

Developing Web Sites with Free Software

Tom Wheeler

Senior Software Engineer,
Object Computing, Inc. (OCI)

About This Presentation

- What this presentation *is*:
 - An explanation of free software, aimed at people who are unfamiliar with it.
 - An overview of tools that might be helpful, that run on systems you're likely to use.
- What this presentation *is not*:
 - Extremely technical or full of zealotry.

What Does “Free” Mean?

- In the English language, the word “free” is a homograph; it has two meanings:
 - The first meaning is “without cost”
 - The second meaning is “liberty” or “freedom”
- Free software can mean either – or both – of these things.

Software Licensing

- Under federal law, computer software is considered “intellectual property,” like books and music.
- This means that when you “buy” software, you're really just buying the right to run it.
- The owner of the software can stipulate the conditions under which you can use it.

End User License Agreements

- Software licensing terms are typically set forth in the EULA; the most common forms are shrink wrap and click-through licenses.
- EULAs protect the rights of the vendor, and ***you*** generally cannot negotiate its terms. In some cases, they can significantly reduce your rights:
 - Database server licenses commonly prevent you from publishing benchmarks.

Free (Without Cost)

- This is also called “free, as in beer”
- You may only receive a “binary” version, and may not be allowed to modify it.
- You might also not be able to redistribute it.
- Examples include Internet Explorer, iTunes and “lite” editions of commercial programs.

Free (Liberty)

- Conversely, some software is even *more* “free” in that it gives you more rights.
- This is also called “free, as in speech”
- It may grant you the ability to inspect and modify the source code. This can be seen as a sort of “insurance policy.”
- It may also allow (or require) you to distribute your changes to others.

Free Software/Open Source

- So, why would programmers develop and distribute software for free?
 - The author created it to solve her own need, and figured others might benefit from it too.
 - The author may want to gain skill in a language or technique that he couldn't do at work.
 - They might give away the software, but charge for support or documentation.

Linux and Free Software

- The Linux operating system is a popular example of free software.
- The core (kernel) of the operating system, as well as most utilities, are available for free – in both senses of the word.
- Consequently, a lot of development of free software has centered around Linux and similar free UNIX-like operating systems.

But I Use Windows/Mac OS X!

- Much of the free Web development software is created for UNIX and Linux, but:
 - Since the Mac operating system (Mac OS X) is now based on UNIX, most of this software is available for it too (see the Fink homepage).
 - Some of the most popular applications have been ported to run on Microsoft Windows.
 - Every program I will describe tonight runs on Microsoft Windows, Mac OS X and Linux.

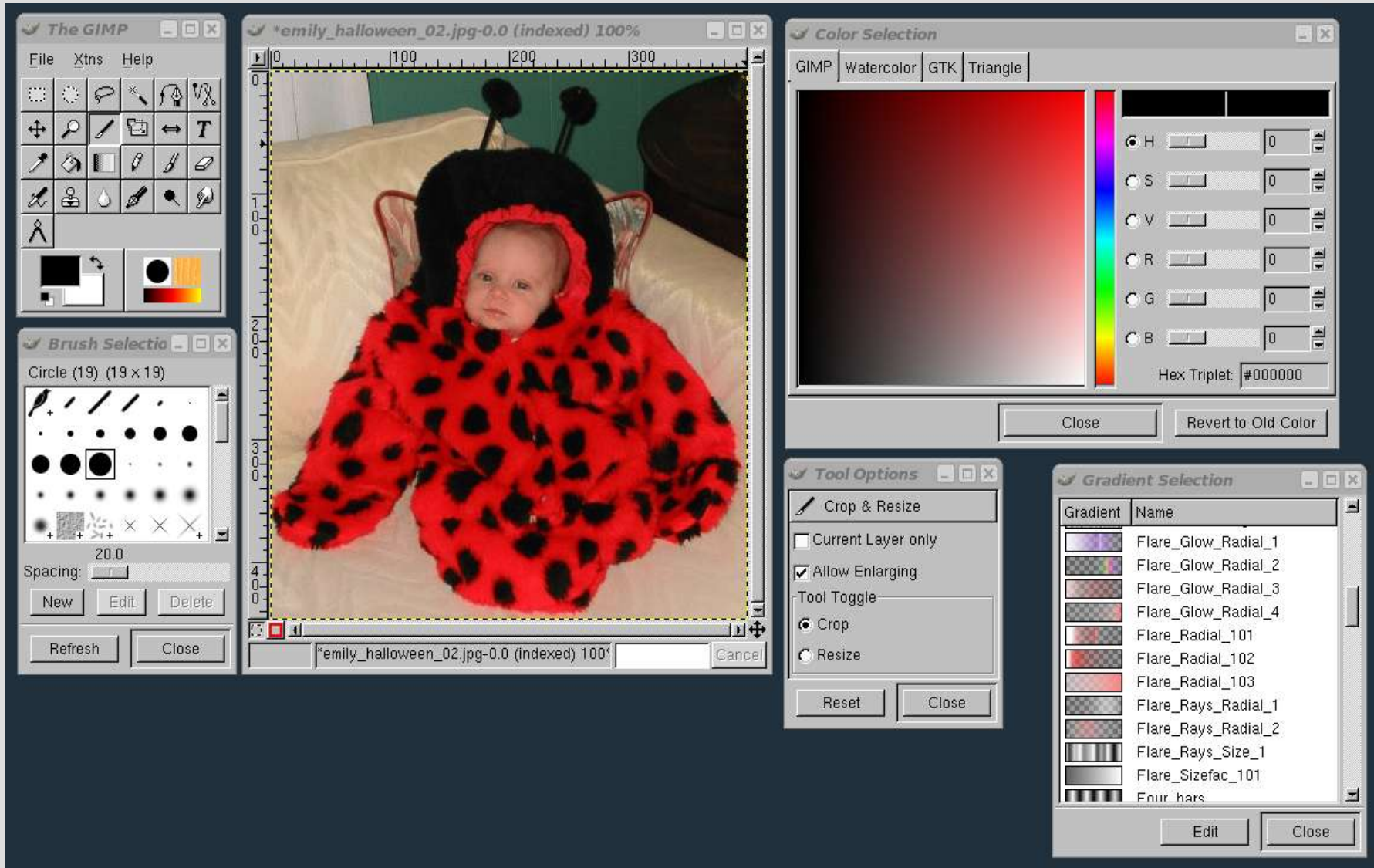
And Now on to the Software...

- I will give a short overview of applications that are useful in Web development.
- To help you understand each program, I will also list similar commercial programs that might be considered “competitors”.
- By “competitor” I mean that they have the same general purpose, not that they necessarily support all the same features.

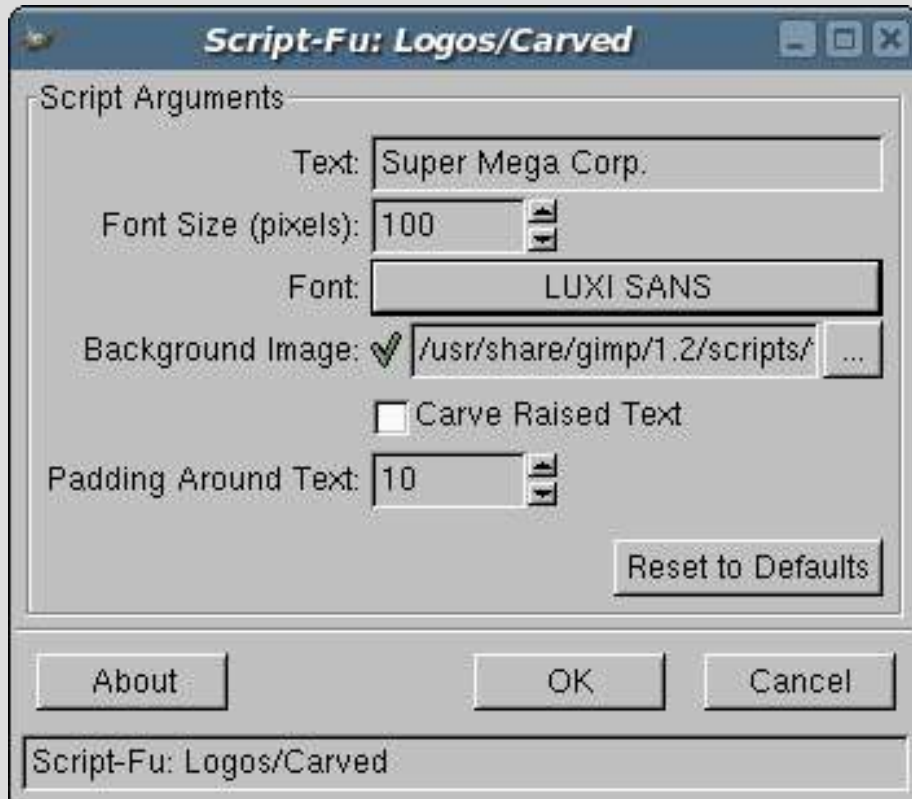
Graphics: The Gimp

- The GNU Image Manipulation Program (GIMP) is a graphics editing package that is similar to Photoshop or Paint Shop Pro.
 - It can handle many image formats, including BMP, GIF, JPG, PNG, Photoshop (PSD), PostScript and TIFF.
 - Comes with more than 50 built-in filters.
 - The “Script-Fu” extension makes it easy to create customized buttons and logos.

Graphics: The Gimp



Graphics: The Gimp

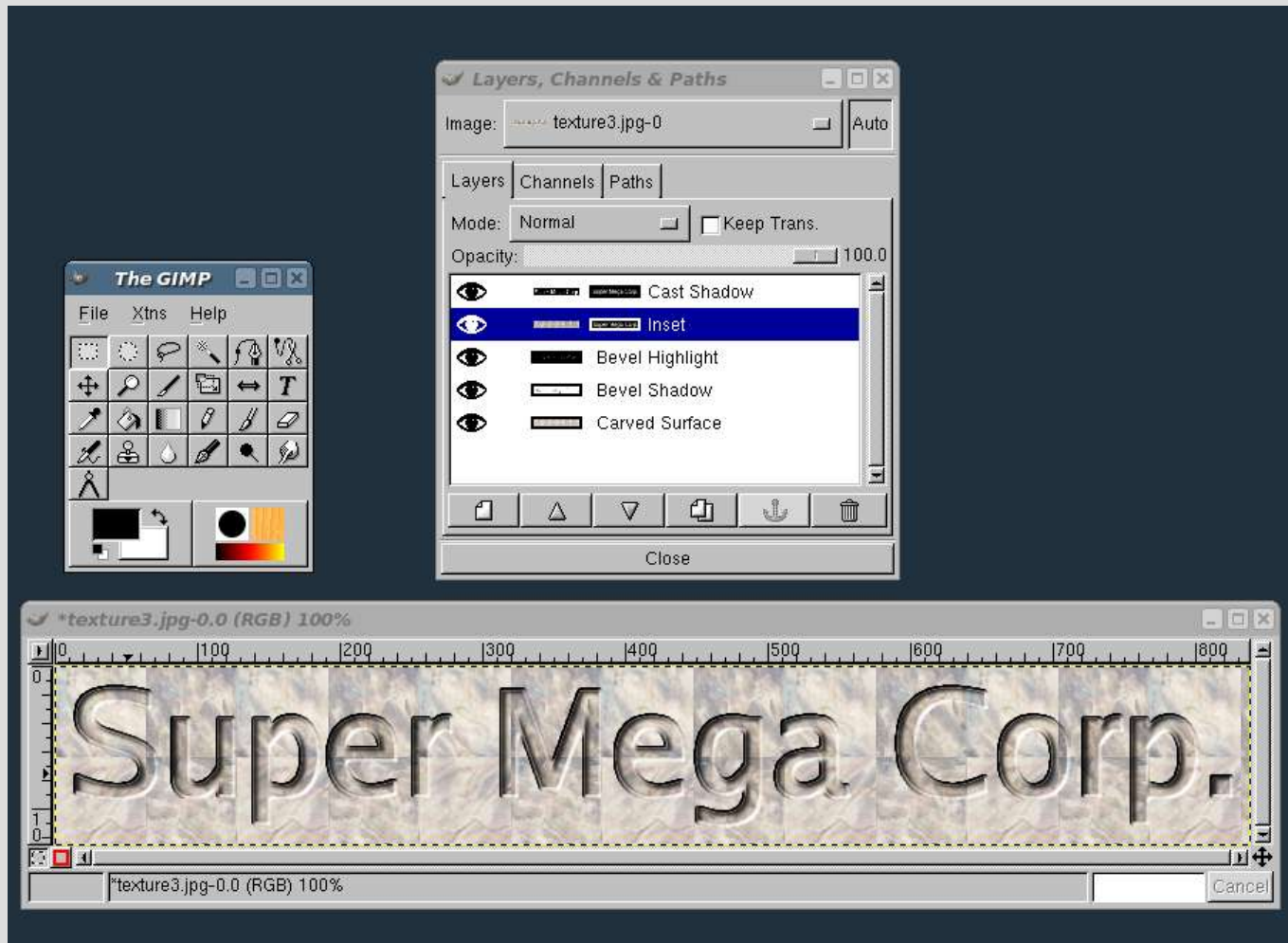


Here is an example of a “Script-Fu” plugin.

I just type some text, choose a font and color scheme, and it will create a logo for me.

There are dozens of built-in scripts for logos and buttons.

Graphics: The Gimp



This is the logo created by the “Script-Fu” plugin.

Web Server: Apache

- Apache is Web server software, which allows your computer to serve Web pages to others.
- Similar programs include Microsoft's Internet Information Server (IIS) and Netscape Enterprise Server.
- According to Netcraft, Apache is by far the most popular Web server software, and serves pages for 67% of all Internet domains.

Web Server: Apache

- It contains “modules” for additional functions, such as user authentication, rewriting URLs and using CGI scripts.
- Modules are also available to allow you to create dynamic content with JSP or PHP.
- While the Apache project was originally formed to create the Web server, it now also produces many other free programs like Ant, SpamAssassin, Cocoon and AXIS.

Programming Language: Java

- The Java programming language was released in 1995 by Sun Microsystems.
- One of the main advantages of Java is that it is cross-platform, meaning that your program will run unmodified on any operating system.
- The Java Development Kit (JDK) is available at no cost from Sun Microsystems Web site.
 - The Mac OS X version is provided by Apple.

Programming Language: Java

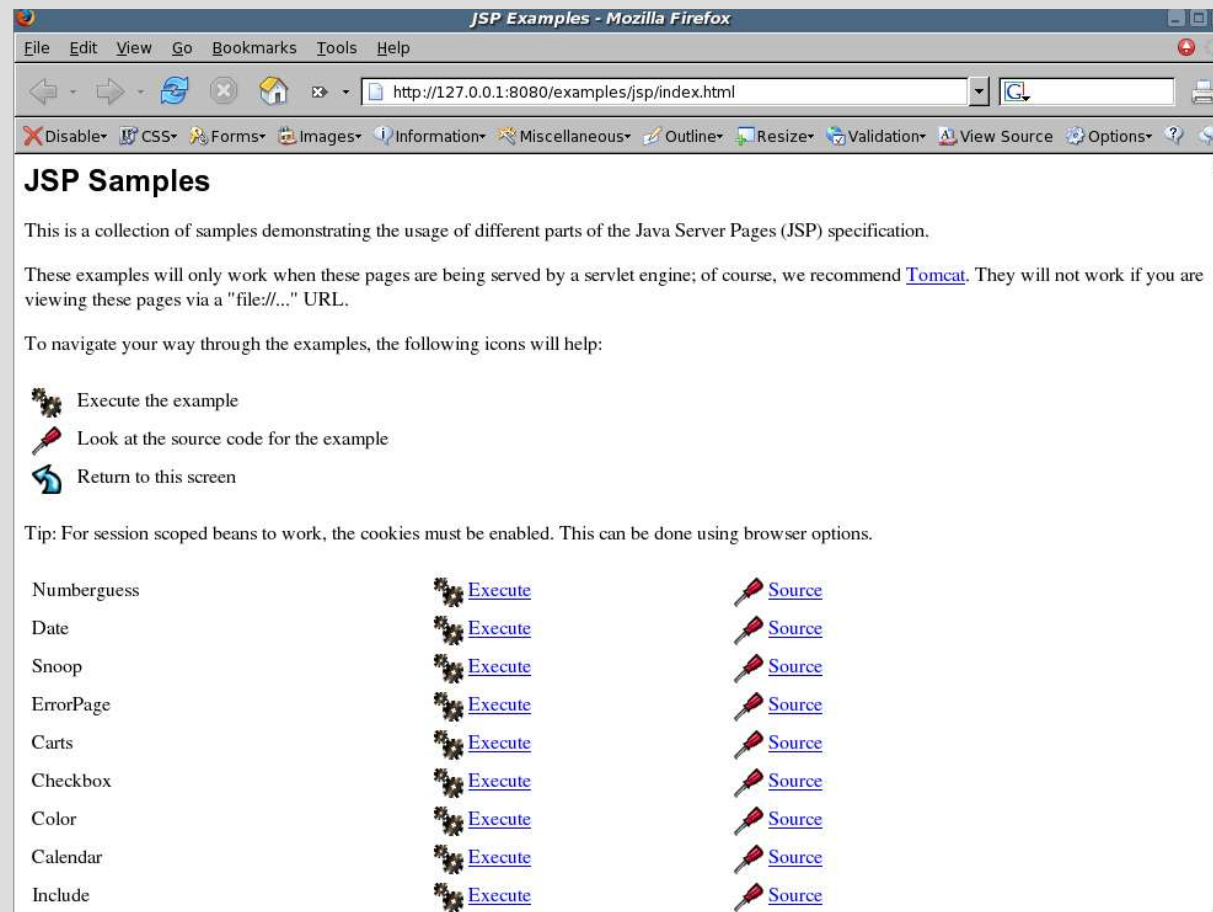
- Designed for network environments, Java programs generally have fewer security problems than those developed in similar languages like C or C++.
- You can write server-side Web applications in Java using servlets or JSP, or by using a framework like Struts.
- Java Web apps are bundled into “WAR” files, which are very easy to deploy.

Java Web Engine: Tomcat

- Tomcat is a Java JSP/Servlet container, and allows you to develop and serve Java-based Web applications.
- Similar software includes IBM WebSphere and Macromedia JRun.
- Tomcat is a part of the Apache project, and you can either run it “standalone” or with Apache.

Java Web Engine: Tomcat

- Tomcat comes with several examples of both servlets and JSP – great for learning.



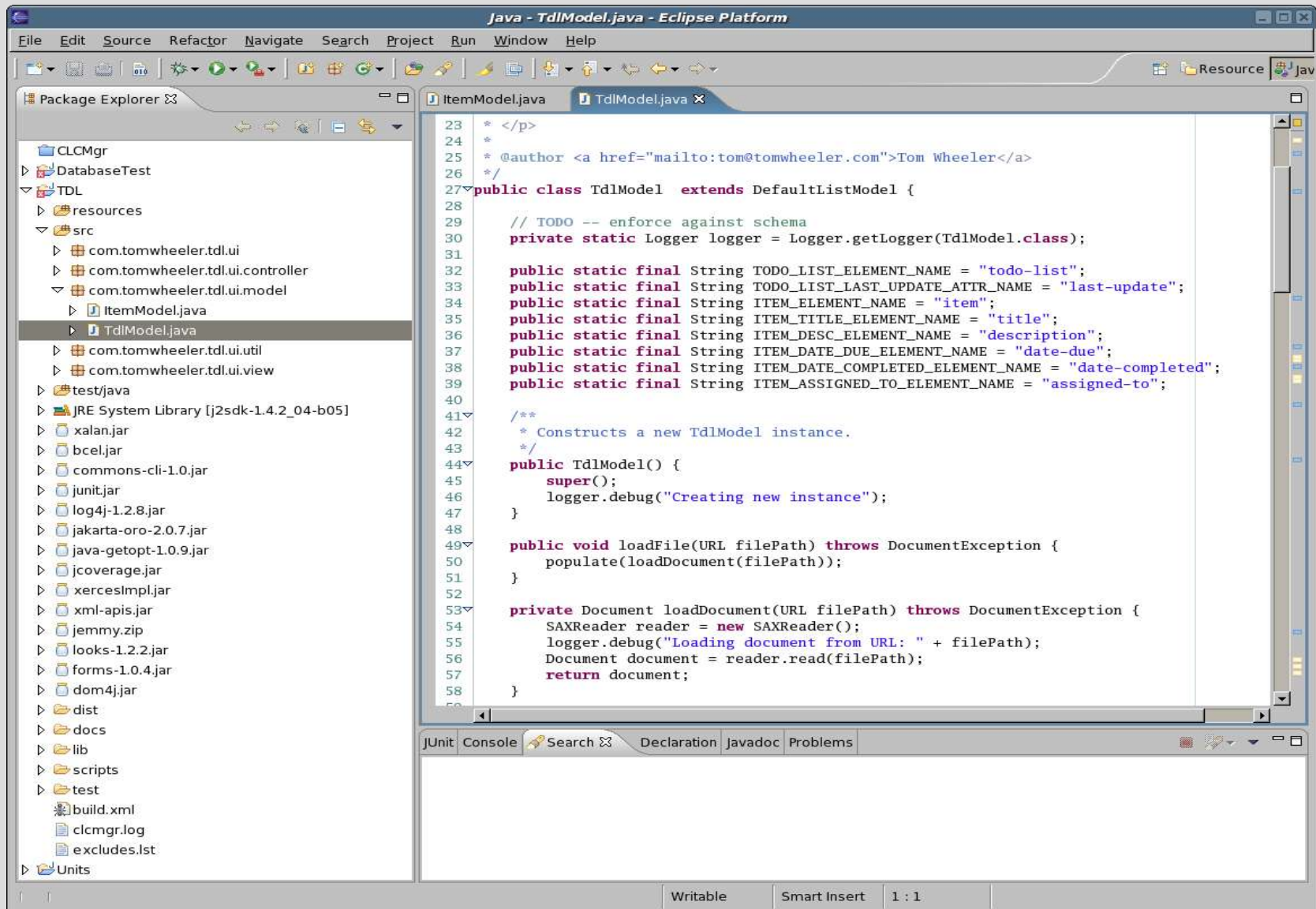
Java Development: Eclipse

- IBM helped to create an open source project based on its Visual Age for Java, which is similar to Borland JBuilder and IntelliJ IDEA.
- Both the project and the IDE are called Eclipse.
- An IDE lets you create, edit, run and debug programs with a single tool.

Java Development: Eclipse

- Eclipse can be used to create any type of Java project – including applets and command-line programs.
- The free Sysdeo Tomcat Plugin allows you to control Tomcat from Eclipse for easier JSP/servlet development and deployment.
- There are also plugins available for Eclipse to work with XML and XSL files.

Java Development: Eclipse



Programming Language: Perl

- The Perl programming language excels at text processing and is the most popular way to create CGI scripts for Web applications.
- In addition to running as CGI on a Web server, Perl is also useful for pre-processing:
 - You can write a script to handle complex search and replace tasks across thousands of files.
 - You can automate the task of creating thumbnails and adding copyright messages for images.

Programming Language: PHP

- PHP is a scripting language that is most widely used for Web applications.
- You can configure the Apache Web server (or IIS) for PHP support.
- Many complete PHP applications are freely available, such as Web-based mail, message boards, and contact managers.
- PHP offers better performance than CGI.

Utilities: Cygwin

- Linux and Mac OS X come with many small UNIX utility programs like sort, uniq, grep and tail.
- The Cygwin project is an effort to port common UNIX tools to the Windows environment.
- Cygwin now comes with these and hundreds more programs, such as the vi editor and a C/C++ compiler (gcc).

Web Browser: Firefox/Mozilla

- In 1998, Netscape released the source code to its Communicator suite.
- It took several years of development, but the project eventually release Mozilla, an updated version of Communicator.
- Mozilla was eventually split into several pieces, each concentrating on a specific task, like Web browsing or e-mail.

Web Browser: Firefox/Mozilla

- In 2004, the Mozilla project released version 1.0 of Firefox, a small, fast Web browser.
- While Internet Explorer leads in market share, Firefox has many features that IE does not, such as tabbed browsing and themes.
- It supports “extensions,” which can improve user experience (BugMeNot)

Web Browser: Firefox/Mozilla

This is Firefox, with four tabs open. The Web developer toolbar is also visible.



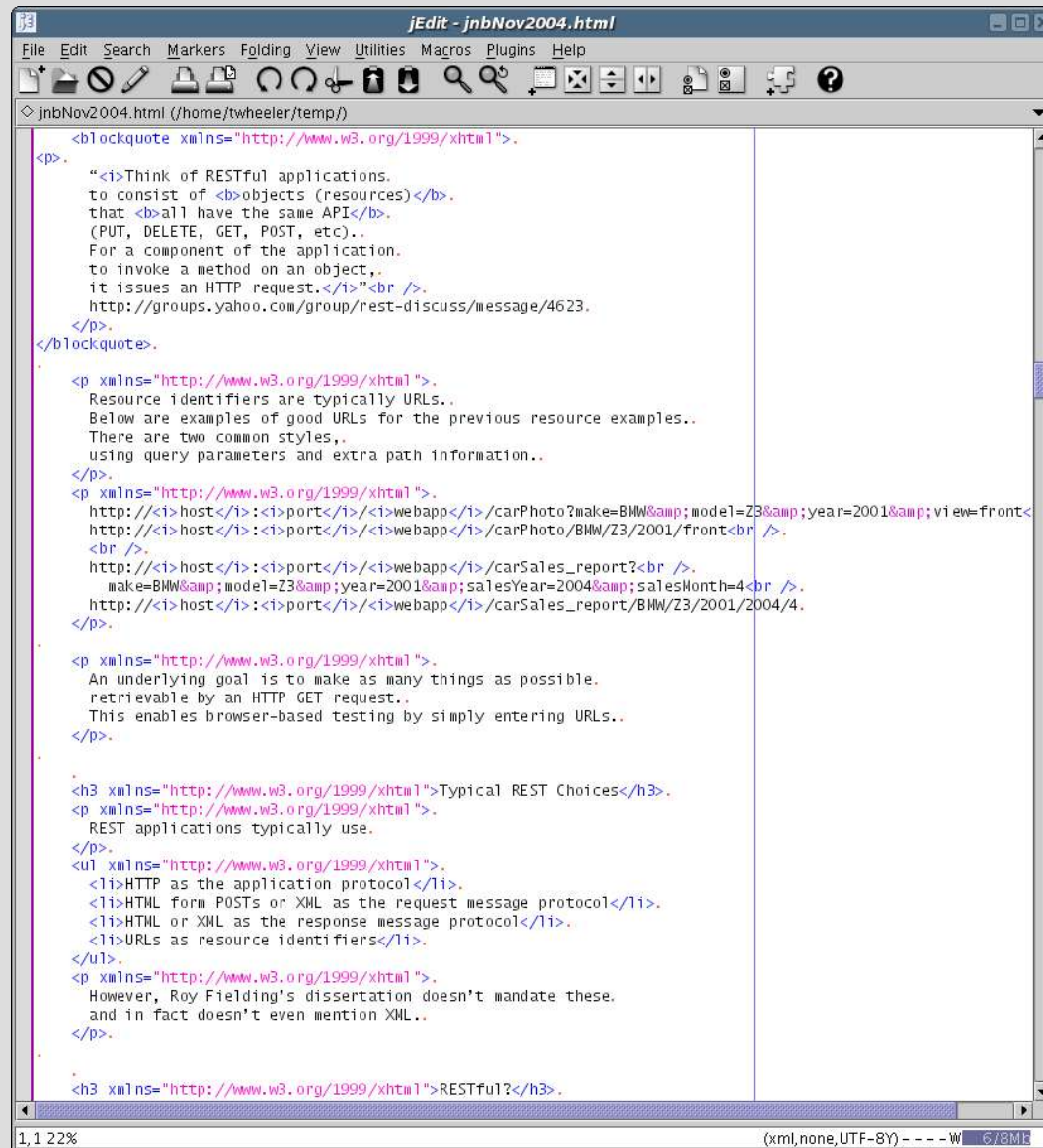
Web Browser: Firefox/Mozilla

- Other extensions are helpful to Web developers, for example:
 - The Web Developer extension adds a toolbar with menus that let you:
 - Resize browser window for a specific resolution
 - Disable javascript
 - Disable CSS
 - Disable images
 - Display “alt text” in place of images
 - Display HTML comments
 - Validate HTML and CSS

Text Editor: jEdit

- jEdit is a powerful text editor written in Java.
- It could be considered a competitor to Emacs, UltraEdit and BBEdit.
- It's features include syntax highlighting, code folding, BSH scripting support and macros.
- Plugins offer more features, such as code formatting, validation and source control.

Text Editor: jEdit



This is a screenshot of jEdit with an HTML document.

Notice the syntax highlighting.

Database Server: MySQL

- MySQL is a small, fast database server.
- It could be considered a competitor to Microsoft SQL Server, Oracle or Sybase.
- It doesn't include all the features of commercial database, but it has very good performance.
- MySQL is a popular choice for Web applications and is available from most ISPs.

Database Server: MySQL




- Database servers are programs that provide data access to other programs, and generally have no user interface.
- However, several GUI and Web-based administration tools are available for MySQL, including MySQL Administrator.
- MySQL Administrator is also free software.

Database Server: MySQL

Table Editor

Table Name: Database: Comment:

Columns and Indices | Table Options | Advanced Options

Column Name	Data Type	NOT NULL	AUTO INC	Flags	Default Value	Comments
 id	int(4)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			The primary key column
 example	varchar(200)	<input type="checkbox"/>	<input type="checkbox"/>		something	This holds a textfield
	INT(11)	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

Column Details | Indices | Foreign Keys

Name: Data Type: Default Value:

Column Options: ☐ Primary Key ☐ Not NULL ☐ Auto Increment

Flags:

Character Set: Collation:

Comment:

This is an example of creating a new table with MySQL Administrator.

Database Server: PostgreSQL

- PostgreSQL is a full-featured database server. Like MySQL, there are graphical and Web-based administration tools available.
- It includes most features found in commercial databases, and some unique features, too.
- Runs on most UNIX platforms (including Mac OS X), and the newest version now natively supports Microsoft Windows.

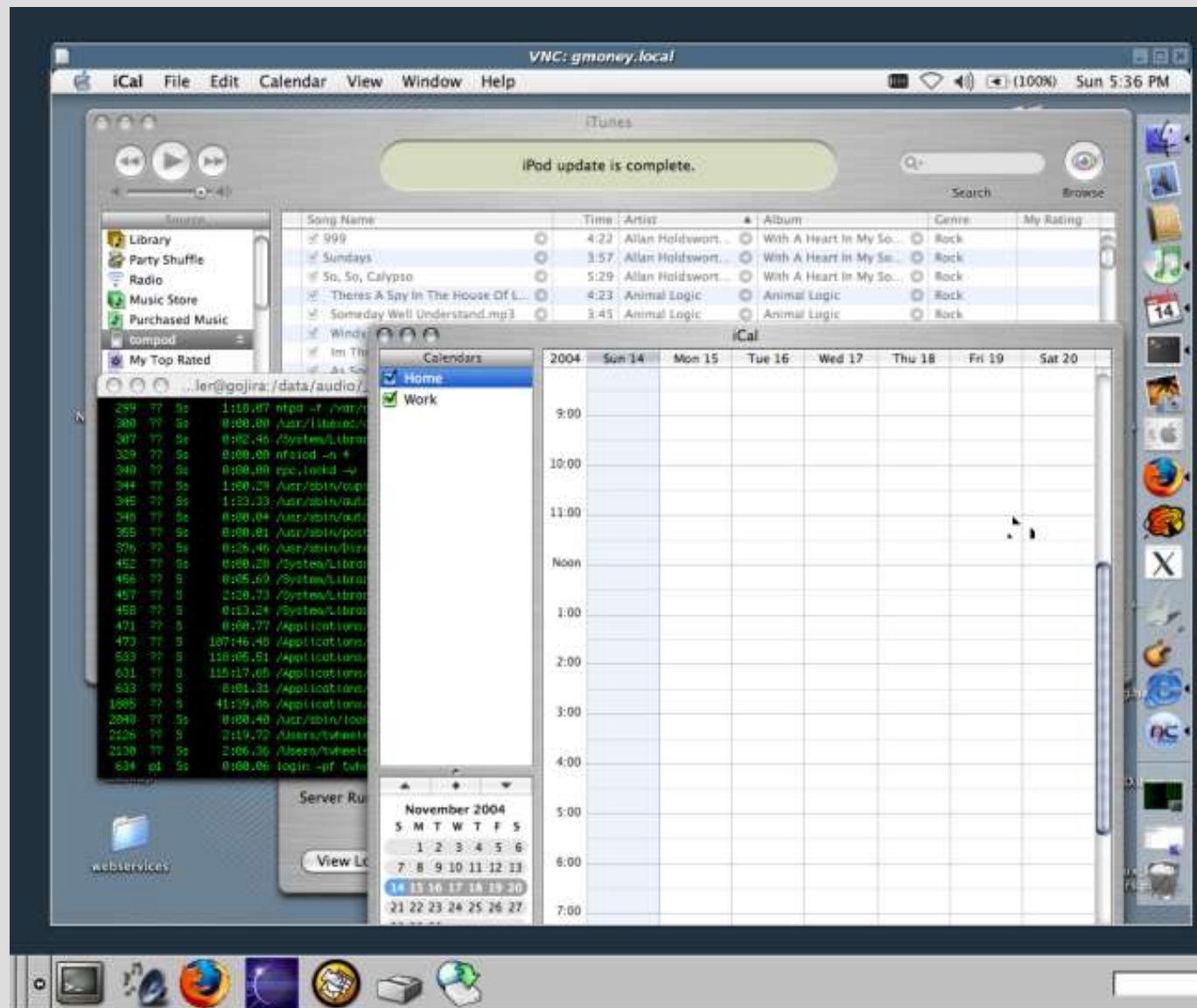
Remote GUI Access: VNC

- VNC (virtual network computing) is a protocol for accessing one system's desktop from another.
- It could be considered a competitor to Remote Desktop or PCAnywhere.
- The two systems don't have to be the same: for example, you can access Windows from a Mac or Linux from Windows.

Remote GUI Access: VNC

- VNC is particularly helpful for remote administration of Microsoft Windows-based systems, since command-line admin tools are not as common as on UNIX.
- With most versions of VNC, you can even copy and paste text between two VNC windows!
- Some versions also have a feature to copy files between systems, like FTP.

Remote GUI Access: VNC



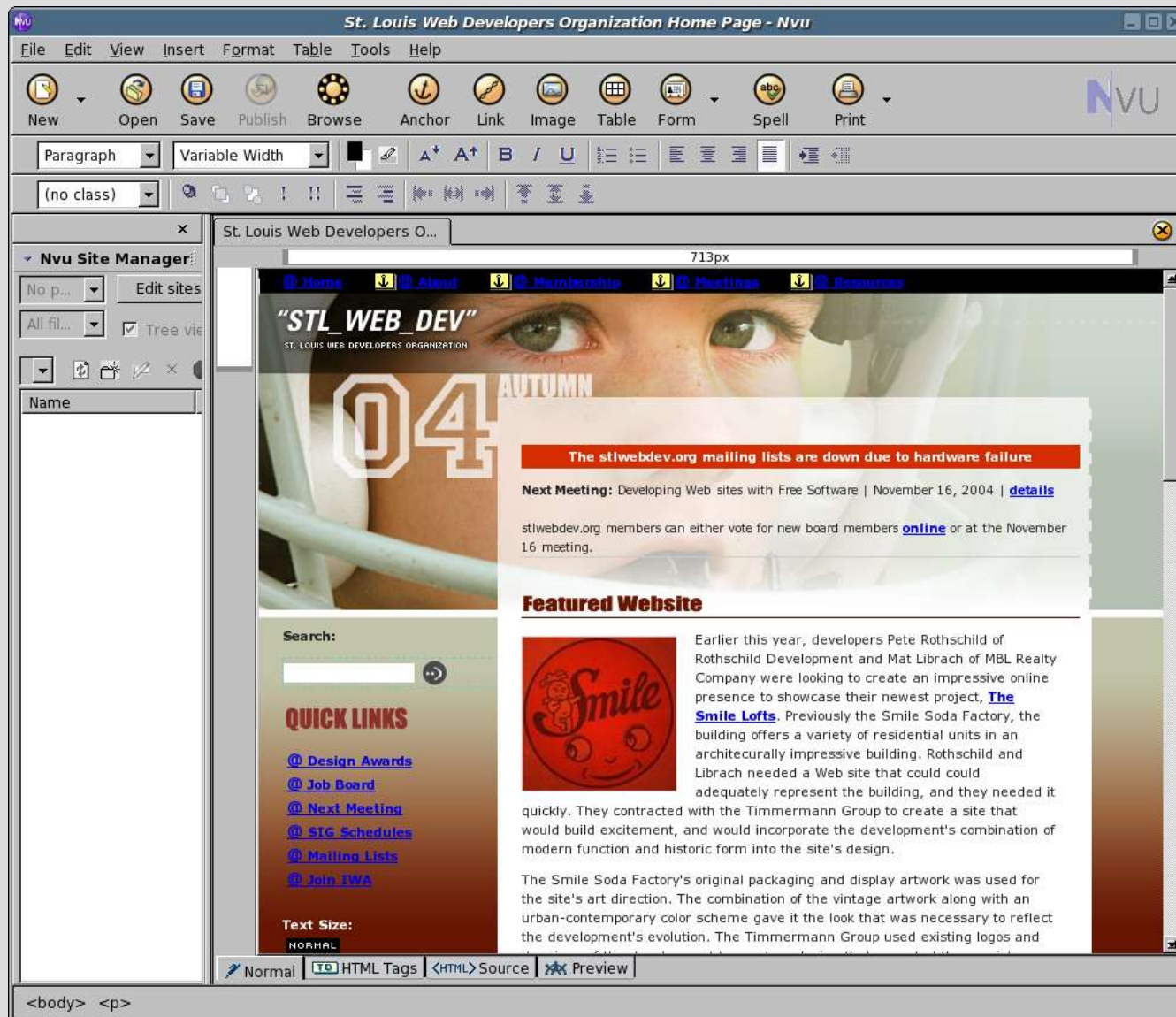
Accessing my
Mac OS X
desktop from
Linux

HTML Page Layout: NVU

- NVU, pronounced “En-view,” is a WYSIWYG Web authoring application.
- NVU is similar to Microsoft FrontPage or Macromedia Dreamweaver.
- It features a tabbed interface, like Firefox, so you can quickly switch between pages.
- NVU also comes with a built-in CSS editor.

HTML Page Layout: NVU

This is the edit mode in NVU.



Conclusion

- Web developers today face greater demands and smaller budgets. Free software *can be* one way to minimize expense.
- It's also important to seek alternatives that give us the freedom to work under our terms, not those dictated by a vendor.

Resources

- The GIMP (Graphics Editing)
 - <http://www.gimp.org/>
- Apache (Web Server)
 - <http://httpd.apache.org/>
- Java (Programming Language)
 - <http://java.sun.com/>
- Tomcat (Java JSP/Servlet Container)
 - <http://jakarta.apache.org/tomcat/>

Resources

- Eclipse (Java IDE)
 - <http://www.eclipse.org/>
- Sysdeo Tomcat Plugin for Eclipse
 - <http://www.sysdeo.com/eclipse/tomcatPlugin.html>
- Perl (Programming Language)
 - <http://www.perl.org/>
- PHP (Programming Language)
 - <http://www.php.net/>

Resources

- Cygwin (UNIX Tools for MS Windows)
 - <http://www.cygwin.com/>
- Mozilla (Web Browser Suite)
 - <http://www.mozilla.org/>
- Firefox (Web Browser)
 - <http://www.mozilla.org/products/firefox/>
- BugMeNot (Firefox Plugin)
 - <http://www.bugmenot.com/>

Resources

- Web Developer Plugin for Firefox
 - <http://www.chrispederick.com/work/firefox/webdeveloper/>
- jEdit (Text Editor)
 - <http://www.jedit.org/>
- MySQL (Database Server)
 - <http://www.mysql.com/>
- PostgreSQL (Database Server)
 - <http://www.postgresql.org/>

Resources

- Real VNC – Windows and UNIX
 - <http://www.realvnc.org/>
- Tight VNC – Windows and UNIX
 - <http://www.tightvnc.com/>
- OSXVNC – Mac OS X (Server only)
 - <http://www.redstonesoftware.com/vnc.html>
- Chicken of the VNC – Mac OS X (Client only)
 - <http://sourceforge.net/projects/cotvnc/>

Resources

- NVU (Web Site Editor)
 - <http://www.nvu.com/>
- FINK (Unix utilities for Mac OS X)
 - <http://fink.sourceforge.net/>
- SourceForge (lots of free software here)
 - <http://www.sf.net/>
- Freshmeat.net (lots of free software here)
 - <http://www.freshmeat.net/>