askea

PDF

Kalitate neurketa ⓘ: ◯ (2,36)

PDF edo **P**ortable **D**ocument **F**ormat (Dokumentu Formatu Eramangarria) dokumentuen elkartrukerako fitxategi formatua da, Adobe Systems enpresak garatutakoa. 2008ko uztailaren 1az geroztik estandar irekia da, *ISO 32000-1:2008* kodearekin[1][2].

PDF agirien logotipoa

Ezaugarriak

- Plataforma-anitza da, sistema eragile nagusietan bistaratu daiteke, hala nola Windows, Linux edota Mac OS.
- Testua, irudiak eta musika gordetzeko gai da.
- Interneten, zein enpresa eta gobernuetan oso zabalduta dagoen formatu bat da.
- Irekia da eta PDF formatua sortu, bistaratu eta aldatzea ahalbidetzen duten aplikazioak[3] sortu eta banatzea baimenduta dago.
- Edukia babesteko asmoz, kodetu egin daiteke.

PDF hibridoak

PDF hibridoak PDF fitxategiak dira, beste edozein PDF bezala irakur daitezkeenak, baina jatorrizko dokumentua ODF formatuan ere badute. Esate baterako, LibreOffice erabiliz PDF hibridoak eskaini daitezke, non PDF testua jasotzen duenak testuaren zati batzuk erraz edita ditzake eta testuaren beste zati batzuk, ordea, irudi bezalako zerbait aldaezin agertuko dira[4].

Erreferentziak

1. ↑ PDF 1.7, ISO 32000 bezala onartua. (https://web.archive.org/web/20080830010142/http://www.theinquirer.net/gb/inquirer/news/2007/12/05/pdf-approved-iso-32000)
2. ↑ **(Gaztelaniaz)** Merino, Marcos. (2021-04-21). «La historia de cómo el PDF logró convertirse en el formato por excelencia para compartir documentos en Internet» (https://www.genbeta.com/ofimatica/historia-como-pdf-logro-convertirse-formato-excelencia-para-compartir-documentos-internet) *Genbeta* (kontsulta data: 2021-04-22).
3. ↑ **(Ingelesez)** October 26, Jack Wallen in Open Source on; 2016; Pst, 7:35 Am. «How to create interactive PDFs with LibreOffice» (https://www.techrepublic.com/article/how-to-create-interactive-pdfs-with-libreoffice/) *TechRepublic* (kontsulta data: 2020-04-23).
4. ↑ **(Ingelesez)** «What is a hybrid PDF file?» (https://wiki.documentfoundation.org/Faq/Writer/PDF_Hybrid) *wiki.documentfoundation.org* (kontsulta data: 2020-04-23).

Kanpo estekak

- **(Ingelesez)** Adobe (http://www.adobe.com)
- **(Ingelesez)** PDFak sortzeko *PDFCreator* programa askea (http://sourceforge.net/projects/pdfcreator/)

	Wikimedia proiektuak · Datuak: Q42332 · Multimedia: Portable Document Format (https://commons.wikimedia.org/wiki/Category:Portable_Document_Format) / Q42332 (https://commons.wikimedia.org/wiki/Special:MediaSearch?type=image&search=%22Q42332%22)
Autoritate kontrola	**Identifikadoreak** · GND: 4523240-4 (https://d-nb.info/gnd/4523240-4) · LCCN: sh00002670 (https://id.loc.gov/authorities/sh00002670) · NKC: ph198745 (https://aleph.nkp.cz/F/?func=find-c&local_base=aut&ccl_term=ica=ph198745) · AAT: 300266022 (https://vocab.getty.edu/page/aat/300266022) · **Hiztegiak eta entziklopediak** · Britannica: url (https://www.britannica.com/technology/portable-document-format)

WIKIPÉDIA
L'encyclopédie libre

Portable Document Format

Le ***Portable Document Format***, communément abrégé en **PDF**, est un langage de description de page présenté par la société Adobe Systems en 1992 et qui est devenu en 2008 une norme ISO en format ouvert.

La spécificité du PDF est de préserver la mise en page d'un document — polices de caractères, images, objets graphiques, etc. — telle qu'elle a été définie par son auteur, et cela quels que soient le logiciel, le système d'exploitation et l'ordinateur utilisés pour l'imprimer ou le visualiser.

PDF
Portable Document Format

Icône Adobe PDF.

Caractéristiques

Extension	`.pdf`
Type MIME	`application/pdf`, `application/x-pdf`, `application/x-bzpdf`, `application/x-gzpdf`
Signature	`25 50 44 46` (hexa)
Développé par	Adobe
Version initiale	Juin 1993
Type de format	Description de pages
Basé sur	PostScript
Norme	ISO 32000-1:2008
Spécification	Format ouvert
Site web	`(en)` www.iso.org/standard/75839.html (https://w

Description

Généralités

Le *Portable Document Format* qui se traduit de l'anglais en « format de document portable », généralement abrégé en PDF, est un format de fichier informatique créé par Adobe Systems.

L'avantage du format PDF est qu'il préserve les polices de caractères, les images, les objets graphiques et la mise en forme de tout document source, quelles que soient l'application et la plate-forme utilisées pour le lire.

Le format PDF peut aussi être interactif. Il est possible (grâce à des logiciels tels Adobe Acrobat Pro, LibreOffice ou Scribus) d'incorporer des champs de textes, des notes, des corrections, des menus déroulants, des choix, des calculs, etc. On parle alors de formulaire PDF.

ww.iso.org/standard/75839.html)

C'est pourquoi ce format est utilisé dans un ensemble large et varié de logiciels, de l'exportation dans les suites bureautiques grand public, aux manipulations par des programmes spécialisés de l'industrie artistique, en passant par la génération de factures électroniques ou documents officiels via Internet.

Plus techniquement, les fichiers PDF peuvent être créés avec des options personnalisées, tant au niveau de la compression des images et des textes, de la qualité d'impression du fichier, que du verrouillage (interdiction d'impression, de modification…).

Le PDF s'est imposé comme format d'échange (consultation d'écran, impression, etc.) et d'archivage de documents électroniques, il est devenu un « standard international »[1].

Historique

Le format PDF est né de l'imagination de l'un des fondateurs d'Adobe, John Warnock. C'est à l'origine un projet destiné à répondre aux besoins de fonctionnement interne de sa société. Adobe étant déjà propriétaire et utilisateur du format PostScript, c'est naturellement ce format qui a servi de base au projet.

Avant sa première présentation officielle, le nom utilisé pour définir le projet était IPS, pour Interchange PostScript. Le logiciel destiné à l'exploitation de ce format portait le nom de code Carousel. C'est pour cette raison que le type de fichier Macintosh attribué au format PDF est CARO.

Annoncé lors de la conférence du Seybold à San Jose (Californie) en 1991, le PDF 1.0 a été présenté au Comdex en 1992, où il a remporté le *Best of Comdex Award*. Depuis, le format a évolué à plusieurs reprises jusqu'à sa normalisation ISO en 2008.

Cette première version gérait déjà les liens, les signets et l'incorporation des polices de caractères, mais ne reconnaissait que l'espace colorimétrique RVB. Ce qui la rendait inutilisable par les professionnels du prépresse.

Le prix de la première version d'Acrobat Exchange était élevé et la version Reader coûtait 50 $US. À cause de cette politique tarifaire, Acrobat et le PDF ont d'abord connu une diffusion confidentielle. Qui plus est, il y avait des formats concurrents, comme *Envoy* (WordPerfect), *Common Ground Digital Paper* et même le format PostScript (.ps) d'Adobe.

Ensuite, Adobe a révisé le tarif d'Acrobat Exchange (devenu depuis Acrobat Pro) à la baisse et diffusé Acrobat Reader gratuitement.

Fonctions notables (innovantes à l'époque) :

- Display PostScript ;
- Portabilité ;
- Compression (ZIP pour les textes et les éléments vectoriels, ZIP ou JPEG pour les images matricielles) ;

- Indépendance par rapport aux polices de caractères (incorporées) ;
- Modifications incrémentielles ;
- Extensibilité du code interne.

Le format de fichier PDF a changé plusieurs fois, et continue d'évoluer, parallèlement à la sortie de nouvelles versions d'Adobe Acrobat. Il y a eu neuf versions de PDF et la version correspondante du logiciel :

- 1993, PDF 1.0 / Acrobat 1 ;
- 1994, PDF 1.1 / Acrobat 2 ;
- 1996, PDF 1.2 / Acrobat 3 ;
- 1999, PDF 1.3 / Acrobat 4 ;
- 2001, PDF 1.4 / Acrobat 5 ;
- 2003, PDF 1.5 / Acrobat 6 ;
- 2005, PDF 1.6 / Acrobat 7 ;
- 2006, PDF 1.7 / Acrobat 8 ;
- 2008, PDF 1.7, Adobe Extension Level 3, Acrobat 9 ;
- 2009, PDF 1.7, Adobe Extension Level 5, Acrobat 9.1.

Le format ouvert « ISO 32000-1:2008 PDF » a été publié par l'Organisation internationale de normalisation (ISO) le 1er juillet 2008. PDF est à présent une norme ISO, intitulée « Gestion de documents - - Format de document portable - - Partie 1: PDF 1.7 »[2].

Le 9 janvier 2017, le projet de norme ISO 32000-2 a atteint le stade d'approbation en étant publié par l'ISO en tant que texte final (*FDIS en anglais*), intitulé « Gestion de documents - - Format de document portable - - Partie 2 : PDF 2.0 »[3].

Atouts et limites

Reconstitution à l'identique

Le format PDF préserve la mise en forme du document source parce qu'il intègre dans un seul et même fichier les polices, les images, et autres éléments utilisés pour la création du document.

Portabilité

Le PDF est consultable sur de nombreux appareils communicants (ordinateurs, tablettes, smartphones, etc.)[4].

Le lecteur diffusé gratuitement par Adobe, nommé Adobe Reader est disponible sur de très nombreuses plates-formes et systèmes d'exploitation : Android, iOS, Windows, MacOS, Linux, Palm OS, Pocket PC, Symbian OS, Sun Solaris Sparc, IBM AIX, HP-UX, OS/2 / Warp, etc.

De nombreux autres lecteurs, dont certains sont des logiciels libres, existent également (Xpdf, gv,

Foxit Reader, etc.).

Interactivité

Le format PDF peut aussi être interactif : il est en effet possible, grâce à des logiciels tels Adobe Acrobat Pro, Scribus ou OpenOffice.org, d'incorporer des champs de textes, des notes, des corrections, des menus déroulants, des choix, des calculs, etc. On parle alors de formulaire PDF, ou de PDF multimédia.

Par ailleurs, il existe des lecteurs tiers capable de gérer une partie de ces fonctionnalités avancées, tels par exemple les divers lecteurs basés sur Poppler (Evince, Okular, ...), qui implémentent les formulaires PDF utilisant AcroForms, et en partie ceux utilisant XFA [réf. nécessaire].

Il est ainsi possible, par exemple :

- d'incorporer des boutons radios (pour choix), des cases à cocher, des zones de listes, des champs de texte.
- de gérer des actions en fonction d'évènements (bouton de souris relâché, bouton de souris enfoncé, sortie d'un champ...) ;
- de créer des liens web (création d'un courrier électronique avec une adresse électronique via un logiciel de messagerie par défaut, consultation d'un site internet via un navigateur) ;
- de réaliser des calculs (total, somme...) ;
- d'incorporer des séquences animées (aux formats SWF et FLV uniquement, Flash Player requis pour l'utilisateur) ;
- de réaliser, via des choix proposés ou le langage JavaScript, une ou plusieurs actions.

Ses formats standards de pages similaires à ceux qui sont existants pour le papier (ex: A4, *US letter*, etc.) facilitent l'impression (contrairement aux formulaires web difficilement imprimables et archivables).

Standard ouvert

Le format PDF a toujours été un standard ouvert[5] et, en 2008, il est devenu une norme sous l'appellation ISO 32000. Gérée par l'ISO (Organisation internationale de normalisation), la norme ISO 32000 est développée dans le but de protéger l'intégrité et la longévité du format PDF, qui constitue un standard ouvert pour plus d'un milliard de fichiers PDF actuellement en circulation.

Évolutivité

Plus de 2 000 fournisseurs à travers le monde proposent des solutions basées sur le format PDF : outils de création, modules externes et outils de conseil, de formation et de support.

Fiabilité

La technologie PDF est de plus en plus utilisée pour la collecte d'informations, comme l'attestent les millions de documents PDF actuellement publiés sur le web et un nombre incalculable de

fichiers PDF circulant dans les entreprises et administrations du monde entier.

Intégrité des fichiers garantie

Les fichiers PDF sont fidèles aux documents originaux et conservent les informations du fichier source — texte, dessins, contenu multimédia, vidéo, éléments 3D, cartes, images couleur, photos et même fonctions de traitement — quelle que soit l'application utilisée pour le créer et même lorsque plusieurs formats sont regroupés au sein d'un Porte-document PDF. Les fichiers PDF sont donc orientés *présentation*, contrairement aux fichiers HTML et XML qui dissocient fondamentalement le contenu de sa présentation[6].

Sécurité

On peut apposer une signature numérique ou protéger par mot de passe des documents PDF avec de nombreux logiciels.

Indexation

Les fonctions de recherche de texte – à la condition qu'on ait utilisé un programme de reconnaissance optique de caractères – dans les documents et métadonnées facilitent l'indexation des documents PDF.

Accessibilité

Compatibles avec les technologies d'assistance, les documents PDF facilitent l'accès aux informations électroniques pour les personnes handicapées.

3D

Il est possible depuis un logiciel de dessin CAO 3D d'insérer des fenêtres 3D dans les fichiers PDF. Différents outils existent pour ajouter de la 3D : Adobe Acrobat Pro supporte par défaut les formats U3D et PRC.

Des sociétés comme Tetra4D, proposent des outils d'import/export gérant de nombreux formats. La nouvelle tendance en 2016 consiste à créer des PDF riches et interactifs permettant d'exploiter de manière aussi complète que possible les informations contenues dans les fichiers 3D. Les PDF 3D sont surtout utilisés pour effectuer de la revue de projets et échanger des informations avec les différents intervenants. La lecture de ces fichiers 3D est possible nativement avec Acrobat Reader.

Gestion des droits d'auteur

Avec l'acquisition en octobre 2000 de Glassbook Reader[7], une interface de mise en forme du livre basée sur le format PDF[8], Adobe peut offrir aux éditeurs un système de gestion des droits numériques (DRM), qui permet de limiter la lecture ou la modification du document. À l'image de l'industrie de la musique ou du cinéma, l'industrie du livre s'intéresse à une technologie qui lui

permet de diffuser des œuvres soumises au droit d'auteur en ayant la garantie que le fichier ne se diffuserait pas en dehors des ordinateurs « autorisés ».

Le premier livre massivement diffusé sur le Glassbook Reader est *Riding the Bullet* de Stephen King, en avril 2000[9].

Il existe également différents outils de DRM permettant la distribution de fichiers PDF tout en conservant une parfaite maîtrise des droits des utilisateurs des documents (copier-coller, modification, impression, etc.) :

- CodeAndSoft distribue la solution DRM Ownerguard[10] ;
- Locklizard[11] ;
- FileOpen : permet de contrôler l'accès aux documents PDF.

Fin 2018, les formats eBooks, dont l'ePub, adaptés aux liseuses électroniques, concurrencent le format PDF pour la lecture de livre.

Format

Versions

La création du format PDF date de 1992. Depuis, le format a évolué à plusieurs reprises jusqu'à sa normalisation. La dernière version en date porte le numéro 2.0. Celle couramment implémentée dans les lecteurs PDFs est en revanche la 1.7.

Normalisation

Le format PDF dans sa version 1.7 est normalisé par l'Organisation internationale de normalisation (ISO) sous la référence ISO 32000-1:2008. La norme a été publiée le 1er juillet 2008. La société Adobe Systems n'est donc plus maîtresse de l'évolution du format qu'elle a créé, dont les spécifications ont cependant toujours été publiques et gratuites. La publication de cette norme est maintenant à la charge de l'Organisation internationale de normalisation, qui la délivre contre 198 CHF.

Pour maintenir l'universalité du format, la société Adobe a cependant obtenu de l'ISO de pouvoir diffuser gratuitement sa propre version de cette publication, à condition qu'elle ne soit pas identique à l'original pour que son apparence ne puisse pas prêter à confusion quant à sa provenance. C'est donc une version différente dans la forme mais strictement identique sur le fond que la société Adobe délivre gratuitement au format PDF[12].

Prévue à l'origine pour début 2012, la version ISO 32000-2, alias PDF 2.0, a finalement été publiée en juillet 2017[13].

Des sous-ensembles du format PDF ont également été normalisés par l'ISO, il s'agit des formats PDF/A-1 (*PDF for Archive*, référencé par la norme ISO 19005-1), PDF/X (*PDF for eXchange*),

PDF/VT (*PDF for Volume Transactional Output*), PDF/E (*PDF for Engineering*)[14], PDF/UA[15] et d'autres sous-ensembles sont actuellement en proposition pour devenir des normes ISO.

Format ouvert

PDF est un format ouvert, c'est-à-dire que ses spécifications sont connues et que son créateur Adobe Systems autorise des programmes tiers à réutiliser son format.

Bien qu'Adobe détienne un certain nombre de brevets portant sur le format PDF, il accorde une licence gratuite à tous les développeurs pour mettre en œuvre les fonctions de lecture et de création de PDF dans des logiciels tiers[16].

Logiciels manipulant les PDF

Les listes suivantes sont non exhaustives.

Affichage

Quelques exemples de logiciels permettant d'afficher un fichier PDF.

Logiciel	Créateur(s) / Développeur(s)	Système(s) d'exploitation	Licence
Adobe Acrobat	Adobe	Windows, macOS, Android, iOS, BlackBerry Tablet OS, Windows Phone	Propriétaire
Aperçu	Apple	macOS	Propriétaire
Evince	L'équipe Evince	GNU/Linux, macOS, BSD, Unix, Windows	GPL (logiciel libre)
Foxit Reader	Foxit Corporation	GNU/Linux, macOS, Windows	Propriétaire
Sumatra PDF	Krzysztof Kowalczyk	Windows	GPL (logiciel libre)
GSView	L. Peter Deutsch / Artifex Software	Multiplateforme	GPL, Aladdin Free Public License (logiciel libre)
Microsoft Edge	Microsoft Corporation	Windows, Android, iOS, macOS	Propriétaire
Okular	L'équipe Okular	GNU/Linux, BSD, Unix, Windows, macOS	GPL (logiciel libre)
OnlyOffice	Ascensio System SIA	GNU/Linux, macOS, Windows	SaaS, GNU Affero General Public License3, Apache (logiciel libre)
Google Chrome	Google Inc.	Android, GNU/Linux, macOS, Windows	Propriétaire
Mozilla Firefox	Mozilla	Android, GNU/Linux, macOS, Windows	MPL2 (logiciel libre)
PDF Studio (en)	Apryse	GNU/Linux, macOS, Solaris, Windows	Propriétaire
STDU Viewer	STDUtility	Windows	Propriétaire (gratuit)
Xpdf	Foo Labs	GNU/Linux, Unix	GPL2 (logiciel libre)
XnView	Pierre-Emmanuel Gougelet	Windows, macOS, GNU/Linux x86, GNU/Linux ppc, OpenBSD x86, NetBSD x86, FreeBSD x86, Solaris sparc, Solaris x86, Irix mips, HP-UX et AIX	Gratuiciel (utilisation privée, dans l'éducation ou les organisations à but non lucratif).
Zathura (en)	pwmt	macOS, GNU/Linux x86, GNU/Linux ppc, OpenBSD x86	Licence zlib (logiciel libre)

Création

Ces logiciels créent des fichiers dans différents formats et peuvent exporter dans le format PDF.

- Adobe Acrobat
- WPS Office
- Apache OpenOffice
- FineReader
- Ghostscript
- LibreOffice
- Certaines versions de Microsoft Office
- iWork
- Scribus
- 3D Turbo
- Adobe InDesign
- MuseScore
- Google Docs

Conversion vers le PDF

Ces logiciels permettent de générer des fichiers PDF depuis certains types de formats :

- Gestionnaires d'impressions :
  - les gestionnaires d'impression, notamment sur Mac OS/X et Linux, permettent d'« imprimer dans un fichier », au format PostScript ou PDF ;
  - le gestionnaire d'impression PDFCreator permet d'imprimer dans un fichier au format PDF sous Windows.
- Autres :
  - certains navigateurs web possèdent souvent une fonction d'export dans un fichier en PDF (on peut retrouver les mêmes fonctions avec l'outil en ligne de commande *html2pdf*) ;
  - luatex et laTeX permettent de convertir depuis LaTeX vers du PDF ;
  - Joplin exporte des documents HTML ou Markdown, notamment en PDF ;
  - Sphinx peut générer des fichiers PDF à partir de sources écrites en reStructuredText ;
  - Les suites bureautiques dérivées d'OpenOffice.org permettent d'exporter les documents compatibles avec celles-ci vers différents formats PDF (hybride, PDF/A, FDF, etc.) ;
  - Les suites bureautiques Microsoft Office et WPS Office permettent d'exporter ou de convertir les types de documents Word, Excel, PowerPoint vers le format PDF.

Édition

- Adobe Acrobat :
- Adobe Illustrator ;
- Draw (Apache OpenOffice et LibreOffice) ;
- Foxit PDF Editor ;
- Inkscape ;
- Microsoft Word ;
- Microsoft Edge ;
- PDF Studio (en) ;
- Sejda PDF Desktop ;
- WPS Office ;
- PDFedit ;
- PDFtk ;
- Wondershare PDFelement

Conversion

- Apache OpenOffice ;
- WPS Office ;
- GIMP ;

- LibreOffice ;
- pdf-parser (en).

Notes et références

1. *L'Ordinateur individuel* n° 203, mars 2008.
2. Vincent Hermann, « Le PDF 1.7 devient la norme ISO/DIS 32000 (https://web.archive.org/web/20071206141138/http://www.pcinpact.com/actu/news/40495-adobe-pdf-17-iso-dis-32000-norme.htm) », sur *pcinpact.com*, 5 décembre 2007 (version du 6 décembre 2007 sur *Internet Archive*)
3. « ISO/DIS 32000-2.4 - Gestion de documents -- Format de document portable -- Partie 2: PDF 2.0 (https://www.iso.org/fr/standard/63534.html) », sur *www.iso.org* (consulté le 28 février 2017)
4. J. R. Boulay, « Qu'est-ce que le PDF ? • abracadabraPDF (https://www.abracadabrapdf.net/format_pdf/quest-ce-que-le-pdf/) », sur *abracadabraPDF*, 4 avril 2013 (consulté le 13 novembre 2024)
5. Barnaby Lewis, « La norme mondiale pour les documents électroniques évolue (https://www.iso.org/fr/news/ref2199.html) », sur *ISO*, 3 août 2017 (consulté le 13 novembre 2024)
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7. (en) *« Adobe Announces E-Book Acquisition, Partnerships, New Product »* (http://www.infotoday.com/IT/oct00/news11.htm), *Information Today*, vol. 17, no 9, octobre 2000.
8. Christian Vandendorpe, « Livre virtuel ou codex numérique ? Les nouveaux prétendants » (http://bbf.enssib.fr/consulter/bbf-2000-06-0017-001),*Bulletin des bibliothèques de France*, novembre 2000, n° 6.
9. (en) *« PDF eBooks are Here to Stay »* (http://www.planetpdf.com/enterprise/article.asp?ContentID=6358)
10. (en) « HugeDomains (http://www.codeandsoft.com/) », sur *HugeDomains* (consulté le 7 avril 2023).
11. Solution de protection pour PDF, Fichiers et Ebook.
12. (en) Adobe System Incorporated, « Document management — Portable document format — Part 1: PDF 1.7 (http://www.adobe.com/content/dam/Adobe/en/devnet/acrobat/pdfs/PDF32000_2008.pdf) », 2008.
13. (en) « ISO 32000-2:2017 - Document management -- Portable document format -- Part 2: PDF 2.0 (https://www.iso.org/standard/63534.html) », sur *www.iso.org* (consulté le 25 septembre 2018).
14. « Norme ISO 24517-1:2008 intitulée *Gestion de documents — Format de documents d'ingénierie utilisant le PDF – Partie 1 : Utilisation du PDF 1.6 (PDF/E-1) »* (http://www.iso.org/iso/fr/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=42274).
15. (en) PDF for Universal Access (https://www.abracadabrapdf.net/format_pdf/normes_iso_et_pdf/pdfua/).
16. (en) « Legal notices for developers. » (http://partners.adobe.com/public/developer/support/topic_legal_notices.html), *partners.adobe.com* - consulté le 28 février 2015.

Voir aussi

Articles connexes

- Adobe (entreprise)
- Formulaire PDF
- PDF/A

Formats similaires

- DjVu
- XML Paper Specification
- PostScript Printer Description

Liens externes

- (en) Site officiel (https://www.iso.org/standard/75839.html)
-
- Notices dans des dictionnaires ou encyclopédies généralistes : *Britannica* (https://www.britannica.com/technology/portable-document-format) · *Gran Enciclopèdia Catalana* (https://www.enciclopedia.cat/EC-GEC-0263128.xml)
- Notices d'autorité : LCCN (http://id.loc.gov/authorities/sh00002670) · GND (http://d-nb.info/gnd/4523240-4) · Israël (https://www.nli.org.il/en/authorities/987007291610605171) · Tchéquie (https://aleph.nkp.cz/F/?func=find-c&local_base=aut&ccl_term=ica=ph198745)
- « ISO/DIS 32000-2.4 - Gestion de documents -- Format de document portable -- Partie 2: PDF 2.0 (https://www.iso.org/fr/standard/63534.html) », sur *www.iso.org* (consulté le 28 février 2017)
- L'histoire du PDF, l'invention « la plus stupide » devenue incontournable (https://www.macg.co/logiciels/2019/05/lhistoire-du-pdf-linvention-la-plus-stupide-devenue-incontournable-106176)
- Spécifications fournies par Adobe pour les développeurs tiers :
  - (en) Spécifications du format PDF (http://www.adobe.com/devnet/pdf/pdf_reference.html)
  - (en) ressources techniques (http://www.adobe.com/devnet.html)
- Liste exhaustive d'outils de création, d'édition et de conversion de documents PDF (https://www.fichier-pdf.fr/logitheque-pdf/liste-complete/)

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PDF

Portable Document Format (**PDF**), standardized as **ISO 32000**, is a file format developed by Adobe in 1992 to present documents, including text formatting and images, in a manner independent of application software, hardware, and operating systems.[2][3] Based on the PostScript language, each PDF file encapsulates a complete description of a fixed-layout flat document, including the text, fonts, vector graphics, raster images and other information needed to display it. PDF has its roots in "The Camelot Project" initiated by Adobe co-founder John Warnock in 1991.[4] PDF was standardized as ISO 32000 in 2008.[5] It is maintained by ISO TC 171 SC 2 WG8, of which the PDF Association is the committee manager.[6] The last edition as ISO 32000-2:2020 was published in December 2020.[7]

PDF files may contain a variety of content besides flat text and graphics including logical structuring elements, interactive elements such as annotations and form-fields, layers, rich media (including video content), three-dimensional objects using U3D or PRC, and various other data formats. The PDF specification also provides for encryption and digital signatures, file attachments, and metadata to enable workflows requiring these features.

Portable Document Format

Adobe PDF icon

Filename extension	`.pdf`

Internet media type	`application/pdf`,[1]
	`application/x-pdf`
	`application/x-bzpdf`
	`application/x-gzpdf`

Type code	PDF [1] (including a single trailing space)
Uniform Type Identifier (UTI)	com.adobe.pdf
Magic number	%PDF
Developed by	Adobe Inc. (1991–2008) ISO (2008–)
Initial release	June 15, 1993
Latest release	2.0
Extended to	PDF/A, PDF/E, PDF/UA, PDF/VT, PDF/X
Standard	ISO 32000-2
Open format?	Yes
Website	iso.org/standard/75839.html (https://iso.org/standard/75839.html)

History

The development of PDF began in 1991 when John Warnock wrote a paper for a project then code-named Camelot, in which he proposed the creation of a simplified version of PostScript called Interchange PostScript (IPS).[8] Unlike traditional PostScript, which was tightly focused on rendering print jobs to output devices, IPS would be optimized for displaying pages to any screen and any platform.[8]

Adobe Systems made the PDF specification available free of charge in 1993. In the early years PDF

was popular mainly in desktop publishing workflows, and competed with several other formats, including DjVu, Envoy, Common Ground Digital Paper, Farallon Replica and even Adobe's own PostScript format.

PDF was a proprietary format controlled by Adobe until it was released as an open standard on July 1, 2008, and published by the International Organization for Standardization as ISO 32000-1:2008,[9][10] at which time control of the specification passed to an ISO Committee of volunteer industry experts. In 2008, Adobe published a Public Patent License to ISO 32000-1 granting royalty-free rights for all patents owned by Adobe necessary to make, use, sell, and distribute PDF-compliant implementations.[11]

PDF 1.7, the sixth edition of the PDF specification that became ISO 32000-1, includes some proprietary technologies defined only by Adobe, such as Adobe XML Forms Architecture (XFA) and JavaScript extension for Acrobat, which are referenced by ISO 32000-1 as normative and indispensable for the full implementation of the ISO 32000-1 specification.[12] These proprietary technologies are not standardized, and their specification is published only on Adobe's website.[13][14][15] Many of them are not supported by popular third-party implementations of PDF.

ISO published version 2.0 of PDF, ISO 32000-2 in 2017, available for purchase, replacing the free specification provided by Adobe.[16] In December 2020, the second edition of PDF 2.0, ISO 32000-2:2020, was published, with clarifications, corrections, and critical updates to normative references[17] (ISO 32000-2 does not include any proprietary technologies as normative references).[18] In April 2023 the PDF Association made ISO 32000-2 available for download free of charge.[16]

Technical details

A PDF file is often a combination of vector graphics, text, and bitmap graphics. The basic types of content in a PDF are:

- Typeset text stored as content streams (i.e., not encoded in plain text);
- Vector graphics for illustrations and designs that consist of shapes and lines;
- Raster graphics for photographs and other types of images; and
- Other multimedia objects.

In later PDF revisions, a PDF document can also support links (inside document or web page), forms, JavaScript (initially available as a plugin for Acrobat 3.0), or any other types of embedded contents that can be handled using plug-ins.

PDF combines three technologies:

- An equivalent subset of the PostScript page description programming language but in declarative form, for generating the layout and graphics.
- A font-embedding/replacement system to allow fonts to travel with the documents.
- A structured storage system to bundle these elements and any associated content into a single

file, with data compression where appropriate.

PostScript language

PostScript is a page description language run in an interpreter to generate an image.[8] It can handle graphics and has standard features of programming languages such as branching and looping.[8] PDF is a subset of PostScript, simplified to remove such control flow features, while graphics commands remain.[8]

PostScript was originally designed for a drastically different use case: transmission of one-way linear print jobs in which the PostScript interpreter would collect a series of commands until it encountered the `showpage` command, then execute all the commands to render a page as a raster image to a printing device.[19] PostScript was not intended for long-term storage and real-time interactive rendering of electronic documents to computer monitors, so there was no need to support anything other than consecutive rendering of pages.[19] If there was an error in the final printed output, the user would correct it at the application level and send a new print job in the form of an entirely new PostScript file. Thus, any given page in a PostScript file could be accurately rendered only as the cumulative result of executing all preceding commands to draw all previous pages—any of which could affect subsequent pages—plus the commands to draw that particular page, and there was no easy way to bypass that process to skip around to different pages.[19]

Traditionally, to go from PostScript to PDF, a source PostScript file (that is, an executable program) is used as the basis for generating PostScript-like PDF code (see, e.g., Adobe Distiller). This is done by applying standard compiler techniques like loop unrolling, inlining and removing unused branches, resulting in code that is purely declarative and static.[19] The result is then packaged into a container format, together with all necessary dependencies for correct rendering (external files, graphics, or fonts to which the document refers), and compressed. Modern applications write to printer drivers that directly generate PDF rather than going through PostScript first.

As a document format, PDF has several advantages over PostScript:

- PDF contains only static declarative PostScript code that can be processed as data, and does not require a full program interpreter or compiler.[19] This avoids the complexity and security risks of an engine with such a higher complexity level.
- Like Display PostScript, PDF has supported transparent graphics since version 1.4, while standard PostScript does not.
- PDF enforces the rule that the code for any particular page cannot affect any other pages.[19] That rule is strongly recommended for PostScript code too, but has to be implemented explicitly (see, e.g., the Document Structuring Conventions), as PostScript is a full programming language that allows for such greater flexibilities and is not limited to the concepts of pages and documents.
- All data required for rendering is included within the file itself, improving portability.[20]

Its disadvantages are:

- A loss of flexibility, and limitation to a single use case.

- A (sometimes much) larger file size.[21]

PDF since v1.6 supports embedding of interactive 3D documents: 3D drawings can be embedded using U3D or PRC and various other data formats.[22][23][24]

File format

A PDF file is organized using ASCII characters, except for certain elements that may have binary content. The file starts with a header containing a magic number (as a readable string) and the version of the format, for example `%PDF-1.7`. The format is a subset of a COS ("Carousel" Object Structure) format.[25] A COS tree file consists primarily of *objects*, of which there are nine types:[18]

- Boolean values, representing *true* or *false*
- Real numbers
- Integers
- Strings, enclosed within parentheses (`(...)`) or represented as hexadecimal within single angle brackets (`<...>`). Strings may contain 8-bit characters.
- Names, starting with a forward slash (`/`)
- Arrays, ordered collections of objects enclosed within square brackets (`[...]`)
- Dictionaries, collections of objects indexed by names enclosed within double angle brackets (`<<...>>`)
- Streams, usually containing large amounts of optionally compressed binary data, preceded by a dictionary and enclosed between the `stream` and `endstream` keywords.
- The null object

Comments using 8-bit characters prefixed with the percent sign (`%`) may be inserted.

Objects may be either *direct* (embedded in another object) or *indirect*. Indirect objects are numbered with an *object number* and a *generation number* and defined between the `obj` and `endobj` keywords if residing in the document root. Beginning with PDF version 1.5, indirect objects (except other streams) may also be located in special streams known as *object streams* (marked `/Type /ObjStm`). This technique enables non-stream objects to have standard stream filters applied to them, reduces the size of files that have large numbers of small indirect objects and is especially useful for *Tagged PDF*. Object streams do not support specifying an object's *generation number* (other than 0).

An index table, also called the cross-reference table, is located near the end of the file and gives the byte offset of each indirect object from the start of the file.[26] This design allows for efficient random access to the objects in the file, and also allows for small changes to be made without rewriting the entire file (*incremental update*). Before PDF version 1.5, the table would always be in a special ASCII format, be marked with the `xref` keyword, and follow the main body composed of indirect objects. Version 1.5 introduced optional *cross-reference streams*, which have the form of a standard stream object, possibly with filters applied. Such a stream may be used instead of the ASCII cross-reference table and contains the offsets and other information in binary format. The format is flexible in that it allows for integer width specification (using the `/W` array), so that for

example, a document not exceeding 64 KiB in size may dedicate only 2 bytes for object offsets. To ensure backward compatibility, a hybrid-reference PDF file may include both traditional cross-reference tables and cross-reference streams, allowing older PDF processors to read the file while still taking advantage of the new features introduced in version 1.5.[27]

At the end of a PDF file is a footer containing

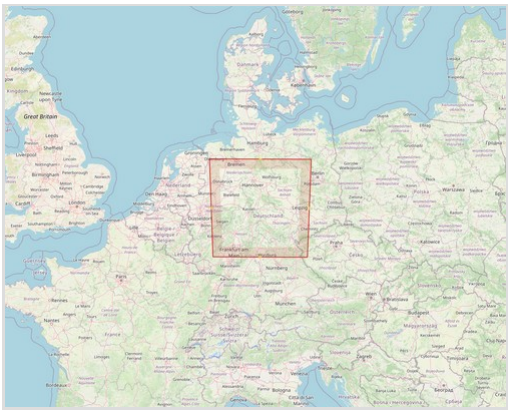
- The `startxref` keyword followed by an offset to the start of the cross-reference table (starting with the `xref` keyword) or the cross-reference stream object, followed by
- The `%%EOF` end-of-file marker.

If a cross-reference stream is not being used, the footer is preceded by the `trailer` keyword followed by a dictionary containing information that would otherwise be contained in the cross-reference stream object's dictionary:

- A reference to the root object of the tree structure, also known as the *catalog* (`/Root`)
- The count of indirect objects in the cross-reference table (`/Size`)
- Other optional information

Within each page, there are one or multiple content streams that describe the text, vector and images being drawn on the page. The content stream is stack-based, similar to PostScript.[28]

There are two layouts to the PDF files: non-linearized (not "optimized") and linearized ("optimized"). Non-linearized PDF files can be smaller than their linear counterparts, though they are slower to access because portions of the data required to assemble pages of the document are scattered throughout the PDF file. Linearized PDF files (also called "optimized" or "web optimized" PDF files) are constructed in a manner that enables them to be read in a Web browser plugin without waiting for the entire file to download, since all objects required for the first page to display are optimally organized at the start of the file.[29] PDF files may be optimized using Adobe Acrobat software or QPDF.



The maximum size of an Acrobat PDF page, superimposed on a map of Europe.

Page dimensions are not limited by the format itself. However, Adobe Acrobat imposes a limit of 15 million by 15 million inches, or 225,000,000,000,000 square inches (145,161 km²; 56,047 sq mi), an area slightly larger than Tajikistan.[2]:1129

Imaging model

The basic design of how graphics are represented in PDF is very similar to that of PostScript, except for the use of transparency, which was added in PDF 1.4.

PDF graphics use a device-independent Cartesian coordinate system to describe the surface of a

page. A PDF page description can use a matrix to scale, rotate, or skew graphical elements. A key concept in PDF is that of the *graphics state*, which is a collection of graphical parameters that may be changed, saved, and restored by a *page description*. PDF has (as of version 2.0) 25 graphics state properties, of which some of the most important are:

- The *current transformation matrix* (CTM), which determines the coordinate system
- The *clipping path*
- The *color space*
- The *alpha constant*, which is a key component of transparency
- *Black point compensation* control (introduced in PDF 2.0)

Vector graphics

As in PostScript, vector graphics in PDF are constructed with *paths*. Paths are usually composed of lines and cubic Bézier curves, but can also be constructed from the outlines of text. Unlike PostScript, PDF does not allow a single path to mix text outlines with lines and curves. Paths can be stroked, filled, fill then stroked, or used for clipping. Strokes and fills can use any color set in the graphics state, including *patterns*. PDF supports several types of patterns. The simplest is the *tiling pattern* in which a piece of artwork is specified to be drawn repeatedly. This may be a *colored tiling pattern*, with the colors specified in the pattern object, or an *uncolored tiling pattern*, which defers color specification to the time the pattern is drawn. Beginning with PDF 1.3 there is also a *shading pattern*, which draws continuously varying colors. There are seven types of shading patterns of which the simplest are the *axial shading* (Type 2) and *radial shading* (Type 3).

Raster images

Raster images in PDF (called *Image XObjects*) are represented by dictionaries with an associated stream. The dictionary describes the properties of the image, and the stream contains the image data. (Less commonly, small raster images may be embedded directly in a page description as an *inline image*.) Images are typically *filtered* for compression purposes. Image filters supported in PDF include the following general-purpose filters:

- *ASCII85Decode*, a filter used to put the stream into 7-bit ASCII,
- *ASCIIHexDecode*, similar to ASCII85Decode but less compact,
- *FlateDecode*, a commonly used filter based on the deflate algorithm defined in RFC 1951 (https://www.rfc-editor.org/rfc/rfc1951) (deflate is also used in the gzip, PNG, and zip file formats among others); introduced in PDF 1.2; it can use one of two groups of predictor functions for more compact zlib/deflate compression: *Predictor 2* from the TIFF 6.0 specification and predictors (filters) from the PNG specification (RFC 2083 (https://www.rfc-editor.org/rfc/rfc2083)),
- *LZWDecode*, a filter based on LZW Compression; it can use one of two groups of predictor functions for more compact LZW compression: *Predictor 2* from the TIFF 6.0 specification and predictors (filters) from the PNG specification,
- *RunLengthDecode*, a simple compression method for streams with repetitive data using the run-length encoding algorithm and the image-specific filters,

- *DCTDecode*, a lossy filter based on the JPEG standard,
- *CCITTFaxDecode*, a lossless bi-level (black/white) filter based on the Group 3 or Group 4 CCITT (ITU-T) fax compression standard defined in ITU-T T.4 and T.6,
- *JBIG2Decode*, a lossy or lossless bi-level (black/white) filter based on the JBIG2 standard, introduced in PDF 1.4, and
- *JPXDecode*, a lossy or lossless filter based on the JPEG 2000 standard, introduced in PDF 1.5.

Normally all image content in a PDF is embedded in the file. But PDF allows image data to be stored in external files by the use of *external streams* or *Alternate Images*. Standardized subsets of PDF, including PDF/A and PDF/X, prohibit these features.

Text

Text in PDF is represented by *text elements* in page content streams. A text element specifies that *characters* should be drawn at certain positions. The characters are specified using the *encoding* of a selected *font resource*.

A font object in PDF is a description of a digital typeface. It may either describe the characteristics of a typeface, or it may include an embedded *font file*. The latter case is called an *embedded font* while the former is called an *unembedded font*. The font files that may be embedded are based on widely used standard digital font formats: Type 1 (and its compressed variant CFF), TrueType, and (beginning with PDF 1.6) OpenType. Additionally PDF supports the Type 3 variant in which the components of the font are described by PDF graphic operators.

Fourteen typefaces, known as the *standard 14 fonts* or *base fourteen fonts*,[30] have a special significance in PDF documents:

- Times (v3) (in regular, italic, bold, and bold italic)
- Courier (in regular, oblique, bold and bold oblique)
- Helvetica (v3) (in regular, oblique, bold and bold oblique)
- Symbol
- Zapf Dingbats

These fonts, or suitable substitute fonts with the same metrics, should be available in most PDF readers, but they are not *guaranteed* to be available in the reader, and may only display correctly if the system has them installed.[31] Fonts may be substituted if they are not embedded in a PDF.

Within text strings, characters are shown using *character codes* (integers) that map to glyphs in the current font using an *encoding*. There are several predefined encodings, including *WinAnsi*, *MacRoman*, and many encodings for East Asian languages and a font can have its own built-in encoding. (Although the WinAnsi and MacRoman encodings are derived from the historical properties of the Windows and Macintosh operating systems, fonts using these encodings work equally well on any platform.) PDF can specify a predefined encoding to use, the font's built-in encoding or provide a lookup table of differences to a predefined or built-in encoding (not recommended with TrueType fonts).[2] The encoding mechanisms in PDF were designed for Type 1 fonts, and the rules for applying them to TrueType fonts are complex.

For large fonts or fonts with non-standard glyphs, the special encodings *Identity-H* (for horizontal writing) and *Identity-V* (for vertical) are used. With such fonts, it is necessary to provide a *ToUnicode* table if semantic information about the characters is to be preserved.

A text document which is scanned to PDF without the text being recognised by optical character recognition (OCR) is an image, with no fonts or text properties.

Transparency

The original imaging model of PDF was *opaque,* similar to PostScript, where each object drawn on the page completely replaced anything previously marked in the same location. In PDF 1.4 the imaging model was extended to allow transparency. When transparency is used, new objects interact with previously marked objects to produce blending effects. The addition of transparency to PDF was done by means of new extensions that were designed to be ignored in products written to PDF 1.3 and earlier specifications. As a result, files that use a small amount of transparency might be viewed acceptably by older viewers, but files making extensive use of transparency could be viewed incorrectly by an older viewer.

The transparency extensions are based on the key concepts of *transparency groups*, *blending modes*, *shape*, and *alpha*. The model is closely aligned with the features of Adobe Illustrator version 9. The blend modes were based on those used by Adobe Photoshop at the time. When the PDF 1.4 specification was published, the formulas for calculating blend modes were kept secret by Adobe. They have since been published.[32]

The concept of a transparency group in PDF specification is independent of existing notions of "group" or "layer" in applications such as Adobe Illustrator. Those groupings reflect logical relationships among objects that are meaningful when editing those objects, but they are not part of the imaging model.

Additional features

Logical structure and accessibility

A **tagged PDF** (see clause 14.8 in ISO 32000) includes document structure and semantics information to enable reliable text extraction and accessibility.[33] Technically speaking, tagged PDF is a stylized use of the format that builds on the logical structure framework introduced in PDF 1.3. Tagged PDF defines a set of standard structure types and attributes that allow page content (text, graphics, and images) to be extracted and reused for other purposes.[34]

Tagged PDF is not required in situations where a PDF file is intended only for print. Since the feature is optional, and since the rules for tagged PDF were relatively vague in ISO 32000-1, support for tagged PDF among consuming devices, including assistive technology (AT), is uneven as of 2021.[35] ISO 32000-2, however, includes an improved discussion of tagged PDF which is anticipated to facilitate further adoption.

An ISO-standardized subset of PDF specifically targeted at accessibility, PDF/UA, was first published in 2012.

Optional Content Groups (layers)

With the introduction of PDF version 1.5 (2003) came the concept of Layers. Layers, more formally known as Optional Content Groups (OCGs), refer to sections of content in a PDF document that can be selectively viewed or hidden by document authors or viewers. This capability is useful in CAD drawings, layered artwork, maps, multi-language documents, etc.

Basically, it consists of an Optional Content Properties Dictionary added to the document root. This dictionary contains an array of Optional Content Groups (OCGs), each describing a set of information and each of which may be individually displayed or suppressed, plus a set of Optional Content Configuration Dictionaries, which give the status (Displayed or Suppressed) of the given OCGs.

Encryption and signatures

A PDF file may be encrypted, for security, in which case a password is needed to view or edit the contents. PDF 2.0 defines 256-bit AES encryption as the standard for PDF 2.0 files. The PDF Reference also defines ways that third parties can define their own encryption systems for PDF.

PDF files may be digitally signed, to provide secure authentication; complete details on implementing digital signatures in PDF are provided in ISO 32000-2.

PDF files may also contain embedded DRM restrictions that provide further controls that limit copying, editing, or printing. These restrictions depend on the reader software to obey them, so the security they provide is limited.

The standard security provided by PDF consists of two different methods and two different passwords: a *user password*, which encrypts the file and prevents opening, and an *owner password*, which specifies operations that should be restricted even when the document is decrypted, which can include modifying, printing, or copying text and graphics out of the document, or adding or modifying text notes and AcroForm fields. The user password encrypts the file, while the owner password does not, instead relying on client software to respect these restrictions. An owner password can easily be removed by software, including some free online services.[36] Thus, the use restrictions that a document author places on a PDF document are not secure, and cannot be assured once the file is distributed; this warning is displayed when applying such restrictions using Adobe Acrobat software to create or edit PDF files.

Even without removing the password, most freeware or open source PDF readers ignore the permission "protections" and allow the user to print or make copies of excerpts of the text as if the document were not limited by password protection.[37][38][39]

Beginning with PDF 1.5, Usage rights (UR) signatures are used to enable additional interactive features that are not available by default in a particular PDF viewer application. The signature is

used to validate that the permissions have been granted by a bona fide granting authority. For example, it can be used to allow a user:[40]

- To save the PDF document along with a modified form or annotation data
- Import form data files in FDF, XFDF, and text (CSV/TSV) formats
- Export form data files in FDF and XFDF formats
- Submit form data
- Instantiate new pages from named page templates
- Apply a digital signature to existing digital signature form field
- Create, delete, modify, copy, import, and export annotations

For example, Adobe Systems grants permissions to enable additional features in Adobe Reader, using public-key cryptography. Adobe Reader verifies that the signature uses a certificate from an Adobe-authorized certificate authority. Any PDF application can use this same mechanism for its own purposes.[40]

Under specific circumstances including non-patched systems of the receiver, the information the receiver of a digital signed document sees can be manipulated by the sender after the document has been signed by the signer.[41]

PAdES (*PDF Advanced Electronic Signatures*) is a set of restrictions and extensions to PDF and ISO 32000-1[42] making it suitable for advanced electronic signatures. This is published by ETSI as TS 102 778.[43]

File attachments

PDF files can have file attachments which processors may access and open or save to a local filesystem.[44]

Metadata

PDF files can contain two types of metadata.[2] The first is the Document Information Dictionary, a set of key/value fields such as author, title, subject, creation and update dates. This is optional and is referenced from an `Info` key in the trailer of the file. A small set of fields is defined and can be extended with additional text values if required. This method is deprecated in PDF 2.0.

In PDF 1.4, support was added for Metadata Streams, using the Extensible Metadata Platform (XMP) to add XML standards-based extensible metadata as used in other file formats. PDF 2.0 allows metadata to be attached to any object in the document, such as information about embedded illustrations, fonts, and images, as well as the whole document (attaching to the document catalog), using an extensible schema.

PDF documents can also contain display settings, including the page display layout and zoom level in a Viewer Preferences object. Adobe Reader uses these settings to override the user's default settings when opening the document.[45] The free Adobe Reader cannot remove these settings.

Accessibility

PDF files can be created specifically to be accessible to people with disabilities.[46][47][48][49][50] PDF file formats in use as of 2014 can include tags, text equivalents, captions, audio descriptions, and more. Some software can automatically produce tagged PDFs, but this feature is not always enabled by default.[51][52] Leading screen readers, including JAWS, Window-Eyes, Hal, and Kurzweil 1000 and 3000 can read tagged PDFs.[53][54] Moreover, tagged PDFs can be re-flowed and magnified for readers with visual impairments. Adding tags to older PDFs and those that are generated from scanned documents can present some challenges.

One of the significant challenges with PDF accessibility is that PDF documents have three distinct views, which, depending on the document's creation, can be inconsistent with each other. The three views are (i) the physical view, (ii) the tags view, and (iii) the content view. The physical view is displayed and printed (what most people consider a PDF document). The tags view is what screen readers and other assistive technologies use to deliver high-quality navigation and reading experience to users with disabilities. The content view is based on the physical order of objects within the PDF's content stream and may be displayed by software that does not fully support the tags' view, such as the Reflow feature in Adobe's Reader.

PDF/UA, the International Standard for accessible PDF based on ISO 32000-1 was first published as ISO 14289–1 in 2012 and establishes normative language for accessible PDF technology. PDF/UA addresses accessibility of the PDF format it brings the ideas behind WCAG 2.0 to establish PDF-specific accessibility rules.[55]

Multimedia

Rich Media PDF is a PDF file including interactive content that can be embedded or linked within the file. It can contain images, audio, video content, or buttons. For example, if the interactive PDF is a digital catalog for an E-commerce business, products can be listed on the PDF pages and can be added with images and links to the website and buttons to order directly from the document.

Forms

Interactive Forms is a mechanism to add forms to the PDF file format. PDF currently supports two different methods for integrating data and PDF forms. Both formats today coexist in the PDF specification:[40][56][57][58]

- AcroForms (also known as Acrobat forms), introduced in the PDF 1.2 format specification and included in all later PDF specifications.
- XML Forms Architecture (XFA) forms, introduced in the PDF 1.5 format specification. Adobe XFA Forms are not compatible with AcroForms.[59] XFA was deprecated from PDF with PDF 2.0.

AcroForms were introduced in the PDF 1.2 format. AcroForms permit the uses of objects (*e.g.* text boxes, Radio buttons, *etc.*) and some code (*e.g.* JavaScript). Alongside the standard PDF action types, interactive forms (AcroForms) support submitting, resetting, and importing data. The "submit" action transmits the names and values of selected interactive form fields to a specified

uniform resource locator (URL). Interactive form field names and values may be submitted in any of the following formats, (depending on the settings of the action's ExportFormat, SubmitPDF, and XFDF flags):[40]

HTML Form format
: HTML 4.01 Specification since PDF 1.5; HTML 2.0 since 1.2

Forms Data Format (FDF)
: based on PDF, uses the same syntax and has essentially the same file structure, but is much simpler than PDF since the body of an FDF document consists of only one required object. Forms Data Format is defined in the PDF specification (since PDF 1.2). The Forms Data Format can be used when submitting form data to a server, receiving the response, and incorporating it into the interactive form. It can also be used to export form data to stand-alone files that can be imported back into the corresponding PDF interactive form. FDF was originally defined in 1996 as part of ISO 32000-2:2017.

XML Forms Data Format (XFDF)
: (external XML Forms Data Format Specification, Version 2.0; supported since PDF 1.5; it replaced the "XML" form submission format defined in PDF 1.4) the XML version of Forms Data Format, but the XFDF implements only a subset of FDF containing forms and annotations. Some entries in the FDF dictionary do not have XFDF equivalents – such as the Status, Encoding, JavaScript, Page's keys, EmbeddedFDFs, Differences, and Target. In addition, XFDF does not allow the spawning, or addition, of new pages based on the given data; as can be done when using an FDF file. The XFDF specification is referenced (but not included) in PDF 1.5 specification (and in later versions). It is described separately in *XML Forms Data Format Specification*.[60] The PDF 1.4 specification allowed form submissions in XML format, but this was replaced by submissions in XFDF format in the PDF 1.5 specification. XFDF conforms to the XML standard. XFDF can be used in the same way as FDF; e.g., form data is submitted to a server, modifications are made, then sent back and the new form data is imported in an interactive form. It can also be used to export form data to stand-alone files that can be imported back into the corresponding PDF interactive form. As of August 2019, XFDF 3.0 is an ISO/IEC standard under the formal name *ISO 19444-1:2019 - Document management — XML Forms Data Format — Part 1: Use of ISO 32000-2 (XFDF 3.0)*.[61] This standard is a normative reference of ISO 32000-2.

PDF

The entire document can be submitted rather than individual fields and values, as was defined in PDF 1.4.

AcroForms can keep form field values in external stand-alone files containing key-value pairs. The external files may use Forms Data Format (FDF) and XML Forms Data Format (XFDF) files.[62][60][63] The usage rights (UR) signatures define rights for import form data files in FDF, XFDF, and text (CSV/TSV) formats, and export form data files in FDF and XFDF formats.[40]

In PDF 1.5, Adobe Systems introduced a proprietary format for forms; Adobe XML Forms Architecture (XFA). Adobe XFA Forms are not compatible with ISO 32000's AcroForms feature, and most PDF processors do not handle XFA content. The XFA specification is referenced from ISO 32000-1/PDF 1.7 as an external proprietary specification and was entirely deprecated from PDF with ISO 32000-2 (PDF 2.0).

Licensing

Anyone may create applications that can read and write PDF files without having to pay royalties to Adobe Systems; Adobe holds patents to PDF, but licenses them for royalty-free use in developing software complying with its PDF specification.[64]

Security

Changes to content

In November 2019, researchers from Ruhr University Bochum and Hackmanit GmbH published attacks on digitally signed PDFs.[65] They showed how to change the visible content in a signed PDF without invalidating the signature in 21 of 22 desktop PDF viewers and 6 of 8 online validation services by abusing implementation flaws. At the same conference, they additionally showed how to exfiltrate the plaintext of encrypted content in PDFs.[66] In 2021, they showed new so-called *shadow attacks* on PDFs that abuse the flexibility of features provided in the specification.[67] An overview of security issues in PDFs regarding denial of service, information disclosure, data manipulation, and arbitrary code execution attacks was presented by Jens Müller.[68][69]

Malware vulnerability

Some popular PDF readers have a history of security vulnerabilities that allows PDF files that have been infected with viruses, Trojans, and other malware to inflict damage. Such PDF files can have hidden JavaScript code that might exploit vulnerabilities in a PDF reader, hidden objects executed when the file that hides them is opened, and, less commonly, a malicious PDF can launch malware.[70]

PDF attachments carrying viruses were first discovered in 2001. The virus, named *OUTLOOK.PDFWorm* or *Peachy*, uses Microsoft Outlook to send itself as an attached Adobe PDF file. It was activated with Adobe Acrobat, but not with Acrobat Reader.[71]

Over the years, several vulnerabilities have been discovered in various versions of Adobe Reader,[72] which prompted the company to issue security fixes. Vulnerabilities have been discovered in other PDF readers as well. One aggravating factor is that a PDF reader can be configured to start automatically if a web page has an embedded PDF file, providing a vector for attack. If a malicious web page contains an infected PDF file that takes advantage of a vulnerability in the PDF reader, the system may be compromised even if the browser is secure. Some of these vulnerabilities are a result of badly written PDF readers mishandling JavaScript embedded in the PDF file. Disabling JavaScript execution in the PDF reader can help mitigate such future exploits, although it does not protect against exploits in other parts of the PDF viewing software. Some security experts say that JavaScript is not essential for a PDF reader and that the security benefit that comes from disabling

JavaScript outweighs any compatibility issues caused.[73] One way of avoiding PDF file exploits is to have a local or web service convert files to another format before viewing.

On March 30, 2010, security researcher Didier Stevens reported an Adobe Reader and Foxit Reader exploit that runs a malicious executable if the user allows it to launch when asked.[74]

Zip bomb

PDF streams can have nested filters, which allows one to craft a 5 kilobyte file that unpacks to 1 petabyte in RAM. This can be used to cause a denial of service with implementations that don't guard against this like it was the case with pypdf (https://github.com/py-pdf/pypdf)'s CVE-2025-55197. [75][76]

Software

Viewers and editors

Many PDF viewers are provided free of charge from a variety of sources. Programs to manipulate and edit PDF files are available, usually for purchase. Additionally, most modern web browsers, including Chrome, Firefox, and Safari, include PDF viewing capabilities, replacing browser plugins that were previously created for such purposes.[77]

There are many software options for creating PDFs, including the PDF printing capabilities built into macOS, iOS,[78] and most Linux distributions. Much document processing software including LibreOffice, Microsoft Office 2007 (if updated to SP2) and later,[79] WordPerfect 9, and Scribus can export documents in PDF. There are many PDF print drivers for Microsoft Windows, the pdfTeX typesetting system, the DocBook PDF tools, applications developed around Ghostscript and Adobe Acrobat itself as well as Adobe InDesign, Adobe FrameMaker, Adobe Illustrator, Adobe Photoshop, that allow a "PDF printer" to be set up, which when selected sends output to a PDF file instead of a physical printer. Google's online office suite Google Docs allows uploading and saving to PDF. Some web apps offer free PDF editing and annotation tools.

The Free Software Foundation was "developing a free, high-quality and fully functional set of libraries and programs that implement the PDF file format and associated technologies to the ISO 32000 standard", as one of its high priority projects.[80][81] In 2011, however, the GNU PDF project was removed from the list of "high priority projects" due to the maturation of the Poppler library,[82] which has enjoyed wider use in applications such as Evince with the GNOME desktop environment. Poppler is based on Xpdf[83][84] code base. There are also commercial development libraries available as listed in List of PDF software.

The Apache PDFBox project of the Apache Software Foundation is an open source Java library, licensed under the Apache License, for working with PDF documents.[85]

Printing

Raster image processors (RIPs) are used to convert PDF files into a raster format suitable for imaging onto paper and other media in printers, digital production presses and prepress in a process known as rasterization. RIPs capable of processing PDF directly include the Adobe PDF Print Engine[86] from Adobe Systems and Jaws[87] and the Harlequin RIP from Global Graphics.

In 1993, the Jaws raster image processor from Global Graphics became the first shipping prepress RIP that interpreted PDF natively without conversion to another format. The company released an upgrade to its Harlequin RIP with the same capability in 1997.[88]

Agfa-Gevaert introduced and shipped Apogee, the first prepress workflow system based on PDF, in 1997.

Many commercial offset printers have accepted the submission of press-ready PDF files as a print source, specifically the PDF/X-1a subset and variations of the same.[89] The submission of press-ready PDF files is a replacement for the problematic need for receiving collected native working files.

In 2006, PDF was widely accepted as the standard print job format at the Open Source Development Labs Printing Summit. It is supported as a print job format by the Common Unix Printing System and desktop application projects such as GNOME, KDE, Firefox, Thunderbird, LibreOffice and OpenOffice have switched to emit print jobs in PDF.[90]

Some desktop printers also support direct PDF printing, which can interpret PDF data without external help.

Native display model

PDF was selected as the "native" metafile format for macOS (originally called Mac OS X), replacing the PICT format of the earlier classic Mac OS. The imaging model of the Quartz graphics layer is based on the model common to Display PostScript and PDF, leading to the nickname *Display PDF*. The Preview application can display PDF files, as can version 2.0 and later of the Safari web browser.[91][92] System-level support for PDF allows macOS applications to create PDF documents automatically, provided they support the OS-standard printing architecture. The files are then exported in PDF 1.3 format according to the file header. When taking a screenshot under Mac OS X versions 10.0 through 10.3, the image was also captured as a PDF; later versions save screen captures as a PNG file, though this behavior can be set back to PDF if desired.

Annotation

Adobe Acrobat is one example of proprietary software that allows the user to annotate, highlight, and add notes to already created PDF files. One UNIX application available as free software (under the GNU General Public License) is PDFedit. The freeware Foxit Reader, available for Microsoft Windows, macOS and Linux, allows annotating documents. Tracker Software's PDF-XChange Viewer allows annotations and markups without restrictions in its freeware alternative. Apple's

macOS's integrated PDF viewer, Preview, does also enable annotations as does the open-source software Skim, with the latter supporting interaction with LaTeX, SyncTeX, and PDFSync and integration with BibDesk reference management software. Freeware Qiqqa can create an annotation report that summarizes all the annotations and notes one has made across their library of PDFs. The Text Verification Tool exports differences in documents as annotations and markups.

There are also web annotation systems that support annotation in pdf and other document formats. In cases where PDFs are expected to have all of the functionality of paper documents, ink annotation is required.

Conversion and Information Extraction

PDF's emphasis on preserving the visual appearance of documents across different software and hardware platforms poses challenges to the conversion of PDF documents to other file formats and the targeted extraction of information, such as text, images, tables, bibliographic information, and document metadata. Numerous tools and source code libraries support these tasks. Several labeled datasets to test PDF conversion and information extraction tools exist and have been used for benchmark evaluations of the tool's performance.[93]

Alternatives

The Open XML Paper Specification is a competing format used both as a page description language and as the native print spooler format for Microsoft Windows since Windows Vista.

Mixed Object: Document Content Architecture is a competing format. MO:DCA-P is a part of Advanced Function Presentation.

See also

- ebook
- Web page
- XSL Formatting Objects
- Page margin
- PDF portfolio

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