

Computer Know How

Who this book is for

This book is designed by Tmxxine ^[1] HolyGeek ^[2] as a resource for all users to empower their use of computer skills and knowledge. You will need a PC compatible and might find a basic vocabulary of Geek Speak ^[3] useful but not essential. Most of this stuff is for users of Microsoft Windows, but there is info on other Operating Systems available elsewhere in wikibooks.

First step : the Operating System

The first thing you will need to know is which Operating System (or "OS") is installed on your computer. Here's a list of common operating systems, approximately ranked from the most popular to the least popular.

- Microsoft Windows (the most recent version is Windows Vista. Previous versions include Windows XP, Windows 2003, Windows 2000, Windows Me, Windows 98 OSR2, Windows 98, Windows 95)
- Mac OS X (the most recent version is Leopard. Previous versions Tiger, Panther, Jaguar, Puma, Cheetah)
- Linux (either Red Hat, Fedora, Debian, Ubuntu, Knoppix, Linspire)
- old-generation Mac OS
- open source BSD (either FreeBSD or OpenBSD)
- Solaris.

If you do not know which operating system you are using, chances are that it is either Microsoft Windows (if you're not using an Apple Computer) or Apple's Mac OS X (if you're using a Macintosh computer). Generally, the name of the operating system appears somewhere while the computer is starting. Typically, Windows displays a *Start* menu in the lower-left corner, while Mac OS X displays an apple in the lower-right corner. Linux and BSD can masquerade as either.

The reason why you need to determine your operating system is that each operating system is built around a different conception of *how a computer should get the work done*. Indeed, while the visible result of an application is often quite similar between two operating systems, the insides of applications are generally quite different, which leads to different categories of problems. In particular, computers using Mac OS X and well-administered computers using Linux or BSD are generally considered enormously more secure than computers using Microsoft Windows. On the other hand, it is often more complex to get Linux or BSD to work on a brand-new laptop.

From this point on, we will write "OS" for "Operating System", "Windows computer" for "a computer using any version of Microsoft Windows", "Linux computer" for "a computer using any version and distribution of Linux", etc.

Microsoft Windows

Common abbreviations

XP

Windows XP

win2k

Windows 2000

Me

Windows Me

9x

Either Windows 95, Windows 98, Windows 98 OSR2 or Windows Me

win32

Any version of Windows between Windows 95 and Windows XP.

Drivers

A *device driver*, or *driver* for short, is a piece of software designed to permit the execution of a device, such as a USB key, a CD drive, a scanner, etc.

Certain 9x Operating Systems come preloaded with tons of Device Drivers. However some older version of operating system and some newer ones don't have these.

Some operating systems can use two types of device drivers 16-bit and 32-bit. Windows 95 and 98 can use both 32 and 16 bit drivers. Windows 95 and 98 are perhaps the best operating systems when looking for available drivers. Some people prefer Windows 98 over 95. Windows XP and Windows Me only allow 32 bit drivers.

Free information, help and consultancy

There are several organisations offering free geek help

1. Windows Help pages ^[4]
2. Get Net Wise ^[5]
3. Freebyte ^[6]

More speed

Turn off some of the "visual effects" to get a faster computer

1. Click Start
2. Select Control Panel
3. Click to Open "System"

An alternate method is to right click

My Computer on your desktop and select Properties. (A third way is to hold down the Windows key and press the pause/break button.)

The System Properties dialog box will appear.

1. Select the Advanced tab
 2. Under *Performance* section click the *Settings* button
-

the Performance Options dialog box will appear

Remove the check beside the following options:

- Fade or slide menus into view
- Fade or slide ToolTips into view
- Fade out menu items after clicking
- Show Shadows after menus
- Slide open combo boxes
- Slide taskbar buttons
- Use a background image for each folder type
- Use common tasks in folders

Speed Xp up !!!! This is for ADVANCED USERS ONLY!!!

1. Goto the directory where you have your windows xp installation

for example if windows is installed in c:\ then the windows installation would be c:\windows or c:\winnt

2. Goto the c:\windows\prefetch\ folder and delete everything there...

restart windows and .. viola!! your computer is a performer

3. go to

c:\documents and settings\ current user\local settings \temp\ delete everything there (must click on "Tools". Then "Folder Options". Then click on "view" tab. and finally: uncheck the "Do not show hidden files and folders" option in order to access c:\documents and settings\ current user\local settings \temp\)

4. Goto c:\windows\temp and delete everything there...

5. On Windows XP

Increase Virtual Memory

1>Right Click on My Computer>Properties>Advanced Tab

2>Under Performance Click Settings>Advanced

3>Virtual Memory>Change

4>Select Custom Size set your minimum and maximum as high as possible according to your Hard Drive's Free space, (Like 1024-2048)

6. Search for *.tmp and *.chk(Check Disk Fragments) and delete those

RUN command

To use Run left click on the Start button. Click on Run. (or press the Windows key on your keyboard and the letter "r")

calc (opens calculator utility)

cdplayer (opens cd player)

charmap (opens character map utility)

clipbrd (opens clipboard utility)

command (or cmd) (opens DOS window at command line)

control (Control Panel)

control folders (Folder Options)

control userpasswords (User Accounts)
control desktop (Display Properties)
control printers (Printers and Faxes)
control mouse (Mouse Properties)
control keyboard (Keyboard Properties)
control netconnections (Network Connections)
control color (Display Properties \ Screensaver)
control date/time (Date and Time Properties)
control schedtasks (Scheduled Tasks)
control admintools (Administrative Tools)
control telephony (Phone and Modem Options)
control fonts (Fonts Folder)
control international (Regional and Language)
defrag (opens defrag utility)
drvspace (opens drive space utility to compress drives, etc.)
dxdiag (for DirectX, sound, input devices-joysticks, etc. info)
freecell (opens freecell game)
mplayer2 (opens Windows Media Player 6.4)
msconfig (accesses programs that run on startup)
mshearts (opens hearts game)
msinfo32 (accesses system resources info)
notepad (opens program)
regedit (accesses command to edit the registry)
rsrctr (loads resource meter utility in system tray)
scandisk (accesses scan disk utility)
scanregw (registry scan)
services.msc (like msconfig but more options)
sndrec32 (opens sound recorder)
sndvol32 (opens sound volume utility)
sol (opens a solitaire game)
sysedit (accesses the System Configuration Utility)
sysmon (opens system monitor utility)
win.ini (accesses file that loads some Windows components)
winfile (opens File Manager, still useful to associate file types)
winipcfg (displays Internet connection/adaptor info)
winver (displays the Windows version installed on the computer)
wmplayer (opens Windows Media Player)
wordpad (opens program)
wupdmgr (connects to Windows update)

(It's easy to add more commands to this list. Simply create a shortcut to the program you want and put that shortcut in the \Windows [WINNT] directory and you can execute any command that can be made with a shortcut through the run command.)

Improve Your Security

One thing you need to know is that, unless Microsoft drastically changes its policies and eventually keeps its 10-year-old promises, your Windows computer is never going to be as secure as a Mac OS X, BSD or Linux computer. Therefore, it is **strongly** advised to back up your data and personal information on CDs or DVDs regularly and keep a version of your install CD of Windows handy.

1. If you are using it, dump Internet Explorer. Use Firefox or Opera to browse the Web. You will still be forced to use IE to update your system, but that is the **ONLY** thing you should use it for. Security-wise, Internet Explorer is the single worst piece of software installed on your computer.
 2. Similarly, dump Outlook Express. If you need a tool other than your webbrowser to read your mail, use Thunderbird or Opera.
 3. Patch your system. Install the recommended security updates and patches for ALL software on your system, not just the operating system.
 4. Run a proven software firewall. Don't rely on the Windows Internet Connection Firewall (ICF); it blocks inbound attacks only. ZoneAlarm and Sygate offer excellent free versions of their products. If you install a hardware router (like a Linksys BEFSX41, about \$70), you don't need a software firewall at all - the hardware router has one built in. It doesn't hurt to run both if you wish.
 5. Run a good antivirus program. Choices abound. AntiVir Personal Edition (free); other good ones are Norton Antivirus, Panda Software, and Grisoft's AVG (free).
 6. Run Spyware Blaster and keep it updated. This free program blocks adware and spyware from installing in the first place and is frequently updated.
 7. Run Ad-Aware and keep it updated. I recommend you scan weekly, more frequently if you are a heavy surfer.
 8. Run Spybot S&D and keep it updated on the same schedule as Ad-Aware.
 9. Use this if you are technically competent x-raypc^[7] - if unsure avoid it
-

XP Specific

Securing_Windows_XP Troubleshooting_Windows_XP

- Free powertoys utils from Microsoft ^[8]
- Speeding up XP ^[9]

Mac OS X

Linux

In Linux, drivers are called Kernel Modules.

Generic information

Tutorials

- Lissa explains ^[10] Young of Heart **web page** designing tutorial
- W3 Schools ^[11] has a number of web-related tutorials

Direct link Image storing

Photobucket ^[12] free, simple, fast, reliable image hosting site and online photo album that allows direct linking Flickr ^[13] is another photosharing site in a similar vein, and uses an advanced flash interface for easy management and organization of photos, that has the advantage of serving several sizes of photos.

Direct linking is very important You can put something like this in a wiki

eg. (photobucket)

http://photobucket.com/albums/v514/HolyGeek/Moon_with_StreetLamps_2.jpg

eg. (flickr)

http://www.flickr.com/photos/1572269_de9d44daad.jpg ^[14]

Email lists

The following specialise in tips on getting the best from your computer. Please add your favourite

- scambusters ^[15] Keeping free of internet scams
 - LockerGnome ^[16] Excellent range of specialised lists including Linux, Windows Fanatics, Hot downloads, Web masters and Search Engine news. More commercial than previously.
 - Tourbus ^[17] In depth support
 - Blackviper ^[18] Lists Windows services and what they do, useful to help disable what you don't need. Also gives other performance help.
-

Essential skills

Keyboard and mouse skills are usually the first we learn using a Web Browser, email, a text editor or word processor and paint programs. These types of programs are built into Windows, most desktop Linux distros and Mac (?).

Next we develop specialised skills. For example:

1. Photo retouching
2. DTP
3. Structured drawing
4. Ray tracing

according to needs and requirements.

Security Information

- Steve Gibson ^[19]
- Removing spyware ^[20]
- Trojan removal software review ^[21]
- Spangourmet ^[22] creates a temp number of possible emails to an address

someword.x.user@spangourmet.com

where someword is a identifier and x is the number of emails - so you can trace where email was sourced from

This is most useful for when some companies ask for your email address

promise not to pass it on etc . . .

also mailinator ^[23] allows you to fill out a form (some require an email to activate service and provide passwords, confirmation etc)

the email is only active for a few hours

You go to the address and put in the name you used

Another good method of avoiding registration is by accessing BugMeNot's ^[24] database of usernames and passwords.

Creating an ISO image

Linux distributions and other files are often supplied as an ISO image which has to be burnt or copied onto a CD with a CD writer

- info on using CD burning software ^[25]
- Burncdcc ^[26]

Free Software

Freeware

What do these terms mean?

Please add terms glossary from wikipedia

Installing Linux Distros to a hard disk

- Knoppix ^[27] Based on 100% free Debian. Secure. Well supported and developed. Knoppix free pdf Book ^[28]

Installing Linux

By downloading and using a bootable linux distro we also have the opportunity to install it on the hard disk. In this example Mepis ^[29] is used

On line Services

Dropload ^[30] Web site that allows you to share large files with specific people. You can use Dropload as a means of sharing files. With Dropload, you can literally drop a file on a server. An e-mail will be sent to the intended recipient to come and pick up the file. Once you drop your file on the server, it is held for 48 hours then deleted. There is a file size limitation of 50 MB. On line compiler ^[31] Compile your programs from anywhere

I just signed up for an account with mail.com ^[32] and will see how it works out. Looks good so far and i like the flexibility they give you when creating your address...

How to Buy a PC

If you are certain that a new PC is required then read the computer press. However it is quite likely you may just need to upgrade parts of your machine.

In October, 2004, prices for complete, (name brand), Pentium 4 systems clocking at just below 3Ghz are as low as \$350 after completing rebates. Some 17" LCD monitors are as inexpensive as \$200, usually involving a rebate. This would make a PC and monitor package cost around \$550, if you shop effectively. Conversely, some popular retailers will sell similar packages for \$200 to \$300 more.

Do you need a new PC?

More memory

If you hear your computer constantly addressing the hard drive you need more memory - cheap and cheerful upgrade 128 MB is underpowered, 256 MB is minimum.

If you are unsure it is safer but slower to have a virus checker in memory Linux users do not have this situation . . .

Virus checkers and other programs in memory can slow a system down (they are taking up CPU time) The registry (a database of settings) can also become complex and slow the machine down.

Most viruses come from e-mail - so if you are set to only receive text and do not automatically open .SCR .pif and all the other potential viruses you are OK

So if you do a virus check each day ideally you do not absolutely require a virus checker in memory

- oh one more tip on speeding up your computer

- use faster software . . .

and as usual fast software (like fast hardware - as in overclocking)

that is so fast it crashes

is not fast (though it may be fun) . . .

Use other people's computers. You will never collect all the interesting platforms at home. SourceForge provides free shell accounts for software developers. HP has a TestDrive program for the prospective customers. telnet or ssh will connect your box to any system in the world, providing yo have an account.

Buying Equipment

see How To Build A Computer

How to upgrade your Hardware

Don't - buy a laptop or PDA instead . . .

If you get a new motherboard, get one with EVERYTHING built in (it is designed to work together). At the present time (October 2004) buying a whole bare bones computer is not much more than second hand or the price of a motherboard. This may vary in your section of the market.

Using Windows-Key Keyboard Shortcuts

Are you a user who finds reaching for the mouse an annoying action? If so, then consider keeping your fingers on the keyboard to accomplish the same objectives by using the keyboard shortcuts listed below.

Windows Key + E

Opens the Explorer window.

Windows Key + D Brings the desktop to the foreground. If you repeat the keyboard combination, it returns the desktop to the background and the open windows will return to their original state.

Windows Key + F

Displays the Search Result window.

Windows Key + L

Locks your Windows XP computer.

Windows Key + M

Minimizes all open windows to display the Desktop.

Windows Key + R

Displays the Run command. (try that and type in OSK - just in case you have no keyboard)

Windows Key + F1

Displays the Help and Support Centre window.

Windows Key + Pause/Break

Displays the Systems Properties dialog box.

Windows Key + Tab

Cycles through the buttons on the Task Bar. To activate the selected button on the Task Bar, press the Enter key.

Alt + Tab

Toggles or switches between open windows.

Alt + F4

Closes the active window.

Graphics card

If you scroll through a text document with graphics or a web page and it is slow, a new graphics card will speed this up.

Here are some guides for getting an add on:

PCI cards are the oldest technology.

AGP is now the standard. Make sure your motherboard can cope with the different speeds of AGP:

x1

x2

x4

x8

(I recently got this but my motherboard only goes up to X4 - the amount of data that can be pumped in and out)

So I am using an old voodoo 16 meg PCI accelerator - great for all but very intense video work . . . ray tracing.

A new graphic system known as PCI Express 16x is here. This is faster than AGP and is now shipping on most new motherboards. Currently one motherboard company is offering support for SLI cards. This allows you to have two video cards (currently they have to be the same, though oneday someone will release a patch for warranty voiding goodness) in tandem to give about a 1.8 time performance increase, using this turned you PCI-E 16x slot into two PCI-E 8x slots.

Unless you are playing games or using ray tracing the most useful part of a graphic card is the amount of memory.

There is one more family of graphic cards in the market called Dualhead Graphic Cards. Dualhead Cards are the easiest way to expand your desktop to two (or more) screens. An alternative to a dualhead card is a two-card setup although for the novice this may be difficult.

Infact there is great industry support for these kind of graphic cards (e.g. could be Matrox G550DH 32MB AGP)

Future Directions

If possible, buy a machine with Sound, Ethernet, USB, FireWire and possibly graphics built into the motherboard. Gamers (and others) will want an AGP or PCI Express slot with a separate video card. The processor is not that important as most are sufficiently powerful.

Linux users - Windows and Linux are slowly beginning to merge - WinX

As much as possible try to use software that runs on Linux and Windows so that your skills will have long term security.

The memory and support chips for the the CPU (presently on the motherboard) will all be integrated, networking, graphics etc

Emerging standards are

1. Wikipedia: Ogg vorbis to replace Wikipedia: MP3
2. Wikis to replace 'static web pages'
3. Operating System on the motherboard
4. Open Source certified software

See also

- Computers for Beginners
- Free Computing Curriculum Project ^[33] wiki
- A Plus Certification for experts on computer hardware

External links

- [1] <http://www.zen45800.zen.co.uk/ya/>
 - [2] <http://www.zen45800.zen.co.uk/hg/>
 - [3] http://www.pbs.org/opb/nerds2.0.1/geek_glossary/
 - [4] <http://www.windows-help-desk.com/>
 - [5] <http://www.getnetwise.org/>
 - [6] http://www.freebyte.com/technical_support/#support
 - [7] <http://www.x-raypc.com/>
 - [8] <http://www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.mspx>
 - [9] http://www.microsoft.com/windowsxp/using/setup/expert/northrup_restoreperf.mspx
 - [10] <http://www.lissaexplains.com>
 - [11] <http://www.w3schools.com/default.asp>
 - [12] <http://photobucket.com/>
 - [13] <http://flickr.com/>
 - [14] <http://www.flickr.com/photos/adonm/1572269/>
 - [15] <http://www.scambusters.org/>
 - [16] <http://www.lockergnome.com/>
 - [17] <http://www.tourbus.com/>
 - [18] <http://www.blackviper.com>
 - [19] <http://www.grc.com/su-firewalls.htm>
 - [20] <http://www.michaelhorowitz.com/removespyware.html>
 - [21] <http://www.anti-trojan-software-reviews.com/index.htm>
 - [22] <http://www.spamgourmet.com/>
 - [23] <http://www.mailinator.net>
 - [24] <http://www.bugmenot.com>
 - [25] <http://iso.snoekonline.com/iso.htm>
 - [26] <http://www.terabyteunlimited.com/utilities.html>
 - [27] <http://www.knoppix.net/>
 - [28] <http://www.pjls16812.pwp.blueyonder.co.uk/knowning-knoppix/index.html>
 - [29] <http://www.mrbass.org/linux/mepis/installmepis/>
 - [30] <http://www.dropload.com>
 - [31] http://www.rustyspigot.com/groovyweb/index.php?page_name=tools
 - [32] <http://www.mail.com>
 - [33] <http://itp.innoved.org/wiki/freecourse/>
-

Source: [http:// en. wikibooks. org/ w/ index. php? title=Computer_ Know_ How&oldid=1311013](http://en.wikibooks.org/w/index.php?title=Computer_Know_How&oldid=1311013)

Principal Authors: Dallas1278, Herbythyme, Mkz1000, 2 anonymous edits

License

Shortcut:WP:GFDL
Version 1.2, November 2002

Copyright (C) 2000,2001,2002 Free Software Foundation, Inc. 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

0.PREAMBLE

The purpose of this License is to make a manual, textbook, or other functional and useful document "free" in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondly, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of "copyleft", which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1.APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The "Document", below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as "you". You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A "Modified Version" of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A "Secondary Section" is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document's overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The "Invariant Sections" are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The "Cover Texts" are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A "Transparent" copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not "Transparent" is called "Opaque".

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The "Title Page" means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, "Title Page" means the text near the most prominent appearance of the work's title, preceding the beginning of the body of the text.

A section "Entitled XYZ" means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as "Acknowledgements", "Dedications", "Endorsements", or "History".) To "Preserve the Title" of such a section when you modify the Document means that it remains a section "Entitled XYZ" according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2.VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3.COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4.MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
- List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.
- State on the Title page the name of the publisher of the Modified Version, as the publisher.
- Preserve all the copyright notices of the Document.
- Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
- Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.
- Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.
- Include an unaltered copy of this License.
- Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.

- J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.
- K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.
- L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.
- M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.
- N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.
- O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties--for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5.COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements."

6.COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7.AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8.TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9.TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

10.FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See <http://www.gnu.org/copyleft/>.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

Copyright (c) YEAR YOUR NAME. Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the "with...Texts." line with this:

with the Invariant Sections being LIST THEIR TITLES, with the Front-Cover Texts being LIST, and with the Back-Cover Texts being LIST.

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.