Adobe™ Acrobat™

Press Backgrounder

An Overview of Acrobat Products and Technology

Overview

In the last decade, personal computer users have come to depend on their machines for a variety of tasks, nearly all of which culminate in the creation of documents. These can range from one-page spreadsheets or simple letters to more complex creations, such as newsletters or reports, that combine text, charts, graphs, illustrations and photographic images.

The computer has traditionally been a tool for building or authoring these documents, then printing them onto paper for distribution to their intended audiences. Despite many technological advances, computers have not been able to effectively communicate the digital documents they create.

Much of the difficulty for computer users in sharing computer-originated documents stems from the mix of computing platforms, configurations and applications found in most of today's offices. Incompatible hardware platforms, operating systems and application software have prevented sharing all but the most rudimentary documents. When it can be shared across these barriers, text must be exchanged only in character-based ASCII (American Standard Code for Information Exchange) format, which changes the nature of *all* documents, robbing them of any distinctive typefaces or page design and precluding the use of any color or graphic elements.

Adobe Systems Incorporated, developer of software technology for creating, displaying and printing digital documents, is overcoming these barriers with a new approach to document communication. The Adobe Acrobat product family allows users to send documents created on their computer to other computers electronically, regardless of hardware platform, operating system, application or font software used to create the original. The document can be read, annotated, printed and stored by the receiving computer. Adobe Acrobat products preserve the document's essential look and feel, and provide tools to aid the receiver in navigating through its pages on-screen.

Adobe Acrobat products will eliminate the need to distribute many documents in paper form and make possible, for the first time, effective universal electronic document communication, storage and retrieval. Computer users can distribute fully formatted documents containing distinctive typefaces, color, graphics and photographs in electronic form, and protect current investments in hardware and software. Documents can be communicated in one of two ways: as part of simple document distribution, in which recipients navigate, view and print documents; or document exchange, in which recipients navigate, view, print and annotate documents from others, and originate documents for transmission. This capacity for instantaneous communication of documents between computer users will be applicable to a broad range of business and consumer uses.

Adobe Acrobat Products

Adobe Acrobat software is a family of products that work together to enable document communication. The key individual products include:

Acrobat Reader – a software application that addresses the needs of information distributors and consumers. It enables users to view, navigate, and print documents represented in a special cross-platform file format, the Portable Document Format (PDF). Acrobat Reader software will be available for Macintosh®, Windows™, DOS and UNIX® platforms.

Acrobat Exchange – a software application that addresses the needs of document exchangers. It enables users to view, navigate, annotate and print PDF files. The PDF Writer will be included in this product to enable the creation and transmission of PDF files. Acrobat Exchange software will be available for Macintosh, Windows, DOS and UNIX platforms.

Acrobat PDF Writer – a platform-specific printer driver that produces PDF files from applications, so that documents can be sent across platforms. PDF Writers will be bundled with Acrobat Exchange versions for Macintosh and Windows, the environments where such a driver will be the primary means of producing PDF files.

Acrobat Distiller™ – a software program that translates PostScript™ language files into PDF files for information distributors. Acrobat Distiller software will be available for Macintosh, Windows and UNIX platforms.

Following is a description of the technical components of Acrobat products and how they work together to enable universal document communication.

The Technology Behind Adobe Acrobat : The Portable Document Format (PDF)

The key to the cross-platform functionality of Adobe Acrobat products is a unique PostScript language-based file format called the Portable Document Format. A PDF file can describe documents containing any combination of text, graphics and images in a device- and resolution-independent format. These documents can be one page or thousands of pages, very simple or extremely complex, with rich use of fonts, graphics, color and images.
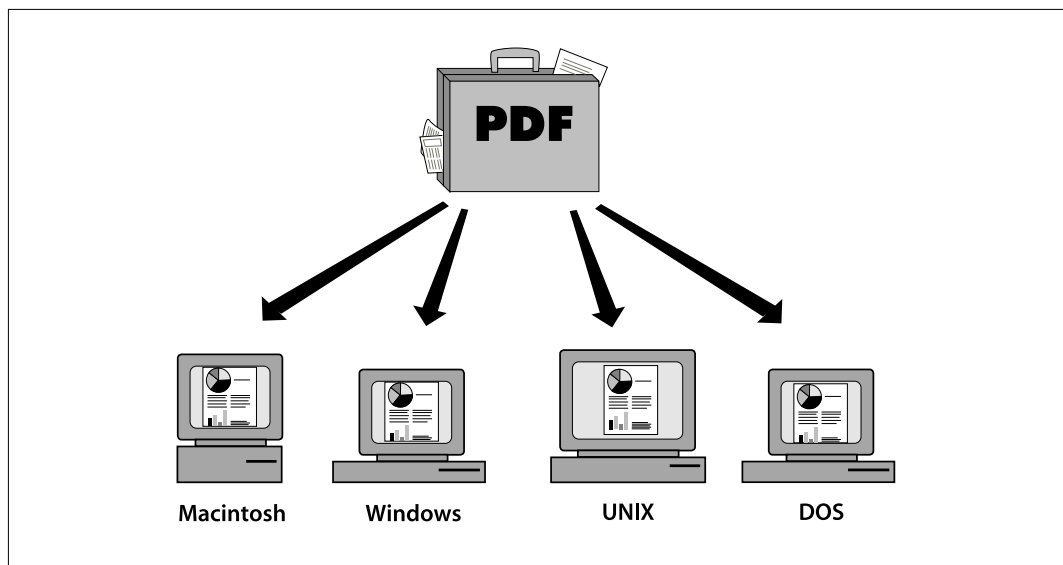

PDF, the specification for which Adobe will document and publish for use by software developers as an open standard, is designed to replicate the appearance of pages with the same high fidelity as the PostScript language. A PDF file uses the PostScript language to describe not only the visual (printable) aspects of a document, but also additional document elements such as annotations (notes), hypertext links, miniature "thumbnail" views of pages, and bookmarks.

Like the PostScript language, PDF files are both device- and resolution-independent. They appear on a computer display at the screen's highest possible resolution, regardless of the hardware design or manufacturer. Because it is device-independent, PDF represents information about page appearance in a manner that can be rendered by all major computers, display screens or output devices – an essential capability in today's world of multiplatform computing environments.

Creating PDF Files

Because the Portable Document Format is hardware platform, operating system and application neutral, virtually any document on any platform from any application can be converted into a PDF file.

A PDF file can be created from any application program that prints. The file may start as a word processing document, illustration from a drawing program, or a worksheet or graph from a spreadsheet program. The conversion from the document produced by the application into a PDF file is accomplished in one of two ways – either by using the specially designed printer driver, called the Acrobat PDF Writer, or through the software translation program, called the Acrobat Distiller.
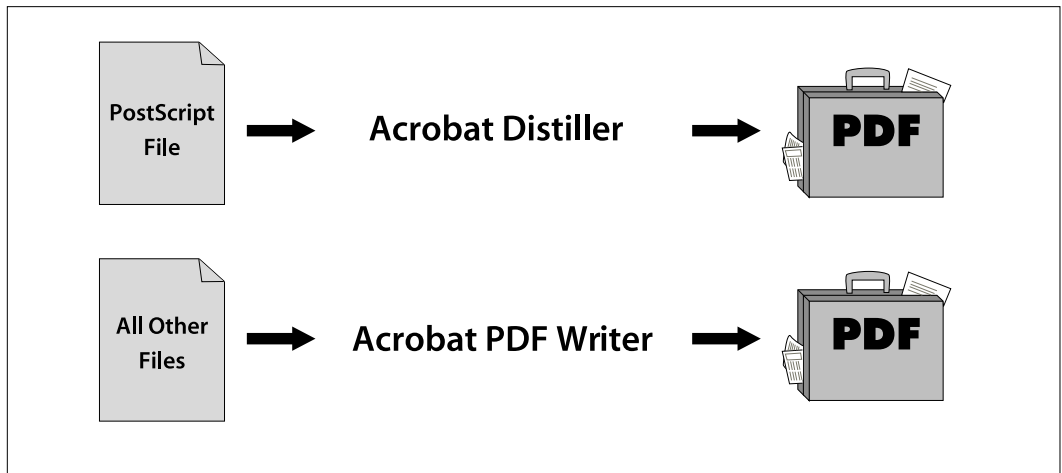
To produce a PDF file using the PDF Writer, the user simply creates a document with a favorite application and proceeds as if to print the pages. In a special print dialog, the option of creating a PDF file is presented to the user. The PDF Writer is designed to translate most files created on PCs running Windows and on Macintosh computers. The PDF Writer essentially converts GDI (for Windows) or QuickDraw™ (for Macintosh) document descriptions into PDF descriptions and uses the standard system-level printing interfaces to communicate with applications.

Acrobat Distiller software translates PostScript language files into PDF files. It is designed to create PDF files from computing environments such as UNIX and DOS, where printer drivers do not exist. In addition, Acrobat Distiller helps users create PDF files from documents that contain placed Encapsulated PostScript (EPS) language artwork or images, as well as from documents created in applications that bypass system-level printing facilities and generate their own PostScript language files for printing.

Small, Portable Files

The PDF is 7-bit ASCII, which means that it is extremely portable between diverse hardware and operating system environments. By international agreement, this standard is recognized by all computer hardware and software makers as a universal means of exchanging text information electronically.

While 7-bit ASCII formatting ensures the universality of PDF files, data compresssion makes them compact for speedy transmission and low demand on memory space. Compression algorithms such as LZW®, RLE, CCITT Group 3 and 4, and JPEG are used to keep file sizes manageable. Compression of information within a PDF file will occur in the PDF Writer or Acrobat Distiller software, and decompression will take place on the fly within Acrobat Reader or Acrobat Exchange software.

With JPEG, color and grayscale images can be compressed by a factor of 10:1 or more. The effective compression of monochrome images is highly dependent on the compression filter used and the properties of the image, but factors of 2:1 to 8:1 are common. LZW compression of text and graphics comprising the balance of the document results in compression ratios of approximately 2:1.

For all but the most graphics-intensive documents, PDF files will be significantly smaller than the CCITT Group 3-compressed counterparts used for facsimile. A 200-dpi CCITT Group 3 file of 50 to 65K per page, for example, would require only 5 to 10K per page as a PDF file, and would be capable of printing at 300 dpi or any other required resolution. The reduction in file size translates into shorter transmission times across networks and phone lines and less demand for memory space, saving time and money. In addition, traditional document imaging systems that represent document pages as Group 4 images are restricted by fixed resolution, no color, no ability to search for content, and limited portability.

The universality of PDF and the effectiveness of its compression scheme allow PDF files to be communicated by a variety of means – over LAN networks, on CD-ROM or magnetic diskette, or over telecommunications networks or other electronic highways. Before Adobe's PDF, the only universal language available for this type of cross-platform communication was ASCII text. PDF provides the first universal alternative to ASCII, and the only reliable means of conveying formatted information with graphics and photographs between platforms.

With PDF, authors or publishers can create documents in a single format, then send them to computer users on many platforms. These documents can be viewed or printed by any computer equipped with Acrobat Reader or Acrobat Exchange software. This eliminates the need to publish documents in formats specific to each intended reader's computer system.

Acrobat Exchange Software

Acrobat Exchange software lets users view, navigate, annotate and print incoming PDF documents. Its graphical interface provides clear, intuitive access to all of its functions.

Acrobat Exchange includes navigational tools that can pan, scroll and zoom, and allow the user to access different portions of a document using miniature "thumbnail" representations of each page. The thumbnails appear in the margin of the main window and are visible independently from the document open on-screen. The user can leaf through the thumbnails as if they were bound in a magazine, then jump from the page on-screen to a distant page by mouse-clicking the thumbnail for the destination page.

Acrobat Exchange also has a "live links" feature that enables users to create cross-references within or across PDF documents. For example, an organization chart could contain "deep" information that would enable a reader to simply click on a name to reveal the person's biography.

Acrobat Exchange software even allows the reader to annotate PDF files by affixing electronic "sticky" notes to them. These notes are transmitted along with the main PDF file, and may be hidden or displayed at the reader's discretion.

Acrobat Exchange software includes the PDF Writer printer driver to enable document creation and transmission.

Font Substitution

A key component of Adobe Acrobat software is a font substitution capability that solves one of the fundamental barriers to document communication, "the font problem." In current systems, if a computer lacks a font in a document received, the user may not be able to view or print the document, or the computer may substitute a different font for the absent one, drastically altering the document's appearance or making it completely illegible.

Adobe Acrobat products use Adobe's multiple master font technology to solve the font problem in document communication. Multiple master fonts were developed by Adobe as an extension to its Type 1 font format. They can allow users to control weight, width, size and style of type across a broad adjustable range.

PDF files carry the metrics and other information about the fonts used in a document, without actually including the font. The PDF file contains information about the weight, width, size and style of the typefaces in the document, as well as the names of the specific fonts. When the receiver of a PDF file lacks a typeface in a document, Acrobat software reads the metrics and simulates the absent fonts with a

original

simulated font
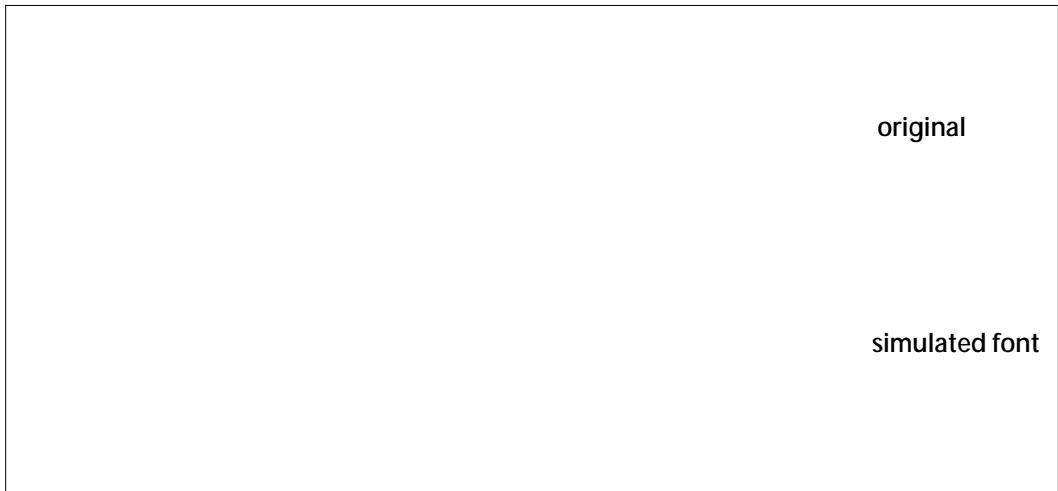
special Adobe multiple master typeface. The appearance of the unavailable font is approximated so closely that, even if the recipient has none of the fonts in the original document, the relative size, boldness and style of type on the page is retained, preserving the look and feel of text on the page.

Acrobat software uses two special multiple master fonts, a serif and sans serif design, developed with a wide dynamic range to effectively simulate a vast number and variety of text typefaces.

Acrobat Publisher's Tools

In the future, a set of tools for corporate and commercial publishers will provide a means of creating new PDF documents with a variety of enhanced functions. Publishers will use these tools to add value to PDF versions of their publications, which could be distributed on-line or on CD-ROM with versions of Acrobat Reader software. The Acrobat publisher's tools will enable automatic "live-linked" indexes for documents, allowing the reader to locate any passage instantly by clicking on its entry in the index. The tools also will accommodate popular search-engine software, which will enable the user to locate any word or entry in a document instantly, or even cross-reference different subjects within a document or set of documents.

Another possibility is the creation of "deep" advertisements within electronic documents. An interested reader could, for example, click on a photo of an advertised product and gain access to more detailed information about it, such as performance specifications or a list of local dealers.

In addition, Adobe Acrobat products will provide support for representing document structure, such as that written in the Standard Generalized Markup Language (SGML), and for file formats of different applications.

Markets for Adobe Acrobat Products

The ability to send and receive fully formatted electronic documents immediately lends itself to two uses: personal and mass communication. To fully realize its long-term potential, any significant document communication strategy must fulfill the requirements of both markets today.

Personal Communication

Communication is a primary area of immediate use for Adobe Acrobat products. In this context, communication may be defined as enabling a group of computer users to create and send an electronic document to other members of the group, even if their computer system and applications are different.

Communication roles for Adobe Acrobat products can be characterized as server-based or telecommunications-based. Server-based applications involve the communication of computer files in PDF across networks. The technology functions equally well within local-area networks (LANs), like those that might link computers within an office, and wide-area networks (WANs), like those that might connect co-workers across a campus of several buildings or branch offices across the country. Telecommuni-

cations-based document communication enables electronic documents to be sent across telephone lines by modem. This is useful for communicating information between distant offices and is also ideal for traveling executives who use portable computers.

For business users, documents in Adobe's PDF can replace much of the paper correspondence that litters office desktops. The result will be greater convenience, increased productivity, significant cost reductions and more effective communication. Adobe Acrobat products will cut expenses associated with printing and photocopying documents, conveying them from sender to recipient, and filing and tracking them for future use. It will also reduce expenses – of both money and time – associated with moving paper documents from centralized corporate publishing sites to their target readers. Adobe Acrobat products will allow readers to print just the pages they need on their own office printers, any time and in any quantity they desire.

Mass Communication

Electronic publishing, which may be defined as production and distribution of documents from a single source to many readers at remote sites, can itself be divided into two segments: commercial and corporate or business publishers. Commercial publishers make their profits directly from the sale of information and advertising in publications such as newspapers, magazines and books. Business publishers create and distribute documents in the course of business activity. Such documents include procedural manuals, technical documentation or user manuals, annual reports and marketing studies.

With the Adobe Acrobat family of products, both ventures may take advantage of publishing media that are more cost-effective than paper, including on-line, or server-based, transmission, CD-ROM, and any use of the existing electronic highways. On-line, or server-based, electronic publishing involves direct transmission of documents over computer networks or telecommunications channels. The publisher might send documents to the reader across these channels, or the reader might access a server and order desired documents.

CD-ROM electronic publishing entails the use of read-only optical compact discs as a publishing medium. The publisher distributes these discs to readers, who view them using a CD-ROM drive. CD-ROM is rapidly gaining popularity as a publishing vehicle because it offers impressive information storage capability and permits very quick access to information stored anywhere on the disc.

Adobe Acrobat software offers advantages both to on-line and CD-ROM publishers by enabling documents to be published in a format that any computer user can read. For the first time, networked computers on different platforms will be able to easily communicate files that contain graphics, photographs and complex layouts. Acrobat software also eliminates the need to publish different CD-ROMs for every target computing system.

The Emerging Document Communication Field

The field of document communication is in its infancy, and a number of products and technologies have been announced that offer some capabilities of document communication. Some of them will compete with Adobe Acrobat products, while others will be complementary to them.

Many of the emerging technologies are more limited in scope than Adobe Acrobat products. Some are designed for multiplatform publishing, but not communication; others allow two-way exchange of documents, but are limited to specific platforms or applications. Adobe is committed to developing Adobe Acrobat products for universal document communication, offering full publishing and communication functionality on all major platforms, operating systems and applications.

As it evolves, document communication will mark a convergence of technical advancements in the areas of computer publishing, printing and information distribution, video and telecommunications. Because the PostScript language is already a standard in these areas, Adobe is well aware of their collective and individual needs. This insight, as well as experience as an innovator in platform-independent software, places Adobe in a strong position to lead the way toward digital document communication of the future.

Future Technology Directions for Adobe Acrobat Products

As electronic document communication becomes a reality, the requirements of the technology and users' needs will continue to grow and expand. Adobe is developing advanced technologies for the extension of Adobe Acrobat products and the Portable Document Format. These include products that will incorporate optical page recognition, enable direct editing of PDF documents, and manage large numbers of documents, as well as extensions to PDF that will include audio and video segments.

For the last ten years, Adobe Systems has been a pioneer in the development of technology for the creation, display and printing of electronic documents. Adobe's knowledge of electronic documents and the people who use them have led the company to embrace document communication as the next logical step in its evolution.

In the 1980s, Adobe anticipated the needs of office users with PostScript software technology that allowed them to create, display and print professional-quality documents. In the 1990s, with the introduction of Adobe Acrobat products, Adobe will take communication to the next phase of its evolution.