

GNOME Architecture



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 - About GNOME
- **Libraries & Tools**
 - Developer's Perspective
- **Applications**
 - User's Perspective
- **Epilogue**
 - Past, Present and Future

Prologue



About GNOME

GNOME is...



- GNU Network Object Model Environments
- Yahoo! says:
 - gnome [nóum] n. 신령, 꼬마 도깨비, 난쟁이 (dwarf)



Why GNOME?



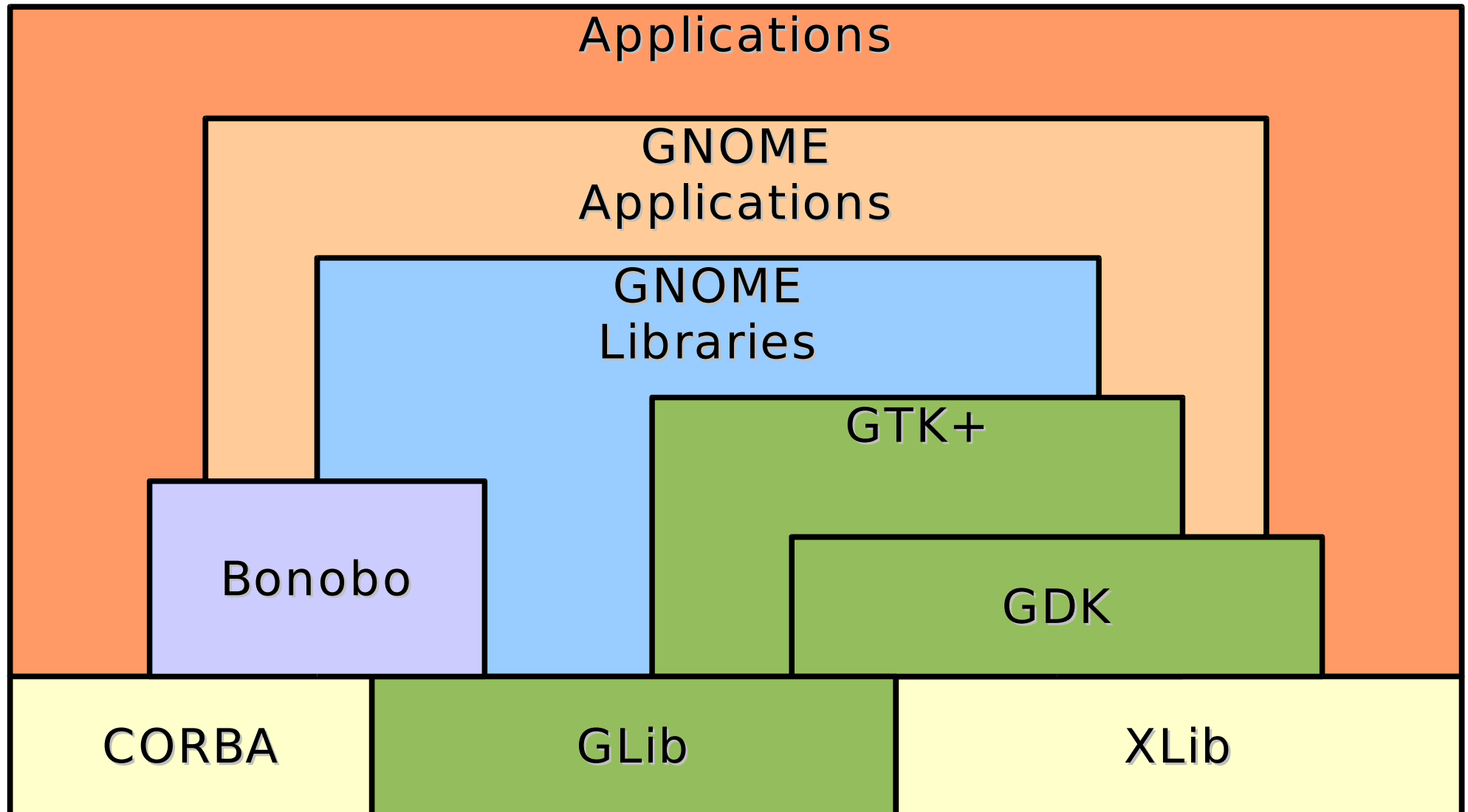
- Started in Aug 1997
 - by Miguel de Icaza
 - to provide a Free desktop for the GNU/Linux operating system.
- Why not KDE?
 - based on Trolltech's QT (license issues)
 - written in C++
- Why GTK+?
 - written in C
 - LGPL
 - already used by The GIMP, a popular Free software project.

GNOME provides...



- ☛ for Users:
 - ☛ a complete, free and easy-to-use "Desktop Environment"
- ☛ for Developers:
 - ☛ a powerful application "Development Framework"
- ☛ <http://www.gnome.org/about/>

GNOME at a glance...





Developer's Perspective

GLib & GObject



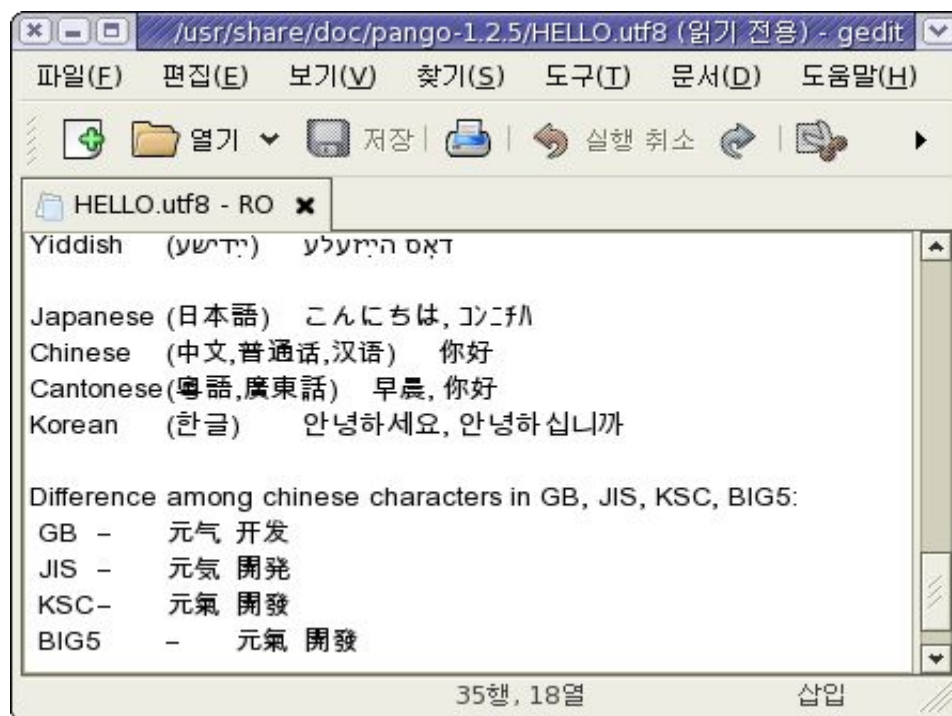
€ GLib

- € fundamentals: basic types and macros
 - € core application support: event loop
 - € utilities: thread, string, scanner, xml parser...
 - € data types: linked list, hash table, tree ...
- *Pleasant, Convenient and Portable*

€ GObject

- € generic type system
 - € fundamental type implementations
 - € signal system & notification mechanism
 - € parameter/value system
- *Easy to Map (into Other Languages) Object Oriented Framework for C*

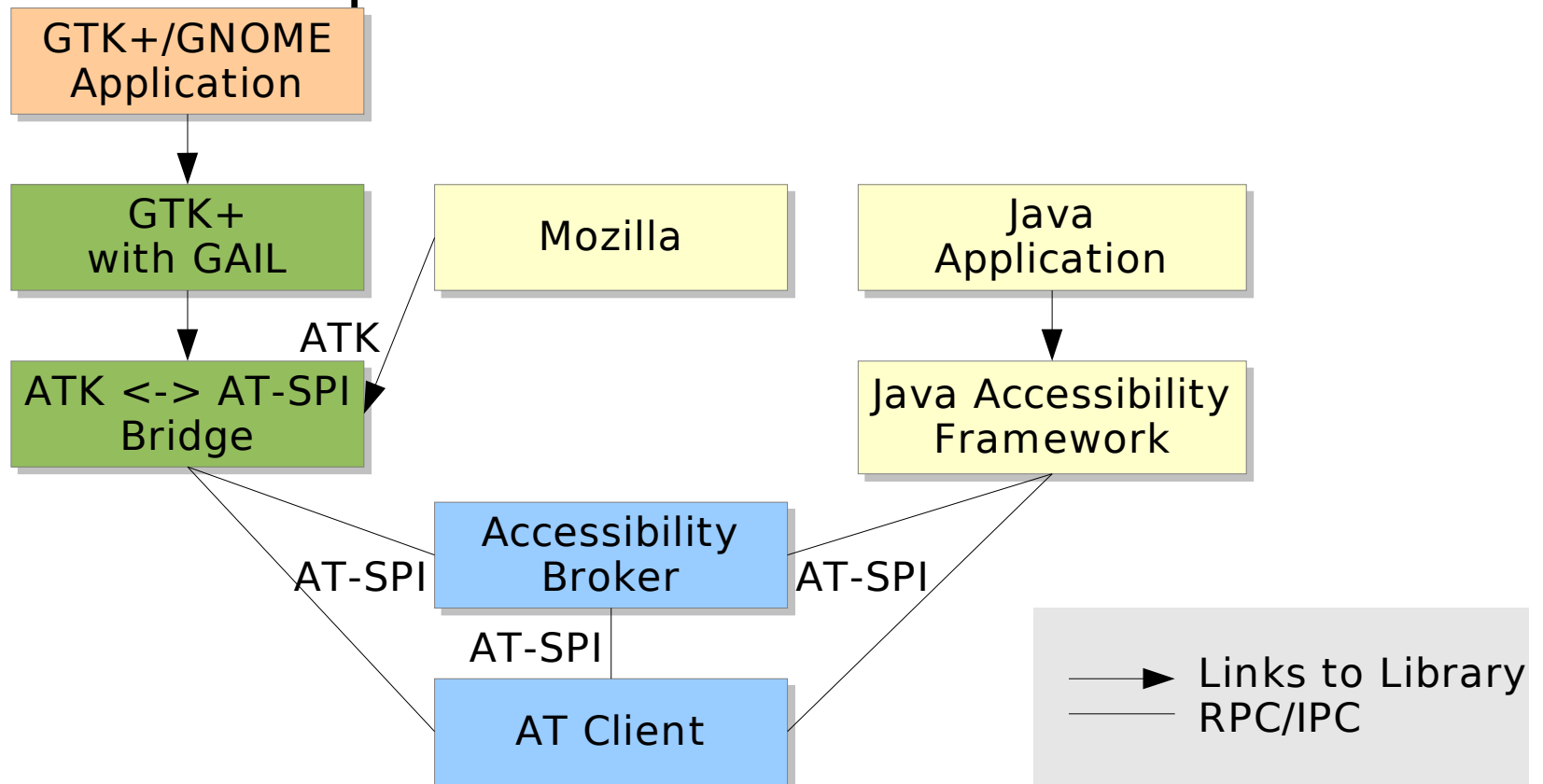
- Pango (Παν 語)
 - Greek "Pan" (All) + Japanese "Go" (Language)
 - the layout and rendering framework of internationalized text



• ATK : Accessibility ToolKit

• a Set of interfaces for accessibility

• GAIL is an implementation of ATK for GTK+



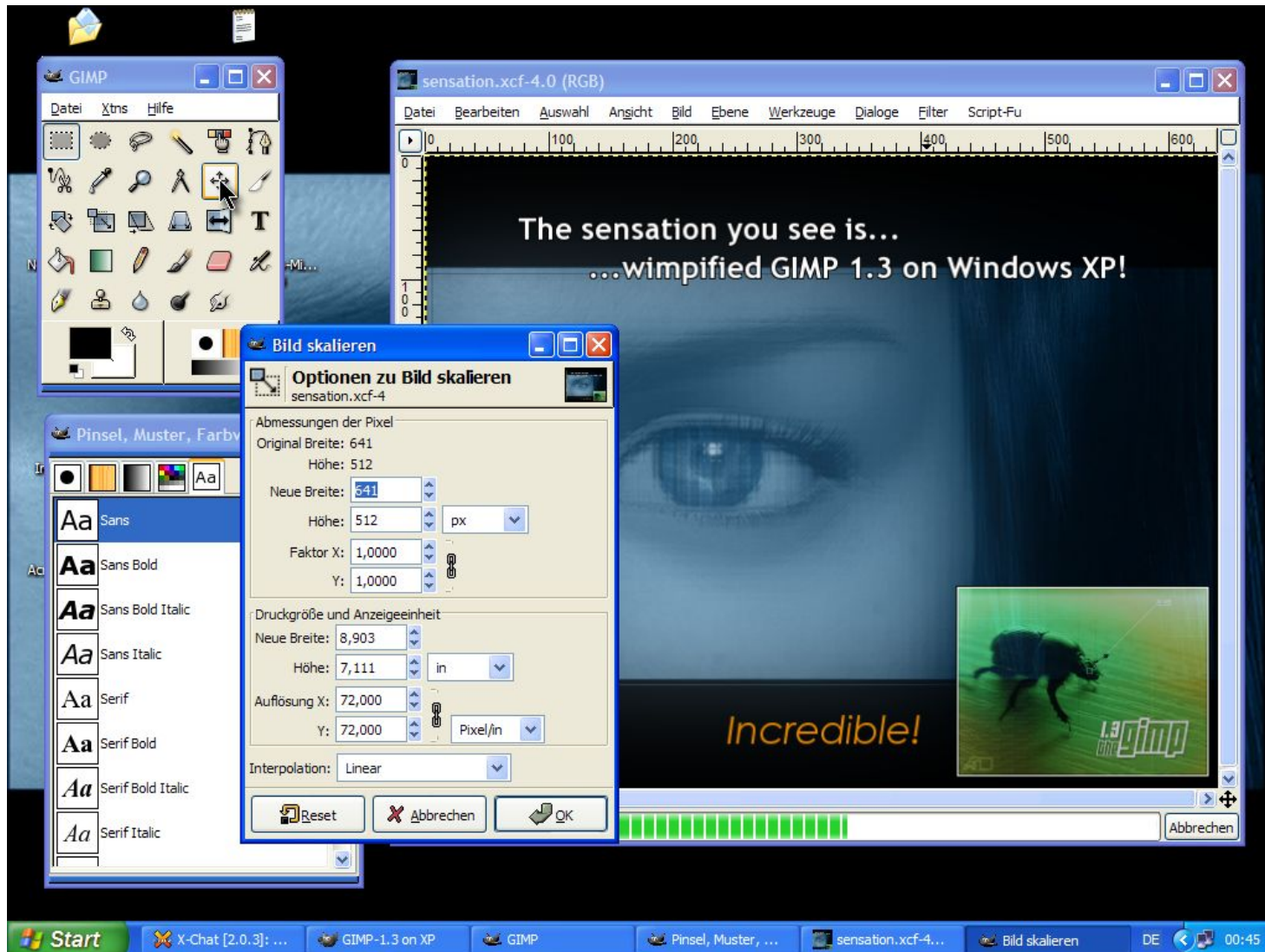
GDK & GdkPixbuf



- ☛ **GDK : GIMP Drawing Kit**
 - ☛ a wrapper around the low-level functions for accessing the underlying windowing functions (Xlib in the case of the X-Window)
 - ☛ easy to port into other windowing systems
- ☛ **GdkPixbuf**
 - ☛ image loading with custom loader
 - ☛ client-side (in memory) image manipulation
 - ☛ replaces imlib

- ☛ GTK+ : **G**IMP **T**ool**K**it
 - ☛ C-based Object Oriented API
 - ☛ works on many Unix-like platforms(X-Window), Windows, Framebuffer devices, and Console ...
 - ☛ Rich Widget Set
 - ☛ basic widgets: GtkEntry, GtkButton, ...
 - ☛ layout managers: GtkBox, GtkTable
 - ☛ complex widgets: TreeView, TextView
 - ☛ common dialogs: File/Font/Color/Input
 - ☛ action-based Menu/Toolbar
 - ☛ Themeable Look & Feel
 - ☛ Supports XIM and Custom Input Method
 - ☛ we have "**nabi**" & "**imhangul**" ;D
 - ☛ LGPL

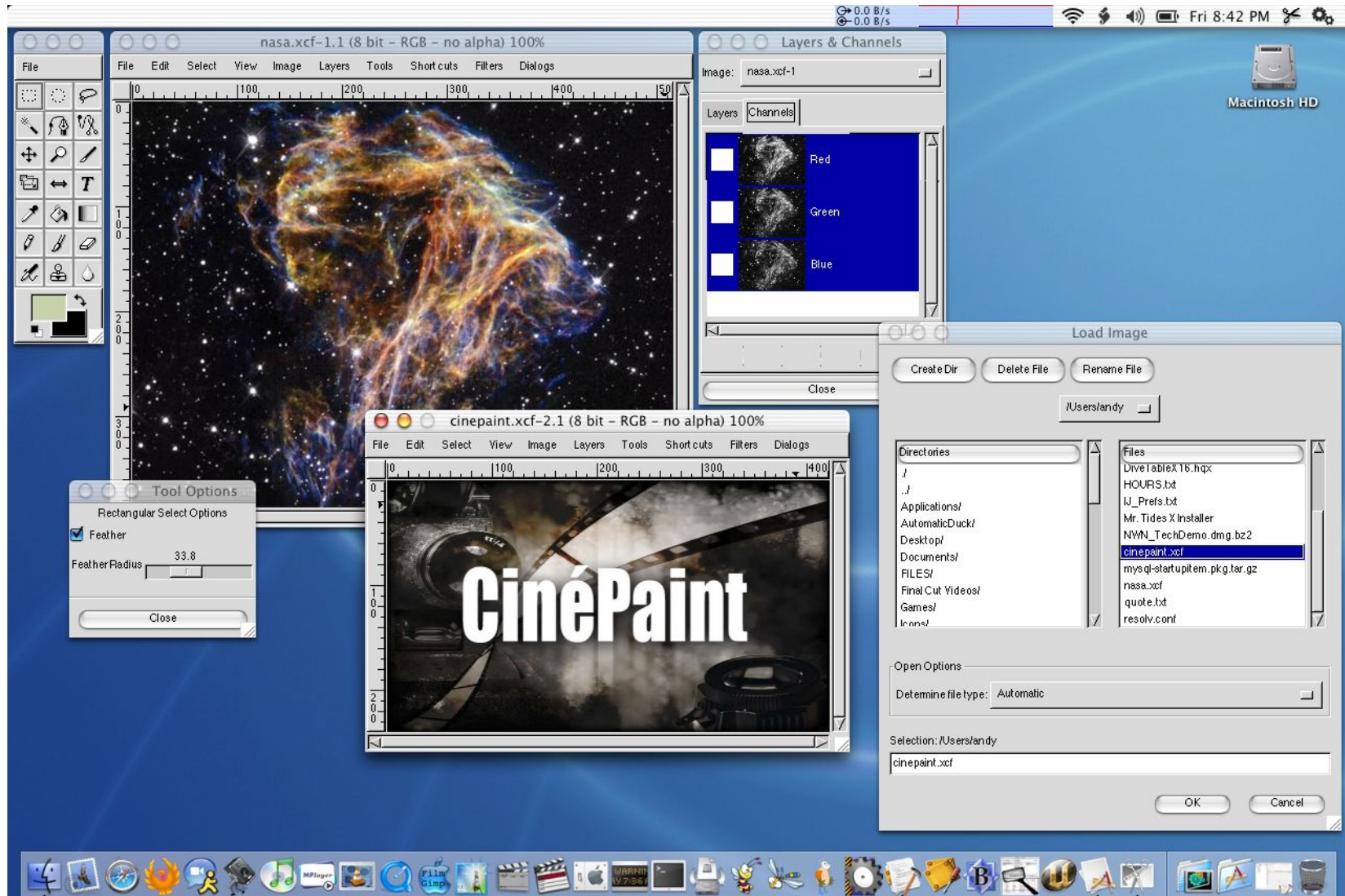
GTK+ on Win32



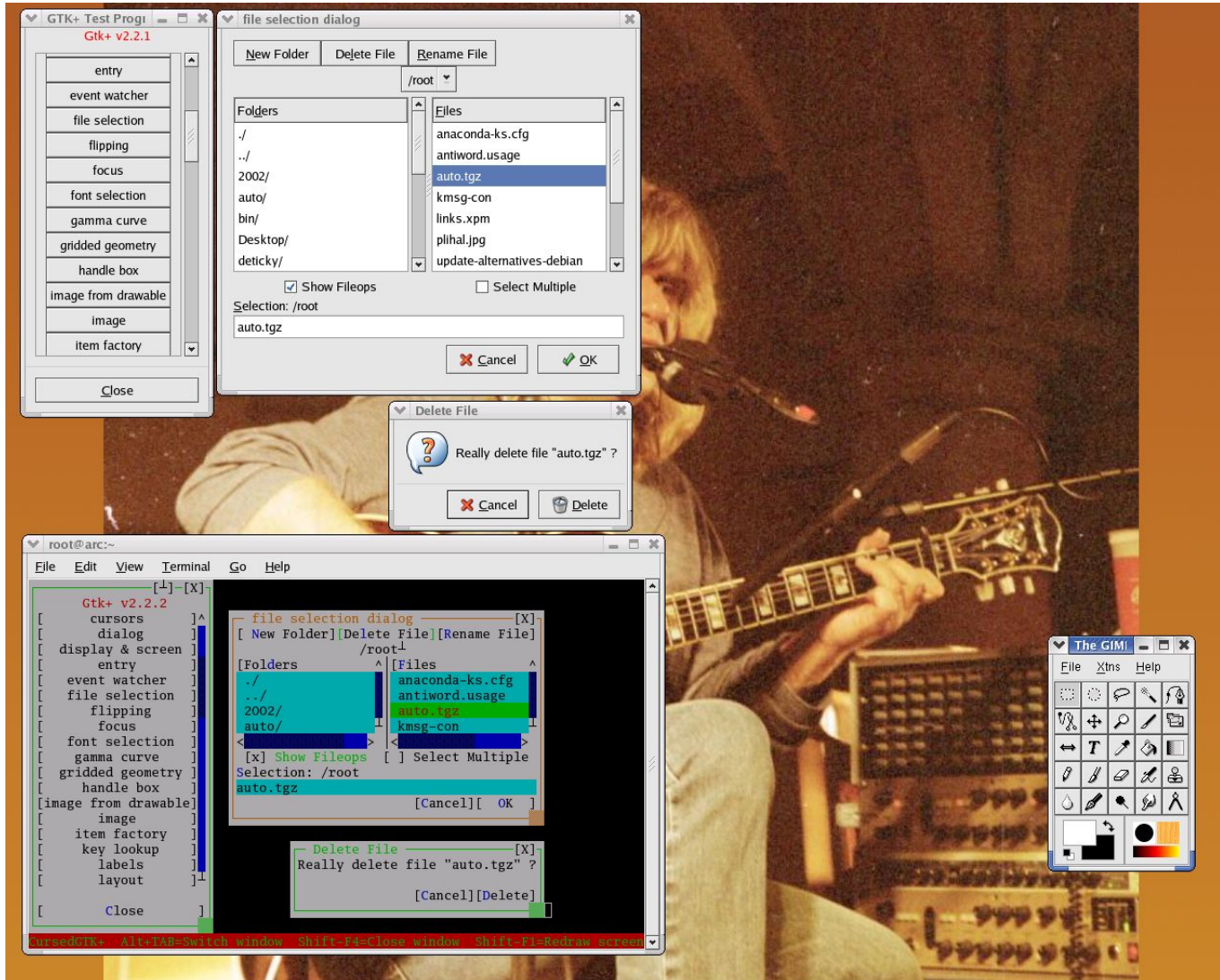
GTK+ on DirectFB



GTK+ on OSX



GTK+ on Console



Component Model



☛ Bonobo

- ☛ the Component Model of the GNOME
- ☛ provides:
 - ☛ interfaces with CORBA IDL
 - ☛ wrappers with C
 - ☛ implementation with any language
- ☛ assists in the Implementation of:
 - ☛ Components
 - ☛ Controls
 - ☛ Compound Document Support

☛ ORBit

- ☛ a CORBA implementation with a C mapping of the CORBA 2.2 specification

GNOME Libraries [1]



☛ GNOME VFS

- ☛ makes accessing various kinds of file systems transparent to the user and developer
- ☛ local files, HTTP, FTP, WebDAV, NNTP ...

☛ GNOME Canvas

- ☛ widget to create custom displays using stock items such as circles, lines, text, ...
- ☛ originated from a port of the Tk canvas

☛ GNOME Print

- ☛ extends GNOME Canvas widget to printing devices

GNOME Libraries [2]



- **GConf**
 - manages application configuration data in a tree structure
 - replaces gnome-config
- **GNOME DB**
 - a free unified data access architecture
 - libgnomedb / libgda
- **GStreamer**
 - multimedia framework
 - graph structure of multi-threaded pipelines
 - intelligent plugin architecture

GNOME Libraries [3]



- libglade
 - builds the interface from an XML file (.glade) at runtime
- libXml2 / libXSLT
 - aka GNOME-XML
 - full featured XML C parser and toolkit
- gtkhtml3
 - simple HTML view/edit widget
- libcroco, librsvg, and so on...

Language Bindings

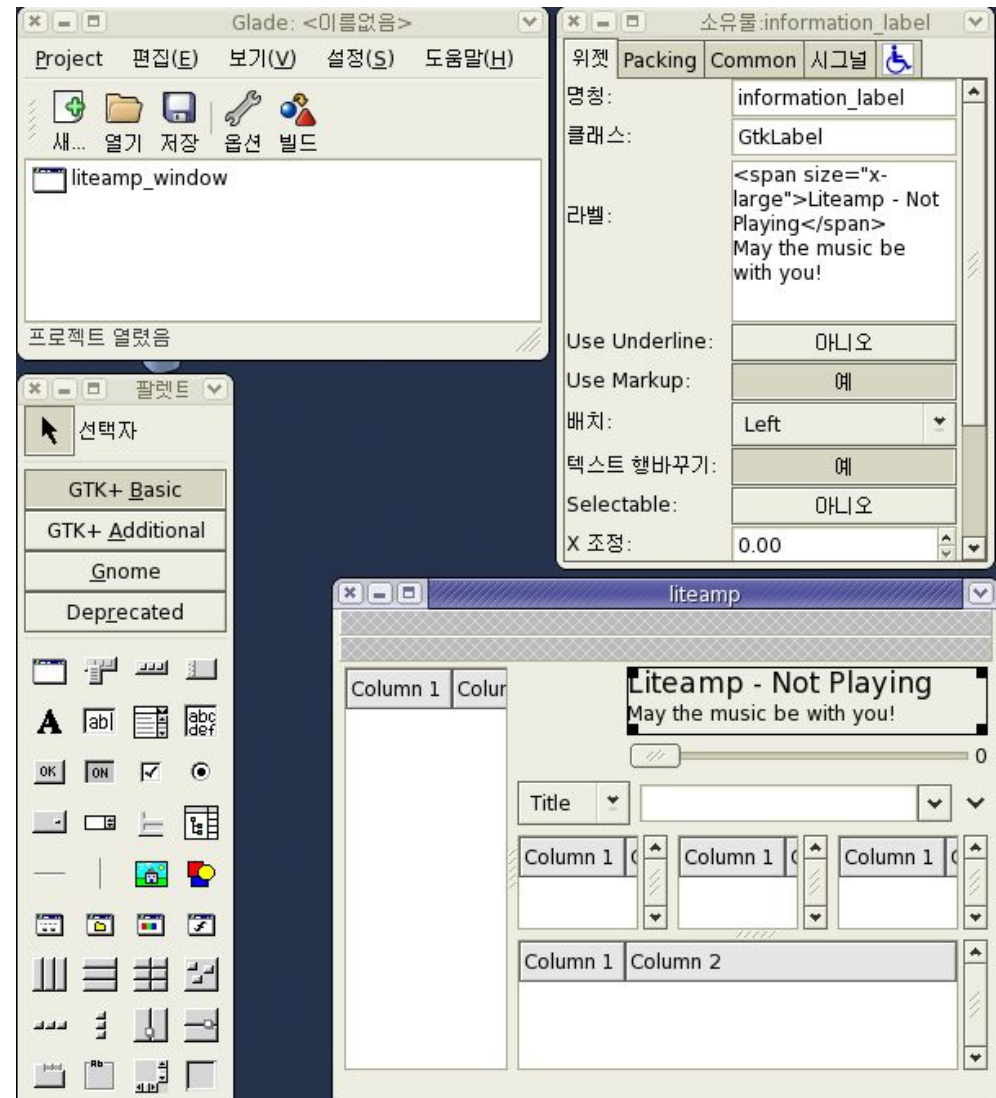


Language	Binding	Homepage
Ada	GtkAda	http://libre.act-europe.fr/GtkAda/
C++	Gnomemm/gtkmm	http://www.gtkmm.org/
C++	Inti	http://inti.sourceforge.net/
C#	GTK#/Mono	http://gtk-sharp.sourceforge.net/ http://go-mono.com/
Java	Java-GNOME	http://gtk-sharp.sourceforge.net/
Objective-Caml	LablGTK	http://wwwfun.kurims.kyoto-u.ac.jp/soft/olabl/lablgtk.html
Perl	gtk2-perl	http://gtk2-perl.sourceforge.net/
Python	PyGnome/PyGTK	http://www.daa.com.au/~james/pygtk/
Ruby	Ruby-GNOME2	http://ruby-gnome2.sourceforge.jp/
Scheme	Guile-gtk/Guilt-gobject	http://www.gnu.org/software/guile-gtk/
TCL	Gnocl	http://www.dr-baum.net/gnocl/

Developer Tools



- GNU Build Tools
 - autoconf, automake, libtool ...
- Glade GUI Builder
 - WYSIWYG GUI Designer & Code Generator
- DevHelp
 - MSDN style API document browser
 - <http://lidn.sf.net/>

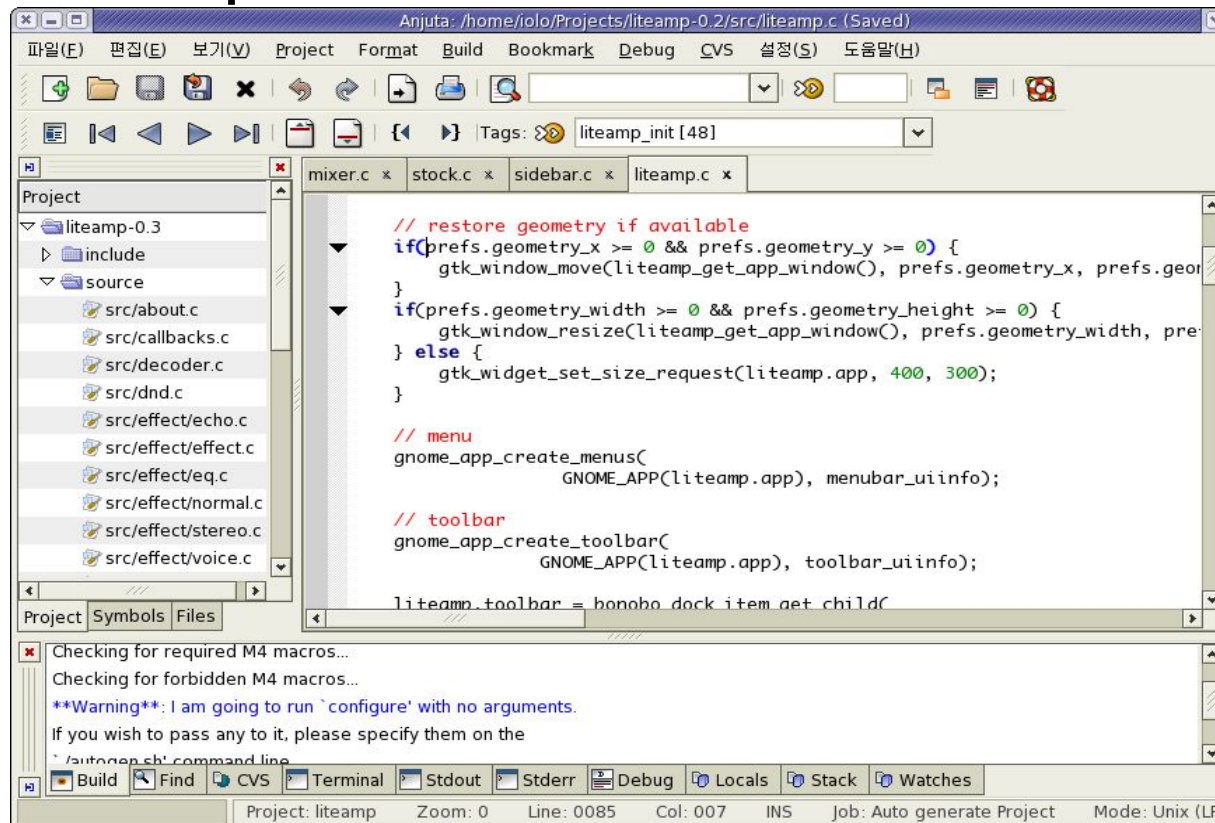


Developer Tools



• Anjuta

- Full Featured IDE for GNOME/GTK+ Application Development



Developer Tools [3]



- ☛ Scaffold
 - ☛ aka Anjuta2
 - ☛ Light-weight and (more) GNOME-compliant fork of Anjuta
- ☛ GOB: **G**Object **B**uilder
 - ☛ generates GObject-based .c/.h files from Java-like .gob source file
 - ☛ everybody loves screenshot ;)

```
Terminal
lesZ gob gtk-button-count.gob
lesZ
```



User's Perspective

GNOME Desktop

Core Applications [1]



- gnome-panel – launcher & applet dock
- control-center – user preferences
- nautilus - desktop & file manager
- gnome-session – session manager
- gdm – display manager
- metacity – window manager
- bug-buddy - bug reporting tool
- eog – image & image collection viewer
- epiphany – web browser
- file-roller - archive manager
- gcalctool - desktop calculator

GNOME Desktop

Core Applications [2]



- gedit - syntax highlight text editor
- gnome-terminal - multi-tabbed terminal
- ggv - postscript viewer
- gnome-meeting - H.323 teleconferencing
- gnome-network
- gnome-system-monitor
- gnome system tools
- gpdf - PDF viewer
- gucharmap - unicode character map
- rhythmbox - iTunes-style music manager
- yelp - help(info, man) browser

GNOME Desktop Core Applications [3]



- zenity - display dialogs from scripts
- gnome-applets
- gnome-games
- Nautilus Viewer Components:
 - nautilus-media
 - nautilus-cd-burner
 - gtksourceview
 - fontilus
- Accessibility Tools
 - gnopernicus - screen reader
 - gok - dynamic on-screen keyboard

GNOME Fifth Toe [1]



- Stable, Maintained, and Conform to GNOME HIG
- Development
 - ghex - binary editor
 - gob - GObject builder
 - meld - visual diff & merge tool
 - memprof - memory profiling and leak detection
 - regexxer - multi-file search & replace tool
- Entertainment
 - gcompris - education game suite
 - gtetrinet - tetrinet client

GNOME Fifth Toe [2]



☛ Internet

- ☛ gnomeicu - ICQ client
- ☛ balsa - email client
- ☛ drivvel - LiveJournal Client
- ☛ gaim - multi-protocol IM client
- ☛ galeon - web browser
- ☛ gURLChecker - web links checker
- ☛ heartbeat - server & service monitor
- ☛ pan - usenet news reader
- ☛ ticker - stock ticker
- ☛ tsclient - rdesktop/vnc frontend
- ☛ xchat - IRC client

GNOME Fifth Toe [3]



☛ Video/Sound

- ☛ camorama - webcam application
- ☛ gnomeradio - FM-radio tuner
- ☛ gthumb - an image viewer and browser ut
- ☛ streamtuner - a stream directory browser
- ☛ totem - movie player

☛ Misc.

- ☛ gdeskcal - skinnable desktop calendar
- ☛ gchord - guitar chord & scale database
- ☛ gswitchit - xkb toolkit
- ☛ seahorse - gnupg frontend
- ☛ seti-applet - panel applet for seti@home



☛ Productivity

- ☛ dia - Visio-style diagram drawing
- ☛ gnotime - time tracker/billing
- ☛ abword - word processor
- ☛ gpaint - small easy-to-use painting
- ☛ mergeant - visual database management
- ☛ planner - project management
- ☛ workrave - RSI prevention

GNOME Office



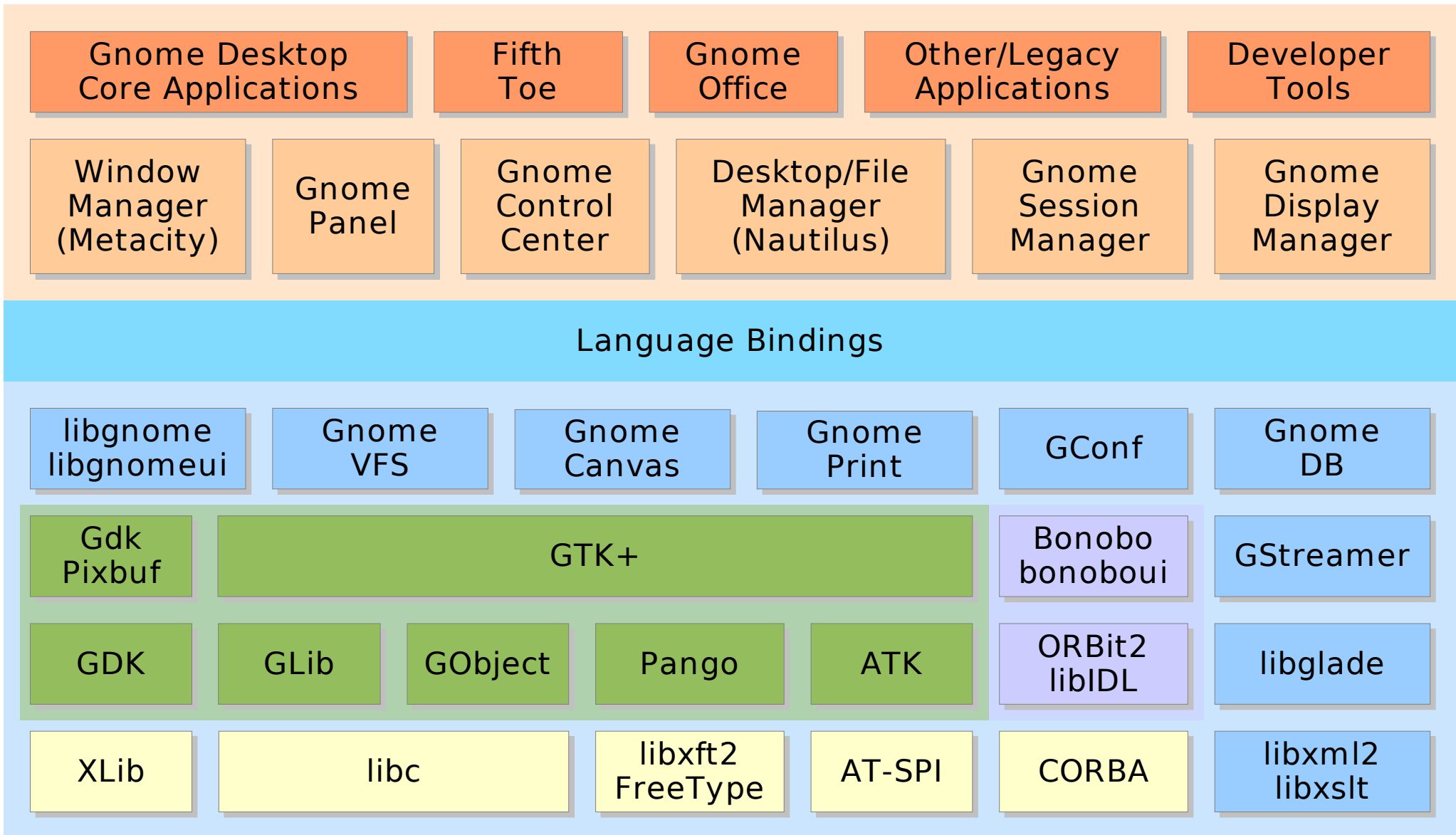
- abword - word processor
- conglomerate - xml editor
- dia - Visio-style diagram drawing
- evolution - mail client with PIMS
- gfax - free frontend to the various facsimile programs
- gimp - bitmap image manipulation
- gnucash - personal finance manager
- gnumeric - spread sheet
- mergeant - visual database management
- planner - project management
- sodipodi - SVG-based illustration
- and so on...

Epilogue



Past, Present and Future

Overall Architecture



Past



- GNOME project announced - Aug 1997
- GNOME 1.0 - Mar 1999
- “October” GNOME 1.0.55 - Oct 1999
 - Gnome Bug Tracking System Introduced
- “Bongo” GNOME 1.2 - May 2000
 - Helix GNOME 1.2
 - My First GNOME Desktop ;)
- GNOME Foundation announced
– Aug 2000
- GNOME 1.4 - Sep 2000
 - Eazel Nautilus & Helix Evolution



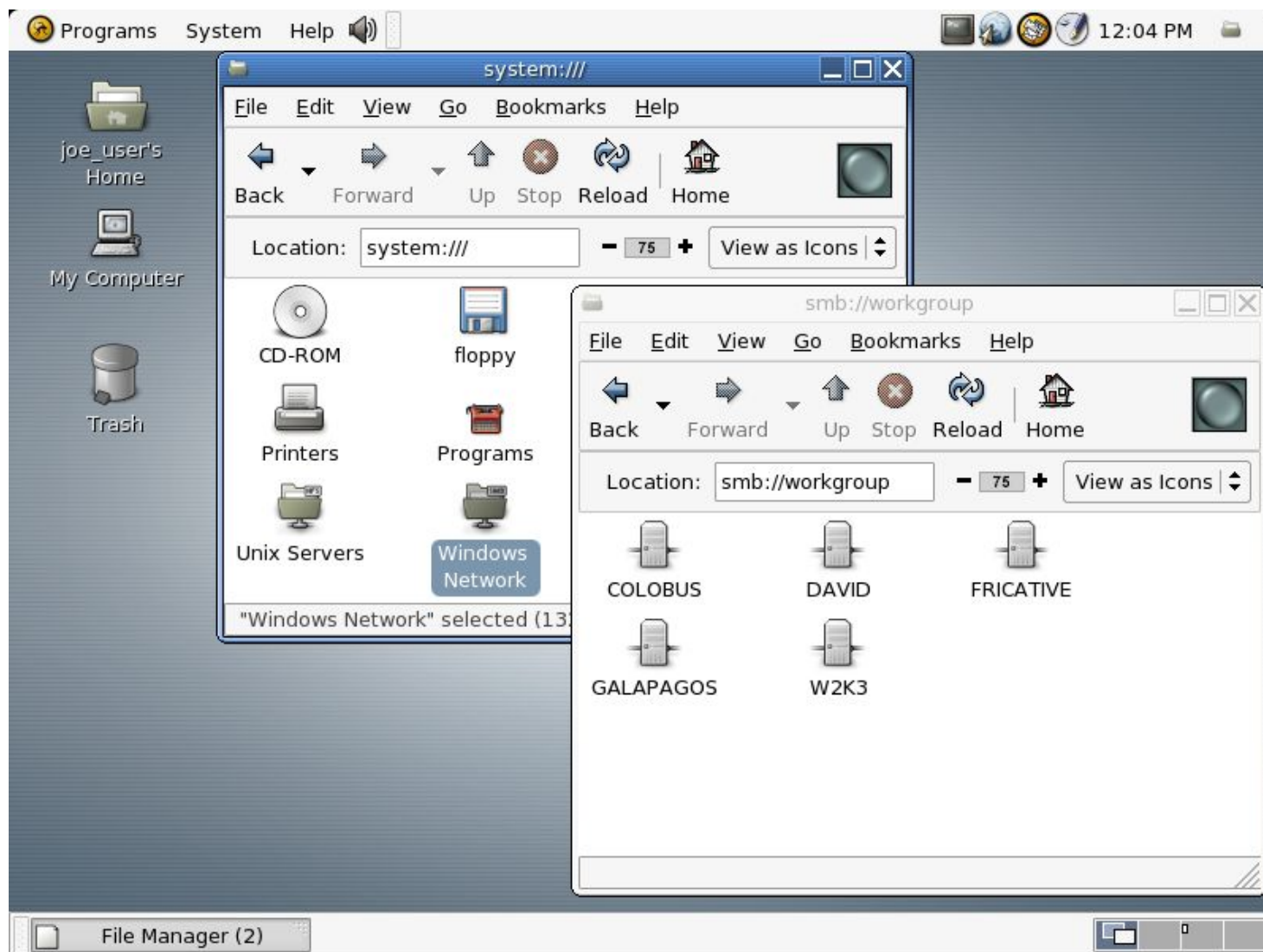
Present and Future



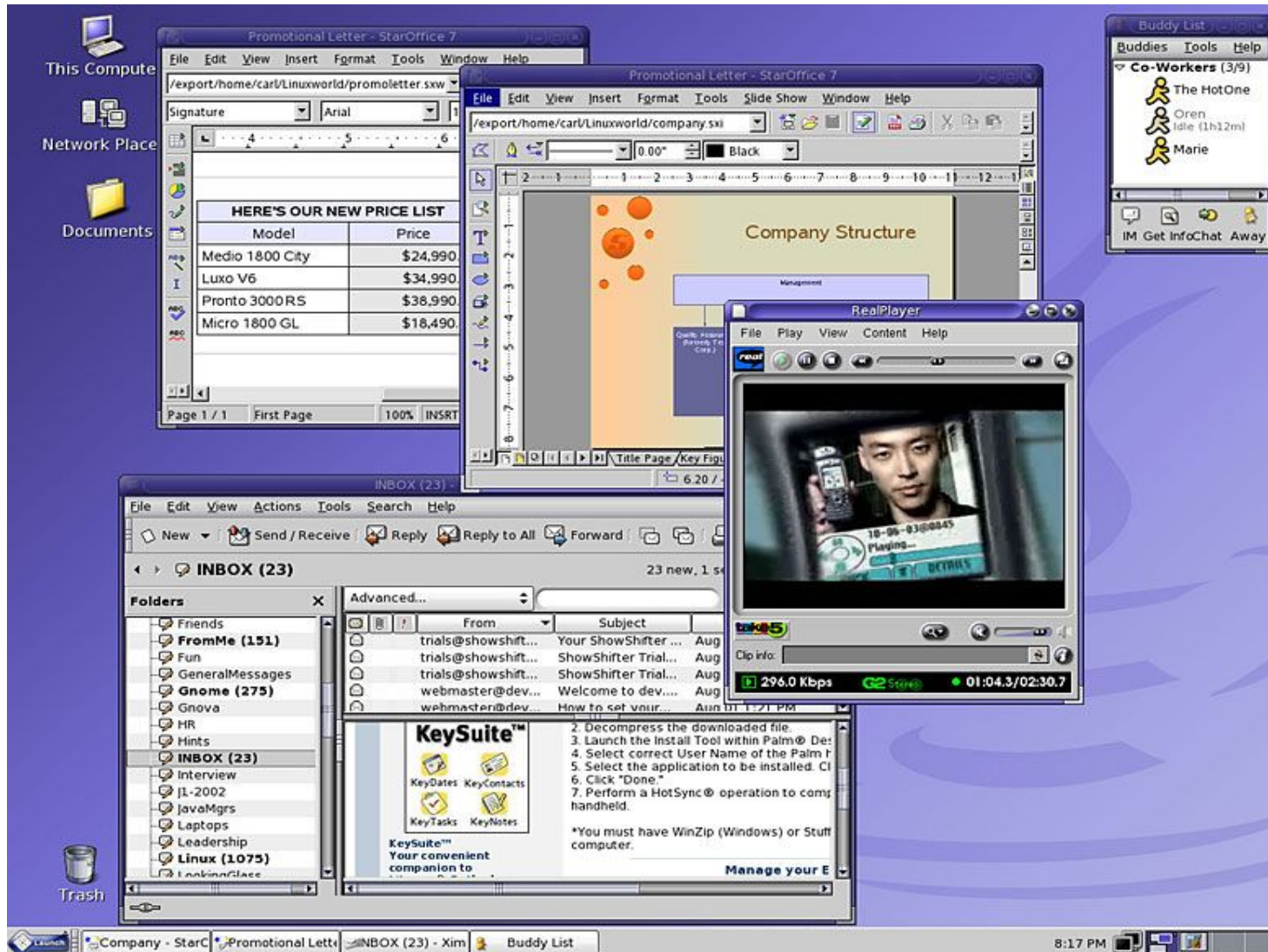
- GNOME 2.0 - Jun 2002
 - The first major upgrade with GTK+ 2.0
- GNOME 2.2 - Feb 2003
 - Ximian Desktop 2, Sun Java Desktop System
- GNOME 2.4 - Sep 2003
- GNOME 2.4.1 - Nov 2003
 - Latest stable release
- GNOME 2.5.0 - Nov 2003
 - Latest unstable release
- GNOME 2.6 - Mar 2004 ?
 - with GTK+ 2.4



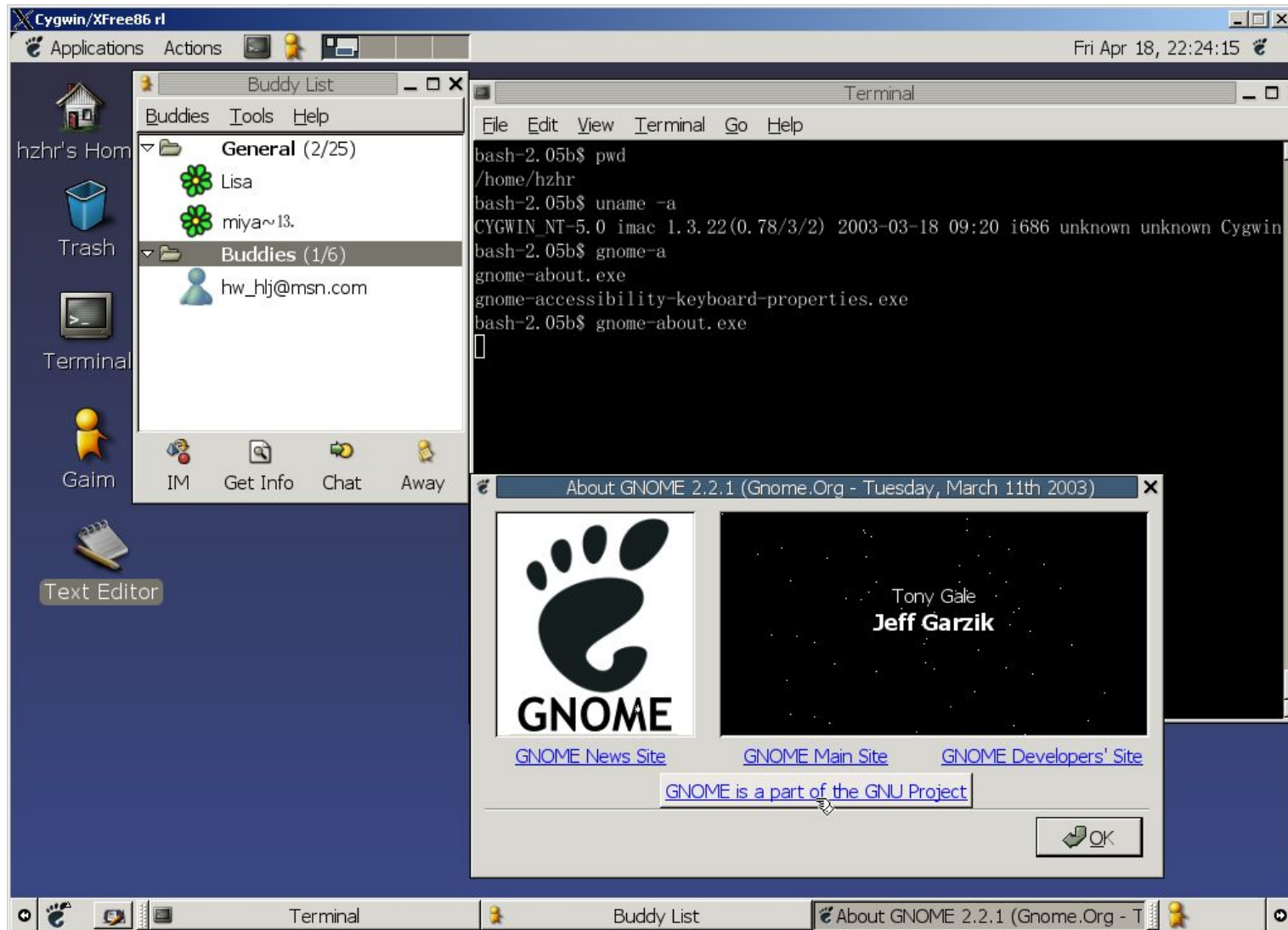
Ximian's Ximian Desktop 2



Sun's Java Desktop System

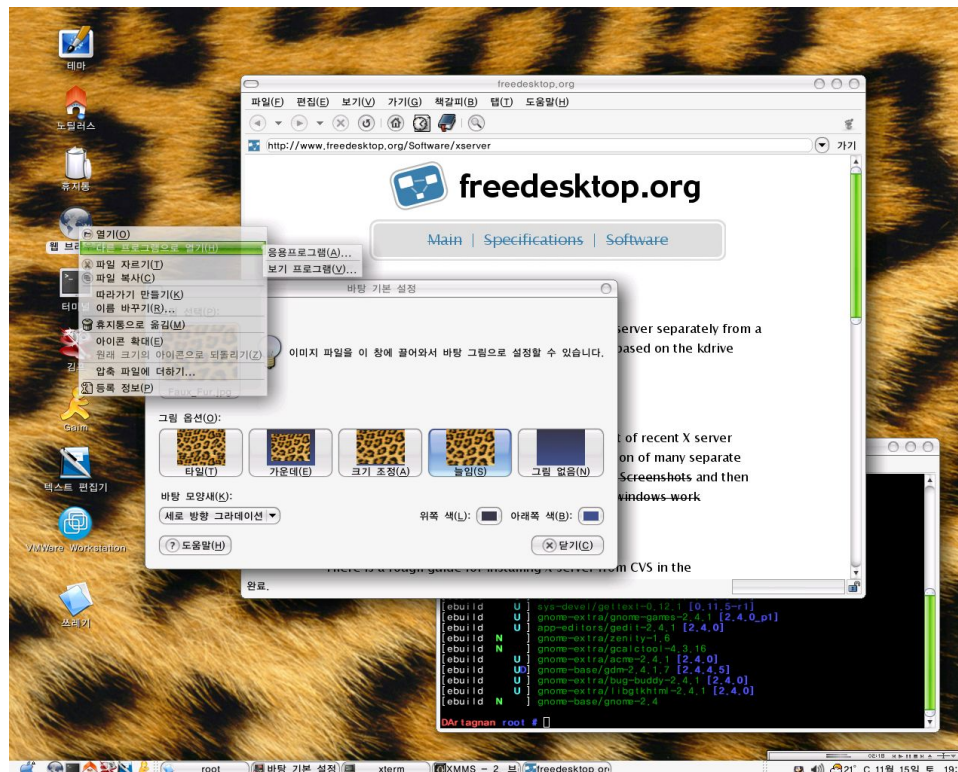


CyGnome 2.2.1

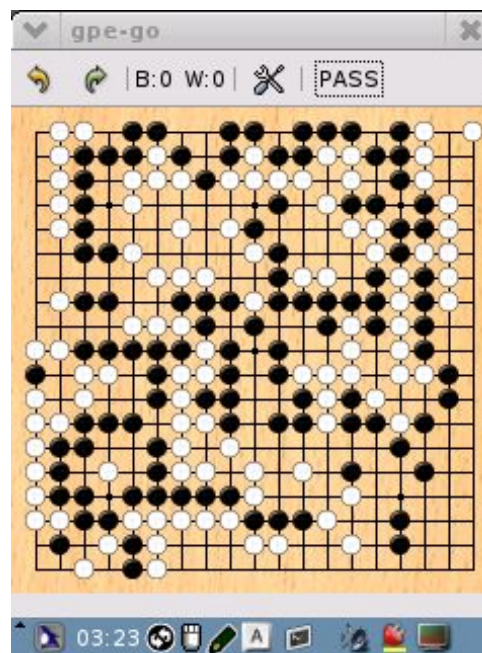


freedesktop.org

- freedesktop.org interoperability and shared technology for desktop environments for the X Window System



- GPE: The GPE Palmtop Environment
 - a Free software GUI environment for **palmtop/handheld computers** running the GNU/Linux operating system using X-Window system and GTK+



References



- ☺ GNOME Official Homepage - <http://gnome.org>
- ☺ GTK+ Official Homepage - <http://gtk.org>
- ☺ GIMP Official Homepage - <http://gimp.org>
- ☺ GNOME Korea Official Homepage - <http://gnome.or.kr>
- ☺ <http://primates.ximian.com/~miguel/gnome-history.html>
- ☺ Pango Official Homepage - <http://pango.org/>
- ☺ GNOME Accessibility Project - <http://developer.gnome.org/projects/gap/>
- ☺ GTK+ for Win32 - <http://www.gimp.org/win32/>
- ☺ GTK-Wimp - <http://gtk-wimp.sourceforge.net/>
- ☺ GTK+ for DirectFB - <http://www.directfb.org/gtk.xml>
- ☺ GTK+ for OSX - <http://gtk-osx.sourceforge.net/>
- ☺ Cursed GTK - <http://zempljanka.sourceforge.net/cursed/>
- ☺ ORBit2 - <http://www.gnome.org/projects/ORBit2/>
- ☺ GNOME DB - <http://www.gnome-db.org/>
- ☺ GNOME print - <http://www.gnome.org/projects/gnome-print/>
- ☺ GStreamer - <http://gstreamer.net/>
- ☺ libXml2/libXSLT- <http://www.xmlsoft.org/>
- ☺ GNOME Fifth Toe - <http://5toe.lyrical.net/>
- ☺ GNOME Office - <http://www.gnome.org/gnome-office/>
- ☺ <http://freedesktop.org>
- ☺ IBM developerWorks - <http://www.ibm.com/developerworks/>
- ☺ Miguel de Icaza Homepage - <http://primates.ximian.com/~miguel/>
- ☺ Special Thanks to <http://google.com> ;)