Internet-aware Acrobat 2.0 PDF documents

Click on any of the icons or the boxed text below to resolve a variety of URLs

OVERVIEW

This document is a simple example of using a combination of Adobe Acrobat 2.0 pdf files and InternetLink a plugin extension for Acrobat 2.0 developed at the University of Minnesota.

GOPHER

• pdf document
• directory
• text document

With the Acrobat Exchange software and our plugin, you can place links to Internet resources in a pdf file by entering the appropriate Uniform Resource Locator (URL). Our InternetLink plugin extends the capabilites of the Acrobat link tool to allow you to enter links in pdf documents that refer to URLs for Internet resources like ftp servers, gopher servers and WWW servers.

FLASHY DEMO SECTION

FTP

• pdf document
•directory
• text document

If you have the InternetLink plugin installed along with Acrobat 2.0 Exchange, you can can see several colored boxes around the items in the left column; these boxes represent links to Internet resouces stored on a variety of servers. Assuming you have the appropriate protocol helper application installed, you can click on the links to resolve the references. Cool!

You can also make invisible links, so an even cooler demo than this document might be to put invisible links on a world map and let users travel the globe fetching items from gopher, ftp, and www servers. Since PDF is a real page description language, it is painless to control exactly how the pages are displayed. This is in contrast with HTML which doesn't let you control the exact layout, representation, or fonts used when your document is rendered. Authoring PDF is easy... use your favorite work processor (I'm using MacWrite Pro) and print to PDF directly or use the Acrobat Distiller to convert existing Postscript documents.

HTTP

• html document

WHY USE PDF AND URLs FOR INTERNET HYPERTEXT?

PDF has several advantages over the HTML documents for document delivery, but two objections to Acrobat have been that the viewer program is not free and pdf documents don't support internet-aware hypertext links. Acrobat 2.0 viewers are free which solves one of the two problems, and the InternetLink plugin helps solve the requirement for internet-aware hypertext links. While overcoming two problems with previous versions of Acrobat, Acrobat retains the virtues of the previous release. It is easy to compose document using off-the-shelf tools, you have tight control over the look and feel of the document, and you can easy to convert existing documents without manual page markup

One reason for looking at Acrobat as an alternative to HTML is the need in the scientific and technical community to support equations. Postscript's ability to specify fonts is a big help since you can display symbols.

PDF files are portable postscript documents and any popular word processor, drawing program, or page layout software can easily generate postscript. This makes it is easy to compose pages that can be converted into pdf. Since postscript gives you tight control over how the pages look, it is easy top do multi-column text or other fancy layouts. This is not the case with HTML documents.

The approach the WWW community has taken to supporting mathematical equations is to add URL support to TEX and call TEX documents from HTML documents. This is not a really general solution since the bulk of the machines in the world (the Macs and PCs) are not running TEX. Ideally, a page description language ought to be rich enough to handle special symbols for math and other special purpose applications (like musical notation).

HTML documents are based on a page *markup* language rather than a *page description* language... The idea behind page markup is to associate some semantics with parts of a document rather than to specify an exact look for the document. With HTML you don't really know how the document will look on the user's screen, and you cannot control which fonts are used, how sections are arranged, etc. If you are serious about graphic design you should be concerned by HTML's lack of control over presentation. Academics should also be concerned about a exclusive diet of nothing but HTML, since none of the current HTML viewers will render equations (unless you make the equation into an inline graphic). For instance, a meaningless equation $\Psi(\alpha) = \sin(i) + \xi$ can easily be dropping in a sentence.

One other item of note about Acrobat: when you generate the pdf files you can specify that the level of compression applied to graphic images and you can ask that text be compressed as well. This speeds up network transmission of pdf documents and minimizes the storage requirements for pdf.

The IETF standard for Uniform Resource Locators (URLs) will soon make hypertext documents very common outside of WWW. Expect to see all major page description languages become internet-aware (via URL links to net resources)

For instance, the same code we use in the InternetLink plugin is being added to our POPmail e-mail client so that POPmail users can treat URLs inside e-mail messages as hypertext links and resolve them directly.

In this sort of world a suite a protocol helpers is essential unless we are going to build gopher, ftp, http, and other clients into all word processing, email, drawing, and other programs. Embedding URLs into OpenDoc and OLE docuemnts will make hypertext a part of everyday computing.

HOW IT WORKS

When a user selects one of the links that refer to a URL, the InternetLink plugin calls the appropriate helper application for gopher, ftp, or http servers. This modular approach means that the InternetLink architecture is *open* and you can potentially substitute your favorite gopher, www, or ftp client for those supplied with the InternetLink plugin. Of course for such any open architecture to work, there need to be standards for how one application tells another to fetch a URL.

We currently have a working Macintosh InternetLink plugin (with a Windows plugin under contruction). On the Macintosh, the InternetLink plugin sends an OpenURL AppleEvent to signal the appropriate network application to fetch the URL. If the application can render the item referenced by the URL it does; otherwise it calls an appropriate application to display the item. For instance, TurboGopher renders text, gopher search engines, and directories itself, but calls Acrobat to display PDF files. This means that if the URL points to another PDF document, you have a seamless PDF experience. (**click here**). An application like Fetch can be configured to automatically guess at file types based on filename extension, so its also easy to make even PDF items residing on an ftp server accessible in a seamless way with the InternetLink plugin.

Most of the major players in the Macintosh client development arena are working out a common GetURL event, so Macintosh inter-client communication will soon be standardized.

The current Macintosh InternetLink plugin uses AppleEvents to call TurboGopher 2.0 and MacWeb but there are some minor differences in how TurboGopher, Anarchie, NewsWatcher and MacWeb support these AppleEvents, and Fetch does not yet support GetURLs (although it probably will in the next release). So, although the InternetLink plugin is using a couple different methods to call helper applications, this should be greatly simplified in the near future as new clients support a common GetURL event. Note that GetURL support is important even to E-mail client writers, since it will make it easy to add URL support to e-mail clients such as POPmail and Eudora. In any case, so that we have something useful while we wait for the next release of MacWeb, TurboGopher, Anarchie, etc. the current InternetLink plugin supports both sorts of AppleEvents and a couple other less elegant ways of calling protocol helpers. If you are interested in supporting GetURL events, please contact us via e-mail at:

<gopher@boombox.micro.umn.edu>

for details.

Among the Macintosh developers that have agreed to support GetURL AppleEvents are:

Steve Dorner
Eudora

John Hardin
MacWeb

Jim Matthews
Fetch

Peter Lewis
Anarchie

John Norstad
Newswatcher

U of M n
Turbogopher

U of M n
POPmail

U of M n
InternetLink plugin

GETTING THE InternetLink PLUGIN SOFTWARE

InternetLink is available via anonymous ftp or gopher from boombox.micro.umn.edu.

– Internet Gopher development team

University of Minnesota